

**Министерство сельского хозяйства РФ
Департамент научно-технологической
политики и образования
Федеральное государственное бюджетное образовательное
учреждение высшего образования
«Воронежский государственный аграрный университет
имени императора Петра I»**

**Кафедра иностранных языков и деловой международной
коммуникации
Совет молодых ученых и специалистов**

АКТУАЛЬНЫЕ ПРОБЛЕМЫ АГРАРНОЙ НАУКИ, ПРОИЗВОДСТВА И ОБРАЗОВАНИЯ

**МАТЕРИАЛЫ II МЕЖДУНАРОДНОЙ ЗАОЧНОЙ
НАУЧНО-ПРАКТИЧЕСКОЙ КОНФЕРЕНЦИИ
МОЛОДЫХ УЧЕНЫХ И СПЕЦИАЛИСТОВ НА
ИНОСТРАННЫХ ЯЗЫКАХ**

(Россия, Воронеж, апрель 2016 г.)

Воронеж
2016

Печатается по решению научно-технического совета и совета молодых ученых и специалистов ФГБОУ ВО «Воронежский государственный аграрный университет им. императора Петра I»

УДК 338.431

ББК 65.315

А 43

А 43 Актуальные проблемы аграрной науки, производства и образования: материалы международной заочной научно-практической конференции молодых ученых и специалистов на иностранных языках (Россия, Воронеж, апрель 2016 г.) – Воронеж: ФГБОУ ВО Воронежский ГАУ, 2016. – 383с.

АКТУАЛЬНЫЕ ПРОБЛЕМЫ АГРАРНОЙ НАУКИ, ПРОИЗВОДСТВА И ОБРАЗОВАНИЯ

Данный сборник содержит статьи участников Международной заочной научно-практической конференции молодых ученых и специалистов на иностранных языках, которая проводилась в апреле 2016 года в Воронежском государственном аграрном университете имени императора Петра I. Рабочие языки конференции – английский, немецкий, французский и китайский. Публикация сборника материалов конференции позволяет ознакомить российских и зарубежных коллег с направлениями и результатами исследований молодых ученых и специалистов разных стран и расширить их научные контакты. Конференция была посвящена 85-летию кафедры иностранных языков и деловой международной коммуникации

URGENT ISSUES OF AGRICULTURAL SCIENCE, PRODUCTION AND EDUCATION

We proudly present collected articles of participants of the International Correspondence Conference on Agricultural Studies and Practical Work that was held in Voronezh State Agricultural University in April 2016. Languages used were English, German, French and Chinese. We hope that articles under consideration are to have not only Russian researchers, but their colleagues abroad acquainted with study trends and achievements of young scientists and experts, and enhance their academic contacts. The conference was dedicated to the 85th anniversary of the Department of Foreign Languages and Business International Communication of VSAU after Emperor Peter the Great.

Редакционная коллегия:

Н.И. Бухтояров, Н.М. Дерканосова, В.А. Гулевский, Ю.В. Некрасов,
А.С. Менжулова, Е.Н. Ромашова

ISBN 978-5-7267-0848-5

© Коллектив авторов, 2016

© Федеральное государственное бюджетное образовательное учреждение высшего образования «Воронежский государственный аграрный университет имени императора Петра I», 2016

***Секция I. Инновационные технологии в агрономии,
агрохимии и экологии***
***Section I. Innovative technologies in agronomy, agro-
chemistry and ecology.***

УДК 631.95:633.12

**Alpatova E.A.,
Stekolnikova N.V.**

**Voronezh State Agricultural University after Emperor Peter the
Great, Voronezh, Russia**

**INFLUENCE OF COMBINED SOWING OF HAIRY VETCH AND
BUCKWHEAT ON STRUCTURE AND PRODUCTIVITY OF
AGROPHYTOCENOSIS**

Аннотация: В работе рассматривается целесообразность использования вики мохнатой (озимой) для конструирования смешанного агрофитоценоза гречихи.

Ключевые слова: агрофитоценоз, бинарный посев, гречиха

The problem of constructing high-productive and environmentally sustainable agricultural ecosystems is one of the most complex and the least examined issues in agroecology [1].

In this respect, the aim of this research is to study the efficiency of combined sowing of buckwheat and hairy vetch (winter-annual).

Experimental research was conducted in Voronezh State Agricultural University in 2013-2014. Field experiments were carried out on the territory of Agrotechnology Educational Research and Technology Center in Voronezh State Agricultural University after. Peter the Great according to the following layout:

1. Buckwheat single-crop sowing (100 kg/ha)
2. Buckwheat binary sowing (100 kg/ha)+hairy vetch (15 kg/ha)

Buckwheat cultivation technology is recommended for Central Chernozem region. Conventional methods of laying out and experimenting were used in the research [2, 3].

As a result of the research performance, we determined that in case of combined sowing of hairy vetch and buckwheat the number of segetal plants was noted to decrease during vegetation. At the 3rd stage of

buckwheat organogenesis the number of weedage accounted for 22.8 pcs/sq m, which is less than single-crop sowing by 42%.

The number of field pansy, blindweed, treaclewort, sheepbine, quack grass reduced considerably. There a lack of such undesirable plants as duck-wheat and dindle in phytocenosis structure of binary sowing.

Weed species diversity increased greatly by the time of buckwheat fruitification. Knotgrass, green foxtail, barnyard grass, dindle, catchweed, green amaranth spread in agrocenosis. The number of weedage in binary sowing was 38% lower than in single-crop agrocenosis.

The average height of buckwheat plants at the 4th stage of organogenesis in single-crop and binary sowing was approximately the same (27.3-27.8 cm) but by the end of intensive growth of vegetative mass the height of buckwheat plants in combined sowing exceeded the height of the ones in single-crop sowing by 11 cm. Binary sowing had substantial advantage in the number of primary branches – 4.6 pcs/plant – and in the number of blossom clusters – 20.0 pcs/plant, which exceeded single-crop sowing by 35.3% and 16.9 %, respectively.

Leaf surface in joint agrocenosis of buckwheat and hairy vetch also considerably exceeded single-crop sowing at all stages of buckwheat development; at the 4th stage of organogenesis this number was exceeded by 6.1%; at the 8th stage – by 14.2%; at the 9th stage – by 34.6%; at the 10th stage – by 43.1%.

These numbers indicate that interspecific interactions in agrophytocenosis have positive effect.

Buckwheat productivity was formed in combined sowing with hairy vetch and accounted for 13.2 metric centners/ha, which exceeded single-crop sowing by 37.5%.

Accordingly using hairy vetch (winter-annual) to form interspecific agrophytocenosis provides optimal conditions for growth, development and high buckwheat productivity.

Список литературы:

1. Уразаев Н.А. Сельскохозяйственная экология / Н.А. Уразаев, А.А. Вакулин, А.В. Никитин и др., - М.: Колос, 2000. – 304 с.
2. Методы учёта, картирования и прогноз засоренности полей. - Воронеж, 1984. – 37 с.
3. Опытное дело в полеводстве. – М.: Россельхозиздат, 1982. – 190 с.

УДК 631.527

**Bezruchko O.,
Goncharov S.**

**Voronezh State Agricultural University after Emperor Peter the
Great, Voronezh, Russia**

CEREALS SEED LIFE CYCLE

Abstract: Cereals seed life cycle based on author's approach is calculated. Winter wheat varieties are listed in the National Register, and are commercialized for 14 years, and spring barley ones are for 15 years. Oat and spring durum wheat varieties are listed for 25 and 22 years correspondingly.

Key words: cereals seed life cycle, variety registration, National Register.

The seeds business is reasonable to explore from the standpoint of marketing, i.e. as the life cycle length of a product. The actual length of a variety life is considered as duration of its commercial use, or period of having margin from a product market introduction (a variety registration) till its withdrawal from the market. Actually, it is average period of listing a variety.

The shorter is life cycle of the product, the faster market growth is, especially in the conditions of high competition on the seeds market, high input technologies, and profitable crop production. New generation of varieties with better adding value (greater yield potential, better quality and adaptation) is able to increase the profitability of whole value chain from breeder till processor.

Fairness of the variety registration, patent protection and complicated certification has a direct impact on the pace of varieties flow in the National register and length of their life cycle. The CIS countries and the EU ones have common approach to the protection of intellectual property of seeds, and National registers populating.

Comparison of life cycle duration between field crops explains some details of crop competitiveness, attractiveness of markets for seed and other commercial products.

Materials and methods. Updated data of the National Register of the Russian Federation of cereals in 2015 [1], been interpreted with the author's method of variety life cycle calculation [2], served as source for initial data.

Results and discussion. National Register of breeding achievements admitted for use, contains a list of registered varieties in the year of its publication. New registered varieties entered there, leaving ones from the market are excluded.

There were 296 winter wheat varieties from by 60 breeders are listed in the National Register. Direct count of varieties listed annually shows a dynamic range that is insufficient for a variety life cycle calculation (fbg.1). For example it is possible to count the number of varieties listed by 2001 in updated National Register, but it is unknown number of withdrawn ones, as tracks are not available.

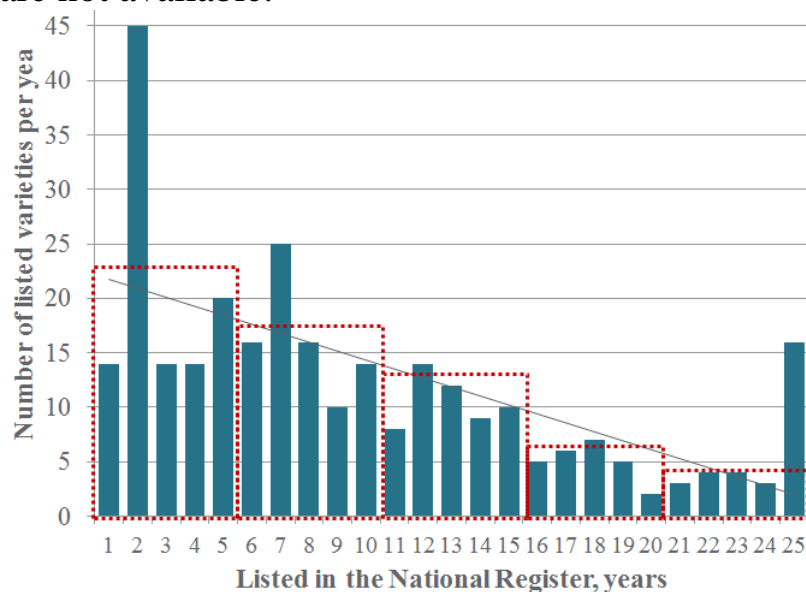


Fig.1. – Dynamic row of winter wheat varieties number with period of their listing

Let’s make the assumption that, the number of varieties, listed within five years, is constant, and combine varieties over the past 30 years, released during the five-year period of time in the group. There are 36% listed varieties are “new”; they are up to 5 years old; 27% are commercialized within 6-10 years, 5% 18% are used within 11-15 years and so on

Period of varieties registration, years	Varieties number per group	Share of group, %	Relative share compare to group <5 years	Staying in the group for a variety, years
<5	107	36%	100%	5.0
6-10	81	27%	76%	3.8
11-15	53	18%	50%	2.5
16-20	25	8%	23%	1.2
20-25	17	6%	16%	0.8
>26	13	4%	12%	0.6
Total	296	100%	-	13.8

Table 1. Calculation of a variety life cycle on winter wheat example, based on the National Register of Russia, 2015

It is evident, that all varieties not older 5 years will be listed in the National Register all period for 5 years. The varieties from the group 6-10 years old will be listed all the 5-years long period with probability 76%, or their input in life cycle is 3.8 years (5 years x 76%). The varieties from the group 11-15 years old will be listed all 4 years period with probability 50%, or their input in life cycle is 2.5 years. Adding all probabilities will receive average life cycle of winter wheat variety in Russia (14 years).

Similar procedures with other cereals varieties listed in the National registers demonstrate wide range of their commercial life circles (fig.2). Oat is a crop with longest variety life cycle (25 years) in Russia, and spring durum wheat has slightly shorter one. Winter durum wheat is comparatively new crop at the introduction stage of the grain market without significant acreage. Winter durum varieties have been listed only last 15 years only. Calculated by us life cycles of cereals are close to the results of Dr. Khalipsky assessment, who has reported about “length of registration period” such crops as winter rye (22.6 years), oat (18.1), common wheat (13.6), and barley (12.9) [3].

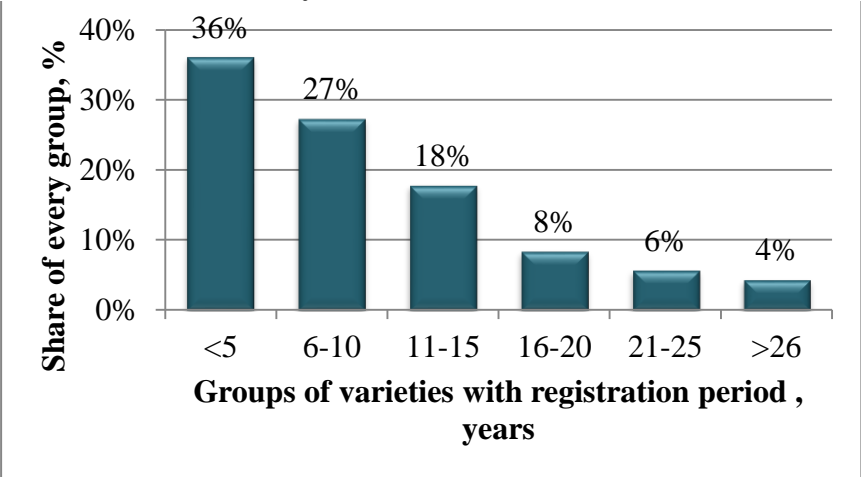


Fig.2. – Groups of winter wheat varieties with different period of their listing in the National Register

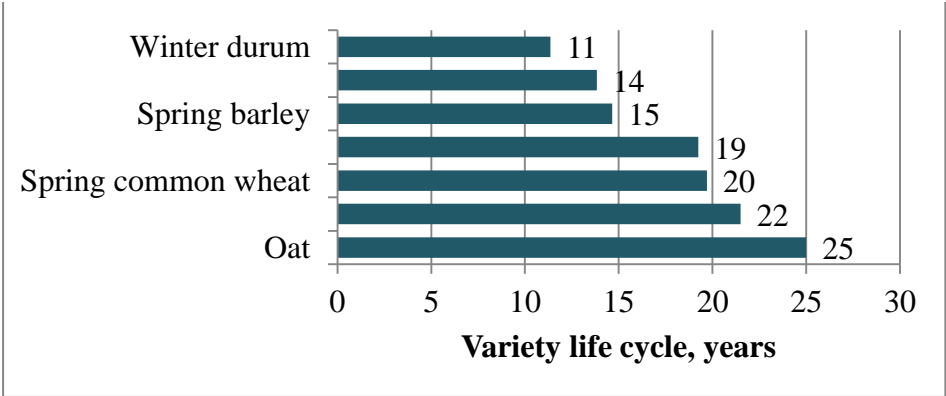


Fig. 3. - Variety life cycle of cereals varieties in Russia, 2015.

Common spring wheat varieties are commercialized longer, then

winter one, what is common for crops with less margin, and less input. Acreage per crop and acreage per variety in particular are other reasons for difference in life cycles. Both spring and winter wheat, and spring barley have the biggest acreage in this country, and taking in consideration seeds and seeds exchange rate, their seeds market are most attractive for seed business (table 2). High seed planting rate in terms of weight, and 87-95% share of farm saved seeds are main constrains there.

Crop	Listed varieties number	Acreage, mln, Ha	Seed rate, tons per Ha	Seed demand, mln tons	Seed exchange rate, %	Commercial seeds volume '000 tons	Seeds sales market, mln RUR
Spring oat	115	3.265	0.14	0.46	5%	22.9	230
Spring durum	48	0.5	0.20	0.10	5%	5.0	70
Spring common wheat	205	13.1	0.20	2.62	6%	157.2	1886
Winter rye	77	1.48	0.17	0.25	5%	12.6	150
Spring barley	202	8.045	0.20	1.61	13%	209.2	2720
Winter common wheat	292	13.1	0.23	3.01	10%	301.3	4520
Winter durum	25	0.1	0.20	0.02	8%	1.6	20

Table 2. Cereals seeds market calculation (without royalty)

Winter durum seed market is niche one and it is in beginning of its development. Seed exchange rate of spring barley is higher other cereals one due to malting varieties impact. Further seed market growth is expected by increase of seed exchange rate (share of commercial seeds). In common cereals are losing competition with oil seeds, corn, sugar beet, and other crops with higher margin. But from point of crop ratio, cereals share will not be reduced radically, and will be stabilized, especially in “row materials zones” close to grain markets.

Conclusions:

- 1) Variety life cycle of cereals takes from 11 (winter durum) till 25 (spring oat) years in Russia.
- 2) Winter and spring wheat seed market, and spring barley one as well are the biggest in terms of volumes and money both.
- 3) Cereals seed market potential without royalties is assessed as 9,6 bln RUR in 2015.

Список литературы:

1. Реестр селекционных достижений, допущенных к использованию в 2015 г. // www.gosort.com
2. Гончаров С.В. Жизненный цикл сортов озимой пшеницы // Бюллетень СНИИСХ. - Ставрополь: АГРУС Ставропольский ГАУ, 2013. - №5. – С. 21-28.

3. Халипский А.Н. Роль агроэкотипа и фона возделывания в эффективности сортосмены полевых культур в Красноярском крае: Диссертация на соискание ученой степени доктора сельскохозяйственных наук, - Краснодар, КНИИСХ, 2009. – 285 с.

УДК 631.8:631.445.4

**Berdnikova T.N.,
Stekolnikova N.V.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

**AGROECOSYSTEMS MONITORING OF LTD
"BUTURLINOVSKY AGROCOMPLEX" IN BUTURLINOVSKY
DISTRICT OF VORONEZH REGION**

Аннотация: В статье приводятся результаты оценки экологического состояния территории сельскохозяйственного предприятия по почвенным и ботаническим критериям и воздействию экологически опасных объектов на состояние атмосферного воздуха.

Ключевые слова: мониторинг, агроэкосистема, экологический риск, ветровая эрозия, агроценоз, ботанический критерий, засоренность.

At present to maintain the ecological balance of the landscape it is necessary to carry out agroecological monitoring.[1].

The purpose of this work is to monitor agroecosystems of LTD "Buturlinovsky Agrocomplex" in Buturlinovsky district of Voronezh region.

The study of agroecosystems was carried out according to the scheme of complete agroecological monitoring.

The results of the research showed that the humus content in farms arable soils of 1303 hectares decreased from 6.9% in 2009 to 5.7% in 2013, which corresponds to 79 % of the original and is in the limits of environmental risk. On arable land of 1213 hectares, a decline was from 7.5% to 6.3%, or 81% of the initial content that corresponds to the limits of environmental regulations.

The total area of eroded land was 1985 ha or 43% of the area of the farm that is in the limits of ecological crisis.

The degree of gully ruggedness of 0.75 km/km² is the zone of

ecological crisis.

Wind erosion on the farm did not spread, which corresponds to the norm (table. 1).

57 species of vascular plants belonging to 19 families were found in agrocenoses. The greatest number of species includes the cruciferous family – 12, Asteraceae family – 8, cereals – 7, lamiaceae – 5 other families include 1-2 plant species.

Indicator	Normal	Risk	Crisis	Disaster
The humus content (% of initial)	> 90	70-90	30-70	< 30
LTD "Buturlinovsky Agrocomplex"	81%	79%	-	-
The area of water erosion (% area)	< 10	10-25	25-50	> 50
LTD "Buturlinovsky Agrocomplex"	-	-	43%	-
Gully compartmentalization (km/km ²)	< 0.3	0.3-0.7	0.7-2.5	> 2.5
LTD "Buturlinovsky Agrocomplex"	-	-	0.75 (km/km ²)	-
Area wind erosion (% area)	< 5	5-15	15-25	> 30
LTD "Buturlinovsky Agrocomplex"	-	-	-	-

Table 1. Soil indicators of zones of normal (N), risk (R), crisis (K) and disaster (B)

In different crops, the abundance of weeds varies. Especially high abundance of weeds is observed on the borders fields with roads and forest belts. Such weeds as a field sow Thistle, chamomile odorless, common winter cress, knotweed, shepherd's purse, the weed field create monospecific thickets.

Pollution of agricultural lands is mostly medium. According to the botanical criteria agricultural lands belong to the zone of risk.

Pasture productivity is very low fluctuating from 33 to 48 % of the potential. The total area of the broken pastures was 105 ha. By this indicator the territory of the agricultural landscape should be to the zone of ecological crisis (table. 2).

Indicator	Normal	Risk	Crisis	Disaster
Infestation of crops (% of weeds)	< 10	20-50	60-90	> 90
LTD "Buturlinovsky Agrocomplex"	-	18-24%	-	-
The productivity of pasture vegetation (% of potential)	> 80	60-70	10-60	<5
LTD "Buturlinovsky Agrocomplex"	-	-	33-48%	-

Table 2. Plant indicators of areas of environmental norms (N), risk (R), crisis (K) and disaster (B)

Sources of pollutant emissions into the atmosphere are: the engines of vehicles and machinery, welding station, stables for the cows, grain warehouse, mills, silos, manure storage sites.

The farm has 37 sources of pollutants including those organized by 1 (boiler pipe), and 36 unorganized. The total of annual waste products 3.59 t., including 0.021 t/year solid, 3.57 t/year.

The main pollutants are carbon oxides, nitrogen dioxide, ammonia, hydrogen sulfide, dust grain and animal origin. Concentrations of pollutants is not higher than the established standards.

The condition of the free air on the territory of industrial enterprises and residential zones is within the normal range, i.e. it is not the source of the impact on the environment and human health (table. 3).

Indicators	Environmental parameters			<i>LTD</i> <i>Buturlinovsky</i> <i>Agrocomplex"</i>
	Disaster	Crisis	Normal	
Sulfur dioxide, mg/m ³	> 2	0.1 – 0.2	< 0.02	0.011
Nitrogen dioxide, mg/m ³	> 0.3	0.2 – 0.3	< 0.03	0.015
Hydrogen fluoride, mg/m ³	> 0.02	0.01 – 0.02	<0.002–0.003	0.001

Table. 3 Critical loads and critical levels of pollutants in ambient air

Thus, the condition of agroecosystems LTD in "Buturlinovsky Agrocomplex" is characterized by a significant level of human impact on the landscapes and for the stabilization and subsequent improvement of the environmental situation of the farm territory are necessary measures for its reduction.

Список литературы

1. Агрэкологія/ В.А.Черніков, Р.М. Алексахін, А.В. Голубев и др.; Под ред. В.А.Черникова, А.И. Чекереса. – М.: Колос, 2000.– 535 с.
2. Определитель сорняков Центрального Черноземья / К.И. Александрова, Г.И. Барабаш, Г.М. Камаева, Н.С. Камышев. – Воронеж, 1975. – 276 с.
3. Житин Ю.И. Агрэкологічэскі моніторынг/Ю.И. Житин, Л.В. Прокопова. – Воронеж: ФГОУ ВПО ВГАУ, 2011.– 272 с.

**Borovkova A. N.,
Khromykh Y. V.,
Kryukova T. I.**

THE EFFECT OF PLANT GROWTH REGULATOR ON GERMINATION ENERGY AND LABORATORY GERMINATION OF SUDAN GRASS AND SORGHUM SEEDS

Abstract: this article provides experimental data on the effects of the Cavita Biocomplex growth regulator on sowing qualities of Sudan grass and sorghum seeds

Key words: Sudan grass, sorghum, plant growth regulators, germination capacity, germination energy

One of the most important objectives of modern agroindustrial complex of Russia is reliable and consistent food supply of the population under market economy conditions. The production sector in its turn is responsible for providing the country with high-quality raw materials.

It is virtually impossible to provide the population with livestock products without a strong fodder base. The matter of increasing high-quality feed production becomes more urgent in conditions of Central Black Earth region.

We should not underestimate the value of such an important feed crop as Sudan grass as it can help to create a strong fodder base for livestock breeding needs [4].

Sudan grass is very valuable as a feed crop since it can be used both for hay, haylage, grass meal or silage production, and half-soiling and pasturing [1].

The seed multiplication system of the crop is as important for obtaining high crop yields of proper quality as the usage of advanced agricultural technologies [2].

The development of scientific methods that can help to increase ground germination capacity of seeds is one the most significant problems that seed breeding faces today.

The usage of a seed production technology presupposes justification of the choice of ecologically harmless pre-seeding treatments and creation of efficient protectants, growth regulators or biological products.

In modern crop production phyto regulators are used to make agrocoenosis more resistant to various environmental factors [3].

The purpose of the study is to determine effects of the Cavita Biocomplex growth regulator on the germination energy and laboratory germination of the accessions of Sudan grass and sorghum.

This stimulator is produced on the basis of environmentally clean peat deposits. It is a black concentrated gel. Its usage helps to increase crop yields up to two times, reduce the number of plant diseases and restore the soil.

In this study we used the accessions of Sudan grass Voronezhskaya 24, ST 12 and sorghum 5. The experiment was performed in triple replication in accordance with GOST 12038-84, GOST 12036, GOST 12037. 100 seeds were examined in each replication.

We used the Cavita Biocomplex growth regulator to reveal and compare the effect that growth regulator has on germination of the taken accessions. The variant where distilled water was used to conduct the experiment was considered as the control sample. (Table 1)

When conducting the experiment we followed the methods described in GOST 12038-84. According to the all-Union State Standard, the seeds are to be laid on double- or three-layer damped paper in Petri dishes prepared in advance. The seeds then are to be covered with one more layer of damped filter paper.

For the variant where the growth regulator was used, 5 ml of the Cavita Biocomplex regulator per one liter of distilled water was taken. The seeds then were soaked for 2 hours in the prepared liquid which was removed from Petri dishes afterwards. Completely dry seeds were then left for germination.

In accordance with the methodology, we estimated the germination energy on the 4th day of the experiment and germination capacity of the seeds on the 7th day. (Table 2)

Germination energy of the seeds, %								
Sample	Control sample				Cavita Biocomplex regulator			
	replication, pcs			average, %	replication, pcs			average, %
	I	II	III		I	II	III	
Sudan grass								
Voronezhskaya 24	96	96	92	94.6	92	96	94	94
Accession of ST 12	94	80	94	89.4	96	98	100	98
Sorghum								
Accession of SG 5	96	96	88	93.4	100	100	98	99.4

Tab. 1. Germination energy of Sudan grass and sorghum seeds, 2015

Accessions of Sudan grass ST 12 proved to be the most responsive to the effect of the growth regulator. Average germination energy of the seeds of the control samples is 89.4%, whereas average germination energy of

the seeds pretreated with the Cavita Biocomplex regulator increased by 8.6% to 98%. It is also worth to be noticed that germination energy of sorghum SG 5 seeds also increased by 6% to 99.4%.

Germination capacity of the seeds, %								
Sample	Control sample				Cavita Biocomplex regulator			
	replication, pcs			average, %	replication, pcs			average, %
	I	II	III		I	II	III	
Sudan grass								
Voronezhskaya 24	98	98	94	96.6	96	98	94	96
Accession of ST 12	100	92	100	97.4	96	98	100	98
Sorghum								
Accession of SG 5	100	96	100	98.6	100	100	100	100

Tab. 2. Germination capacity of Sudan grass and sorghum seeds, 2015

The Cavita Biocomplex growth regulator significantly affected both the intensity of germination and germination energy, and germination capacity. However growth regulator we used had a different effect on each cultivar. For example it had no significant effect on germination energy and laboratory germination of Voronezhskaya 24.

On the basis of the results obtained, it can be concluded that accessions of Sudan grass ST 12 and sorghum SG 5 proved to be the most responsive to the effect of the Cavita Biocomplex growth regulator as their germination energy increased by 8.6% and 6%, respectively.

Список литературы:

1. Павлюк, Н.Т. Суданская трава и соя в Центрально-черноземной зоне России (научно-методические основы селекции и технологии производства семян и кормов) [Текст] / Н.Т. Павлюк, Т.Г. Ващенко. – Воронеж: ФГБОУ ВПО ВГАУ. – 2004.- 358с.
2. Павлюк, Н.Т. Суданская трава селекции Воронежского Агро-университета/ Н.Т. Павлюк, Т.Г. Ващенко, Т.И. Крюкова // Агробиологические основы повышения урожайности и качества продукции полевых культур в ЦЧР. Юбилейный сборник научных трудов, посвященный 95-летию Агрономического факультета.-2009.- С.219-226.
3. Пестрецов, А.Н. Влияние регуляторов роста на энергию прорастания и лабораторную всхожесть семян зерновых культур/ А.Н. Пестрецов, Г.Д. Шенцев // Молодёжный вектор развития аграрной науки.-2014.-Ч.II.-С.113-115.
4. Шаталов, И.С. Суданская трава [Текст]/ И.С. Шаталов.- М.: Колос, 1981.-206с.

УДК 568.244.4

Bragina N.A.

**Voronezh State Agricultural University after Peter the Great,
Voronezh, Russia**

THE INFLUENCE OF FERTILIZERS ON SOIL FERTILITY

Аннотация: Главным источником жизни является почва - важнейший компонент биосферы. Залогом хороших урожаев является высокая плодородность почвы. Наиболее эффективный способ улучшить ее состав – обогатить структуру полезными веществами. Самыми естественными и безопасными из них являются органические удобрения, которые помогают вырастить экологически чистую продукцию.

Ключевые слова: почва, плодородие, органоминеральные удобрения, навоз, плод.

The main source of life is the soil being the most important part of the biosphere. It is the unique object including all living and lifeless things. It obtains an exceptional compound structure.

The areas with the arid climate have a lower soil productivity which reduces agricultural crops yield. The soil should be enriched by nutrition and water to be more efficient for agriculture.

Since ancient times people have understood that it is impossible to get regular yields without soil nutrition particularly at that time people burnt out the parts of forest and cultivated them. It needed a lot of labor inputs without any stable results.

Later people began to use manure which brings the part of nutrients back to the soil. But just only in the middle of the nineteenth century in Europe they began to use mineral fertilizers. As a result the load on the environment increases heavily (salinization of the soil, humification, etc.). Unbalanced additions without any agricultural and ecological specifications of fertilizers lead to the deterioration of crops and as a result influenced people's health.

Long-term use of chemical fertilizers inevitably lead to contamination of soil, its salinity and degradation, the accumulation of heavy metals and other hazardous to human health chemical compounds in food crop production.

The guarantee of good crops yields is the fertile soil. The most efficient method to improve its structure is nutrients application. The most

natural and safe are organic fertilizers which help to grow up ecologically puke crops.

Organic fertilizers are useful for the soil structure, stabilize it, improve such characteristics as the airtight and moistureproof.

Decomposed organic fertilizers develop the humus soil layer; raise its fertilization and nutrients content organic fertilizers also help the biological processes and activities of soil microorganisms.

Organic fertilizers are multipurpose; they have all necessary elements for plants nutrition. But the resources of these fertilizers are limited and they do not contain there are enough basic nutrients. Thus manure just consists of 0.5% of nitrogen, 0.25% of phosphorus, 0.6% of potassium [1].

With the combination of mineral and organic fertilizers we can get organomineral fertilizers, the humic ones. These fertilizers combine advantages of both the types.

Mineral salts help to increase the efficiency of, organic elements, supply plants with the complex of nutrients. In addition they change the physicochemical property of the soil, making it more fertile and intensify the microbiological processes.

It is known that plants with organomineral fertilizers cope with the adverse conditions: light frosts, lack of illumination and oxygen, they are resistant against diseases and pests, increase the quality of fruits and vegetables. They accumulate more sugar, vitamins, starch, gluten and less nitrates [2].

Application of organic fertilizers provides a unique ecological system, able in a short period to create the fertile soil layer and ensure a high level of efficiency for many years.

An important factor is economic efficiency of organic fertilizers. In the regions of the Central Federal District of the Russian Federation their economic efficiency is from 3 to 20 rubles per 1 ruble of expenses depending on the crop variety.

In many European countries with the developed economy and highly productive agriculture organomineral fertilizers are widely used.

Thus Russia increase the production of these fertilizers every year, the most part of them is already used by the farmers.

Список литературы:

1. Кидин В.В. Агрохимия и агропочвоведение: Учебник - М.: Изд-во РГАУ - МСХА имени К.А. Тимирязева, 2012.
2. Мельников Л.Ф. Органоминеральные удобрения.- Изд-во Политехнического университета, Санкт-Петербург, 2007.
3. Ягодин Б.А. Агрохимия: Учебник - М.: Изд-во Колос, 2003.

УДК 669.713.7

**Glushkov S. A.,
Voronin V. I.,
Dedov A. V.,
Nesmeyanova M.A.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE CHOICE OF EXPERIMENTAL PLOT AND METHODOLOGICAL TECHNIQUES TO IMPROVE THE ACCURACY OF INITIAL VALUES OF GROSS HUMUS IN THE SOIL.

Аннотация. В данной статье отражены предложения по повышению точности при определении исходного содержания валового гумуса в почве. Приведён пример перерасчёта результатов данного показателя с учётом сформулированных в статье рекомендаций.

Ключевые слова: плодородие, севооборот, стационар, валовой гумус, обработка массива данных.

During single visit of various experimental plots and as a part of complex expedition based on the studies of V.V. Dokuchaev in 1978 and 1979 we noticed that on the experimental plots of crops with slightly different color and height of stalks are located. These differences in color and height remain on all phases the crops of development. Only after complex expedition (devoted to V.V. Dokuchaev) we decided to find out the reasons of the similar phenomenon [1, 2].

Of course every object has its corresponding set of crops in relation to this or that soil-climatic zone and it is usually placed on the ground in time and space. Thus the required experimental area increases. That can create difficulties in the processing of the data, for the controlled variability indicators will depend not only on agronomic techniques used, but also on the placement area. The cultivated areas depend on the number of the crops and crop rotations in the experiment. To reduce the territorial (soil) impacts on the soil physical fertility systematic or square placement of plots and their reps (at least 4) with investigated are applied [3-7].

The studies are mostly caring out only in one crop rotation or in its links. In the Stavropol research institute of agriculture five crop rotations have been studied since 1968 time that was not observed in others similar organizations. In these five crop rotations (V. G. Homko) were cultivated

simultaneously 10 crops. Besides all the crops were placed on fertilized and none fertilized plots according to the existing alternation. Thus for all odd plots small doses of fertilizers were applied. The fertilizers were added manually. Such method of fertilizer application proved that on such plots crops with a somewhat different color scheme and height stalks were noticed. They were apparent for every phases of the crops development.

Using such a unique opportunity of simultaneous ten fields with 5 crop rotations and 10 crops in each on the area we planned to reveal the variability of gross humus. It was necessary to use the original data received before sowing [8]. Soil samples were taken on 20 acre to determine the content of initial gross humus and nitrogen in the soil.

To process the data by gross humus and nitrogen traditional method was used, medium arithmetic values were produced with averaging elements. Thus the data are given up to two decimal places, which automatically averaged the results. Besides, maximum gross humus content (6.4%) was not considered, but they pointed it out in the text of the publication.

Taking into consideration the above mentioned, we decided to test their data. For this we repeated their calculations with the averaging elements and without them (i.e. without averaging) and then compared the received divergences. We propose these divergences for further improved accuracy for the data. Before carrying out the calculations their data have been changed to mg per 100 gram of soil. We draw your attention to the fact that their data are inflated at the expense of failure by the third and the fourth decimal places. Even using their overestimated data, we got a divergence in the original content of humus. Of course, these discrepancies are not so great, but they allow t increasing the calculations carried out without averaging accuracy of the controlled indicators.

Thus, the earlier claimed initial content of gross humus (5.4% in V. G. Homko experimental plots (Shkonde E.I., Lola M. V., 1990)) is not quite accurate. Its original content can be counted as two-levels: 5.365%, or 5360 mg / 100 g of the soil, and 5.65%, or 5645 mg / 100 of the soil. The second level use of the original content is associated concerning the maximum value gross humus (6.4%) which the authors did not use. Thanks to this significance we receive two ranges of the of gross humus content: 4.9-6.4%, or 4890-6400 mg / 100 g of the soil.

Dividing the sum of each range we receive the second initial content of the gross humus: 5.65% (with averaging) or 5645mg (without averaging). The difference between them (5650-5645) will make 5 mg, it is

not desirable to abandon it according to the following reason. Rejection of 5 mg will lead to 13875 mg underestimation of the gross humus per 1 hectare, or 0.138% respectively. Based on the results we suggest using the original content of the gross humus content up to 5334.2 mg / 100 g of the soil, or 5.3342%.

Список литературы:

1. Воронин В.И. Трансформация почвенного плодородия в десятипольных севооборотах длительного стационара / В.И. Воронин// Плодородие почв Ставрополя и приемы его повышения. – Ставрополь. – 1988. – С. 109 – 118.

2. Воронин В.И. Ранняя диагностика выявления изменения потенциального плодородия почв/ В.И. Воронин, А.А. Панфилов. – Ставрополь, 1995.

3. Дедов А.В. Содержание гумуса и лабильного органического вещества в севооборотах с бинарными посевами / А.В. Дедов, М.А. Несмеянова, А.А. Дедов, Т.Г. Кузнецова // Вестник ВГАУ. – 2014. – №1-2. – С. 20-25.

4. Коротких Е.В. Легкогидролизующий гумус, его динамика и содержание в почве под культурами севооборота/ Е.В. Коротких// Растениеводство: научные итоги и перспективы. Воронеж, 2013. С. 302 – 306.

5. Морозова Е.В./ Мониторинг лабильного органического вещества в черноземных почвах/ Е.В. Морозова, Т.А. Трофимова, С.И. Коржов, В.А. Маслов// Опыт и проблемы природопользования при реализации президентских программ в Центральном Черноземье России. Воронеж, 2006. С. 265-268.

6. Несмеянова М.А. Плодородие чернозема типичного и урожайность подсолнечника при различных приемах биологизации и основной обработки почвы в лесостепи ЦЧР: автореф. дисс. ... канд. с.-х. наук.-Воронеж, 2014.-24 с.

7. Коржов С.И. Оценка различных способов использования черноземов / С.И. Коржов, Т.А. Трофимова, В.А. Маслов // Вестник Российской академии сельскохозяйственных наук. – 2011. – №3. – С. 27-29.

8. Шконде Э.И., Лола М.В. // Почвоведение. – 1980. – №12. – С. 103-111.

УДК: 551.577 / 578: 502.72

**Пыина L.S.,
Voloshina E.V.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

INFLUENCE OF PRECIPITATION ON AGROPHYTOCENOSES PRODUCTIVITY

Аннотация: Проведен анализ воздействия кислотных осадков на продуктивность озимой вики.

Ключевые слова: агроэкосистемы, кислотные осадки, симбиотический аппарат, леггемоглобин.

In modern conditions of energy deficiency the symbiosis between rhizobia and legumes *Rhizobium* is of great importance. These communities allow providing agrocenoses with biological nitrogen and reducing human pressure on the agro-ecosystem.

In the Central Black Soil area hairy vetch (winter variety). It is of niter can be used both autumn and spring sowings accumulating up to 200 kg / ha of nitrogen, providing honey yield up to 40-250 kg / ha. Productivity of green mass is 20-30 tons / ha. It is sown out on saline soils as a phytomelionant. (Lakhani 2002).

It was necessary to solve the following problems in the course of the research:

- to examine the features of the formation of symbiotic apparatus at different stages of development;
- to identify the impact of acid rain on the growth and development of plants and vetch shaggy nodule bacteria's;

The climate of the of the research area of Nizhdevitskiy district of Voronezh region is moderately continental.

There were unfavorable conditions for of winter crops sowing due to the lack of moisture in the soil of the beginning of autumn of these years, and only in mid-September there was heavy rainfall, which contributed to the development of the plants during autumn vegetative season. During winter there were frequent thaws, which adversely affected the wintering of winter watch. Spring and summer were characterized by the deficient rainfall.

The research was conducted on heavy, low-power leached black soil with humus content up to 4.5-5.1%, pH of salt extraction being 4.9-5.3, the

content of mobile phosphorus being 67 mg / kg of soil and exchangeable potassium being 120 mg / kg of the soil.

Techniques common in agroecology of the experiments conducting were used.

The object of the study was the population of vetch shaggy (*Viciavillosa* Roth) Glinkovsky variety with a seeding rate of 2 mln of germinating seeds per hectare and nodule bacteria's *Rhizobium vicia*.

The sowing was in the third decade of August. The imitation of acid precipitation was implemented in the form of water solutions of acids H₂SO₄ + HN0₃ (pH 4.5)

The predecessor of vetch shaggy was corn for green fodder. The plots were of 5 square meters. It repetition was four fold.

These test results prove the activity of the interaction of populations of vetch shaggy and nodule bacteria's to be determined by the influence of precipitation.

Acid precipitation greatly influenced on the development of nodules, and hence the activity of symbiotic apparatus. The number of nodules on the vetch shaggy plant decreased compared to the control by 26.6%, while the weight of nodules per plant was reduced by 30%.

Negative effects of acid rain are associated with acidification of the soil solution, thus increasing the number of clay particles, which leads to deterioration of soil aeration, increasing mobility of heavy metals.

In particular, Efremova (1968) approves that the best symbiotic apparatus of a vetch shaggy develops in the slightly acidic and neutral soils (pH 6.5-7.0).

Subsequent observations during the autumn period revealed the lack of the further active development of symbiotic apparatus of vetch shaggy.

Thus since the third decade of September in the Central Black Soil conditions, when the day length is less than 12 hours and the temperature is 5-12°C, there are unfavorable conditions for the development of root nodule bacteria's.

At acid rain introduction plant height reduced by 23% and the number of shoots reduced up to 35% (Table. 1).

Option	Plants height	Number of branches	% of overwintered plants
1. control	11.4	5.3	95.0
2. acid precipitation	8.7	3.4	89.0

Table 1 - Biometric performance of vetch winter before leaving in winter

During this period the plant of vetch shaggy changes the direction of

physical biochemical and metabolic processes improving their frost- and winter hardiness. The results of the analyses proved that in acid rain introduction winter hardiness decreased compared to the control by 12%.

Considering that the nodule bacteria produce a lot of biologically active substances and increase the resistance of plants to disease and negative weather conditions. The indicator of symbiotic apparatus can be used as a test of hardiness.

In spring in the phase of vetch shaggy at branding introduction of acid precipitation into the system the number of nodule bacteria decreased compared with the control 22.6%.

It was found that at good development of unit symbiotic apparatus rot infestation of crops greatly reduced.

At the beginning of budding, within 10-15 days, the number of nodules in plants of vetch shaggy increased almost twice (Table. 2).

The same pattern of anthropogenic load on the number and weight of nodules and leghemoglobin content, as in the previous phase of development was observed.

Crops damage by mildew was less than in the control variant to 41.6%.

Option	Number of nodulation	Weight of nodules	Content of leghemoglobin	By mildew, %
1. control	17.5	49.9	10.8	7.2
2. acid precipitation	9.5	39.0	7.7	10.2

Table 2 - The development of symbiotic apparatus in a the budding phase of winter vetch

At the beginning of flowering symbiotic apparatus of vetch shaggy reaches the maximum value.

In the phase of flowering vetch shaggy the number of nodules per plant during the study period was 24 (control), in introduction of acid precipitation the number of acidic precipitation nodules decreased relatively the to control to 44%. The weight of nodules in the flowering stage increased and reached the control version 61.6 mg / plants. The system of the mass of nodules in relation to the control decreased by 22%, under the influence of acid rain. Leghemoglobin respectively content in the nodules decreased.

It is important to note that a vetch shaggy combined two energy-intensive processes: nitrogen fixation and secretion of nectar.

Formation of symbiotic apparatus acid rains have a negative influence on the formation of flowers and nectar secretion.

The content of the nectar in the of vetch shaggy flowers declined when introducing acid rains by 49% at the beginning of flowering and by 72% in the middle of flowering

During the phase of beans formation the number and weight of nodules decreased, and the effect of law precipitation was the same as in the previous stages. The number, weight and content of the nodules leghemoglobin also reduced (tabl.3).

option	Phase of the formation beans			The maturation phase		
	Number of nodules	Weight nodules	Content of leghemoglobin	Number of nodules	Weight of nodules	Content of leghemoglobin
1. control	20.8	61.3	13.3	15.0	44.6	12.6
2. acid precipitation	11.1	47.6	10.1	9.1	31.6	9.6

Table 3 - The development of symbiotic apparatus of winter vetch

In the maturation phase of vetch shaggy the number and weight of nodules decreased significantly compared with the phase of the beans formation. This is due to the significant number of nodules death.

Content of leghemoglobin dramatically reduced, due to the fact that leghemoglobin transferred in holyglobin (green stuff), and then lysis of nodules begin.

In introduction of acid precipitation into the system seed production crops decreased by 18.0%.

Thus we can conclude that a lot of green and green manure crops vetch shaggy should be used at the beginning of flowering, and to ensure high productivity of legume crops the most comfortable areas should be use.

Список литературы

1. Ефремова В.И. Отношение вики озимой к различной реакции среды в разном возрасте / В.И. Ефремова // Научная конференция молодых ученых. - М., 1968. - С. 162 - 163.
2. Лаханов А.П. Вика мохнатая в Европейской части России /А.П. Лаханов, Н.В. Парахин. - Орел: Из-во Орел ГАУ, 202. - 348 с.

УДК 631.8:631.445.4

Komova A. V.
Polunina E. Y.
Stekolnikov K. E.,

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE EFFECT OF FERTILIZERS APPLICATION AND MELIORANT ON THE FRACTIONAL COMPOSITION OF PHOSPHATES OF LEACHED CHERNOZEM

Аннотация: В работе было выявлено влияние удобрений и мелиоранта на содержание изучаемых форм фосфора.

Ключевые слова: извлечение, фосфаты, контроль абсолютный, чернозем, элювиально-иллювиальный тип распределения.

It is known that excretion phosphates depend not only on their content in soil but also on the extraction conditions: concentration and properties of the solvent, the ratio of soil: extractant, exposure, etc. So when removing the phosphate by the method of Kirsanov using 0.2 n HCl solutions (pH 0.74), Chirikov 0.5 n solution of CH₃COOH (pH 2.25), Trough of 0.002 n H₂SO₄ buffered sulfate ammonium to pH 3.0 at a ratio soil: solution being 1:5, 1:25, 1:200 respectively. As for the exposure, it varies within very wide limits - 15-minute settling, hour shaking daily settling and 30 minutes one respectively. All this often leads to comparable results.

In nature there are no natural sources of the phosphorus replenishment in the soil. So the only way to increase the content of P₂O₅ in the soil is the use of phosphorus fertilizer. Due to the low mobility of phosphates in soil there is practically no natural way of phosphorus losses. Organic phosphates are considered to be found mainly in the composition of humus, but this is not so. They are in composition of, aboveground and underground plant litter. Organic phosphate is a part of fitina, nucleic acids, phosphatides, sugar phosphates and other organic compounds of the soil. Some part is to be in the plasma of microorganisms. After the death this phosphorus becomes available to plants. Organic phosphates become accessible to plants only after mineralization of organic substances. If the organic substance contains 0.2 to 0.3 % P₂O₅, when accumulation available to plants of phosphorus compounds does not occur of its decomposition. In this case the phosphorus is completely linked associated with soil

microflora [1].

Taking into consideration the significance of individual forms of phosphorus in plants, we aimed to study the effect of fertilizer and meliorant on the soil phosphate composition.

The studies were conducted at the experimental plot the department of agricultural chemistry, founded in 1987 at the experimental station in VSAU. The soil cover of the plot presents a medium-power, low-humus heavy loam leached chernozem: the humus content being 4.20%, pH of aqueous extract 5.58-6.15, pH salt extraction 5.14-5.48, the amount of exchange basements 26.3-30.3 and hydrolytic acidity being 5.20-7.03 mg-equivalent/100 g of the soil, degree of saturation with bases being 81-85%. 6-field crop rotation is developed. The experiment includes 15 options. Plots placement is, systematized. All the on crops the rotation was grown taking into account agrotechnical requirements of their cultivation in Voronezh region. Mineral fertilizers were applied annually. Ammonium nitrate, double superphos-fat, potassium chloride were used. Dung and defecation were applied once per rotation for sugar beet crop.

The studies were conducted on variants of the experiment. For the study we used the method of determining the composition of the phosphate of Karpinsky-Zamyatina [1]. Organic matter is oxidized with 6% hydrogen peroxide. After oxidation of organic matter a significant portion of soil phosphorus becomes soluble in dilute acids. They are extracted by 0.05 n HCl solution. The content of the organophosphates was determined by the difference between the gross content (defined in the oxide by the linkage of soil) and mineral phosphorus (as defined in the non-oxidized sample of the soil).

The content of different forms of phosphorus varies in a wide range. The minimum content of all forms of phosphate is observed in the topsoil, and the maximum in the layer of 20-40 cm on all variants of the experiment. The application of organic and mineral fertilizers increases the share of organophosphates. The same effect is observed when defecate are used on the background of organic and mineral fertilizer both. The content of the organophosphates in these variants is more stable during the survey period and comes nearer by this indicator to the con-control option. However at the control option the content of the organophosphates is higher at virtually the entire profile. Mineral phosphorus compared with organophosphates is contained in smaller amounts and its distribution by the profile is irregular. The maximum content of mineral phosphates is accounted for the layer of 20-40 cm, however its share in this layer is not always higher than that of organophosphates. Fertilizer and meliorant application in contrast to the absolute controls option significantly increases the proportion of mineral phosphorus in this layer.

It is considered that in the presence of free calcium organics degrades

quickly. The consequence of this is expected to be lower levels of organophosphates in versions with defecation. However, the results such pronounced effect of reducing in organophosphates content on the options with defecation is not observed. Moreover the content of organophosphates varies little during the year, of observation, and their distribution along the profile, especially in the variant with organic defecate in the natural background is more uniform.

The overall pattern of the profile distribution for all forms of phosphorus is an explicit differentiation within the humus horizon, both for different versions and years. The maximum content value occurs in the layer of 40 cm of the humus horizon and a minimum to the topsoil. The distribution character corresponds to the eluvial-illuvial type.

Список литературы:

1. Пейве Я.В. Биохимия почв. М., Сельхозгиз, 1961.-421.

УДК 633.113

**Koryakin V.V.,
Karavaeva A.G.,
Abrosimova A.V.**

Tambov State University after G.R.Derzhavin, Tambov, Russia

HETEROGENEITY OF SEEDS IN EARS OF THE FAVORITE AND KWS AQUILON WHEAT VARIETIES.

Abstract: In this paper we study the parameters of the ears of different sorts depending on the conditions of the year. Each variety forms differ in productive ear, weight of grains, number of spikelets in one spike and unequal number of stems per unit area.

Key words: wheat, ear, seed, spikelet, quality, variety

The phenomenon of seeds heterogeneity attracts great theoretical and practical interest. It is well known that formed even in the same box or in the same ear seeds, have individual characteristics and varying degrees of heterogeneity. This phenomenon is defined with three interrelated factors: heredity, environmental conditions in which the plant grows the conditions of seeds development on the mother-plant [4].

Intensity Changes - of growth processes are caused by some changes in seeds physiological qualities. Contents of some physiologically active

substances, vitamins and oxidative enzymes have confirmed that. Different environmental conditions also contribute to the quality range. Nutrition variation of plants, specifically fertilizers also has its contribution [2].

However, despite the fact that already published extensively on diversiform seed, a clear understanding of this property of the seeds is not yet available, every author puts in this term [5].

The study of common spring wheat ears, the object of which was heterogeneity, has been a big interest for us. The studies have been conducted for three years in the Tambov region. Five ears of the studied varieties were collected annually before harvesting. Spikes were analyzed on the location of each weevil. The kernel mass was determined by weighing on the scales of the brand CAUX.

Favorit and KWS Aquilon varieties were listed in 2007 and 2013 respectively. Both varieties of spring wheat have good bread quality [1]. Favorite recommended for commercial use in 5, 7, 8 and 9 regions of Russia, while KWS Aquilon does in fifth.

During the study of varieties of soft spring wheat it has been found that they differ in productive ear, weight of grains, number of spikelets in one spike and unequal number of stems per unit area depending on the year [3].

The table 1 shows the data that have been obtained for the three-year studies of two varieties.

Variety	Year	The number of spikelets with different content of seeds, %					
		5	4	3	2	1	0
Favorite (standard)	2013	-	5.75	42.53	39.08	5.75	6.90
	2014	-	2.38	57.14	25.00	11.90	3.57
	2015	-	2.7	37.84	37.84	18.92	2.7
KWS Aquilon	2013	14.1	50	20.51	8.97	5.13	1.28
	2014	7.25	31.88	27.54	14.49	11.59	7.25
	2015	1.39	27.78	36.11	6.94	18.06	9.72

Table 1 The number of spikelets with different content of seeds (5 ears of corn).

According to the results, Favorit contains less grain in the spikelets than KWS Aquilon does. It is known that in some spikelets of wheat 0 - 5 grains can be formed. This is connected with the genetic characteristics of the variety and weather conditions. The maximum number of seeds in spikelet of Favorit was calculated as - four, and five in spikelets of Aquilon. Multidimensionality of the second variety is likely to be genetically determined. Differences over the years in each class depended

on weather conditions. The vast number of spikelets with three grains was observed in the Favorit and KWS Aquilon throughout all years of research. The number of spikelets without seeds in the Favorit plants was 4.39% in the average, and KWS Aquilon - 6.1%. The difference has amounted to 1.71%. A standard variety had the maximum number of spikelets without grains in 2013, while Aquilon suffered more in 2014 and 2015 [3].

Previous researchers have found that mainly the upper and lower parts of the ears were exposed to the lack of grains in spikelets. Our three-year data shows the validity of this statement.

Indicators	Parts of the ear					
	Higher		Average		Bottom	
	Favorit	KWS Aquilon	Favorit	KWS Aquilon	Favorit	KWS Aquilon
The total number of flowers, piece	132	116	246	206	126	116
The number of grains are not tied, piece	37	22	3	2	16	32
Incomplete setting of grains, %	28.0	18.9	1.2	0.9	12.7	27.6

Table 2. Incomplete setting of grains of different parts of the ear (2013-2015)

The number of spikelets without grains in the middle part of ear is approximately 1%. We have detected that Favorit has more spikelets without grains on the top of the ear, rather than in the lower parts- 28.0 vs. 12.7%. At the same time, the KWS Aquilon has opposite figures, the lower part - 18.9 and 27.6% respectively (Table 2).

We have determined that Favorit had more spikelets without grains on the top of ear in 2013. On the other hand, the variety KWS Aquilon suffered more in the lower part of the ear in 2015.

In our point of view, a reduction of the spikelets without grains in the ear will provide additional reserve for increasing the yield of both varieties.

Conclusions.

1. Variety Favorit has more spikelets in the spike in comparison to KWS Aquilon.
2. Aquilon surpassed Favorit by the number of kernels in the ear.
3. In general, during three years the standard variety has had 11.1% of spikelets without grains, while variety Aquilon - 12.8%.
4. The variety Favorit has more spikelets without grains at the top of the ear, rather than in the lower part - 28.0 vs. 12.7%.
5. KWS Aquilon has at 18.9 and 27.6% of flowers the top and in the lower part of the ear without grains respectively.

Список литературы:

1. Каталог сортов сельскохозяйственных культур,

допущенных к использованию в Центрально-черноземном регионе и по Тамбовской области в 2014 году. Тамбов, 2014. С.104.

2. Кизилова Е.Г. Разнокачественность семян и ее физиологические основы / Биология и технология семян. Харьков, 1974. С.195.

3. Корякин В.В., Мартынов Д.А., Засыпкин А.С. Влияние условий года на параметры колоса сортов яровой пшеницы. / Materials of the XI International scientific and practical conference «Science without borders – 2015». Sheffield, Science and education LTD., 2015. С.81-85.

4. Поляков И.М., Кизилова Е.Г., Шмагина М.А.. Процесс оплодотворения и разнокачественность семян / Биологические основы повешения качества семян с/х растений. М., 1964.

5. Строна И.Г. Разнокачественность семян полевых культур и ее значение в семеноводческой практике / Биологические основы повешения качества семян с/х растений. М., 1964.

УДК 568.244.4

Kostina M.A.

**Voronezh State Agricultural University after Peter the Great,
Voronezh, Russia**

THE INFLUENCE OF BIO-ORGANIC-FERTILIZERS ON CROP YIELDS AND SOIL FERTILITY

Аннотация: Так как базисом сельскохозяйственного производства является почва, то продуктивность этой отрасли хозяйства зависит от состояния почв. В этом и состоит главная проблема, проблема сохранения и восстановления плодородия почв. Одним из путей решения данной проблемы является переход к биологической модификации минеральных удобрений, создавая биоорганоминеральные удобрения на основе органического материала.

Ключевые слова: почва, плодородие, биоорганоминеральное удобрение, гумус, урожайность.

Agricultural industry is the basis of human society, as it provides a person with everything without which life is impossible - food and

clothing, raw material for the production of clothing. Soils the basis for the agricultural activity - "day" or outer horizons of rock ,a naturally changed by the combined action of water, air and a variety of organisms, either living or dead (V.V. Dokuchaev).

On the basis of soil crop cultivation is realized, which the base for livestock breeding and animal production is providing human beings with food and many others things. Agriculture provides food industry with raw materials, partly light, biotechnological, chemical, pharmaceutical and other sectors of the economy.

Since the basis of agricultural production is the soil, the productivity of this branch of the economy depends on the state of the soil. The main problem is, soil fertility conservation and restoration.

One way to this problem is to transfer to the modification of biological fertilizers, creating bio-organic-fertilizer fertilizers based on organic material (peat, sapropel, poultry and livestock waste, etc.), balancing the mineral constituents, followed by treatment of the final product of biological agents (bacteria).

This bio-organic-fertilizer improves:

-the flow of nutrients to plants, by spot-seeding with granularbio-organic-fertilizers. Fertilizer is set directly in the root system.

-the activity of soil microorganisms, due to the bio-products.

-the content of humic substances in the soil, restoring its fertility. It is achieved by organic basis and biologicpreparations in fertilizers.

It is efficient in dry periods, due to the ability of the organic bases to absorb water and slowly to give it back.

Amino acids, vitamins, hormones and organic acids, bacteria, stimulate and accelerate physiological processes in the plant cell, increase the rate of photosynthesis and respiration, as well as significantly strengthen theplants immune system, accelerate its development.

The tests were carried out of bio-organic fertilizer.

The tests were carried out of in 2015 on maize varieties, "CR-39" (Pioneer) on the RT-144 (117ga) in Trosnyanskiy district, Orel.

When setting bio-organic-fertilizer (200 kg / d), the following factors were considered.

1.soil:

- soil type, pH: dark gray forest, pH = 5

- humus content: 2.3

2.predecessors: corn, winter wheat

3. methods soil tillage: deep loosening, disking, by combined tillage machines, pre-processing, treatment.

4. treatment of seeds:
 - Pesticide: by seed treatment provider «LG (Pioneer)»
5. the date of corn sowing: early May
6. seeding rate: 80 000 seeds / ha
7. when sowing corn bio-organic fertilizer; application rate 2 t / ha were applied.
8. date of seedlings germination: 5-7 days after sowing
9. formation of 2-3 leaves: 15-17 days after sowing
10. seedling treatment (foliar feeding) in the tank mix with pesticides (l / ha): Dionates - 0.7 l / ha, NEO - 0.06 kg / ha,

Methods to use preparations in the experiments	Area, ha		Productivityc / ha		+,- yield control c / ha	% cont rol
	Experime nt	Surveysdu ringharves ting	Control	Anexp erime nt		
1. Adding of granular Bio-organic fertilizer.	117	117	75.36	89.44	14.08	18.7

Table 1: Yields of corn varieties "PR - 39 (Pioneer) in production experiments using fertilizers.

As a control plot the field with the introduction of NPK (200 kg / d) and salt peter (200 kg / d) was taken.

As a result of bio-organic-fertilizer application the yield increased by 18.7%. In addition it is important that there is an increase of humus content from 2.3 to 2.6. Improves the repeated application improves the structuring of the soil structure by accelerating the biological processes in the soil.

Список литературы:

1. Вальков В.Ф., Казеев К.Ш., Колесников С.И. Почвоведение: Учебник для вузов. - М.: ИКЦ «Март», Ростов н/Д.: Изд. центр «МарТ», 2004. - 496с.
2. Земледелие с почвоведением / А.М. Лыков, А.А. Коротков, Г.И. Баздырев, А.Ф. Сафонов. - М.: Колос, 1999. - 448с.
3. Панников В.Д., Минеев В.Г. Почва, климат, удобрение и урожай. - М.: Колос, 1987.
4. Федюшкин Б.Ф. Минеральные удобрения с микроэлементами: технология и применение. - Л.: Химия, 1989. - 270с.

Lovyagina M.V.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

ECOLOGICAL ASPECTS OF ORGANOMINERAL FERTILIZER

Анотация: В работе рассмотрены некоторые аспекты использования органоминеральных удобрений в агроценозах. В качестве удобрений подобного класса предложено использовать композиционное удобрение, созданное на основе мелассы и силицитовых бентонитов. Отмечено благоприятное воздействие органоминерального удобрения на функционирование почвенно-биотического комплекса и продуктивность агроценозов ячменя. Утилизация отходов свеклосахарного производства способствует снижению антропогенной нагрузки на окружающую среду.

Ключевые слова: окружающая среда, агроэкосистемы, органоминеральные удобрения, утилизация отходов, меласса, силициловые бентониты.

Progress was registered in Russian Federation reduction of soil fertility recently. Due to the information of the State agrochemical service of Russia and Goscomzem of Russia it occurs that 56 mln. hectares of ploughed lands (45%) have a low content of humus, which limits the crop capacity on these plots. Nowadays annual input of nutrients from the soils of ploughed land exceeds its return with mineral and organic fertilizer. Use of soil is the national patrimony and food safety of any nation and depends on the soil conditions. Restoration of soil fertility is an urgent problem of the research. Thus application of significant amount of organic matter is necessary.

The share of organic and mineral fertilizers currently accounts for 2% of global production. Their production is not limited by the resource constraints, which greatly affects the development of traditional fertilizers. Production of the last one requires significant energy consumption, which is in conditions of sharply increased cost, leads to the cost reduction of sales opportunities, as well as to a number of environmental impacts. The bulk of energy in the production of organic fertilizers is spent only to achieve the necessary commodity form – drying, granulation, etc. Corresponding power consumption is significantly lower than the production of conventional fertilizer.

In such circumstances, the production of complex organic fertilizers

has good prospects. Their sources of raw materials can be a variety of animal and crop wastes, some other industries in which a significant part of macronutrients are concentrates, removed from the fields agricultural crops after cultivation. Therefore using such class of fertilizers as nitrogen, phosphorus and potassium can be returned to the soil.

Sugar beets occupy a special place in solving this problem. The wastes include beet pulp, molasses and filter cake. Beet pulp is the most voluminous waste from sugar production. It is used for animal feeding and as a dietary fiber, which normalizes cholesterol metabolism, having an antioxidant effect. Filter sediment is applied by its introduction to the soil to neutralize and improve soil structure. It is also used for the production of lime and cement, construction and asphalt concrete materials to reinforce underground in the construction of highways. Molasses is run-off syrups obtained by centrifuging the massecuite final crystallization in the production of sugar. Substances produced from molasses are ethyl alcohol, glycerol, butanol, acetone, lactic, butyric, citric, oxalic, acetic acid and other substances are produced from molasses.

The use of organic wastes as non-traditional fertilizers in agriculture allows introducing organic matter into the soil and nutrients available to plants. At the same time the problem of waste disposal is solved, thereby reducing anthropogenic environmental load. However, the use of non-normed or poor preparation of organic waste can develop processes of pollution, accumulation of nitrate, salinity, as well as their biological activity reduction by the development of pathogenic organisms and the deterioration of water-physical properties. So the problem of improving soil fertility using wastes to increase sugar production is relevant.

The research was focused on the evaluation of the possibility of using compositions based on molasses as a fertilizer in barley agrocenosis.

Field experiments on the effect of fertilizers using molasses on the functioning of agro-ecosystems were carried out on the territory of the "Agrotechnology". Soil the experimental plot is black earth leached, moderate, low humus, heavy loam on loess. The objects of the research are: beet of molasses Khokholsky sugar factory, silticite Kantemirovsky bentonite deposits of Voronezh region, barley agrocenosis of cultivar Odessa 115. The studies included conventional techniques used in agronomy experiments [2].

This publication analyzes the molasses composition suggesting that the content of heavy metals corresponds pH to the requirements of GOST. The fertilizers as characterized by high content of nitrogen, phosphorus, potassium, and especially potassium [5].

Since the molasses is a thick viscous liquid, and this makes it difficult to be used as fertilizer in agrocenosis, we have formulated

compositions based on it with silicite bentonites. They are of some interest, since in the adsorption process they have expanded opportunities mineral crystal cell and the conditions for the additional introduction in the inter-packet space of the adsorbed material that provides increased absorbency. The heavy metal content in the bentonite is less than the maximum allowable standards. It consists of silicon oxide, including amorphous which has high absorbent capacity as well as some trace elements necessary for the normal operation of soil-biotic complex as well as producers [4].

As a result mixing of molasses and silicite bentonites granulated organic fertilizers were developed. (Fig.1).



Fig.1-Fertilizer based on molasses and silicite bentonite.

Interdiction of various substances in the soil causes changes in the activity of the main soil enzymes that affect the exchange of nitrogen, phosphorus, carbon and sulfur. Stable changes in the activity of certain enzymes, can be treated as diagnostic indicators of abiotic component condition. The group of soil oxidoreductases is often used for this purpose. They are less affected by the environmental factors and their activity is more dependent on soil pollution. Among the enzyme class of oxidoreductases, catalase is well studied its formation is connected with the activity of fungi and algae, as well as the roots of higher plants. Catalase is not only the intracellular enzyme, but also is actively released by microorganisms in the environment, has a high resistance, can be accumulated and stored permanently in the soil. According to the degree of activity catalase orientation of the occurring in the soil oxidation processes can be evaluated [3].

The studies proved the fertilizers average value of catalase activity to be increased during the growing season of barley compared to the control variant, except for the version with the introduction of conventional fertilizers - NPK.

At the same time it was the highest during the period of earing when favorable weather conditions for the activity of soil microorganisms. The embodiments during this period were observed, molasses (50 and 75 kg /

ha) activity increased in comparison with the control variant by 4.0 and 10.5%, respectively.

Thus application of fertilizers based on molasses and ААН increases the activity of soil microorganisms, which in turn stabilizes the redox processes PBC optimizes mineral mode power of the producers, thereby reducing the load on the soil-biotic complex and affects agrocoenosis productivity.

The productivity of crops is the most complete and integrated index within the agro-ecosystem and completely-characterized by the degree and nature of different substances effects on crop plants.

Barley harvest accounting showed that fertilizer application in agrocoenosis demonstrated the increase in productivity compared to the control in all the investigated variants (Fig.. 2).

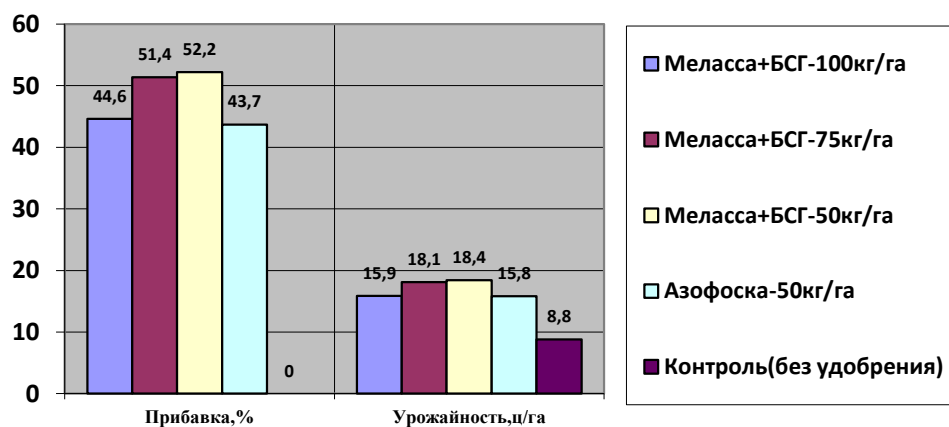


Fig.2 - Yields of barley, kg / ha

The introduction of NPK was 43.7% contributed to the control, the use of molasses + ААН provided yield increase of 44,6-52,2%. The maximum yield of barley was formed on embodiments FCG Molasses + - 50 and 75 kg / ha.

Thus, taking into account all the above factors, we can conclude that molasses, with high level of nitrogen, phosphorus, and especially potassium (2.53%), of heavy metals the content with the lack of limits, promotes yield increased 45-52% for the producers consequently a composition based upon it including bentonite clays (FCG) in the amount of 50 to 75 kg / ha can be recommended for using as an agrocoenosis fertilizer. Production and use of organic fertilizers is a demanded and promising direction and has a fundamental competitive advantage.

Список литературы:

1. Голубев И.Г. Рециклинг отходов в АПК / И.Г. Голубев, И.А. Шванская и др. – М.: Росинформагротех, 2011. – 296 с.
2. Доспехов Б.А. Методика полевого опыта (с основами

статистической обработки результатов исследований) : учебник для студентов высш. с.-х. учеб. заведений по агр. специальностям / Б.А. Доспехов .— Изд. 6-е, стер., перепечатка с 5 изд. 1985 г. — М. : Альянс, 2011 .— 352 с

3. Кононова М.М. Ферментативная активность как диагностический показатель качества почв/ М.М. Кононова // Почвоведение.-1970.- № 7.-С.26-31.

4. Прокопова Л.В. Применение силицитовых бентонитов для повышения эффективности использования азотных удобрений // Агрэкологический вестник. — 2006 .— Вып. 5 .— С. 101-104.

5. ГОСТ Р 53116-08 Удобрения органические на основе органомогенных отходов растениеводства и предприятий, перерабатывающих растениеводческую продукцию. Технические условия // Национальный стандарт Российской Федерации. - М.: ФГУП "СТАНДАРТИНФОРМ", 2009. - 13 с.

УДК 633.491:631.8

Manaenkova I.A.

Bondarchuk O.V.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE FURNITURE FACTORIES WASTEWATER UTILIZATION FOR WINTER WHEAT SEED TREATMENT

Аннотация: В статье обсуждается вопрос объединения в систему предприятий мебельной промышленности и сельскохозяйственного производства, при этом возможно использовать отходы первых в качестве источника энергии и вещества для вторых. Данный приём позволяет заменить импортные, синтетические фунгициды на более низкие по себестоимости и высокие по качеству средства обработки сельскохозяйственных растений.

Ключевые слова: Использование отходов сельского хозяйства, сточные воды, малоотходные технологии, импортозамещение фунгицидов.

Dmitry Ivanovich Mendeleev said that the main goal of an advanced technology was finding ways to make useful products from garbage. He

also noted that there is no waste, but only unused materials. The development of modern industry should be carried out in accordance with the principle of balanced environmental management taking into account the environmental of the territory to technogenic strain.

The development of low-waste technologies is implemented very slowly even they have already been tested because the enormous potential of leading industries is based on old technologies.

The purpose of the research is to evaluate the efficiency and the environmental safety degree of using formaldehyde wastewater from the Voronezh enterprise "Chernozem Region Furniture" in agroecosystems.

Environmental policy of "Chernozem Region Furniture" is based on the following principles:

1. the improvement of all environmental aspects from year to year. The environmental management system should be used to solve any production problems.

2. minimization and consistent reduction of the consumption of material and energy resources per production unit from year to year.

3. increasing the culture of production process. Repairing and regular room cleaning will reduce the losses of raw materials. The improvement of working conditions can reduce the level of defectes and injuries. Involving workers in the company`s environmental activities will eliminate the questions of the implemented technologies.

4. negative impact reduction on the environment. This concept includes the activities aimed at preventing the pollutants creation, reducing the resources and energy losses [1].

The current problems of interest are:

1. the combination of furniture and agricultural enterprises in a system will allow using the wastes of industrial plants as energy and material resources for agroecosystems;

2. furniture and woodworking enterprises wastewater contain formaldehyde and urea-formaldehyde resin which possess disinfectant properties and also the composition of nutrients. This makes it possible to substitute import fungicides by the wastes.

In 2014 the field experiment was conducted in the training center "Agrotechnology" which is located in the forest-steppe part of the Central Chernosem region.

The research object was winter wheat Scarlet Dawn. The experiment was in a crop rotation buckwheat - potato - winter wheat on the area of 5 m², 4th multiplicity, and systematic options accommodation.

Observations and analyzes were carried out in accordance with the existing procedures and standards.

Pests accounting was made according to 9-point scale, harvesting

was carried out manually. The results were mathematically processed by methods of variance analysis on a PC Excel 2000, Statistician 5.5.

The annual volume of wastewater in the Voronezh two plants is approximately 200 m³. The resin concentration in water is 10-40%. During 2-48 hours the emulsion is flaking away separating sewage sludge from the wastewater. Wastewater is a liquid containing dissolved formaldehyde with concentration 0.1-2.0% and the dry residue being 1.0-1.5% including the urea-formaldehyde resin molecular. Its weight is intermediate between monomer and polymer. Both the dissolved free formaldehyde and oligomeric products of urea and formaldehyde have biocidal properties. The wastewater composition analysis shows relatively high nitrogen content - 26-28% and a very low content of phosphorus and potassium. Trace elements required for the full growth of plants - zinc, manganese, copper, cobalt – are contained in the wastewater in quantities lower than the maximum permissible concentration of these elements in the soil [2].

Wastewater reaction is slightly alkaline or neutral - pH 7,0-8,5- which provides the neutralization not only of soil acidity but of physiologically acidic mineral fertilizers acidity as well. There were used wastewater and fungicide Celeste Top in a dose - 2 kg/t seeds in a comparison. Wheat grain yield in both variants with Celeste Top and wastewater in a dose of 10 kg/t seeds totaled 32 t/ha (Table 1).

Variant	Total yield, t/ha	Plant height, sm	Total nitrogen, %
Celeste Top - 2 kg/t seeds	3.2	59.4	1.97
Wastewater - 2 kg/t seeds	2.9	55.5	1.95
Wastewater - 10 kg/t seeds	3.2	57.0	2.13
Wastewater - 50 kg/t seeds	2.8	52.5	1.83

Table 1- Impact of wastewater on winter wheat yield, t/ha

The grain production with wastewater 25.8% is more profitable due to replacing expensive disinfectant Celeste Top.

Using of wastewater as a fungicide for winter wheat seeds does not affect the processes of microbiological activity and does not disturb the functioning of soil-biotic complex of agroecosystems. Using industrial wastes as alternative fungicide positively influences both its productivity and quality.

Список литературы

1. Поспелова М.В., Бондарчук О.В. Использование глинистых минералов в качестве сорбентов для детоксикации почвы. /М.В. Поспелова, О.В. Бондарчук//Молодежный вектор развития аграрной науки: Мат-лы 66-й научной студенческой конференции.- Ч. III

Воронеж: ФГБОУ ВПО «Воронежский ГАУ», 2015.-С.122-127.

2. Пат. 2092052 RUC1A01N 47/28, 35:02. Способ обеззараживания семян злаковых культур / Житин Ю.И., Алипатова О.В. (РФ). Заявлено 06.03.95. Опубл. 10.10.97. Бюл. № 28.

УДК: 633.3:636.085.5

Mitin Ye.V.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE INFLUENCE OF MINERAL FERTILIZERS ON FODDER PRODUCTIVITY OF AMARANTH IN THE CONDITIONS OF CENTRAL CHERNOZEM REGION

Аннотация: В статье рассматривается влияния различных доз минеральных удобрений на кормовую продуктивность и качество получаемого корма из амаранта. Показано, что все варианты с удобрением фонем значительно превосходят контроль. Самая высокая урожайность в среднем по годам отмечена на варианте с нормой внесения $N_{120}P_{120}K_{120}$ и составила в среднем $4,42 \text{ кг/м}^2$, что больше контроля на 52%.

Ключевые слова: амарант, минеральные удобрения, урожайность.

Amaranth is a unique plant due to the high content of protein, balanced in essential amino acids and the content of biologically active substances and pectins. It is not possible to create a highly productive agrophytocenosis of amaranth without the use of mineral fertilizers. However the studies of the effect of fertilizers on the yield are not numerous and contradictory. For example Lasagna Y. (1988) recommended high doses of mineral fertilizers: $N_{170-250} P_{90-150} K_{90-100}$, F. Valverde, M. (1991) N_{375} etc. Gupta V. K. (1991) recommended a low dose of fertilizer - $N_{21}P_{53} N_{90}P_{34}$. Nobody studied the *dependence of doses of fertilizers on the chemical composition of green mass* no one did.

Goals and objectives of the study are to give the scientific rationale to the formation of highly productive crops of amaranth using mineral

fertilizers in the conditions of Central Chernozem region.

The following tasks were set:

1. to study the influence of mineral fertilizers on yield of amaranth.
2. to determine the chemical composition of amaranth.

Experimental work was carried out in 2013-2015 in the fields of educational scientific and technological centre "Agro-technology" of VSAU.

Repetition of the experiment is threefold. The plot size is 25 m². Seeding rate is 1 kg/ha. The method of sowing -is ordinary (15cm). The seeds conformed to the requirements of GOST 28636-90 [1]. Grade: Mixed feed grade amaranth Giant.

variant		Yield per year c/ha				addition to control	
		2013	2014	2015	average	c/ha	%
1	control	360	268	245	291		
2	N ₆₀	450	300	286	346	55	18.7
3	N ₆₀ P ₆₀ K ₆₀	524	388	308	407	116	39.8
4	N ₆₀ P ₆₀ K ₆₀ (азофоска)	514	363	313	397	106	36.4
5	N ₉₀ P ₉₀ K ₉₀	574	390	331	432	141	48.4
6	N ₉₀ P ₉₀ K ₉₀ (nitrogen-phosphorus)	574	390	332	432	141	48.5
7	N ₃₀ P ₆₀ K ₆₀ + N ₃₀ (dressing)	520	399	328	416	125	42.8
8	N ₁₂₀ P ₁₂₀ K ₁₂₀	530	409	389	442	151	52

Table 1. The yield of green mass of amaranth in dependence on mineral fertilizers (kg/ha) at flowering stage 2013-2015.

Fertilizer plays an important part in the formation of the yield of amaranth. As can be seen from Table 1, all the variants with a fertilized background are significantly higher than in the control. The highest yield was registered in the variant with application rate N120P120K120. The yield of green mass against this background averaged 4.42 kg/m² exceeding the control data by 52%. At the control variant the yield was 2.91 kg/m². The smallest increase was observed in the variant with application rates N60 and amounted up to 3.46 kg/m² which is 0.55 kg/m², or 18.7% higher than the control data

As can be seen from table 2 the dose of mineral fertilizers has a significant effect on the chemical composition of amaranth. The amount of protein with the higher doses increased from 8.0% in control to 15.0% at N120 P120 K120 variant with the highest fertilizer rate.

Variants	Protein	Fiber	Calcium	Phosphorus	Fat	Ash	Nitrates
	%, of dry matter in fodder						мг/кг
Control	8.0	22.83	2.0	1.93	1.56	23.05	573
N ₆₀	8.4	21.34	2.0	1.93	3.48	21.76	730
N ₆₀ P ₆₀ K ₆₀	11.9	19.38	2.2	2,13	4,29	17.11	1 172
N ₆₀ P ₆₀ K ₆₀ (nitrogen phosphorus)	11.9	20.06	2.2	2,07	4,35	17.65	1 200
N ₉₀ P ₉₀ K ₉₀	12.8	17.99	2.6	2,49	4,35	18.44	1 437
N ₉₀ P ₉₀ K ₉₀ (nitrogen phosphorus)	12.3	18.03	2.7	2,59	4,71	18.80	1 581
N ₁₂₀ P ₁₂₀ K ₁₂₀	15.0	16.53	3.0	2,93	4,90	16.94	1 816

Table 2. The chemical composition of green mass of amaranth on different fertilizer in a flowering phase-2013-2015.

The amount of fibre in % of dry matter with the increasing doses of mineral fertilizers decreases from 22.83% to 16.53%.

The amount of nitrates with the increasing doses of fertilizers increased significantly. If at the control the amount of nitrates was 573 mg/kg, in variant norm N120 P120 K120 their number was 1816 mg/kg.

With the increasing doses of mineral fertilizers nonsignificant increase of calcium and phosphorus in Amaranth is observed so the percentage of calcium in the dry matter increased from 2.0% in the control to 3.0% at the option N120P120K120. The amount of phosphorus for similar options changed from 0.28% to 0.52 % in absolutely dry matter.

The amount of fat in dry mass of amaranth with the higher doses of fertilizers significantly increased from 1.56% in the control, up to 5.21% at the option N120 P120 K120.

The amount of ash with the increasing doses of mineral fertilizers decreased from 23% in the control to 16.9% on the variant N120 P120 K120.

Conclusions and suggestions

1. Amaranth is suitable for cultivation for green fodder in the conditions of Central Chernozem region.

2. Fertilizers influence the yield of green mass of amaranth. The gain from application of mineral fertilizers is more than 30 %.

3. With the increasing doses of fertilizers the amount of protein in amaranth increases from 8.0 to 15.0 %. However there will be increases in nitrates in plant tissues from 573 to 1816 mg/kg of fodder.

Список литературы:

- ГОСТ 28636-90. Семена малораспространенных кормовых

культур. Сортовые и посевные качества Конев А.Д. Сроки уборки амаранта / А.Д. Конев, Е.Г. Наумов // Кормопроизводство, 1997.-№10. С 31-32

2. Кононкоф П.Ф. Амарант – перспективная культура XXI века / П.Ф. Кононкоф, В.К. Гинс, М.С. Гинс. – 2-е изд., исправлю и доп. – М.: Издательский дом Евгения Федорова, 1998. – 310 с.

3. Лазаньи Я. Оценка продукции биомассы и семян щирицы в засушливых районах Большой Венгерской низменности / Я. Лазаньи [и др.] // Международ. с.-х журнал. – 1988. -№5. – С. 60 – 64.

4. Lazanyi L. Biomass production on some cultivated and wild amaranth species / L. Lazanyi, Gy. Chrappan, I. Kapocsi // Fazekas M Acta Agron. Hung., 1990. V. 39. № 1 - 2. P. 11 -19.

5. . Gupta V.K. Grain amarant: an ideal crop for marginal areas in Kenia/ V.K. Gupta, D. Thimba //Primer Congreso International del Amaranto. Mecxico, 1991: 57.

6. Valverdee F.M. Efecto del nitrogeno y potasio en et desarroioo y rendimiento de amaranto upo Mercado / F.M. Valverdee, T.A. Santoss // Primer Congreso Intenational del Amaranto. Mexico, 1991. 46p.

УДК: 581.14(551.45+47-13)

Nerovnaya I. J.

Oleinikova E. M.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

ECOLOGICAL FEATURES HERBACEOUS BIOLOGICHESKIE KULSEITOV OF THE VORONEZH REGION

*Аннотация. Проведен эколого-биологический анализ травянистых растений, произрастающих на мелах. Изучен онтогенез и возрастная структура ценопопуляций эндемика меловых обнажений *Pimpinellatragium Vill.* (бедренеца скального). В онтогенезе вида выделено 4 периода и 9 возрастных состояний. Показана зависимость онтогенетической структуры ценопопуляций от физиологических свойств вида и физических свойств мелового субстрата.*

All the world botanists involved in flora studies of the territories, where carbonate rock comes to the Earth surface (Cretaceous outcrops),

note floristic distinctiveness of these territories. In Voronezh region, the outputs of chalk and marl are confined to the riverine slopes and slopes of hills composed of chalk (North-Western, southern, South-Western and South-Eastern areas). Chalk landscape – specific natural-territorial complexes, where the main role is played by chalk-loamy rocks. Natural specificity is determined by the erodibility of the terrain, high reflectivity, lack of the developed soil, predominance of sparse vegetation of calciphyte groups [1]. By the flora of the Cretaceous outcrops a set of species associated in its distribution with the chalk substrate are understood.

According to modern reports more than 500 species of angiosperms growing on the outputs of chalk and marl are marked in Voronezh region. A significant portion of them belongs to endemic and relict species which existed in pre-glacial period. Depending on the degree of adaptation they can be divided into four groups: obligate calcicite, optional calcicite, insensitive to calcium content types, calciphobous species.

Cretaceous outcrops have a number of common features such as lack or weak development of soils, the mobility of the Cretaceous rocks, specific microclimate, physical and chemical properties of chalk as a substrate on which the plants grow. In this regard in the composition of the Cretaceous flora species certain life forms dominate such as subshrubs and perennial herbaceous plants with a powerful taproot penetrating to the depth of 50 cm to 2 m and more [2]. It was repeatedly noted that the taproot types reinforce writing [3-5].

The aim of this work was to study the ontogeny and structure of populations of endemic species of chalk and limestone *Pimpinella tragium* Vill (Pimpernel rock) from the Umbelliferae family. It is a perennial taproot plant for the European part of Russia. The species is confined to the valleys of Volga and Don, Black sea coast of Caucasus. For the Voronezh region it is observed on the North border of the area [2]. Obligate calcific, on chalk outcrops of the South, West and North-West region occurs everywhere: on the moving screes, dense indigenous outcrops of chalk and plumes and cones and outcrops with a mixture of humus and fine-grained deposits [3-5]. The material for the analysis was collected in Ostrogozhsky, Kamensky, Podgorensky, Rossosh, Olhovatsky and Kantemirovsky districts. To highlight the ontogenetic state of the Pimpernel the conventional methods were used. Ontogenetic structure and abundance were analysed on the experimental plots of 1 m², the system has been in systematic way. As counting units individual seed origin was used. The ontogeny of Pimpernel rock is shown in Fig.1.



Fig. 1. Ontogenetic status of Pimpinella rock

It is found that complete development cycle includes 4 periods and 9 age-related conditions. Regenerative period includes: seeds, seedlings, juvenile, immature and virginile individuals. The generative period is represented by young, middle-aged and old generative plants. Postgenerative period includes only senile (non-adult) aged status. Note that the full ontogeny of the species takes in average 12-15 years. 1 year - seedlings, juvenile, immature. 2-3 year – virginile (non-adult) individuals. 4-5 year – young generative, 6-9-11 – year - middle-aged, 11-13 year – old generative, 14-15 – senile individuals.

Simultaneously with the ontogeny ontogenetic structure of *Pimpinella tragium* – participation of individuals of all age was studied. States in the composition of cenopopulations (CP) are shown in Fig.2. 5 communities with participation of Pimpinella were chosen. CPU 1 and 3 were located on the slopes of southern and South-Western exposures, with extensive areas of solid chalk, while the CPU 2, 4 and 5 were a part of the natural phytocenoses of meadow grass on chalk rubble mixed with fine-grained, black carbonate soil or loose chalk outcrops.

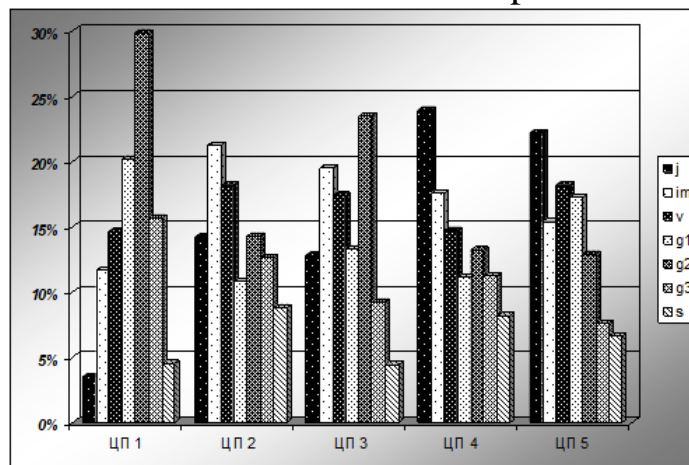


Fig. 2. Ontogenetic structure of the CPU *Pimpinella tragium*

In the CPU 2, 4 and 5 left-sided ontogenetic spectra with maxima at immature or juvenile specimens, the local maximum of g1 (5 CPU) or (CPU 2, 4) g2–units were observed. These CPU of the Pimpernel are part of the turf-covered chalk communities with relatively high projective cover (65-75%) and a low slope of the terrain (5-150). Long-term observations allow the discussion on optimum for the species the timeframe for completion of each period of ontogenesis. Average density of population is 45.8 individuals per 1 m². Left-handed nature of the spectra is due to the fact that the species are reproduced only by seeds. When resources are scarce young individuals can die. Thus the maximums shift all the time in regenerative fraction.

In CPUs 1 and 3 centred aged spectra are at the maximum of the g2 – species. We believe that this type of structure is formed primarily in relation to the physical properties of the Cretaceous outcrops, which produces the Pimpernel. This is solid chalk substrate. Therefore, to gain a foothold and grow out of the seed becomes very difficult. In addition, the top layer of chalk due to seasonal shifts of temperature and humidity gradually loosens and washes away by the snow melting and precipitation. Many seedlings are killed, and generative individuals, due to long-term growth maintain the fixed area and determine the predominant aged group.

Thus the formation of ontogenetic patterns of CPU *Pimpinella tragi* is significantly influenced by the substrate physical characteristics, and therefore by physiological characteristics of this species along with the peculiarities of ontogenesis.

Список литературы:

1 Виноградов Н.П., Голицын С.В., Доронин Ю.А. Донское Белогорье – новый район сниженных альп Среднерусской возвышенности.– Бот.журн. – 1960. – Т. 45, № 4. – С. 524 – 532.

2 Радыгина В.И. Кальцефильная флора Среднерусской и Приволжской возвышенностей и некоторые вопросы ее истории: Дис ... док. биол. наук . – Москва, 2002. – 690 с.

3 Хмелев, К.Ф., Кунаева Т.И. Растительный покров меловых обнажений бассейна Среднего Дона. – Воронеж: Из-во ВГАУ им. К.Д. Глинки, 1999. – 214 с.

4 Агафонов В.А. Степные, кальцефильные, псаммофильные и галофильные эколого-флористические комплексы Бассейна Среднего Дона: их происхождение и охрана. – Воронеж: Из-во ВГУ, 2006. – 250 с.

5 Олейникова Е.М. Эндемичный кальцефит *Pimpinella tragi* (*Apiaceae*) на мелах Среднего Дона. - Вестник ВГУ. Серия:

УДК: 631.8:631.445.41:633.63

**Pelagin D.S.,
Kozhokina A.N.,
Myazin N.G.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

INFLUENCE OF LONG APPLICATION OF FERTILIZERS AND AMELIORANT IN ACID-BASE STATUS OF LEACHED CHERNOZEM AT THE SUGAR BEET

Аннотация: Одним из основных факторов увеличения продуктивности сахарной свеклы является применение достаточно высоких доз минеральных удобрений, что ведет к подкислению почв и изменению состава ППК. Высокий уровень кислотности почв снижает урожайность свеклы, поэтому при ее выращивании часто возникает проблема нейтрализации повышенной кислотности.

Ключевые слова: чернозём выщелоченный, сахарная свёкла, удобрения, мелиорант (дефекат), кислотно-основные свойства, варианты, известкование.

The leached Black soils are among the most fertile soils of Voronezh region. They have favorable agrochemical properties which change markedly under different agricultural use [1]. A significant part is occupied by sugar beet.

One of the main factors of increasing the productivity of agrocenoses of sugar beet is the use of sufficiently high doses of mineral fertilizers (mainly physiologically acidic), leading to soil acidification and changes in the composition of CPD. A high level of soil acidity reduces the yield of beets, so when it is grown often arises the problem of neutralization of acidity by liming [2].

In this regard, the aim of our study was to examine the effect of applying mineral, organic fertilizers and ameliorant (defecate) upon changing the acid-base properties of leached black soil when cultivating sugar beet.

The studies were conducted in 2011-2013 in the territory of the STCU "agro-technology" Voronezh state agrarian UNIVERSITY in long-term stationary experiment of Department of Agrochemistry and soil science on

leached Chernozem in six-field crop rotation. The scheme experience includes 15 options. The studied variants are presented in table 1. Selection of soil samples was conducted in the spring before sowing sugar beet. The tests were performed according to standard techniques.

The results of the research (table 1) showed that, on average, during the three years of basic acidic properties of the soil on the version with delay 40 t/ha manure was not significantly different from the control. So, the value of pHKCl in the soil layer of 0-40 cm was 5.1 Ng is 4.6 mEq/100 g of soil. On the control, these indicators were equal to 5.2 and 4.4 mEq per 100 g of soil, respectively. When mineral fertilizers (NPK 120 and 240 kg/ha) a tendency towards acidification of the soil pHKCl as in (4.9) and hydrolytic acidity (by 5.7 and 5.9 mEq/100 g soil).

Option	H _{KCl}	Hr, mg/100 g of soil	Ca+Mg, mg/100 g of soil	Ca, mg/100 g of soil	Mg, mg/100 g of soil	T, mg/100 g of soil	V, %
1. Control	5.2	4.4	30.1	25.3	4.8	34.5	87.2
2. Background	5.1	4.6	30.6	26.0	4.6	35.2	86.9
3. Background+N ₁₂₀ P ₁₂₀ K ₁₂₀	4.9	5.7	29.4	24.6	4.8	35.1	83.8
5. Background+N ₂₄₀ P ₂₄₀ K ₂₄₀	4.9	5.9	29.1	24.7	4.4	35.0	83.1
12. Background+N ₁₂₀ P ₁₂₀ K ₁₂₀ + Defecation (the aftereffect)	5.4	3.7	31.1	26.6	4.5	34.8	89.4
13. Background + Defecation (the aftereffect)	6.0	2.4	31.7	27.5	4.2	34.1	93.0
15. Defecation (the aftereffect) + N ₁₂₀ P ₁₂₀ K ₁₂₀	5.6	2.9	30.4	26.2	4.2	33.3	91.3

Table 1 – Effect of fertilizer and meliorant on the acid-base properties of leached Chernozem, 2011-2013

The introduction of NPK on the background of manure aftereffect and defecate (option 12) and one defecate (option 15) was instrumental in changing the reaction medium from average acid to slightly acidic and close to neutral. The best indicators of soil acidity were observed in the variant with joint aftereffect of manure and defecate (13). The soil in this embodiment the pH was close to neutral pHKCl 6.0 and Ng – 2.4 mg-EQ/100 g of soil.

The amount of calcium and magnesium in the control variant amounted to 30.1 mEq/100 g of soil, the background was increased by 0.5, and with simultaneous application of organic and mineral fertilizers decreased by 0.7-1.0 mg-EQ/100 g of soil compared to control. On a variant with entering

N120P120K120 amid aftereffect defecate and organic fertilizers (variant 12), and the joint aftereffect of organic fertilizers and ameliorant (13) sum of calcium and magnesium increased up to 31.1 and 31.7 mEq/100 g of soil. The calcium content in the soil absorbing complex is 5-6 times higher than the magnesium content. The highest content of calcium was observed on the background form as well as on the variants with ameliorant.

The degree of saturation of soil bases on the control variant was 87.2%, while making 40 t/ha manure it decreased to 86.9%. In fertilized variants without liming (options 3 and 5), this indicator was virtually the same - and 83.8 83.1%, and if you make defecate it increased by 2.2-5.8% in comparison with the control.

Thus, the application of mineral fertilizers on the background of organic aftereffect without liming helped to increase soil acidity, decrease the amount of Ca and Mg and the degree of saturation of soil bases. Making defecation stabilized acid-base properties of leached black soil, turning the soil from the discharge average acid in slightly acidic and close to neutral and increasing the calcium content and degree of saturation of soil bases.

Not to mention the fact that stabilizing effect on acid-basic parameters of soil application of the manure. As can be seen from the presented data, in the soil background option is not observed a pronounced change for the worse of acidity.

The yield of sugar beet in three years on the average on the fertilized variants ranged from 51,1 t/ha to 55.8 t/ha, with yields on control and background - 31,7 and 47.8 t/ha. The largest collection of sugar was obtained when making N120P120K120 on the background of manure aftereffect and defecate and 9.8 t/ha. N120P120K120 Introduction on the background of manure aftereffect provided a somewhat lower value of this index of 9.2 t/ha. The lowest sugar harvest was obtained on the variants with a double dose of fertilizer and the joint aftereffect of manure and defecates at 8.8 and 8.7 t/ha.

Thus, the most favorable alternative for the cultivation of sugar beet, despite the slightly acidic reaction environment, was the introduction N120P120K120 on the background of manure aftereffect and defecate.

Список литературы:

1. Ахтырцев П.Б. Почвенный покров Среднерусского Черноземья / Б.П. Ахтырцев, А.Б. Ахтырцев. – Воронеж: ВГУ, 1993. – 216 с.
2. Карпенко В.П. Свекловодство / В.П.Карпенко. - Москва: Колос, 2004. – 308 с.
3. Алексеева Д.М. Агрохимические методы исследования почв / Д.М. Алексеева. – Москва: Наука, 1975. – 420 с.

УДК 633.11.«324»:631.531.04(470.324)

Podlesnykh N. V.
Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia
Starodubtseva A. M.
Moscow Agricultural Academy named after K.A. Timiryazev, Moscow, Russia

NET PHOTOSYNTHESIS RATE AND BIOMASS BUILDUP IN WINTER WHEAT SPECIES IN THE CONDITIONS OF CENTRAL CHERNOZEM ZONE

Аннотация. В статье рассмотрены показатели фотосинтетической деятельности озимой твердой (сорт Дончанка), тургидной (сорт Донской янтарь) и мягкой (сорт Безенчукская 380) пшеницы. Приведены результаты по ЧПФ и приросту биомассы разных видов озимой пшеницы в условиях лесостепи Воронежской области.

Ключевые слова: озимая твердая, тургидная и мягкая пшеница, чистая продуктивность фотосинтеза, прирост биомассы.

Among the processes determining plant productivity and in winter wheat too, the key place belongs to photosynthesis. It is the process of organic matter creation by green plants, as 90-95% of plant dry weight consists of organic substances. Plant productivity is conditioned by the parameters of photosynthetic activity, including net photosynthetic productivity (NPP) [1].

The performance of photosynthetic apparatus can be assessed by net productivity rate which describes the intensity of organic matter formation and accumulation. Precisely, the NPP features not exactly photosynthesis but the daily change between the amount of organic matter formed by photosynthesis, and the amount of assimilates spent by the plant on breath, etc., per leaf area unit [2-4].

Studying the NPP in different agro-ecological conditions during the vegetation allows revealing the factors limiting the materialization of the crop's potential productivity. [5]. Therefore studying the issue is important.

Our experiments were conducted in the fields of Voronezh State Agrarian University in 2005-2008 using appropriate standard methods on hard winter wheat – durum (*cv. Donchanka*), turgid (*cv. Donskoy yantar'*) and soft (*cv. Bezenchukskaya 380*). The NPP varied greatly during the growing season, dependent on the wheat cultivar and phases of growth and

development (Table 1).

Winter wheat type	Interstage period					
	tillering to shooting	shooting to heading	heading to flowering	flowering to liquid grain	liquid to wax grain	wax to full ripeness
Durum	6.48	7.27	7.09	6.60	6.09	4.98
Turgid	6.56	7.44	7.73	7.13	6.30	5.13
Soft	6.19	7.09	6.84	6.18	5.53	4.75

Table 1. Daily net photosynthetic productivity of durum, turgid and soft winter wheat in 2006-2008, $g \cdot m^{-2}$

Since spring regrowth beginning, the NPP increases because the plants do not shade each other, all the leaves are well lit, and the NPP reaches its peak in the phases of shooting to flowering. On average for the period of studies, dry biomass produced by the plants during the day per $1 m^2$ of leaf area, increased daily in durum wheat up to $7.27 g \cdot m^{-2}$, in turgid – $7.73 g \cdot m^{-2}$, and soft – $7.09 g \cdot m^{-2}$.

The NPP of durum and turgid wheat was higher than that of soft, the improvement increased through shooting to maturation stage (Table 2). In terms of NPP turgid wheat exceeded the soft-type cultivar (4.9-15.4%), so did the durum one yet lesser – by 2.5-10.1%. Consequently, it can be assumed that the photosynthesis performance of durum and turgid winter wheat plants is higher than that of the soft wheat plants under forest-steppe conditions. Possibly this was due to the lower plant density in the crops of durum and turgid wheat and consequently to better of lighting.

Later in the season the NPP began to decrease due to the withering and drying of the lower leaves.

Notably, the value of NPP, as well as photosynthetic potential, is influenced by plant density, leaf area per 1 plant and weather conditions.

Winter wheat type	Interstage period					
	tillering to shooting	shooting to heading	heading to flowerin g	flowerin g to liquid grain	liquid to wax grain	wax to full ripeness
Durum	6.48	7.27	7.09	6.60	6.09	4.98
Turgid	6.56	7.44	7.73	7.13	6.30	5.13
Soft	6.19	7.09	6.84	6.18	5.53	4.75

Table 2. Daily NPP changes in wheat types through their development stages, $g \cdot m^{-2}$ (2006-2008, on average)

Correlation and regression analysis between the NPP and leaf area, as well as between the NPP and photosynthetic potential, showed an average positive or negative relationship.

The correlation parameter between leaf area and NPP in durum

wheat varied from -0.54 to +0.67, in turgid it made -0.46 to +0.59, in soft the value fluctuated between -0.66 and +0.62, depending on the development phase. NPP daily increase of $1 \text{ g}\cdot\text{m}^{-2}$ was provided by leaf area growth by 2.8-3.7 thousand $\text{m}^2\cdot\text{ha}^{-1}$ in durum wheat crops, by 2.3-3.1 thousand $\text{m}^2\cdot\text{ha}^{-1}$ in the turgids, and 3.5-4.7 thousand $\text{m}^2\cdot\text{ha}^{-1}$ in soft wheat stands, $t_r > t_{0.5} = 2.78$.

The correlation parameters for NPP and photosynthetic potential ranged from -0.54 to +0.73 during the observation period, depending on development phase and wheat type: durum -0.68 to +0.72, turgid -0.58 to +0.64, and soft -0.54 to +0.58. The regression coefficient ranged from -7.1 to +22.9, depending on the wheat type at $t_r > t_{0.5} = 2.78$. It should be noted that the relationship between NPP and photosynthetic potential in durum and turgid wheat is stronger than in soft wheat.

One of the indicators that characterize photosynthetic activity is the increase in plant biomass during the growing season (Table 3).

Winter wheat type	Interstage period					
	tillering to shooting	shooting to heading	heading to flowering	flowering to liquid grain	liquid to wax grain	wax to full ripeness
Durum	2.27	2.31	1.26	1.08	2.55	0.52
Turgid	2.18	2.20	1.27	1.08	2.32	0.45
Soft	2.54	2.71	1.48	1.25	2.42	0.54

Table 3. Biomass augmentation in durum, turgid and soft winter wheat in 2006-2008, t ha^{-1}

Averagely during the study period, the maximum biomass increase in spring and summer was observed in soft winter wheat, and it made up to $0.54\text{-}2.71 \text{ t}\cdot\text{ha}^{-1}$, which is 4.3-14.6 % more than the durum cultivar performance, and 4.0-18.7 % more than that of the turgid one.

Slower increments in biomass production in the late of the season are due to redistribution of the accumulated assimilates from leaves, stems and roots to generative organs.

Thus, our studies resulted in the following conclusions:

1. During heading to flowering the daily NPP in durum and turgid wheat plants is $0.25\text{-}0.89 \text{ g}\cdot\text{m}^{-2}$ (3.6-13.0%) more than that of soft wheat.
2. The spring and summer biomass buildup in durum and turgid wheat was $0.02\text{-}0.51 \text{ t}\cdot\text{ha}^{-1}$ less than that of wheat.

Список литературы:

1. Зеленский, Н.А. Фотосинтетическая деятельность посевов озимой пшеницы в зависимости от элементов технологии возделывания в условиях Ростовской области [текст] / Н.А. Зеленский, А.П. Авдеенко // Материалы международной научной

конференции "Татишевские чтения: актуальные проблемы науки и практики", Тольятти, 2005, С.3-9.

2. Ермакова, Н. В Особенности развития, формирования урожая и качества зерна озимой твердой и тургидной пшеницы в лесостепи ЦЧР [Текст]: дис. ... канд. с.-х. наук: 06.01.09 / Ермакова Надежда Владимировна; Воронеж. гос. аграр. ун-т им. К.Д. Глинки. – Воронеж, 2009. – 213 с.

3. Ермакова, Н.В. Фотосинтетический потенциал озимой твердой, тургидной и мягкой пшеницы в условиях лесостепи ЦЧР [текст] / Н.В. Ермакова, В. В. Козлобаев, О. С. Калмыкова // Вестник Воронежского государственного аграрного университета имени К. Д. Глинки. –2008. – № 3-4(18-19). – С.18-21.

4 Подлесных, Н.В. Озимая твердая пшеница – лучшее сырье для макаронной промышленности [Текст] / Н.В. Подлесных, Л.М. Власова, Е.А. Купряжкин // Производство и переработка сельскохозяйственной продукции: менеджмент качества и безопасности: материалы III Международной научно-практической конференции, – Воронеж: ФГБОУ ВПО Воронежский ГАУ, – 2015. – Часть I. – С. 47-52

5. Ничипорович А. А. Фотосинтетическая деятельность растений в посевах [Текст] / А. А. Ничипорович, Л. Е. Строганова, С. Н. Чмора. – М.: из-во АН СССР, 1961. – 136 с.

УДК 631.8:631.5

Pospelowa M.W.

**Agraruniversität Woronesh namens Peter des Großen,
Woronesh, Russland**

VERWENDUNG VON TONMINERALIEN ALS SORBENSMITTEL FÜR DIE BODENENTGIFTUNG

Аннотация: В работе проводилась оценка влияния бентонита в композициях для предпосадочной обработки клубней картофеля с целью предотвращения заболевания культур. Картофель, бентонит, сточная вода, формальдегид.

Ключевые слова: бетонит, картофель, сточные воды, глинистые минералы, заболевание.

Das Abwasser der Möbelfabrik Woronesh "Mebel Schternosemja"

hat eine leicht alkalische oder neutrale Reaktion — pH-7.0-8.5, infolgedessen ist es zweckmäßig, es vor allem auf den sauren Böden zu verwenden, die Zahl deren in der Region Woronesh etwa 775.000 ha ausmacht.

Zink, Mangan, Kupfer, Kobalt sind Spurenelemente, die für die vollständige Entwicklung der Pflanzen erforderlich sind. Das Abwasser der obengenannten Möbelfabrik enthält diese in der Menge, die die zulässige Konzentration dieser Elemente im Boden nicht überschreitet.

Das Abwasser enthält freies Formaldehyd etwa 2% in der Lösung, das über biozide Eigenschaften verfügt, sowie niedermolekulare Kondensationsprodukte aus Harnstoff und Formaldehyd.

Ziele:

- den Einfluss von Bentonit auf Wachstum und Entwicklung der Kartoffel studieren;
- Untersuchung der Auswirkungen der Präparation der Kartoffel mit gleichzeitiger Behandlung von Abwasser und Bentonit;
- die Auswirkungen dieser Praktiken auf das bodenbiotische Komplex der Agrarökosystemen untersuchen.

Im Mikrofeldverfahren gibt es 6 Optionen mit dreifacher Wiederholbarkeit. Die Fläche der Parzelle beträgt 1 m². Das Objekt der Studie war Kartoffel der Sorte „Wesna“.

Schema des Verfahrens:

1. Kontrolle (ohne Bearbeitung)
2. Abwasser
3. Abwasser + Bentonit
4. Abwasser (in Scheiben geschnitten)
5. Abwasser + Bentonit (in Scheiben geschnitten)

Vor der Aussaat wurden die Kartoffelknollen mit dem Abflusswasser von 10 l/t bespritzt. In der 2. und 3. des Verfahrens wurden die unversehrten Knollen bearbeitet, und in den 4. und 5. Wurden das die geschnittenen Knollen. Die Bearbeitung von Bentonit wurde durch das Abstauben von Knollen mit dem bentonitenthaltenden Ton verwirklicht.

Variante	Anteil der Rohstoffprodukte,%	Gewicht marktfähiger Produkte, kg / ha	Gesamtfruchtbarkeit, kg / ha
Kontrolle	72	298	417
Abwasser	76	371	490
Abwasser + Bentonit	77	386	502
Abwasser (in Scheiben geschnitten)	78	379	488
Abwasser + Bentonit (in Scheiben geschnitten)	76	388	512

Tabelle 1. Die Fruchtbarkeit von Kartoffeln(2014)

Tabelle 1 zeigt, dass bei den Varianten nur mit Abwasser die Fruchtbarkeit um 17 Prozent im Vergleich zur Kontrolle gestiegen wurde, in der dritten Variante, wo eine Knolle mit Abwasser und Bentonit bearbeitet wurde, stieg sie um 20 Prozent, und in der 4. Version mit geschnittenen Knollen und Verarbeitung mit Abwasser und Bentonit und stieg sie um 25 Prozent. Hieraus können wir schließen, dass die Verwendung von bentonittragenden Ton leistet eine vorteilhafte Wirkung auf die Fruchtbarkeit der Kartoffel.

Ferner schätzten wir den Zustand des bodenbiotischen Komplexes ein, der durch biotische Methode unter Verwendung der roten Radieschen Samen mit weißer Spitze als Testobjekt analysiert wurde. Auch wurde die Aktivität der Bodenkatalyse in Ausführungsformen durchgeführt. Es wurde auch die Bodensäure definiert.

Variante	Katalase-Aktivität cm ³ O ₂ pro 1 g Boden	Toxizität des Bodens (Wurzellänge, mm),%	pH
Kontrolle	2.1	100	6.34
Abwasser	1.4	96	6.26
Abwasser + Bentonit	1.8	115	6.30
Abwasser (in Scheiben geschnitten)	2.0	90	6.35
Abwasser + Bentonit (in Scheiben geschnitten)	2.1	112	6.36

Tabelle 2 Bewertung der Boden

Der Säuregehalt des Bodens, die Aktivität des Enzyms Katalyse für diese Studie unterscheiden von der Kontrolle nicht. Daraus folgt, dass diese Verfahren für die Bearbeitung von Saatkartoffeln ungefährlich sind.

Schlußfolgerungen

1. Die Verwendung von abwasserhaltigen Ton und Bentonit erlaubt, teure Mittel für die Bearbeitung von Saatkartoffeln zu ersetzen. Dadurch erhöht sich die Fruchtbarkeit.

2. Bentonit hat einen positiven Effekt auf die Entwicklung des Saatgutes, erhält Feuchtigkeit in der Knolle, stellt Mikronährstoffen durch die Zellen an der Stelle des Schnittes bereit und verlängert die Wirkung des Abwassers.

3. Bentonit verfügt über eine hohe Absorptionskapazität und binden Gifte, die in das System eintreten, wodurch ihre negative Auswirkung auf die Bestandteile der Agrarzenosen.

Список литературы:

1. Пигорев И.Я Приемы предпосадочной подготовки клубней картофеля к ускоренному размножению районированных сортов/ Пигорев И.Я, Засорина Э.В., Кизилов А.А. // Агроекологические

проблемы современности. -Мат.межд.науч. -практ. конф.- Курск,2001. С.41-44

2. Засорина Э.В, Кизилев А.А. Экологические и агробиологические особенности разноспелых сортов картофеля для ЦЧР/Засорина Э.В, Кизилев А.А.//Агроэкологические проблемы современности.-Мат.межд.науч.-практ. конф.-Курск, 2001. С.47-49

3. Бондарчук О.В. Влияние способов обработки посадочного материала картофеля на продуктивность агроценозов.// Экология России на пути к инновациям: межв. сб. науч. тр. /сост. Н.В. Качалина.- Астрахань: Издатель: Сорокин Иван Васильевич, 2011.- вып. 5.- С.135-137.

**Raspopova, L. A.,
Nesmeyanova, M. A.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE BIOLOGIZATION METHODS IN THE CULTIVATION SUNFLOWER IN THE CONDITIONS OF CCZ

Аннотация: В данной статье представлены результаты исследований кафедры земледелия Воронежского ГАУ по применению различных приемов биологизации при возделывании подсолнечника, в частности, его совместных посевов с многолетними бобовыми травами по фону пожнивной сидерации крестоцветных культур. Согласно полученным данным, использование в качестве бинарного компонента масличной культуры люцерны синей по фону совместного использования на удобрение соломы ячменя и пожнивной сидерации редьки масличной обеспечивает рациональный расход основных элементов питания и доступной влаги в почве, а также существенное увеличение урожайности подсолнечника (на 2-3 ц/га).

Ключевые слова: подсолнечник, бинарный посев, сидераты, многолетние бобовые травы, влажность, урожайность.

In modern conditions of agriculture the major problems in sunflower cultivation of are the increase of the oil seeds yield, the growth of profitability, the preservation and increase of soil fertility. Important role in solving the problems are today given to a promising area of sunflower

cultivation based on the biological part [2, 6]. The given direction includes not only the inclusion of green manure crops in the crop rotation [1, 5, 7], but also the development of inter-species agrophytocenosis of sunflower and legume component [3, 4, 8].

In this regard, the Department of agriculture of Voronezh state agricultural University founded stationary experiment, which aims at determining the effect of binary sowing of sunflower with perennial leguminous grasses on the main indicators of typical chernozem fertility sunflower and yield of. The soil of the plot is typical chernozem, medium-power, clay. The humus content in the topsoil (0-30 cm) is 5,3%, the amount of exchange base is 43,1 mg-EQ./100 g of soil, the content of mobile PHOS-phorus and exchange potassium (by Chirikov), respectively, 113 and 184 mg/kg, hydrolyzable nitrogen is of 62.9 mg/kg of soil.

The experimental scheme included the following versions: 1. Single-species planting of sunflower (control). 2. Binary sowing of sunflower with yellow sweet clover for green manure of oilseed radish. 3. Binary sowing of sunflower with yellow sweet clover for green manuring by crop of white mustard. 4. Binary sowing of sunflower with blue alfalfa green manuring by crop of the oilseed radish. 5. Binary sowing of sunflower with blue alfalfa green manuring on crop of white mustard.

The years of the study were both slightly dry (2014 and 2015: SCC=1.0 and 0.6), and excessively wet (2013: SCC=2.3).

Despite the drought resistance of sunflower the, yield and quality of seeds is largely dependent on the availability of plant available moisture during the growing period of the crop. Therefore, it is necessary to pay special attention to the accumulation of available soil moisture and its rational spending throughout the growing season.

The joint use of barley straw and stubble green manuring as a fertilizer, as one of the biologization methods, provided formation in the soil layer of 0-50 cm good stock of dos -accessible moisture – 80-87 mm at the phase of full shoots.

During the whole vegetation period of sunflower in binary sowing with perennial leguminous grasses more rational consumption of available moisture in the soil was observe, which ensured the formation of a relatively high stock in its major phases of growth and crop development.

In average the consumption of available moisture in soil layer of 0-100 cm in binary crops amounted 38-58 mm, while at single-species sowing (control) the flow rate was much higher – 62 mm.

In the cultivation of sunflower in binary sowing with perennial leguminous herbs rational consumption of major nutrients is noted.

Binary sowing of sunflower in crop sideration of radish not only provides rational consumption of potassium exchange, but the increase in

its reserves (32-48 mg/kg soil) to the end of the vegetation period, whereas at single-species sowing of sunflower, the content of this element in the soil decreased (8 mg/kg of soil).

When the binary sowing of sunflower with legumes on the background of green manuring crop, the radish the increase of phosphorus rolling passes (4 mg/kg of soil) is noted at the control of the stocks of this item at soil decreased up to 12.

Cultivation of sunflower with application of complex biologization methods did not significantly influenced the contents and dynamics of soil nitrate nitrogen, but was characterized by a more rational consumption of ammoniac nitrogen. So, binary crop losses of ammonia nitrogen were significantly lower (0.79-1.06 mg/kg soil) than in single-species sowing of sunflower (1.93 mg/kg soil).

Thus, the use of perennial legumes (alfalfa and clover) as binary components of sunflower on the background of green manure crop (radish and mustard) provided a more rational consumption of major nutrients during the whole vegetation period of the crops.

The final conclusion about the effectiveness of any agrotechnical method is carried out on the basis of crop yields, which is an integrated indicator of an estimation of the investigated factors.

The yield of sunflower (table. 1) significantly depended on the complex of methods of biological and hydrothermal conditions of the vegetation period, which in the years of the research (2013-2015) were mixed, which contributed to greater objectivity and adaptability of the findings and recommendations.

Significantly higher yield of sunflower both to the average for the study and in some years was obtained from its binary sowing with blue alfalfa for both types of green manure crops.

Variant of the experiment	Yield, t/ha			
	2013.	2014	2015	media.
Single-species planting	3.58	2.53	2.29	2.80
Binary planting with clover yellow	3.60	2.58	2.53	2.90
	3.55	2.61	2.56	2.91
Binary planting with Lucerne blue	3.71	2.88	2.64	3.08
	3.75	2.84	2.57	3.05
LSD05 equal to	0.085	0.121	0.137	

Table 1 – the Yield of sunflower, 2013-2015

Note: *the aftereffect of the fertilizer use on barley straw and green manure crop: above the line – radish; under the line – white mustard.

So, in 2013, the sunflower yield in this variant was higher than in single-species crops to 0.13-0.17 t/ha, in 2012 – to 0.31-0.35, 2013 – 0.28-0.35, and on average over 2013-2015 – 0.25-0.28 t/ha.

Thus, in the conditions of Central black earth region for a substantial increase in the yield of sunflower Poseidon varieties (2-3 kg/ha), to maintain and enhance the fertility of typical chernozem it is recommended to cultivate it in binary sowing with blue alfalfa amid the aftereffect of joint use of barley straw as fertilizer and green manure crop of oil radish.

Список литературы:

1. Дедов А.В. Трансформация послеуборочных остатков и содержание в почве подвижных гумусовых веществ / Дедов А.В., Придворев Н.И., Морозова Е.В. // Агрехимия, 2001.-№11 - С. 26-33.

2. Дедов А.В. Биологизация земледелия: современное состояние и перспективы /А.В. Дедов, Н.В. Слаук, М.А. Несмеянова //Вестник Воронежского ГАУ. – 2012. – №3. – С. 57-65.

3. Дедов А.В. Бинарные посеы в ЦЧР: монография / А.В. Дедов, М.А. Несмеянова, Т.Г. Кузнецова. – Воронеж: ФГБОУ ВПО Воронежский ГАУ, 2015. – 139 с.

4. Зезюков Н.И. Роль растительных остатков, соломы и сидератов в воспроизводстве плодородия черноземов / Зезюков Н.И., Дедов А.В. // Мелиорация и водное хозяйство, 1991.-№12.- С. 44-46.

5. Зезюков Н.И. Повышать эффективность использования удобрений / Зезюков Н.И., Дедов А.В., Придворев Н.И. // Земледелие, 1997. - №5. - С. 20-22.

6. Зезюков Н.И. Оптимизация плодородия чернозёма выщелоченного по содержанию подвижных форм органического вещества / Н.И. Зезюков, А.В. Дедов, Е.В. Морозова // Вестник Воронежского ГАУ. – 1999. – №2. – С. 168-177.

7. Коржов С.И. Зелёные удобрения как фактор устойчивости агроландшафта / С.И. Коржов, Т.А. Трофимова, В.А. Маслов // Вестник ВГАУ. – 2010. – № 4 (27). – С. 15-17.

8. Луганцев Е.П. Бинарные посеы подсолнечника и бобовых трав и сохранение плодородия почвы / Е.П. Луганцев и др. // Земледелие. – 2008. –№4. – С. 22-23.

УДК 633.34(470.32)=20

**Semchenko I.N.,
Stolyarov O.V.**

**Voronezh State Agricultural University after Emperor Peter the
Great, Voronezh, Russia**

STATUS, PROBLEMS AND PROSPECTS OF SOYBEAN PRODUCTION IN THE CENTRAL BLACK SOIL REGION

Аннотация: Соя на сегодняшний день стала все шире распространяться по нашей стране. И в ходе её возделывания возникают проблемы, которые мешают получению стабильных и высоких урожаев высококачественной продукции.

Ключевые слова: Центрально-Черноземный регион, белок, соя, сорняки, урожаи, площади, технология, экономика, агропромышленный комплекс.

Among all the world's cultivated crops soybeans is a leader in protein content. Its seeds contain 35-45% of protein, 20-25% fat, 25-27% of carbohydrates, 2-3.5% of lecithin. For manufacturers it is of interest primarily as a source of complete protein. Soybeans are of great importance to cattle as a cheap source of protein. In addition to the livestock soybeans are used for food purposes, and is also common in medicine, cosmetology.

According to some data soybeans had a wide distribution in the Indo-Chinese region and has been cultivated there since the XI century BC, later it is spread around the world. Over the past fifty years soybean began to occupy large areas in America and Europe. Stable growth of its production in the world is noted. In Russia the mass introduction of soybeans began to the far East in the 30-ies of the twentieth century. This is because soybeans are multifunctional in use. There observed high income and increasing the price of its grain due to high demand in the market, and the relatively simple technology of cultivation to achieve profit.

At present world cultivated area of soybean is beyond 100 million ha. In recent years, world production exceeds 250 million tones.

Most of the soybean area is in the United States – over 30 million hectares, in Brazil – more than 25 million hectares and in Argentina about 20 million ha. In Russia, soybean occupies about 2 million ha in soybean production in the world leading place. The USA and Brazil occupy, providing approximately 50 and 20% of the gross harvest of soybeans in

the world. In Europe, soybean production is low - about 1.5-2% of the world total production. World average soybean yield is about 22.5 c/ha [1].

In recent years there has been positive growth of soybean production in the Russian Federation. In 2013 the sown area exceeded 1.5 million hectares. The main region of soybean cultivation remains in the Far Eastern Federal district, there is about 50% of soybean crops in the country. In the 90's reduced soybean production significantly, but in 2013 the sown area in the Far Eastern Federal district amounted to 950 thousand hectares, In the Southern Federal district the crops amounted 200,8 thousand ha, mostly in Krasnodar region. Recently rapid growth of the acreage was observed in the Central Black soil region. This for example, by 2009 soybean crops occupied 43.2 thousand ha, in 2012 the area amounted to 159.5 thousand hectares, in 2014 – 437.0 thousand ha. This is primarily due to the increasing need for protein to balance animal feed – mainly due to a more widespread use in the meat and dairy industries.

For livestock not only soybean grain, is efficient, oil cakes and bean meal, as well as the green mass of soybean, as a useful component to be balanced by protein and essential amino acids juicy fodder from corn and other cereals. When transferred of all the pure corn in the country, grown for green mass and silage, mixed crops with soybeans, is a major reserve of replenishment of feed protein, as it allows gathering from each hectare additional 200-250 kg of full feed protein. Soybean is a good predecessor and enriches the soil with nitrogen from 40-100 kg/ha.

Despite the increasing demand for the processed products of soybean, its production in the Russian Federation is still not.

However, the total soy production in Russia remains insufficient to meet the needs of the national economy in high-protein raw materials, covering them by 20-30% only. Therefore, Russia continues to import grain and soybean meal. In the Russian Federation there are enough natural resources and advanced scientific potential equipment and technology to increase production of soybeans. In the long term to ensure their raw material needs, but export organic soybeans at competitive prices to Europe, as the demand for such products increased.

In the 1990s, the soybean yield in the country was at the level of 0.3 million tons. In 2015, gross harvest of soybeans in Russia exceeded 2.5 million tons, wide spread soybeans production in Russia and Central Black Soil region began several years ago. In the Central Black Soil region it occurred due to the reduction of areas under sugar beet and the emergence of new early-maturing soybean varieties. The average soybean yield for 5 years in the country amounted to 1.3 t/ha [2].

In the cultivation of soybean grain farmers of Central Black Soil region are facing some problems. Today in the soybean crops growing

areas, there is acute problem of weeds clogging. As a consequence, it leads to the yield loss.

The problem in some farms can be the harvesting. Almost 20% of losses in harvesting are, connected with the impossibility of some headers to cut off the bottom bean.

A small amount of precipitation also is the problem limiting the productivity and the active introduction of soybean production in the Central Black Soil region. So, the rainfall rarely exceeds 450-550mm. There are also other problems in the cultivation of soybean.

But in addition there are problems and prospects of soybean production in the Central Black Soil region. The need for soybeans is about 12 million tons. Currently over 2.5 million tons are produced 5 times increase of soybeans production is well known in Russia.

15 breeding centres study of soybean selection in Russia. They developed varieties with yields of 30-40 t/ha, early maturing able to grow in climate zones with the sum of active temperatures being 1750-1850°C. It is at the level of Northern latitudes. Central Black Soil region can become favorable for cultivation of soybean in addition to the far Eastern region could become the.

To maintain the yield at about 20 t/ha in some pretty arid areas of Central Black Soil region and for its improvement irrigation it is necessary to be used. It can have a positive impact not only on the yield of soybean, but also other water-intensive crops [3].

A many farms of the Central Black Soil region, the acreage of legumes are limited. If soybeans are added to crop rotation on the farms the soil will be additionally be enriched with nitrogen up to 100 kg/ha thus saving fertilizers and the cost of their application. Besides soy beans are a good predecessor for grain. The main legume in the Central Black Soil region is pea, and it rarely exceeds 10 thousand rubles per ton, while the soybean price is already exceeds 20 thousand rubles per ton. This means that growing soybeans is not only "useful" for soil management, but also profitable in some farms. Its profitability approaches the sunflower.

Good soybean yield cannot be obtained without perfect technics of its cultivation. Now a lot of methods of soybean cultivation are being developed. So, for example, in Stavropol region free herbicide technology has been developed. It involves soybeans solving in June and the weeds are destroyed before the crops souring. Applying this technology grain ripens simultaneously with the early crops. Today, there are already enough herbicides to combat weeds in soybean crops. So farms can determine the preparations. Minimum technology of soybean cultivation is used. Widely spread experiments conducted in many countries revealed a positive aspect, namely the of erosion, evaporation, and increasing the number of

nodule bacteria and other factors [4, 5].

Thus irrigation of dry areas of the Central Black Soil region can contribute to the solution of the problem of high-quality protein production, as well as to improve the situation for other crops. The introduction of new technologies will allow increasing the yield of soybean in the Central Black Soil region and the country as a whole. It would help to solve the problem of valuable, cheap food and feed protein high vegetable oil, to preserve soil fertility and increase the profitability of agricultural enterprises. In the Central Black Soil region there is a great potential of Black Soil. Not use this natural gift is very wasteful and unwise, because Russia has huge natural and scientific resources to increase soybean production on the vast steppe and forest-steppe spaces of Central Black Soil region of the country where the main crops in field crop rotations are wheat, maize, sunflower, sugar beet. As a result of perennial leguminous crops reduction grasses cattle soybeans can become a saving crop to preserve soil fertility and during decrease the probability of protein deprivation. Soybean can become a strategic crop in the economic recovery of the AIC.

Thus Russian soy market shows good dynamics. Last season a record amount of soybeans was harvested in Russia, The country is increasing its export potential in the supply of soybean oil to foreign markets.

However, to improve their food security, manufacturers need government support from the. Intensification, improvement of logistics, lands improving – are of great importance for the farms of Central Black Soil region.

But all these measures cannot be efficient without government support and control.

Список литературы:

1. В.А. Федотов, С.В. Кадыров, Д.И. Щедрина /Агротехнологии полевых культур в Центральном Черноземье – Воронеж: Истоки, 2011 – 260с.
2. ШпаарД. И др. Зернобобовые культуры. – Минск: ФУА информ, 2000.
3. Птицепром. – 2015. - №3 (27). – С. 20-25.
4. Доценко С. М. Проблема дефицита белка и соя/ С. М. Доценко, В. А. Тильба, С.А. Иванов, Е.А. Абрамкина /Зерновое хозяйство. – 2002. - № 6. – С. 16-18.
5. Кочегура А. В. Потенциал современных сортов сои для юга Европейской части России /А. В. Кочегура, М. В. Трунова /Земледелие. – 2010. – С. 42- 44.

УДК 504.05:631.95(470.324)(045)=30

Skubakowa A.N.

**Agraruniversität Woronesh namens Peter des Großen,
Woronesh, Russland**

DIE EINWIRKUNG DES FLUGHAFENS AUF DIE UMLIEGENDEN AGRARÖKOSYSTEME

Аннотация. Воздействие аэропорта на прилегающие агроэкосистемы

Zivile Luftfahrt von Russland verfügt über 800 Tsd. km Airlines und befördert pro Jahr rund 27 Millionen Passagiere. Die Besonderheit der Auswirkung des Luftverkehrs auf die Umwelt besteht in einem erheblichen Lärmeinfluss und der Freisetzung von Schadstoffen.

Flugzeuge, wie alle Systeme, die die Energie der Oxidation fossiler Brennstoffe verwenden, werfen in die Atmosphäre die Produkte dieses Prozesses, die ihre natürliche Zusammensetzung ändern und als Schadstoffe gelten.

Die meisten dieser schädlichen Substanzen in der Luft werden durch die maximal zulässigen Konzentrationen reglementiert, aber die Norm von maximal zulässigen Emissionen in der Luftfahrt ist nur für folgende vier schädliche Komponente festgestellt: Kohlenmonoxid, unverbrannte Kohlenwasserstoffe, Stickoxide und Rußpartikel (Rauch). Diese Schadstoffe sind von der Richtung der Bewegung der Luftströmung (Windrose) abhängig und können sich auf die unermessliche Territorien verbreiten, und das gilt als der wichtigste Aspekt der Einwirkung des Luftverkehrs auf die ökologische Situation[9].

Die größte Umweltverschmutzung erfolgt im Bereich der Flughäfen während des Starts und der Landung von Flugzeugen, aber auch während der Aufwärmphase der Motoren. Beim Betrieb der Motoren auf Start und Landung kommt in die Umwelt die größte Menge von Kohlenmonoxid und Kohlenwasserstoffverbindungen, und während des Fluges bekommt die Umwelt die maximale Anzahl von Stickoxiden.

Die Beurteilung der Gesamtanzahl der wichtigsten Schadstoffe, die in der Folge der Produktionstätigkeit in die Umwelt in der Zone, die vom Flughafen der zivilen Luftfahrt kontrolliert wird (ohne Berücksichtigung auf die Luftverschmutzung von speziellen Fahrzeugen und anderen Landquellen) kommen, zeigt, dass man auf einer Fläche von etwa 4 km in die Atmosphäre pro Tag von 1000 bis 1500 kg Kohlenmonoxid, 300-500

kg Kohlenwasserstoff-verbindungen und 50-80 kg Stickoxide herausgeworfen wird. Solche Anzahl von ausgeschiedenen Schadstoffen kann bei einer ungünstigen Kombination der meteorologischen Bedingungen zur Konzentrationserhöhung bis zu hohen Werten führen.

Solcherweise, angesichts der obengesagten, besteht das Ziel der vorliegenden Arbeit darin, die Auswirkung des Flughafens auf die Bioressourcen der angrenzenden Gebiete an den Tag zu bringen.

Die Untersuchungen wurden auf dem Territorium von Rayon Ramon des Woronesher Gebiets in der unmittelbaren Nähe (1,5 – 3,0 km) vom Flughafen «Woronesh» durchgeführt[7].

Das Klima ist gemäßigt kontinental mit relativ warmen Sommern und mäßig kalten Wintern, seine Bildung verläuft unter dem Einfluss der gemäßigten, arktischen und tropischen Luftmassen ab.

Rayon Ramonski befindet sich im Nordwesten des Gebiets Woronesh auf dem Territorium des Oksko-Don-Tieflandes. Für dieses Gebiet ist die Verbreitung der gekalkten Schwarzerde in Kombination mit dem typischen schwarzen Boden als auch der Wiese- und Schwazerde und im Norden des Mittlerrussischen Landrückens im Komplex mit den typischen schwarzen Böden kennzeichnend.

Bei der Forschung wurden die in der Agrarökologie allgemein anerkannten Methoden der Anlage des Verfahrens und der Durchführung der Experimente verwendet[3].

Als Objekt der Forschung waren natürliche und landwirtschaftliche Ökosysteme (Lager).

Für die Durchführung der Beobachtungen im Einflussbereich des Flughafens «Woronesh» wurden drei Festpunkte markiert: 1. Festpunkt oder Kontrollvariante liegt 3 km vom Flugplatz ; 2. Festpunkt wird 3 km vom Objekt entfernt, liegt aber in unmittelbarer Nähe der Start- und Landebahn der Bewegung der Flugzeuge; der 3. und der 4. Festpunkte befinden sich in anderthalb Kilometer vom Flughafen direkt auf der Linie der Landung der Flugzeuge auf der Start- und Landebahnen. Die Fläche einer Kontrolllandparzelle beträgt 100 m². Auf dem Territorium der Festpunkte werden während der Vegetationsperiode dreimal Untersuchungen durchgeführt[1].

Die Auswahl der Proben erfolgte durch Marschroutform der agroökologischen Überwachung[4]. Für die Untersuchung der Eigenschaften des Bodens wurden die Bodenproben mit Hilfe von Borax auf eine Tiefe von 0-20 cm-Methode «Umschlag» ausgewählt. Die Bestimmung der enzymatischen Aktivität (Aktivität der Katalase) wurde durch die Methode von Galstjan durchgeführt. Die Anzahl und die Biomasse der Regenwürmer wurden durch das Ausgraben des Monoliths in der Größe von 0,25 m² mit der nachfolgenden Wahl, Zählung und

Gewichtung festgestellt[2]. Boden, Wasser und Atmosphäre werden bei anthropogener Verschmutzung der Agroökosysteme durch direkte Auswirkung ausgesetzt.

Die Bodendecke erfüllt die Schutzfunktion der Lithosphäre von den Auswirkungsfaktoren, regelt die Intensität der geologischen Denudation des Landes. Die wichtigste Funktion des Bodens – die Erzeugung und Erhaltung der biologischen Vielfalt.

Die Bodensauna von Agrophytocenosis präsentiert eine enorme Menge der tierischen Organismen, unter denen Amöben, Flagellaten und andere Protozoen, die Zehntausende und Hunderttausende in einem Gramm aufgezählt werden. Die Zahl der kleinen nicht mikroskopischen Gliedertiere (Zecken, Collembola) wird von den Zehn- und Hunderttausenden auf 1 m² der Ackerkrume festgestellt. Nematoden gibt es manchmal Millionen auf 1 m². Die Masse dieser Tiere wird nach Angaben von Giljarov (1949) in ein paar Tonnen (3-4) pro Hektar Boden geschätzt.

Die Lebensmittel-Kette vertritt auf dem Untersuchungsgebiet vor allem durch Regenwürmer, Tausendfüssler, die Larven des Mai-Käfers.

Die Regenwürmer ändern die Zusammensetzung des Bodens, verbessern seine Struktur und Eigenschaften, erhöhen die Fruchtbarkeit. Die Ergiebigkeit von einigen Kulturpflanzen hängt manchmal von ihrer Tätigkeit ab. Bemerkenswert ist auch, dass die Regenwürmer in der Lage sind, die Radionuklide und Schwermetalle aus dem Lebensraum in den Körpern aufzuspeichern und sie in die tieferen Schichten des Bodens zu verschieben.

Die Dichte der Regenwürmer erreicht im Durchschnitt 120 Individuen/m², und die Biomasse 50g/m² (bei der Masse von einem Wurm 0,5-1,5 G). Unter günstigen Bedingungen erreicht die Dichte eines Ackerwurmes 400-500 G/m²[8].

Die Zahl der Regenwürmer (Lumbricidae) ändert sich in der Einflusszone eines ökologisch gefährlichen Objekts von 6 bis 94 Stück/m².

Die minimale Anzahl dieser Destruktoren ist auf dem dritten Festpunkt eingetragen, weil er direkt im Bereich der Start- und Landung Lichter liegt. Hier ist die Freisetzung von Kerosin sehr hoch und wird durch die Toxizität von gasförmigen Verbindungen aufgestiegen. In der Kontrollvariante ist die Zahl der Würmer 16 Stück/m². Das ist weniger im Vergleich mit den mittelmehrjährigen Daten in den Böden der Waldsteppe. Die Zahl der Lumbricidae im Boden auf dem zweiten Festpunkt (94 Stück/m²) ist höchstnah zu mittelmehrjährigen Daten. Auf diesem Festpunkt schaltet sich wahrscheinlich bei geringem Niveau der Verschmutzung der Mechanismus der Rückseite der negativen Zusammenhang ein, der für die Selbstreinigung des Bodens verantwortlich

ist. Die Regenwürmer sind an dem Abhang der Schlucht (4. Festpunkt) nicht erkannt. Es hängt von dem Grad der Verschmutzung und Verschlechterung der physikalischen Eigenschaften der Böden (Temperatur und Befeuchtung Regime) ab.

Da die Zahl der Regenwürmer nicht immer ihre Arbeitswirksamkeit charakterisiert, viele Forscher empfehlen, Biomasse von Lumbricidae im Ökosystem zu berücksichtigen.

Die größte Biomasse von Regenwürmern ist auf dem zweiten Festpunkt - 48,6 G/m² eingetragen. Das ist in 6,3-mal mehr als auf dem Kontrollterritorium.

Minimale Biomasse von Lumbricidae 4,4 G/m² ist auf dem dritten Festpunkt gezeigt, und das ist in 1,8-mal niedriger des Kontrollwerts.

Die Biomasse eines Individuums auf den untersuchten Gebieten ist nahe mittelmehrjährigen Eigenschaften und reicht von 0,48 bis 0,73 G, wobei die minimale Gewicht einer einzelnen Individuen auf der Kontrollvariante markiert wird, und die maximale – auf dem dritten Festpunkt. Auf der Grundlage dieser Daten ist davon auszugehen, dass die Population der Detritophagous auf dem ersten Festpunkt durch Individuen unterschiedlicher Altersgruppen dargestellt ist, und auf dem dritten Festpunkt – in einem größeren Ausmaß von gleichaltrigen Individuen dargestellt ist. Das ist in erster Linie mit der Anwesenheit oder Abwesenheit von günstigen Bedingungen für die Vermehrung verbunden.

Regenwürmer vermehren sich im Laufe der warmen Zeit. Doch während dieser Zeit kann man die Häufigkeit aufgrund des Klima beobachten. Es bestimmt ein Maximum und ein Minimum an Aktivität der Fortpflanzung[5].

Bei Mangel an Niederschlag laut Chekanovskaja wird die Anzahl und die Aktivität der Regenwürmer in den oberen Schichten des Bodens stark reduziert. Sie lassen sich tief in den Boden nieder und geraten in den passiven Zustand: hören auf zu essen, in eine Kugel rollen, ihre lebenswichtigen Funktionen werden ausgesetzt. Es ist damit verbunden, dass bei der Bestimmung der Zusammensetzung der Nahrungskette im Sommer in der oberen Horizont des Bodens Lumbricidae fast abwesend waren.

Dank der Transformation der Erdebevölkerung kann man den Grad der anthropogenen Auswirkungen auf die Ökosysteme bestimmen. In diesem Fall wird auf dem ersten Festpunkt, wo die Zahl der Lumbricidae deutlich reduziert, gemilumbricide Phase der Transformation markiert, die den mittleren anthropogenen Belastungen entspricht. Auf dem zweiten Festpunkt wird allolumbricide Phase markiert. Sie wird bei den schwachen Wirkungen festgestellt. Kriptolumbricide Phase der Transformation wurde deutlich auf dem dritten Festpunkt gezeigt. Diese Phase wird durch

einzelne Funde von Regenwürmern charakterisiert. Für dieses Stadium passt das durchschnittliche Niveau der anthropogenen Belastung.

Unter Saprophages wurden Tausendfüßler auf dem Untersuchungsgebiet identifiziert. Das sind Landtiere, die geheime Lebensweise führen und die meiste Zeit sich in den Bodenhöhlen oder unter abgefallenen Blättern verstecken. Die sind zahlreich und vielfältig im Boden - диплоподы (Diplopoda) - Tausendfüßer Tausendfüßler. Diplopodas oder zweipaarfüßrige Tausendfüßler sind im Boden mehr zahlreicher und vielfältiger. Das ist eine der wichtigsten Gruppen von Saprophilkomplex, aktive Zerstörer der Streu und des Holzes. Dazu gehören weit verbreitete in Böden Tausendfüßler. Sie sind mit den Böden in verschiedenen natürlichen Umgebungen verbunden. Sie verarbeiten die Abtrennung des Laubes und Holzes. Einige Arten trifft man in offenen Landschaften. in Wiesensteppen, Ackerböden, Halbwüsten. Diese Arten ernähren sich von den Resten der Kräuter. Tausendfüßler auch wie Regenwürmer tragen die Durchlüftung des Bodens bei und öffnen den anderen, weniger starken wirbellosen Tieren den Weg in die tieferen Schichten des Bodens. Boden- und biologische Bedeutung wird durch ihre Teilnahme an der Verarbeitung von abgestorbenen organischen Materialien bestimmt. In der Schicht 1-15 cm erreicht die Zahl 31-160 Exemplare/m², in der Schicht 15-30 cm – 241-3602 Exemplare/m². Die meisten Zweipaarfüßler sterben bei hohen Temperaturen infolge des Wasserverlustes sehr schnell[5].

Tausendfüßler wurden in der Zone des Flughafens nur im Jahr 2014 entdeckt. Diplopodas sind oberflächliche Wirbellosen. Sie erdulden den Mangel aber auch den Ueberschuss an Feuchtigkeit schlecht. In Gebieten mit trockenem Sommer beobachtet man bei Diplopodas regelmäßige Diapause. Bei Diapause gehen sie auf eine Tiefe von 20-30 cm in den Boden oder in das faule Holz. Dort können sie sich eine lange Zeit in einem inaktiven Zustand befinden und ungünstige Bedingungen erleben.

Ihre Zahl reicht auf dem Untersuchungsgebiet von 4 bis 24 Stk./m². Die maximale Anzahl wurde in den Böden aus dem 4. Festpunkt am Hang festgelegt, wo vegetative Abtrennung in größerem Umfang durch die Abtrennung der Blätter der Birke (*Betula pendula*) und der gewöhnlichen Espe (*Pópulus trémula*) dargestellt wird. Auf dem Territorium der restlichen Festpunkte in vegetativer Abtrennung vorhanden ist, die Nadeln der Waldkiefer (*Pinus sylvestris*), die nicht gegessen диплоподами, dass bestimmt das Minimum oder das Fehlen dieser детритофагов

Die Nadeln der Waldkiefer (*Pinus sylvestris*) sind auf dem Territorium der restlichen Festpunkte in vegetativer Abtrennung vorhanden. Die Nadeln werden von Diplopodas nicht gegessen, was Minimum oder Mangel an diesen Detritophagen feststellt. Solcherweise

stellen Diplopodas eine spezialisierte Gruppe von Verbrauchern der Pflanzenreste auf der Bodenoberfläche, von primär Zerstörer der Laubabtrennung und des Holzes dar. In ihren festen Decken sammeln Diplopodas eine Menge von Calciumcarbonat, das die Wasserhaltbarkeit von Boden-Struktur staerkt. In letzter Zeit ziehen Tausendfuessler auf sich die Aufmerksamkeit, wie Organismen, die die Umweltverschmutzung enthuelen. Zum Beispiel, in ihrer Schale sammeln sich die radioaktiven Elemente (radioaktives Strontium, Uran) und Schwermetalle (Blei).

Boden wirbellose Tiere spielen eine wichtige Rolle in der Bildung der Struktur der Mikrobiozönose und der Regulation ihrer Aktivität[6]. Der funktionelle Zustand der lebendigen Gemeinschaft des Bodens wird durch die enzymatische Aktivität gespiegelt. Man muss beruecksichtigen, dass die Wirkung der einzelnen Enzyme, die sich in einer Gruppe befinden, in Uebereinstimmung miteinander ist. Dies ermoeoglicht bei der Beurteilung der biologischen Aktivität des Bodens die Bestimmung der Aktivität einer von Enzyme zu produzieren. Aus карбогидраз wird инвертаз produziert, der die Katalyse von kohlenstoffhaltigen organischen Verbindungen versorgt, aus Amidaz - Urease, die an der Transformation von stickstoffhaltigen organischen Verbindungen teilnimmt, aus Oxydase, die die Redox-Prozesse katalysiert - Katalase.

Nach Ansicht einiger Autoren, die Aktivität der Katalase in Böden kann als ein objektiver Indikator für ihre biologische Aktivität dienen[2].

Die Ergebnisse der Bestimmung der enzymatischen Aktivität der Böden im Bereich des Flughafens sind in Tabelle 1 dargestellt.

Variante	die Aktivität der Katalase O ₂ , cm ³ / g / min.				Aktivität auf einer Skala von Vergleichs
	2013	2014	2015	Mittelwert	
1- Festpunkt (Kontrollpunkt)	4,2	3,3	3,5	3,7	mittel
2- Festpunkt	4,0	4,4	2,6	3,7	mittel
3- Festpunkt	1,9	1,8	2,3	2,0	schwach
4- Festpunkt	1,9	1,6	1,4	1,6	schwach

Tabelle 1 - Der enzymatischen Aktivität der Böden im Bereich des Flughafens "Woronesch", 2013-2015.

Auf der zweiten Station, die vom Flughafen auf 3 km entfernt, wo die maximale Zahl der Lumbricidae markiert, sind mittelvieljaehrige Daten der enzymatischen Aktivität der Böden sehr nah zu den Kontroll-Werten. Auf dem Territorium, das vom Einwirkungsobjekt auf 1,5 km entfernen, ist die Aktivität der Katalase niedriger der Kontrolle auf 45%. Auf der Vergleichskala biologischer Bewertung von Böden ist die Aktivität der Katalase auf dem ersten (Kontrollpunkt) und dem zweiten Festpunkt durchschnittlich, und auf dem dritten und vierten Festpunkt – schwach,

was den kritischen Zustand von Boden Komplex zeigt.

Wetterbedingungen haben einen wesentlichen Einfluss auf die biologische Aktivität der Böden geleistet. In den Jahren der Forschung wurde festgestellt, dass die Aktivität der Katalase höher war, als sich die günstigen Temperaturen und Feuchtigkeit fügten[10].

Scherbakova (1980) betont, dass sich die enzymatische Aktivität in Böden erheblich ändert. Es haeng von Schwankungen der Temperatur und der Feuchtigkeit des Bodens ab. Mit der Erhöhung der Temperatur von 1 bis 18 - 20° steigt die Aktivität von Enzymen konsequent ein. Hohe enzymatische Aktivität ist bei einer Luftfeuchtigkeit von 15 - 25 %. Die Erhöhung der Luftfeuchtigkeit bis zu 35 % führt zu einer geringen Abnahme der enzymatischen Aktivität der Böden. Die größte enzymatische Aktivität entwickelt sich bei der Kombination der optimalen Temperatur, Windgeschwindigkeit und Luftfeuchtigkeit der Böden, nämlich für die Katalase 16 - 22° C und 16 - 20 %.

Auf solche Weise ermöglichen die Studien zur Schlussfolgerung zu kommen, dass die Auswirkungen von Flugzeugen negativ auf das bodenbiotische Komplex von Agroökosystemen in der Nähe zum Flughafen auswirken.

Список литературы:

1. Ахтырцев Б. П. Почвенный покров Среднерусского Черноземья / Б. П. Ахтырцев, А. Б. Ахтырцев. – Воронеж: изд-во Воронеж. гос. ун-та, 1993. -216 с.
2. Галстян А. Ш. Ферментативная активность почв/ А. Ш. Галстян// Проблемы и методы биологической диагностики и индикации почв. – М.: Изд-во МГУ, 1984. – с. 46-54.
3. Ермоленко Н. Н. Атлас Воронежской области / Под ред Ермоленко. – Воронеж, 1993. – 48 с.
4. Житин Ю. И. Агроэкологический мониторинг / Ю. И. Житин, Л. В. Проколова. – Воронеж: изд-во Воронеж. агроун-та, 2004. – 155 с.
5. Звягинцев Д.Г. Биология почв. Учебник / Д.Г. Звягинцев, И.П. Бабьева, Г.М. Зенова. - 3-е изд., испр. и доп. - М.: Изд-во МГУ, 2005. - 445 с.
6. Коржов С. И. Микробиологическая активность чернозема выщелоченного при антропогенном воздействии/ С. И. Коржов. – Воронеж: Истоки, 2005. – 152 с.
7. Луканин В. Н. Промышленно-транспортная экология / Луканин В. Н., Трофименко Ю. В. – М.: Высшая школа, 2001 г.
8. Негробов О. П., Негрובה Е. А. Эколого-фаунистическая характеристика дождевых червей Воронежской области/ О. П.

Негробов, Е. А. Негрובה. – Воронеж: Издательско-полиграфический центр Воронеж. гос. ун-та, 2007. – 42 с.

9. Пашаев А.М. Байранов А. А. Воздействие авиационного транспорта на окружающую среду / А.М. Пашаев, А. А. Байранов // Ученые записки НАА., Баку, 2001, №1, с – 14.

10. Щербакова Т. А. Почвенные ферменты, их выделения, свойства и связь с компонентами почвы / Т. А. Щербакова // Почвоведение. 1980.-№ 5. с. 102-113.

УДК 633.811:635-2=40

Stepanova E.A
Melkumova E.A

**L'Université agraire de l'empereur Purre le Grand de Voronej,
Voronej, La Russie**

MALADIES ET PARASITES DES ROSES DE JARDIN

Аннотация: В статье говорится об инфекционных заболеваниях и их возбудителях, которые зачастую поражают отдельные сорта роз, а так же о мерах предохранения от воздействия патогенов и способах их лечения

Ключевые слова: Мучнистая роса, грибы, тля, инфекция.

Quel jardin sans belles roses! Les roses de parc ouvrent la saison de la floraison, mais au début de la floraison de ces belles fleurs, les premiers parasites apparaissent: le principal parasite des roses est le puceron, contre lequel il faut lutter chaque année, d'autant plus que pendant la saison il peut attaquer la roseraie plusieurs fois. Aux premiers signes de l'apparition de ce parasite, il faut prendre des mesures urgentes pour son extermination. Il y a des plantes dont l'odeur repousse le puceron. Si l'on met des oeillets d'Inde le long du périmètre de la roseraie, l'ampleur de la catastrophe du nom «d'attaque du puceron» sera minimale. La solution de savon est un moyen qu'on peut essayer. Cette solution se prépare simplement, mais pour sa préparation il faut prendre seulement du savon de ménage (plus sombre, c'est mieux). On rape ce savon, on ajoute de l'eau et on laisse le mélange décanter un peu. Quand le savon se dissout, il faut filtrer la solution, la verser dans un pulvérisateur et s'occuper des roses. Mais à condition qu'il n'y a pas beaucoup de pucerons sur les boutons. Face à une attaque plus sérieuse (plus de 60 %), il faut passer aux insecticides. [K.I.Rodina, T.N.

Selivanova, V.V. Zatyamina, V.D. Pazouchko]

Le médicament *Actara* est moins écologique, mais plus efficace. Selon les paramètres préalables, son efficacité biologique fait 57.02 %, Actellik 34.0 %. Aussi les roses subissent "des attaques" du côté de diverses bactéries, virus et

mycètes. La plus dangereuse maladie est la maladie du blanc. Au cours de la période du 5 Août à 15 Octobre 2015 dans le Jardin botanique de Keller, près de 50 % de toute la roseraie était frappé par cette maladie de l'origine de champignon. À la surface des feuilles de la plante frappée l'incursion blanche du mycélium apparaît, sur qui les gouttes du liquide se forment après la maturité la discussion - d'ici le nom «la maladie du blanc». Le mycélium s'installe par les taches, le plus souvent sur les feuilles et les jeunes évasions, mais aussi sur les pédoncules, sur les queues et les fruits. D'habitude, l'infection commence par les feuilles disposées plus près du sol et se répand progressivement à toute la plante.

L'agent pathogène sur les roses s'appelle *Sphaerotheca pannosa forma rosae*. L'agent pathogène hiverne en forme du mycélium dans les

boutons. L'engrais azoté excédentaire, le manque du calcium du sol, le séchage du sol, les sols trop sablonneux ou les sols trop froids et gris contribuent au développement de la maladie. [Stanitcheva-2005]

Agent pathogène	Gloria Dei	Wiener Charme	Roses corails	Masquerade	Kerio
<i>Sphaerotheca pannosa forma rosae</i>	11-25%	11-25%	11-25%	11-25%	0-10%

Annexe 1. Résistance des roses à *Sphaerotheca pannosa forma rosae*

Dans l'Annexe 1, on indique les sortes des roses qui sont plus tolérantes ou plus stables à l'agent pathogène (selon des observations).

Agent pathogène	Rosiers grimpants (pourpres)	Rose thé
<i>Sphaerotheca pannosa forma rosae</i>	plus de 50% instable	plus de 50% instable

Annexe 2.

Dans l'Annexe 2, on indique les sortes instable à la maladie donnée.

Pour la lutte avec *Sphaerotheca pannosa forma rosae*, on choisit préalablement le médicament - *Topaze*"- le fongicide systémique de l'action prophylactique et traitant, il est appliqué pour la protection contre la maladie du blanc. Pour le traitement de la rose, il faut remuer le contenu de l'ampoule dans 5 litres de l'eau. Il faut asperger les plantes par cette solution préparée au temps sec et calme, en mouillant régulièrement les plantes. En automne, il faut éloigner et brûler obligatoirement toutes les feuilles frappées, autrement cette maladie attaque de nouveau à la saison suivante. [V.D. Pazouchko]

Список литературы

1. Иорданка Станчева. д.с\х.н,профессор. София, Болгария:Изд. Пенсофт,2005 г. Учебник. Болезни сельскохозяйственных культур 5/Под ред. Проф. И.П. Фирсова.
2. К.И Родина, Т.Н Селиванова, В.В Затымина, В.Д Пазушко. Определитель болезней цветочно-декоративных растений. Изд. «Урожай»-Минск, 1969.-157 с.
3. Электронные ресурсы: www.cvetniki.ru

УДК 633.63:632.4

**Stognienko E.S.,
Voronezh State Agricultural University after Emperor Peter the
Great, Voronezh, Russia
Vorontsova A.I.
All-Russian Research Institute of Sugar Beet and Sugar after
A.L. Mazlumov, Ramon, Russia**

RESISTANCE OF SUGAR BEET HETEROSIS HYBRIDS TO ROOT ROTS

Аннотация. В работе приведены данные по устойчивости гетерозисных гибридов сахарной свеклы к фузариозному увяданию и кагатной гнили, установлена корреляционная зависимость между этими признаками.

Ключевые слова: сахарная свекла, увядание, кагатная гниль, устойчивость, корреляция.

In 2015, sugar beet fields were strongly affected by wilt that was the result of drought weather conditions and variety resistance. Microbiological analysis of the affected tissues showed that the wilt was caused by *Fusarium oxysporum* fungus (Fusarium wilt) (Table 1).

Disease agents	Disease agent frequency of occurrence, %
<i>Alternaria alternata</i>	50
<i>Fusarium oxysporum</i>	100
<i>Fusarium gibbosum</i>	50
<i>Penicillium sp.</i>	25
<i>Rhizopus stolonifer</i>	100
<i>Mucor himalis</i>	50
<i>Bacteria</i>	50

Table 1 - Species structure of sugar beet wilt disease agents, VNIISS, 2015.

Presence of *Rhizopus stolonifer* in the affected tissues of beets is

caused by hot weather. Being infected with this disease agent, beet roots are attacked by fast-developing clamp rot during storage. When harvesting fields with symptoms of beet root wilting, the latter cannot be clamped for a long storage.

Incidence of wilt under in field conditions indicates resistance to this disease (Table 2). The varieties Zenit, RMS 120, and Volga are the least susceptible to the disease.

Hybrid/variety name	Incidence of beet root wilt, (P, %)	Resistance to clamp rot
Kontata	23.3	2
Zenit	12.7	2
Alegra	23.4	1
RMS 121	35.6	3
RMS 120	19.5	3
Nero	21.1	2
Granate	32.5	2
RMS 60	42.9	3
RO 117	27.0	3
Marusya	28.6	2
Slatka	34.9	3
Svetlana	29.4	
Lidiya, 1	36.4	4
Lidiya, 2	45.2	4
Dubravka	33.3	3
HM 1820	24.0	2
Volga	7.9	3
Crocodile	21.1	2

Table 2 – Incidence of sugar beet root wilt, VNIISS, 2015.

The best safety in clamps is provided by the variety resistance that was studied in sugar beet hybrids the most widespread in the Central Black-Earth Region using microbiological method (according to Shevchenko, 1939). Immune hybrids were not determined, the hybrid Lidiya was a resistant one and RO 117, RMS 60, RMS 120, RMS 121, Volga, Slatka, Dubravka were moderately resistant; the hybrid Alegra was highly susceptible to the clamp rot.

Correlation analysis showed presence of positive correlations between incidence of wilt during vegetation period and resistance to clamp rot ($r=0.51$). Though, table 2 displays that the hybrids with the least values of wilt incidence are not always resistant to clamp rot. And this is the evidence of different mechanisms of resistance to the given disease.

Список литературы:

1. Рекомендации по учету и выявлению вредителей и болезней сельскохозяйственных растений. [Текст] Воронеж, ВНИИЗР, 1984. – 274 с.

2. Стогниенко О.И. Болезни сахарной свеклы, их возбудители. Иллюстрированный справочник. [Текст] / Стогниенко О.И., Селиванова Г.А. // Воронеж: Антарес, – 2008. – 112 с.

УДК 631.53

**Khorin A.
Goncharov S.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

DEVELOPMENT OF SPRING BARLEY BREEDING PROGRAMS IN EUROPEAN UNION

Abstract: Spring barley production in main European countries is discussed. Weather conditions and demand-offer ratio causes impact on spring barley cultivated areas in 2014-2015. Commercial success of malting varieties is defined by malteries demand, and national programs (CBMO, VLB, IBD) approvals. Seed market parameters are multiplication areas, certified seeds shares, rates and potential of royalties etc.

Key words: spring barley, malting varieties, breeding programs, seeds market.

Barley has the fifth part of the arable area of the Europe, gradually losing more profitable crops, such as corn. But due to malting barley segment the crop has additional value for the local market. The article goal was to asses prospects of spring barley development, and breeding programs input in EU.

Production. Barley production by EU-28 was assessed by H.M. Gauger [1] between 56.5 and 60.4 mln t in 2015. According to the Agrar Zaitung agency [2] despite a smaller acreage of spring barley in Europe and the drought in early summer the supply of malting barley will remain good in 2015 (fig.1). The better yields per hectare in France (FR) can't compensate for the smaller area. The second half of the harvest was affected by the rain in In Great Britain (UK). Nevertheless, a high proportion of brewing capable barley and a surplus of about 0.5 mln t were reported. A larger acreage and higher yields than in 2014 is a result in a slightly larger production in Denmark (DM) (fig.2). The export surplus foreseen by 1.0 mln t. Low protein value in the Sweden (SD) also reflects the weak side. This will also determine how high the export surplus will be

up to 0.2 mln t is possible.

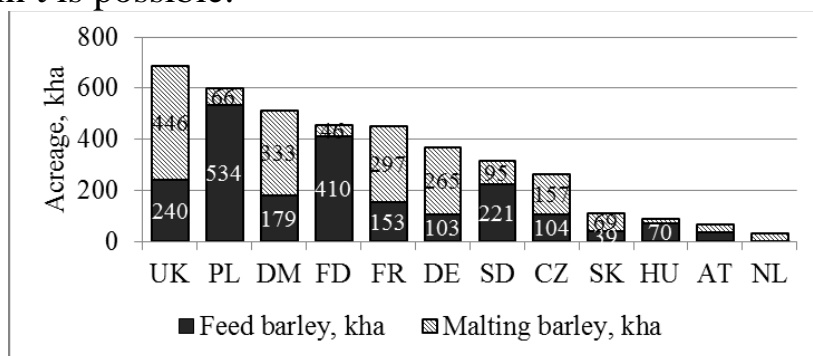


Fig.1. – Feed & malting ratio of spring barley in main EU countries, 2015

The Finland farmers (FL) have suffered under a very cold and wet summer and thus a late harvest in 2015. So there are very large differences in yield depending on the region. The German (DE) farmers achieved good harvest results despite the dry and hot summer.

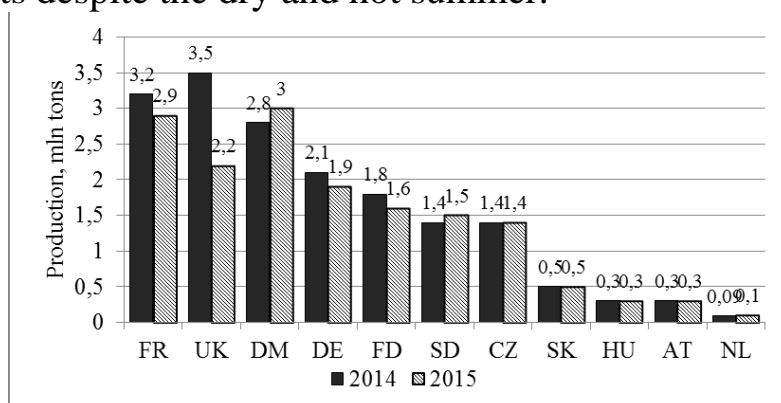


Fig. 2. – Spring barley production in main EU countries, 2014-2015.

From the Netherlands (NL) a slightly larger acreage and higher yields are reported compared to the previous year. With an almost unchanged acreage, the production in Austria (AT) is at the same level as it was last year. Market participants in Slovakia (SK) inform about one of the best harvests in the past decade; a surplus of about 0.1 mln t is expected. The Czech (CZ) farmers achieved the second best result in their history; a surplus of 0.2 mln t is expected. In Hungary (HU) yields have suffered from the dry growing conditions during the vegetation.

Malting barley. Demand for malting barley has been only moderate. Maltsters and brewers are well supplied. In addition, demand from Russia, and other countries is missing. Prices have declined. Therefore, the requirements for malting barley with a FOB price of € 170 / t for January 2016 are also slightly higher than the ideas of the Danes of € 168 / t. For the harvest 2016 bonuses of around € 20 per ton are mentioned for next October referring to October 2015. Franco Upper Rhine has been discussing rates from € 190 to € 192 per ton for January for quite some

time. For the next year the acreage is expected to stay unchanged in Europe. Only for Great Britain an increase of around 10 to 15% is highly possible.

European malting barley is produced within value chain "Breeder – Multiplier - Farmer - Maltery - Brewery". Adding value is created at every stage of the chain by the movement and transformation of raw materials to the goods. The fact of variety registration, approval by maltsters and breweries, together with seeds availability are pre-condition for the variety commercial success. But recommendations of the National Program C.B.M.O. (*Comité Bière Malt Orge*) in France, Program of the Berlin Institute of Brewing VLB (*Versuchs-und-Lehranstalt für Brauerei*) in Germany, and *Institute of Brewing & Distillation* (IBD, in the UK are taken in consideration (fig. 3). The Programs reflect the interests of the malting and brewing companies, and serve channels for malting barley producers, traders, and suppliers.

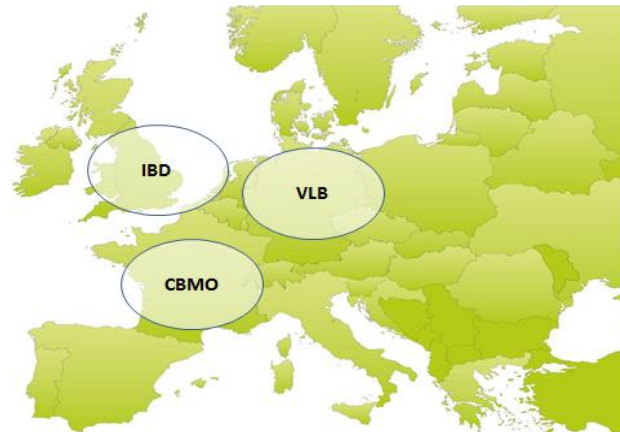


Fig. 3. – Localizations of malting barley testing National Programs in EU.

Breeding programs. There are slightly less, than 50 breeding programmes of spring barley in EU; every second one is targeted on malting qualities. Breeding is a highly innovative sector with 10-15% turnover invested to the R&D. In recent decades, the cost of breeding has greatly increased due to implementation of DH production, cellular genetics, marker-assisted breeding, etc. The cost of maintaining a typical UK cereals breeding programme is estimated at £1.5 million per variety [3]. Developing a successful variety is an extremely lengthy process – up to 12 years for cereals, and up to 8 year with high-tech approach.

Most of breeding programmes have located in France and Germany. Their varieties domain in other European countries, and even in the CIS [4]. Over the past quarter century the number of cereals breeding companies has been reduced twice due to their mergers and acquisitions. Major players absorb smaller competitors, and extend trials network in different countries and regions.

Syngenta, Saaten Union (mainly Nordsaat), Limagrain, Sejet, KWS,

and RAGT reposted as the most successful malting barley breeders in Europe. Their varieties market-leader have significant market share in several countries, for example, in CIS ones (Fig.4).

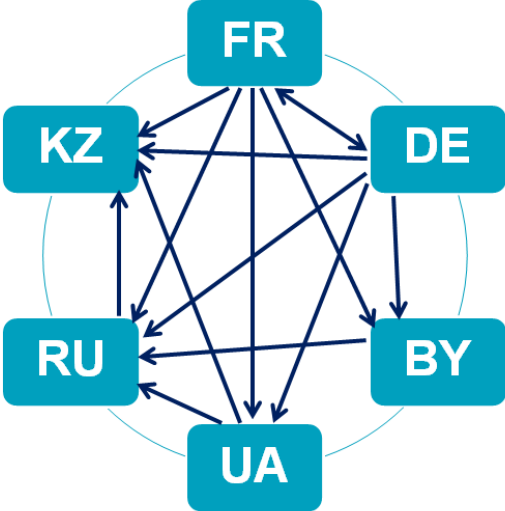


Fig. 4. – Spring barley varieties flows between France (FR). Germany (DE). Belorussia (BY), Ukraine (UA), Russia (RU), and Kazakhstan (KZ)

Seed companies from France and Germany promote their product in CIS, but not vice versa. Such varieties, as Quench, Xanadu, Kangoo, KWS Irina are registered in EU-28 and CIS both, and well commercialized by seeds companies (fig.5). Right business models and the varieties approval by international malteries (Soufflet, Malteurop, Cargill and others) support that trend. Most of varieties without recommendations by the national programmes are cultivated in less scale. Number of applications for registration in Russia from overbroad breeders 2-3 times more, then local ones.

Breeder	Variety / Country	D M	D E	F L	F R	U K	N L	P L	S D	S K	C Z	H U	R U	U A
Syngenta	Quench	█	█			█	█	█	█				█	█
	Propino	█	█			█	█	█	█					
	Tipple			█		█	█	█	█					
	Sanette					█	█	█	█					
Nordsaat Saaten-Union	Marthe		█							█				█
	Xanadu							█			█		█	█
	Grace		█					█				█	█	█
Limagrain	Concerto					█						█		
	Kangoo							█		█	█			
Sejet	Sebastian				█		█			█				
KWS	KWS Irina	█			█	█			█					
RAGT	Prestige							█			█			



Market-leader

Fig.5. Market leaders of malting barley varieties in European countries

Breeding progress in Germany demonstrates by 1.6% growth of wheat yields annually [5]. Breeding programs aimed adaptation to diverse soil and climatic conditions, the production strategy of disease control, increased yield potential with the best response to high input. Concerning malting barley specific goals are competitiveness vs other crops, and compliance with marketing requirements (non-GMO, FAN, *0-lox*, etc.)

Revenue from products of EU breeding programs adds up to 70% as license payments (royalties) and 30% as seeds sale. Therefore, acreage, volume of certified seeds, seeds exchange rate may enlarge breeder's revenue. Royalty rates range from 20-30 €/t in Eastern Europe, about 50 €/t in the North, and up to 75-90 €/t in the West. European legislation allows claiming royalties for the farm saved seeds (FSS) up to 50% of the royalty rate for certified seeds. Spring malting barley acreages of EU-28 is about 2 mln Ha. The potential of royalties for its certified seed is counted as € 30 mln.

Conclusions

- 1) EU is self-sustainable in spring barley (a.e. malting quality) production
- 2) Spring barley productions and malting one in particular is the biggest in United Kingdom, Germany, France, and Denmark.
- 3) Barley breeding programs concentrated in FR, DE, DM and UK, and their products expanded to other countries and to CIS in particular.
- 4) Limited number of malting barley varieties domain in several European countries as market-leaders.

Список литературы:

1. H.M. Gauger GmbH Barley Malt World News. – Market report №7. – August 3, 2015. – 4 p.
2. www.agrarzeitung.de
3. <http://www.bspb.co.uk/BSPB%20Handbook.pdf>
4. Пивоваренный ячмень / С.В. Гончаров, В.А. Федотов, И.В. Матвеев и др. / Под ред. В.А. Федотова, С.В. Гончарова. – М., ООО «Сингента». – 288 с.
5. Циммерман Х. Селекция «топчется на месте»? / Х. Циммерман // Новое Сельское Хозяйство. - М., 2009. - №6. - С. 56-58.

УДК 568.244.4

Tsitsilina T.M.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE INTERACTION OF CULTIVATED AND SEGETAL PLANTS IN AGROCENOSIS OF HIEMS TRITICUM

Ключевые слова: Аллелопатическая активность, сеgetальные растения, органогенез озимой пшеницы, вика мохнатая, продуктивность, агроценоз, эффективность подсева, ингибирующее действие.

The interaction of cultivated and weed plants are mainly manifested in their competition. However the harm caused by weeds, cannot always be convincingly explained by competition. Completely inexplicable growth of cultivated plants in the presence of small amounts of weed is described by many noted researchers and practitioners.

The aim of the research was to study ecological peculiarities of interaction of cultivated and weed plants in agrocenoses of hiems triticum.

To achieve this goal it was necessary to solve the following tasks:

1. to determine the allelopathic activity of seeds of cultivated and weed plants;
2. to examine the abundance and species composition of weed component in single-species and mixed agrocenosis;
3. to study the influence of plant residues on seed germination of cultivated and weed plants ;
4. to justify from an economic point of view the efficiency of seeding the micia villosa the agrocenosis of hiems triticum:

The research was carried out in "Smolyakov Gennady Alekseevich Farm ", Voronezh region, Khokholsky district..

Generally adopted agro-ecological experimental techniques was used in the studies.

Options	Laboratory germination, % of control				
	Hiems triticum	Vicia villosa	Thlaspi arvensis	Capsella bursa-pastoris	Chenopodium album
Control	95	96	89	94	86
Hiems triticum+ thlaspi arvensis	80		87		
Hiems triticum+ capsella bursa-pastoris	93			90	
Hiems triticum+ chenopodium album	98				84
Vicia villosa + thlaspi arvensis		92	56		
Vicia villosa + capsella bursa-pastoris		90		68	
Vicia villosa + chenopodium album		91			87

Table 1. Allelopathic activity of seeds of cultivated and weed plants, 2013-2014.

It is noted in the laboratory experiments that at the stage of seed germination allelopathic interaction of weeds and cultivated plants occurs. Species composition of future weed populations can be determined.

In the co-germination of weed seeds with seeds of hiems triticum and vicia villosa the highest inhibitory effect was observed in vicia villosa. So the germination of thlaspiarvensis decreased by 33%, capsella bursa-pastoris 26%. A slight degree of allelopathic inhibition was observed at the joint germination of hiems triticum seeds with seeds of capsella bursa-pastoris, chenopodium album. The laboratory germination of hiems triticum slightly decreased during germination of seeds of thlaspi arvensis. The decreased germination in comparison with the control was 15%. Germination of chenopodium album changed slightly during germination with both crops.

Segetal plants	The number of plants, pcs./m ²	
	Control	Vicia villosa sowing
Echinochloa crus-galli	6.3	2.3
Setaria viridis	7.3	2.7
Amaránthus retrofléxus	-	-
Capsella bursa-pastoris	8.3	3.0
Thlaspi arvensis	6.7	5.3
Sónchus arvénsis	2.7	0.3
Matricaria inodora	2.0	0.7
Víola arvénsis	14.3	7.7
Fallópia convólulus	4.3	1.3
Fallópia convólulus	5.0	8.0
Chenopodium album	1.3	-
Centaurea cyánu	0.7	-
Gálium aparíne	2.7	1.3
Stellária média	9.3	8.3
The total number of weed plants	70.9	40.9

Table 2. The abundance of species of segetal plants on the IV stage of hiems triticum organogenesis, 2013-2014.

Monitoring conducted in a field experiment shows that sitting down in agroecology of winter triticum vicia villosa, contributed to the 1.5 times decrease in the number of segetal plants.

Segetal plants	The number of plants, pcs./m ²	
	Control	Vicia villosa sowing
Echinochloa crus-galli	9.0	2.7
Setaria viridis	26.7	14.3
Amaranthus retrofléxus	5.7	6.7
Capsella bursa-pastoris	13.0	4.7
Thlaspi arvensis	9.7	8.3
Sónchus arvensis	4.3	2.3
Matricaria inodora	1.7	1.3
Víola arvensis	22.7	13.0
Fallópia convólulus	8.3	5.7
Fallópia convólulus	8.3	6.0
Cirsium arvense	1.7	0.7
Solánum nígrum	0.7	1.3
Gálium aparíne	3.0	1.3
Convólulus arvensis	1.3	0.7
Chenopodium album	2.0	-
Centaurea cyánu	1.0	0.7
The total number of weed plants	119.1	65.0

Table 3. The abundance of species of segetal plants on the VIII stages of organogenesis of winter triticum, pcs./m² 2013-2014.

At the VIII phase of winter triticum development the minimum number of weeds was observed at overseeding of pilosus vetch– 65 PCs/m². This significantly reduced the number of Setaria viridis, capsella bursa-pastoris, Víola arvensis, Echinochloa crus-galli.

The highest productivity was formed in agroecology of winter triticum Vicia villosa in sowing 24.1 to 36.7 c/ha

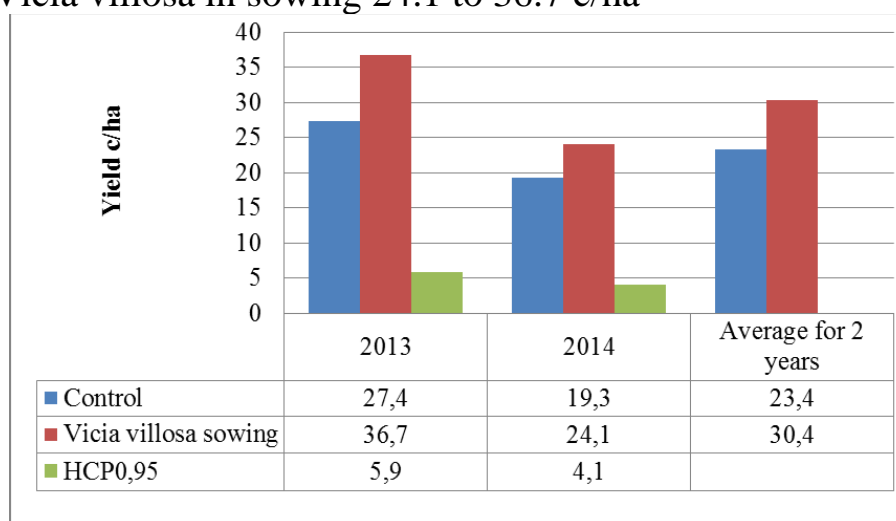


Fig. 1 grain yield of winter triticum , c/ha

Thus pilosus vetch overseeding in agroecology of winter triticum

helps to reduce the number of weed plants, not only due to the limited available ecological niches, but possibly by the released physiologically active substances affecting the germination and growth of weeds.

Options	Laboratory germination, % of control			
	Hiems triticum	Vicia villosa	Thlaspi arvensis	Capsella bursa-pastoris
Control	100	100	100	100
Straw of hiems triticum	98.7	97.9	92.5	100
Green weight vicia villosa (the flowering phase)	99.4	96.6	40.9	34.3
Straw of hiems triticum+ green weight vicia villosa	97.9	100	60.6	45.6

Table 4. The influence of post-harvest residues of hiems triticum and green mass of pilosus vetch on seed germination, 2013-2014.

In agroecosystems an important source of physiologically active substances is ploughing of crop residues, weeds, crops green manure into the soil.

The laboratory studies have shown that the products of decomposition of hiems triticum straw do not affect the germination of seeds of both cultivated and weed plants. The green mass of vicia villosa significantly reduced the germination of seeds of capsella bursa-pastoris to 34% and thlaspi arvensis up to 40%.

Combined use of straw and green mass of vicia villosa to a lesser extent inhibited the germination of weed seeds. However laboratory germination of thlaspi arvensis was 60% and that of capsella bursa-pastoris- 45% compared to the control variant.

Data of the studied organic residues did not influence the germination of seeds of the cultivated plants.

Options	Laboratory germination, % of control	
	Hiems triticum	Vicia villosa
Control	100	100
Thlaspi arvensis	25.4	50.3
Capsella bursa-pastoris	74.6	89.5
Amaránthus retrofléxus	92.6	96.6
Convōlvulus arvēnsis	100	97.2
Gálium aparíne	40.6	51.7

Table 5. The impact of weeds residues on the germination of the cultivated plants seeds, 2013-2014.

Residues of almost all weed plants had inhibitory effect on seed germination of *hiems triticum* and *vicia villosa*. The highest activity was observed in the extracts from plant residues of *thlaspi arvensis* and laboratory germination of *hiems triticum* decreased up to 2%; the *vicia villosa* - 50%; and *gálium aparíne* - 40-51% respectively.

Indicators	Control	Vicia villosa sowing
Grain yield of <i>hiems triticum</i> , c	19.3	24.1
Cost of production, rub.	15440	20485
Production costs, rub.	11889	13217
Cost price of 1 centner, rub.	616.2	548.4
Labor costs per 1 ha, man.-hour.	9.94	11.41
Labor for 1 c, man-hours	0.51	0.47
Conventionally net income, rub.	3551	7268
Profitability level, %	29.8	54.9

Table 6. Economic efficiency of *hiems triticum* cultivation at pilosus vetch overseeding on 1 ha.

The economic efficiency of *vicia villosa* seeding in the agrocenosis of *hiems triticum* showed that as a result of this technique application the level of profitability of *hiems triticum* grain production was higher than in the control variant and amounted up to 55%

Thus not only plants are inhibited by weeds, but vice versa. Moreover these mutually antagonistic relationship can occur during the growing season at the combined growth of the plants through leaf, root and crop residues.

Список литературы:

1. Гродзинский А. М. Аллелопатия в жизни растений и их сообществ / А.М. Гродзинский // Проблемы агробиоценологии. – М.: Изд-во Моск. Ун-та, 1979. – С. 13-19.
2. Гродзинский А.М. Перспективы изучения и использования аллелопатии в растениеводстве / А.М. Гродзинский // Роль аллелопатии в растениеводстве.- Киев: Наукова думка, 1982. – С. 3-14.
3. Груздев Г.С. Научные основы разработки комплексных мер

борьбы с сорняками в интенсивных технологиях возделывания сельскохозяйственных культур / Г.С. Груздев // Борьба с сорняками при возделывании сельскохозяйственных культур. – М., 1988. – С. 15-24.

4. Коренев Г.В. Вика мохнатая / Г.В. Коренев, В.М. Костромитин. – М.: Колос, 1975. – 95 с.

5. Никитин А.В. Сельскохозяйственная экология / А.В. Никитин. – Ставрополь, 1993. – 341 с.

6. Прутенская Н.И. Наличие ингибиторов и стимуляторов горчицы полевой в прорастающих семенах культурных растений. В кн. Физиолого – биохимические основы взаимодействия растений в фитоценозах / Под ред. А.М. Гродзинского. – Киев, 1972. – С. 99-105.

7. Райс Э. Аллелопатия / Э. Райс; Перевод с англ. – М.: Мир, 1978. – 392 с.

8. Торгашева А.П. Озимая вика / А.П. Торгашева, Б.П. Гончаров. – М.: Россельхозиздат, 1970. – 48 с.

УДК 633.11«324»:631.5

**Shakurova S.H.,
Pychkareva V.I.,
Goleva G.G.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

**THE INFLUENCE OF PARTICLE SIZE AND UNIT WEIGHT
ON SOWING QUALITIES OF SEEDS OF WINTER WHEAT
CULTIVAR ALAYA ZARYA**

Abstract. The paper shows the influence of different ways of sorting of winter wheat seeds on their sowing qualities.

Key words: winter wheat, seed grading, uniformity, germination energy, germination.

Seeds and their quality are one of the main factors that determine amount of productivity of cultivated plants.

Yield properties of seeds are determined by hereditary characteristics

of the variety (hybrid), as well as by growing conditions. Therefore, all agricultural activities should be focused on maintaining and increasing the viability of the seeds, in the period of their formation, growth, development and storage, consequently, special technology of seed growing should be developed and applied. Only if seeds are of high quality, the potential of the varieties can be fulfilled and, conversely, the most productive sort may result in low yield if the seeds are of low quality, hence the relevance of the subject of this research.

In this regard, the purpose of the study is to determine the effect of different methods of sorting seeds of a winter wheat cultivar Alaya Zarya on crop quality.

We distinguished seed fractions in relation to the size and unit weight:

- by size – with the help of sieves and the experimental sample of the separator roller;

- by density – using aerodynamic separator (ADS);

- size and density through sieves and ADS.

We repeated the experiment three times.

The following variants have been considered:

- C - control (seeds without sorting)
- S 2,2 –screenings with cell size of 2.2×30 mm;
- S 2,5 –screenings with cell size of 2.5×30 mm;
- S 3 – screenings with cell size of 3.0×30 mm;
- ADS 2 – the second seed fraction, obtained using the aerodynamic separator;

• ADS 3 – the third seed fraction obtained by the aerodynamic separator;

- RS 1 – the first fraction of seeds obtained using roll separator;
- RS 2 – the second seed fraction, obtained using the roll separator;
- RS 3 – the third fraction of seed obtained using roll separator;
- RS 4 – the fourth seed fraction obtained with the roll separator;
- ADS 2+ S 2,2 ;
- ADS 2+ S 2,5;
- ADS 2+ S 3,0;
- ADS 3+S 2,2;
- ADS 3+S 2.5.

Results. An important indicator of sowing qualities of seeds is the seed evenness. Experts claim that using even seeds for sowing provides

uniformity in the development and maturation of plants. Evenness is the degree of homogeneity of individual grains constituting the grain mass.

The seeds of coarse winter wheat (S 3, RS 4, respectively, to 92.2 and 92.0%) are characterized by the best evenness (table 1).

Variant	Coefficient, %	
	Evenness	Variation
C	78.4	21.6
S 2,2	85.4	14.6
S 2,5	89.9	10.1
S 3,0	92.2	7.8
ADS 2	83.0	17.0
ADS 3	82.4	17.6
RS 1	86.1	13.9
RS 2	87.7	12.3
RS 3	88.6	11.4
RS 4	92.0	8.0
ADS 2+S 2,2	87.0	13.0
ADS 2+S 2,5	89.7	10.3
ADS 2+S 3,0	90.5	9.5
ADS 3 + S 2,2	86.0	14.0
ADS 3 + S 2,5	86.5	13.5

Table 1. Evenness of seeds of Alaya Zarya coarse winter wheat variety according to the method of screening.

The seeds of the control variant and the seeds that have passed through aerodynamic separator, variants ADS 2 and ADS 3, have the lowest coefficient of evenness (78.4 and 83.0, 82.4% respectively). The coefficient of variation is used to compare two or more characteristics. It is a relative measure of dispersion, expressed as a percentage. We calculated this indicator and found that in variants S 3, RS 4 and ADS 2+, S 3.0, the coefficient of variation was low, down to 10.0%, indicating a weak variability of this characteristic of evenness.

Seed fraction, separation of which was carried out by grain size, largely differed in growth energy, in comparison with sorting variants sorted on aerodynamical separators (tab.2).

It was found that the largest seeds (RS 3, RS 4 and S 3.0), respectively – 94.0 and 92.5, 94.0% had low levels of growth energy compared with other sorting variants.

Variant	Germination energy	Germination
C	96.5	97.5
S 2.2	96.0	97.0
S 2.5	97.0	97.5
S 3.0	94.0	97.0
ADS 2	96.0	97.5
ADS 3	96.5	97.0
RS 1	97.0	97.5
RS 2	96.0	97.0
RS 3	94.0	97.0
RS 4	92.5	97.0
ADS 2+ S 2.2	94.0	94.5
ADS 2+ S 2.5	98.0	98.0
ADS 2+ S 3.0	97.0	98.5
ADS 3+ S 2.2	98.0	98.5
ADS 3+ S 2.5	96.5	97.5

Table 2. The germination energy and germination of Alaya Zarya winter wheat cultivar, %

It is worth noting that using roller separator, providing for more accurate separation of seeds by their size, displays a clear pattern that increase in seed size is followed by decrease in germination energy.

Seeds sorted on roll separator (RS 1 variant) showed high growth energy (97%). Germination figures in all variants of the experiment were almost identical, except for the small heavy-weight seeds (S 2.2+, ADS 2). Thus, the study has revealed that high evenness is characteristic of coarse winter wheat seeds sorted by size.

Evenness figures of seeds fractions, screened by density, were almost identical. The highest germination energy and germination figures have been observed in RS 1 variant and variants with double sorting (first screened, then ADS separated) (S 2.5 ; ADS 2+ S 2.5; ADS 2+ S 3.0 and ADS 3+ S 2.2).

Список литературы:

1. Васько В.Т. Основы семеноведения полевых культур: Учебное пособие/В.Т. Васько. - СПб.: Изд-во «Лань», 2012.-304 с.

2. Градчанинова О.Д. Изучение коллекции пшеницы. Методические указания / О. Д. Градчанинова, А. А. Филатенко, М. И. Руденко. - Л.: ВИР, 1985.-27 с.

3. Гуляев Г.В. Селекция и семеноводство культурных растений / Г.В. Гуляев, Ю.Л. Гужов. – М.: ВО «Агропромизат», 1987. - 447с

***Секция II. Актуальные проблемы механизации
сельского хозяйства и переработки
сельскохозяйственной продукции***
***Section II. Urgent issues of agricultural mechanization and
product processing***

УДК 568.244.4

Annenkov M.S.

**Voronezh State Agricultural University after Emperor Peter the
Great, Voronezh, Russia**

**POST-HARVEST TECHNOLOGY OF GRAIN HEAP TREAT
MENT**

Аннотация. В статье представлен обзор существующих технологий послеуборочной обработки зернового вороха. Каждая из технологий имеет свои преимущества и недостатки, которые рассмотрены в данной статье.

Ключевые слова: технологии послеуборочной обработки, поточная обработка, двухэтапная, многоэтапная, технологическая линия.

Harvesting system completes the process steps for cultivation of field crops. Its purpose is to harvest with minimum loss of quality and quantity of products. Good preparation and the most complete use of harvesting equipment, machinery revision of primary production, preparation of fields for harvesting, storage facilities and warehouses for the storage of products, and finally the widespread use of the experience of the best farms and mechanics provide the success of harvesting. Technological means and a set of equipment are used for each group of crops. But there are general organizational approaches. Harvesting equipment, weather conditions and the state of the crop cultivation are taken into account considering harvest terms its technological schemes. For grain harvesting direct combining and a two-phase (separated) harvesting method are used. If conditions permit direct combining is advantageous. For example, on clean fields for winter wheat cultivation on the net and engaged furrows, it is appropriate and advantageous. Direct combining, reducing costs by up to 30% is recommended. In other cases the decision may be different. [1]

In agricultural production the following technologies of postharvest

processing of grain are used:

multi-staged - treatment is carried out on separate disparate machines. It is usually unproductive high-cost technology. The need for labor increases;

two-staged at the first stage grain heap is transferred into the grain cleaning machines or grain cleaning and drying complexes. It is prepared for storage. At the second stage the seeds are brought to the required conditions. To increase the efficiency of this technology technical equipment of the production line the quality of food grains should be brought at the first stage of processing to the basis of conditions in a single pass at high production rates;

streaming - processing of grain heap involves bringing the quality of products to the required conditions in one pass, i.e. food grain to the basis condition, and seed - to the seminal conditions. The continuity of the process is provided by the necessary of technical equipment of a technological line, as well as relevant performance of the processes, machines, units and elements of the flow line. [2]

Organization of postharvest processing of grain depends on the provision of farm grain cleaning technique, physical, mechanical properties of a grain heap.

Postharvest processing of grain and seed preparation should be organized in such a way as to reduce the amount and intensity of mechanical influences. Numerous research and production indicate that the quality of seeds sown is reduced at the cost of untimely release of weeds from the grain heap, as well as biologically defective and damaged seeds, which content can reach 25-30%. [5]

The most important task of the postharvest processing of grain is an immediate release of small weeds, crushed and biologically inferior grain from the grain heap that have greater biological activity. Streaming technology of postharvest processing of grain and seed is mainly used at the agricultural enterprises. The applied grain lines are unable to produce quality grain cleaning and sorting of seeds in technological one pass.

The generalization of the known developments in the use of the applied technologies for post-harvest seed treatment shows that only a fractional technology allows fractions cleaning by the shortest way, reducing the amount of mechanical influences on seed fraction, thus to relieve the technological line as a whole. Perfect technology and equipment for postharvest processing of grain heap in order to obtain high quality seeds brings relevant requirements to the system of grain postharvest processing. Throughput and technical equipment of technological lines for the grain postharvest processing must correspond with the volumes of production and the structure of the sown areas. [3, 4]

Thus the grain heap must be treated immediately as it becomes available. This is most efficiently achieved when technological lines provide fractionation of grain lots at the very early stages of post-harvest treatment, heap immediately split into different factions quality. In the separation into fractions the heap increases productivity production line and each of the fractions is processed by the shortest ways that reduces injury grain. [7] Nevertheless, the final stage of post-harvest treatment is secondary or the final treatment, which allows bringing the grain heap up to the required conditions. [6]

The most progressive and economical method of harvesting the organization is in-line method for group use of the equipment: all operations were carried out in sequence on the basis of comprehensive mechanization in a single beam. In flow method of cleaning the operations are performed one after another without interruption, fresh threshed grain immediately after its release from the combine, sent to the winnowing machine, where the primary cleaning heap. There is also a transshipment technology when threshed grain heap comes first on the current, and then it is transferred into the machine and then processed at grain cleaning unit. [8] Which method is more efficient and less damaging to the grains as used for congestion or grain or grain throwers, which in turn hurt the working bodies of the grain, which affects the quality of grain and seeds, and in particular on the seed. Therefore the use of transept cleaning technology, especially for the companies engaged in production of seed material is impractical.

Список литературы:

1. Ермольев, Ю.И. Перспективные технологии и технические средства для очистки зерна / Ю.И. Ермольев // Механизация и электрификация сельского хозяйства. - 2002. - № 6. С. 28-29.
2. Мякин, В. Н. Эффективные технологии очистки и сортирования семян / В.Н. Мякин, С.Г. Урюпин // Экономика сельского хозяйства России. 2003. №4.
3. Оробинский, В.И. Использование двухъярусных четырехрешетных станков для фракционирования зернового вороха [Текст] / В. И Оробинский // Зерновое хозяйство. 2006. № 4. С. 18-19.
4. Оробинский, В.И. Совершенствование технологии послеуборочной обработки семян фракционированием и технических средств для её реализации : автореф. дис. . д-ра с.-х. наук : 05.20.01 / В. И. Оробинский ; Воронеж. гос. аграр. ун-т .— Воронеж, 2007 .— 39 с. : ил. — Библиогр.: с. 38-39 .
5. Совершенствование механизации производства семян зерновых культур: рекомендации. – М.: ФГБНУ «Росинформатех»,

2014. – 60с.

6. Тарасенко, А. П. Качественные показатели работы машин для вторичной очистки зерна / А. П. Тарасенко [и др.] // Сельскохозяйственные машины и технологии. — 2011 .— № 3 .— С. 36-39.

7. Тарасенко, А.П. Повышение качества зерна / А.П. Тарасенко [и др.] // Механизация и электрификация сельского хозяйства. 2010. № 10. С. 7-9.

8. Тарасенко, А.П. Совершенствование послеуборочной обработки семян зерновых культур [Текст] / А.П. Тарасенко, В.И, Орбинский, М.Э. Мерчалова // Механизация и электрификация сельского хозяйства. 1999. № 12. С. 27-28.

УДК 556.043

Boev O.V.

Pukhov E.V.

Belozertsev A.Yu.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE USE OF GIS TECHNOLOGY IN THE TRANSPORTATION OF AGRICULTURAL PRODUCTS BY MOTOR TRANSPORT

Аннотация: В данной статье рассмотрены проблемы актуальные для сферы грузоперевозок сельскохозяйственной продукции. Приведены возможные пути их решения с использованием ГИС - технологий.

Ключевые слова: Гис-технологии, грузоперевозки, сельскохозяйственная продукция.

GIS is a geographic information system that allows the mapping of the objects of the world and then to analyze them by a huge number of parameters, visualize them, and on the basis of these data to predict a variety of events and phenomena. This powerful technology allows solving a great number of problems, both global and private. GIS technology can serve all humanity preventing eco-disasters or helping to solve the problem of overpopulation of certain regions. GIS can be used for the needs of individual companies, to engage the effectively functioning business. For

example, a transportation company can select the optimal routes for their vehicles, by means of special data bases utilities – lay communication to new buildings and other objects. Information system is a huge digital database, converted into a digital format. They are detailed layers united by geography and tied to a specific coordinate system. Any events can be tracked in this database. In addition, one can find almost any point of the globe, to track the movement of virtually any object. The GIS database is able to perform a variety of tasks: to enter relevant data into the data base and in most cases this happens automatically with a scanner; to manipulate data, to zoom their discretion, to collect the necessary for specific task information. As conventional databases a GIS system can be controlled. This is done by means of a set of integrated applications [1]. A large amount of data contained in the database provides wide opportunities for the analysis on various parameters. One can find free plots for building a house, to form traffic flows, in an optimum way, to analyze the proximity of the various objects (e.g., determine the number of people living within walking distance to your store), to impose on each other, various indicators and to analyze the result is. The last task that GIS allows performing is data visualization. There is a possibility to obtain maps, graphs, tables, and even pictures of the areas. These data are of huge importance both for research and for individual companies and organizations. In the current world there are a number of problems with transportation. The most relevant ones are: pavement deterioration as a consequence of overloading of the vehicle; the theft of cargo and fuel; poor timing of traffic and transit; creation of emergency situations in mind of the human factor. Consider the possibility of using GIS technology in transportation of agricultural products by motor transport. First the planning, monitoring, and a review of the use of technology will become easier. Technical subsystem of the agricultural enterprises are also included in the use of geoinformation technologies which includes: scheduling the use of equipment and its repair; analysis of use of machinery and fuel and lubricants (all the movement of equipment, calculation of mileage and treated areas); definition of optimum routes of movement and transportation of machinery from the base to the cultivated fields; definition of optimum routes of delivery of the crop to collection points; monitoring the speed of the equipment movement performing field work; determining the length of estrus or optimum distance between the margin and the points of agricultural products by delivery a digital map; creating accounting sheets of tractor-drivers. The use of GIS-technologies will help to realize the remote control of the economy (to control processes in real time) the managers on the basis of the generated reports to analyze the efficiency of the investments in manufacturing. For dispatch service the use of these technologies allows to quickly track the location of equipment,

coordinate the work of machine operators and drivers, including the establishment of voice communications, as well as to monitor the flow of fuel and the state of the machines. Geographic information technologies allow not only to increase the security of the enterprise, to analyze the flow of cargo to plan transport, but to implement fleet management (tracking, fuel, etc.) considering the features of business processes of a transport company. The control system includes a GPS receiver mounted on the vehicle (locomotive, ship, plane), which the coordinate information transmitted to the control center and stored in a single geo-database. Geographic information systems are used here to display this information in a geographic context.

One of the main advantages is the monitoring of mobile objects. Tracking is widely used on auto and railway transport for transportation of safety and valuable goods. In real time one can get coordinates of vehicle in case of theft or at the request of the operator. Movement recording allows modifying the real situation, which is useful in the analysis of accidents or other emergency situations. System with high precision allows determining the 2D and 3D location and orientation in space. There is also the ability to monitor flow and fuel distribution. In addition to fulfilling the function of tracking vehicles on map, storage of the history of the traveled route and registering deviations of the diagram of motion the control system of a vehicle fleet allows to provide continuous monitoring of flow and fuel distribution. Fuel costs account for 20-30% of the total costs of the company. Each director of a transport company tries to follow the theft of fuel and implement technical controls. The application of GIS technology in a particular way can affect two components: to reduce the mileage due to the optimal layout and routing, and to analyze the driving style and vehicle performance. Of rotational basis of work when several people alternately serve one vehicle a driver identification it can be solved by various technical means: the keyboard of the entered personal code (or number), the personal reader key, reader of the wireless card, voice identification, etc. Undoubtedly the solution of identification will also allow performing a task of working time tracking. This function is performed by passive or active monitoring. Active monitoring provides registration and data o transfer status of units of technical means work to the data server via the GSM channels GPRS, CSD or SMS. Passive monitoring of technical means is made by recording the operation of transport into the built-in data carrier during the work. The reading (transfer) of previously collected data is made through wireless connection by to the arrival to the base or by the responsible person collecting the data on a portable computer means. Based on this information, can decide the need for more qualified personnel, stuff training, promoting the most

responsible workers, vehicle maintenance, etc. Tracking of moving objects in the transport sector includes not only tracking of vehicles, but also the freight. The most urgent task is the transportation of dangerous goods. To avoid delays wrong decisions or complicating action special control systems are applied which ensure: reliable connectivity with the vehicle; monitoring the state of the driver of the vehicle, cargo; determination of the coordinates of the moving vehicle and it display on a map; manager notification in case of any emergency. They, it should be noted that the use of GIS technology in transportation is not only economically profitable, but will also greatly facilitate each of the stages of delivery. The main advantage is the improvement of road safety, prevention of emergency situations and detailed systematization of the whole transport network.

УДК 568.244.4

Borodin S. A.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

IMPROVING STRUCTURES OF MILKING MACHINES

Аннотация. Представлен анализ конструкций используемых доильных аппаратов на молочных фермах. Предложена схема устройства для управления режимом работы доильного аппарата, позволяющая осуществить массаж сосков вымени в начале и конце доения.

Ключевые слова: машинное доение, стимуляция молокоотдачи, сосок, доильный аппарат, пульсатор.

The milking machine and its cup devices which act directly on udder of an animal perform the main function in automatic milking cows. [4]

The picture one presents the classification of nowadays being used milking machines. [1, 2, 5]

Automatic milking is conducted with continuous vacuum under teats in the majority of cases. The teatcup liner of modern milking machines does not provide stimulation of the milk ejection, i.e. it does not conform to the milking physiology. While stimulation of the milk ejection should accompany the working process of milking, it means a milking machine itself should excite milk ejection reflex. [3]

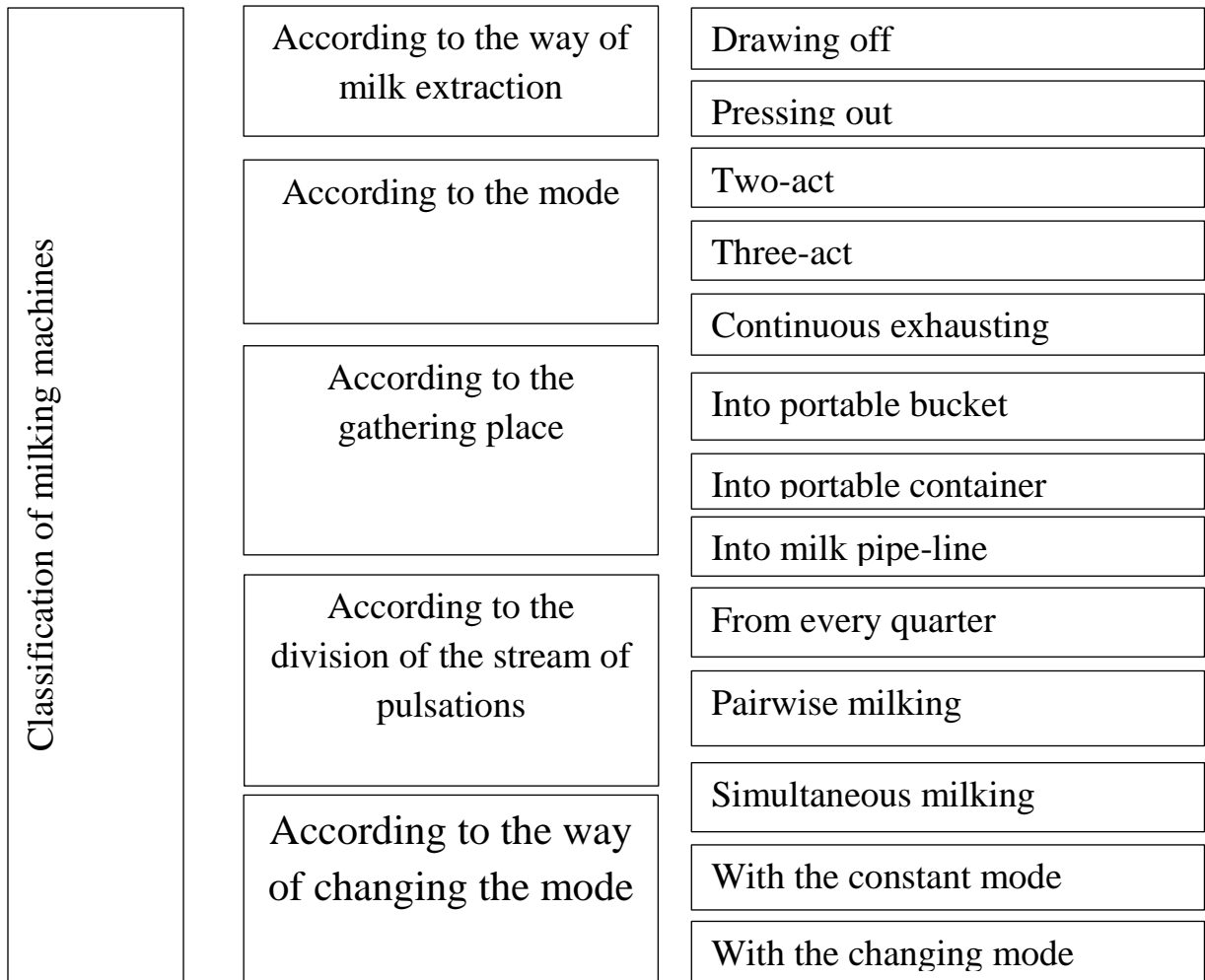


Fig. 1 Classification of milking machines

According to the work [6] the quality of functioning of any milking machine can be estimated with an index which will be defined as.

$$K = K_m \cdot K_n, \quad (1)$$

K_m - an index of milk ejection taking into account the speed of extracting milk;

K_n - an index of completeness milking taking into account an amount of the milk left in the udder after automatic milking.

$$K_n = 1 - \frac{N}{(N+W)} \quad (2)$$

An index of completeness of milking is defined according to dependency

$$K_n = 1 - \frac{N}{(N+W)} \quad (2)$$

We define efficiency of the milking machine according to the formula

$$K = \left[1 - \frac{(Q_{\max} - Q_{cp})}{Q_{\max}} \right] \cdot \left[1 - \frac{N}{(N+W)} \right] \quad (3)$$

W - amount of milk taken from a cow by automatic milk (kg);

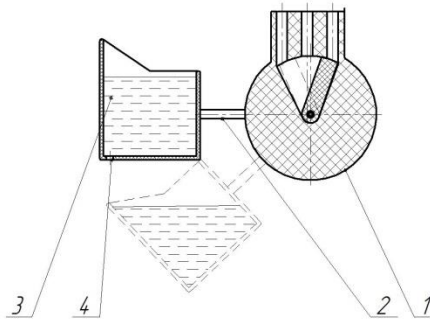
t - time of automatic milking (min);
 N - the amount of milk taken by additional milking (kg);
 Q_{max} - maximum intensity of milk ejection by automatic milking. It is defined according to flow detector (kg/min);
 Q_{cp} - medium intensity of milk ejection by automatic milking (kg/min).

According to the formula 3 the factors should be strengthened, which provide an increase of medium speed and completeness of milking. [3, 7].

From these positions it is important to create such an installation which will provide safety for the animal and milk ejection without automatic additional milking in the conditions of improving milking machines [8].

In perspective manual labour will be used more rarely on farms, therefore milking machines should perform the function of processing of an udder before milking, which allows providing the proper effect of milk flow and keeping it up during the process of milking [1, 2].

Microvibrations of the teatcup liner are suggested to use during milking for realization and keeping the milk ejection reflex at the beginning and the end of milking, when the speed of milk flow is lower than the maximum one. [1] Universal pulsator created on the base of the pulsator SMM – 1 (stimulating milking machine) and the device for controlling mode of the machine situated on the top of a milking bucket (pic. 2).



1 – The device for controlling the mode of milking; 2 – lever; 3 – moisture trap (milk receiver\ bucket); 4 – releaser mil pump.

Fig. 2 The device for controlling mode of the milking machine

The device for controlling the mode of milking is made in the form of a cell, where there is a shutter which confines its turning and divides that cell into three cavities connected with the variable vacuum cells of the stimulating pulsator, vacuum-line and atmosphere pressure [4].

At the beginning and end of milking when the speed of milking is less 200g/min, the moisture trap is the upper position and through the proper canals Microvibrations of the teatcup liner are realized at frequency

of 10 Hz. At maximum speed of milking the moisture trap is in the lower position and through the proper canals the mode of milking is installed as in the usual apparatus at frequency of 1 Hz [9].

Usage of the suggested structure of milking machine allows realizing before milking processing of an udder without using manual labour and provides safety of milking and completeness of it.

Список литературы:

1. Доильный аппарат: пат. 2442319 (С2) РФ, МПК А 01 J 5/00, А 01 J 5/10 (2006.01). /Андрианов Е.А., Андрианов А.А., Андрианов А.М., Злобин В.В.; заявитель и патентообладатель ФГБОУ ВПО Воронежский ГАУ. -№ 2010112576/13; заявл.31.03.2010; опубл. 20.02.2012. Бюл. № 5. -4 с.

2. Устройство для доения коров: пат. № 2556910 РФ; МПК А01J 5/04 / Д.И. Яловой, Е.А. Андрианов, А.М. Андрианов, А.А. Андрианов // № 2013147003/13; заявл. 21.10.2013; опубл. 27.04.2015, Бюл. № 12.

3. Злобин, В.В. Совершенствование устройств для доения первотелок и новотельных коров / В.В. Злобин, Е.А. Андрианов // Инновационные технологии и технические средства для АПК// Материалы всероссийской научно-практической конференции молодых ученых и специалистов, посвященные 100-летию ВГАУ им. императора Петра I. – Воронеж, 2012.- С.103.

4. Злобин, В.В. Управление режимом работы доильного аппарата [Текст] Е.А. Андрианов А.М. Андрианов, А.А. Андрианов, В.В. Злобин //Техника в сельском хозяйстве. – 2012. – № 4. – С. 12-13.

5. Яловой, Д.И. Исследование устройств для машинного доения коров /Д.И. Яловой, Е.А. Андрианов, А.М. Андрианов, А.А. Андрианов // Современные тенденции развития технологий и технических средств для АПК: материалы научной конференции профессорско-преподавательского состава, научных сотрудников и аспирантов. - Воронеж: ВГАУ, 2014. - С. 89-94.

6. Андрианов, А.М. Молочная продуктивность коров в связи с совершенствованием технологий и технических средств, используемых в молочном скотоводстве / А.М. Андрианов, Е.А. Андрианов, А.А. Андрианов. – Воронеж: ФГБОУ ВПО Воронежский ГАУ, 2013. –183 с.

7. Андрианов А.М. Совершенствование устройств для массажа вымени нетелей в период подготовки их к лактации /А.М. Андрианов, Е.А. Андрианов //Совершенствование процессов механизации в растениеводстве и животноводстве: сб. науч. тр. – Воронеж: ВГАУ, 2000. – С. 115.

8. Андрианов, Е. А. К определению расхода воздуха при истечении из камеры управления доильного аппарата [Текст] / Е.А. Андрианов А.М. Андрианов, А.А. Андрианов//Вестник Воронежского государственного аграрного университета. - 2013. - № 1(36). – С. 142-146.

9. Андрианов, Е.А. Исследование устройства для управления режимом работы стимулирующе-адаптивного доильного аппарата [Текст] /Е.А. Андрианов, А.М. Андрианов, А.А. Андрианов //Вестник Воронежского государственного аграрного университета. - 2014. № 3 (42). - С. 123-129.

УДК: 67.620.4

**Vahidov A.,
Turdibayev A.,
Haliknazarov O.**

Tashkent State agrarian university

THE EFFICIENCY OF ELECTRO HYDRO IMPULSE IN PRIMARY PROCESSING OF COTTON SEED IN OIL PRODUCTION

Annotation: Article deals with the primary water electro impulse of processing of technic cotton seed and fastens its moisture as well as reaching its rapid dryness. Furthermore, increasing the volume of oil production and decreasing the energetic expenses.

Key words: oil plants, technic cotton seed, moisture, to granulate, to fry, to press, to extract, energy saving, energetic efficiency, tangible environment, technologic environment, energy technological process.

Food industry enterprises of Uzbekistan Republic consist of more than 200 enterprises and they have been producing products as plant oil, margarine, butter, feta cheese, cheese, candy products, reprocessed meat and dairy products and volume all of these products have been increasing within a year. All of these possibilities are creating an accessibility of consumed products for our population together with exporting them. It is clear that, the order of the president of the republic of Uzbekistan in 2010 December 15 “2011 – 2015 primary directions of improvement of the industry of the republic of Uzbekistan” is becoming an important guide. Because, according to this document old technologies of these enterprises have been renewed step by step, and modernization gives a great

opportunity of creating more competitive products [1]. It is hard to imagine present period without modern, energy saving technologies. For this reason oil production processes are based on improved principles.

To moistening oily plant products, creating technologies and technical means, in order to activate electro hydro impulse processing, organizing principal approaches in destroying the seed cells which keeps the oil and increasing oil production.

Improving the quality of products by reprocessing them by the methods of electro physics before pressing the granules and increasing the process of production of plant oil (preventing the denaturation of proteins, and the clearness of produced plant oil), decreasing the energy expenses (to lower the temperature of frying) and investigated energy saving opportunities.

Electro energy usage in producing oil from technic cotton seed: it characterizes by the energy balance by active, reactive energy in the period of electro balance observation. The active energy balance requirements equals to all used volume, and total expenses in the branch, variables and indirect working machine expenses: [2]

$$W_{np} = \sum_{i=1}^n W_{ni} + \sum_{j=1}^m W_j; \quad i = (1, n), \quad j = (1, m);$$

For producing black cotton oil 280 kwt/h
 for clear cotton seed oil 16 kwt/h,
 for sunflower seeds 300 kwt/h,
 for clear sunflower seed oil 17 kwt/h,
 not rafinated elbows oil – 290 kwt/h
 and rafination elbows oil 17 kwt/h,

For packaging of cotton oil and sunflower oil produced by extracting , cotton and sunflower oil produced by pressing, used 24.2 kw/h, for shipment 15kw/h, for loading 12kw/h, for producing electro energy 17kw/h, for delivering cold water 440kw/h of electro energy is used.

Besides that, for extracting 1 ton of products needed 6l of extra gasoline, 1.17 KGUT/G call natural gas, 1.37 KGUT/G oil is used.

It is clear from the used materials that used energy in oil enterprises electro energy became the main part of oil production (moisture, to granulate, to fry, to press and to extract).

It is the most needed indicator to keep the product`s humidity in optimal level during producing plant oil and to moisture technic cotton seed in the oil industry.[3]

The coefficient of energy transmission of cotton seed is core.

The coefficient of body humidity transmission is equal to potential transmission production humidity of volume capacity of the body.

$$\lambda_m = a_m * C_m * \rho_T$$

here; a_m – coefficient of diffusion humidity; c_m – volume humidity capacity of material; P_m - density of absolute dry part of the material.

The humidity of cotton seed after reprocessing equals to 16% (core) according to information humidity transmission coefficient is $(0.37-1.44) \cdot 10^{-5}$ from increases to $(2.044 - \dots 48) \cdot 10^{-5} \text{ m}^2/\text{s}$. According to absolute bigness the humidity transmission of cotton seed coefficient λ_b (moisture 8-10%) in the condition $\lambda_m = \dots \cdot 10^{-5}$ for grist $\lambda_m = 0.87 \cdot 10^{-5} \text{ m}^2 \text{ c}$ [4]

During moistening the technic cotton seed by the method of electro hydro processing brings to moistening it in optimal level in a short period, destroys the seed walls, which helps to increase the oil volume. Present method of moistening the cotton seed takes 6-8 hours but recommended electro technology reduces the process to 2-3 hours. This gives the opportunity of saving energy.

For the efficiency evaluation and condition parameters of recommended electro hydro impulse process is received the destruction level of cell processed object. According to this there have been established principal electro scheme of laboratory conduction. Technical principals of plant oil extracting were improved.

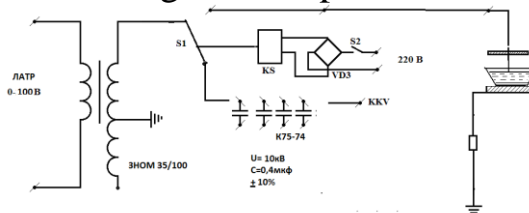


Fig. -1. Principal electric scheme of laboratory conduction desk.

In order to analyze the damage level of every factor during the processing series of laboratory practices concerning the recommended method have been produced.

We can observe the damaging of active cells of production during the processing because of exceeded voltage and this destruction gives an opportunity of increasing oil volume during the extraction comparatively to time.

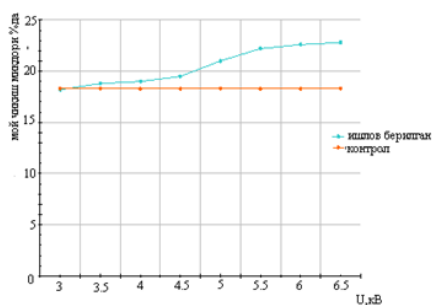
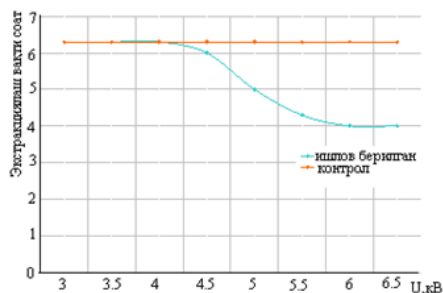


Fig. -2. A) Comparability of processed technic seed oil volume to the voltage increase.



b) Comparability of processed technic seed oil decrease in the period of extracting.

In conclusion we can say, moistening the technic cotton seed by the method of electro hydro processing brings to moistening it in optimal level in a short period, destroys the seed walls, which helps to increase the oil volume. Present method of moistening the cotton seed takes 6-8 hours but recommended electro technology reduces the process to 2-3 hours. This gives the opportunity of saving energy.

List of literature.

1. Hydro electric processing of oil plants. //safarov A. F. Artikov A.A., Usmanov A.U., Mamatkulov A.H, Sarimsakhadjayev A.R. Food manufacture. M. "Agropromizdant", 1990 # P 25-26
2. A. Turdibayev, A. Vahidov, Z. Hurramova The results of electro physic method in producing cotton oil //Agro science magazine Tashkent, 1012. - #2(22). – P 77.
3. Methods of producing oil from cotton seed. Artikov A.A., Safarov A.F., Mamatkulov A.H, Saidmuradov U.A. and others
4. Method of producing oil from cotton bones. Artikov A.A., Safarov A.F., Shomuradov T.R. Gafurov K.H, Bazarbayeva D.Sh.

УДК 621.182.3:662.611.2

**Gorbunov E.A.,
Puhov E.V.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE IMPORTANCE TO CONTROL THE OVER FUEL CONSUMPTION

Аннотация: В статье рассматривается важность контроля над расходом топлива автомобильного транспорта и сельскохозяйственных машин.

Ключевые слова: бережливое производство, технический сервис, автомобильный транспорт, сельскохозяйственные машины.

It is impossible today to underestimate the value to control over fuel consumption. There are several reasons. First of all the reduction of the fuel purchasing cost during the period of continuous growth in prices is very important. The increased consumption of fuel can be a sign of malfunction of the vehicle. Particular attention is paid to the environmental

safety.

Incorrect operation of the engine leads to inefficient combustion and emission of high carbon dioxide content. Fuel consumption monitoring system can be divided into two important parts. First is the optimize action the of enterprises operation, its activity being based on transport as a source of income. Second is an individual control of fuel consumption in the specific vehicle. Mainly the decision of the first problem is the account of all kinds of transport run and the development of logical route. The decision of the second problem is the general condition of the vehicle.

If a company or a separate division is engaged in the transportation of goods or people, there must be a certain number of vehicles. Fuel costs in such organizations are the main item of expenditure and the reduction of expenses provides a substantial increase in profits.

Gasoline or diesel fuel is a consumable material and the filling is made often, sometimes every day. Saving even a few percent per month may be rather significant.

By implementing a quality control system many businesses suddenly found tremendous savings.

In some cases it reaches 40 percent. It is natural that even the most expensive and difficult to install system promptly pays for it.

Companies which install the right equipment typically undertake subsequent service. Turning to the professionals one can get the advice on the use of the system.

There is no need to take separate elements and install them. There is a possibility of incompatibility of certain parts.

Experienced professionals will design everything properly and efficiently. They will assemble all the necessary equipment. Timely and high quality service will maximize the period of its use.

Consumer training is the responsibility of the installer company. Installing and updating of software, testing the system equipped with the vehicles fuel consumption control will save one from a trial and error, if the decision to do the installation with your own hands will prevail.

The effluence of these measures guarantees the company from unnecessary costs.

Accurate data on the consumption, routes and daily monitoring on-time, provide the opportunity to take a fresh look at the organization of the labor process. Optimization of the production activities has a beneficial effect on the economic situation of the company. The possibility of the fuel and "left routes" are excluded. The competitiveness of the company which activities are based on the organization of transport sharply increases. The system of fuel consumption control and the economic effect of its application will possibly encourage the enterprise to apply other modern

methods of business development.

УДК 621.867.423.

**Irgashev A.A.,
Turkmenov H.I.,
Jumaev Z.,
Shermuhamedov H.P.**

Tashkent Institute of Irrigation and Melioration

**FEATURES OF FORMATION OF ACTUAL CONTACT
AREA INTERACTION OF POLYMER MATERIAL WITH
FIBROUS MASS**

Аннотация: На данной статье рассмотрено механизм фрикционного взаимодействия полимерных материалов с волокнистой массой. Сущность метода заключается в том, что ФПК полимерных материалов с хлопком складывается из элементарных площадок контактов, характеризующих средней шириной b_i , и длиной l под воздействием нормальной нагрузки G к хлопку, характер распределения и величина которых адекватна с аналогичными параметрами для одиночного волокна, находящегося в напряженно-деформированном состоянии под нормальной нагрузкой G .

Ключевые слова: Полимер, волокнистая масса, хлопок, фрикционная взаимодействия.

It is known that one of the main factors determining the mechanism of interaction between the friction materials is their actual area of contact (FPC), which for a couple of polymer - Cotton quantitative is not studied well [5].

The processes of deformation of solid distant substances which present in the cotton, and the surface of the polymer materials and links of cotton fibers surface irregularities are not also investigated properly It will complicate the quantity of the individual components of the friction force and the identification of their share and the dominant influence on the value of the total force of friction interaction.

The studies have shown that the frictional interaction of cotton with polymeric materials is significantly indifferent not only from the friction between two solid bodies, but also from friction of cotton with metal

surfaces, which is primarily due to the structural and mechanical characteristics of the interacting materials especially cotton such as macrodispersal heterogeneous fibrous material with a high volumetric deformability [6-8]. According to the results of the study (Table 1) FPC polymeric materials consists of 1-5% raw cotton of the face area and they are unequally distributed across. The magnitude of the FPC and the uniformity of its formation are strongly influenced by the hard impurities of cotton, especially the seeds, through which the contacting of the fibers with the surface of the material where the most intense contact patch occurs and therefore higher actual pressure resulting in mechanical damage the cotton fibers, crushed seeds and surface abrasion of polymeric material. It should be noted that, the most important property of the contacting, determines the magnitude of the FPC polymeric materials with cotton and their modulus of elasticity, which increase leads to a decrease in FPC and thus to decrease the adhesion component of friction force interaction. Increasing of cotton moisture leads to intensive growth of FPC, and rising of corruption directs to its decline, it leads to the changes of the pulp in the co-elastic properties.

According to the mathematical modeling allowed to develop a methodology of calculation for determining the relative FPC, the logic circuit is shown in Figure 1. The essence of the method lies in the fact that FPC polymeric materials with cotton consists of elementary areas of contacts that characterize the average with b_i and length ℓ under the influence of the normal load G of cotton, the nature of the distribution and the magnitude of which is adequate, are the same parameters for a single fiber in dressing-deformed state under normal load G .

In the area of interaction between elastic and plastic contact investigated pairs according to their mechanical properties and modes of friction, the reason of changing in thermal and electrical parameters is an engagement of frictions. The area of the elastic contact carried on the surface layer of the polymeric material occurs on the fatigue mechanism in the area of plastic contact mainly by abrasion and high humidity cotton - corrosion-mechanical mechanism destruction of the materials.

Deformation of force component mainly depends on frictional interaction of hardness in polymeric materials. It was determined by the relative introduction of solid debris and micropolar extremities seed into the polymeric material with the formation of new roughness parameters different in the origin. The magnitude of the roughness parameters and their distribution greatly depends on the hardness of the polymeric material. The beginning of fillers with high hardness in small amounts (up to 10 wt. H.) enlarges the composition of anisotropy in mechanical properties of the materials therefore leads to the increase in their surface of

roughness.

The increase of cotton pollution contributes to the deformation component of friction interaction raising the uneven contact pressure.

Type of material	The size of comparative % at FPC in various pressures P10 (MPa)						
	1	5	10	20	30	40	50
High density polyethylene 0.02	0.02	0.13	0.24	0.52	0.79	0.95	1.22
	0.08	0.45	0.95	2.12	3.22	3.91	4.92
Faedo-20 based on combination	0.02	0.12	0.20	0.51	0.76	0.93	1.02
	0.07	0.48	0.82	2.10	2.91	3.62	4.35
Polycaproamide	0.02	0.10	0.18	0.44	0.65	0.81	0.93
	0.07	0.46	0.79	1.91	2.82	2.86	3.22
Penplast	0.02	0.10	0.17	0.42	0.62	0.76	0.88
	0.06	0.38	0.68	1.64	2.52	2.62	2.95
Ponivnilbutiral	0.01	0.08	0.18	0.34	0.51	0.65	0.74
	0.05	0.34	0.71	1.41	2.03	2.31	3.02
Composite-based ED -16	0.01	0.07	0.16	0.25	0.45	0.58	0.66
	0.04	0.25	0.63	1.21	1.36	1.68	2.26

Table 1 Comparative FPC at frictional interaction of certain polymeric materials with raw cotton

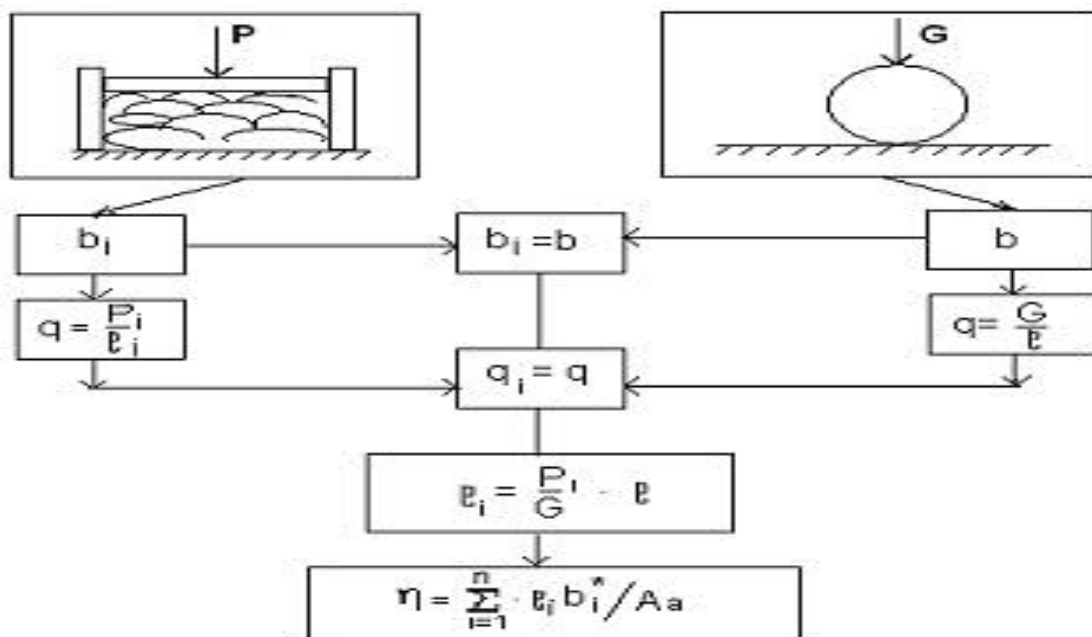


Fig. 1 logic calculation method FPC polymeric materials with cotton - raw

Under certain conditions of frictional interaction, when the height of the surface roughness is comparable to or greater than the diameter of the fiber, it becomes the dominant force of engagement of the fibers of the surface roughness, and it defines the nature and regularity of frictional

interaction and mechanical defectiveness cotton. Moreover the engagement force does not depend only on the ratio of the height of the surface roughness of the opposing member and the diameter of the cotton fibers, but also on the shape and properties of interacting contacts.

The results of the research and generalization of them with the previous studies allowed the development of the method for determining the FPC materials in contact with cotton and methodology for calculating the individual components of the friction coefficient and the properties of the interacting materials. Their use makes it possible to conduct the research on the development of materials with the desired tribological properties at a high level.

Список литературы:

1. Боуден Ф.П., Тейбор Д. Трение и смазка. Пер. с англ. М., Машиностроения, 1968г. 543с.
2. Крагельский И.В., Добычин М.Н., Камбалов В.С. Основы расчетов на трение и износ. М., Машиностроения, 1977г., 527с.
3. Белый В.А., Свириденко А.И., Петроковец М.И., Савкин В.Г. Трение и износ материалов на основе полимеров. Минск, Наука и техника, 1976г., 431с.
4. Демкин Н.Б., Рыжков Э.В., Качество поверхности и контакт деталей. М., Машиностроение, 1981г., 244с.
5. Джумабаев А.Б., Сайпидинов А., Негматов С.С., Иргашев А.А., Эшкабилов Х.К. Моделирование процесса формирования фактической площади касания при фрикционном взаимодействии волокнистых масс с поверхностью полимерного контртела. Трение и износ, 1985г., т. VI, №4 732-735с.
6. Негматов С.С., Джумабаев А.Б., Иргашев А.А. Особенности фрикционного взаимодействия полимерных покрытий с хлопком. Трение и износ, 1983г., т. VI, №3 458-466с.
7. Neqmatov S.S., Jumabaev A.B. Mechano-electro-thermomechanical process of material Friction and their influence in the nature of Body frictional interaction. Eurotrib –85,4 th European TRIBOLOGIC Congress, Lion, 1985.
8. Нажмитдинов М.Ж., Джумабаев А.Б., Негматов С.С., Иргашев А.А., Казаков Б. Т. Расчет механической составляющей силы фрикционного взаимодействия композиционных полимерных материалов с хлопком-сырцом. В сб. трудов ТашПИ «Повышение качества выполнения технологического процесса и надежности машин для хлопководства», Ташкент, 1986г., с.92-97.

УДК 631.362

Kuznetsov M.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE APPLICATION OF SWIVEL MOUNT TO HINGING TAPE BUCKET ELEVATORS

Аннотация. В статье представлены результаты экспериментальных исследований нории с шарнирно-закрепленным ковшом на ленте.

Ключевые слова: ковшовый элеватор, зерно, обратная сыпь.

The key stage in the process of grain production is the postharvest treatment, that is the obligatory link in the process of production and solves two basic associate tasks – its cleaning and drying [1, 5, 7].

Agriculture is equipped with different machines and equipment for postharvest treatment of grain and seed (self-propelled machines, grain cleaning aggregates, grain cleaning drying complexes, equipment for mechanization of works in storages). Majority of the existing grain cleaners and aggregates do not match to the requirements, namely the reduction of grain injuring, improvement of cleaning quality [3]. It is therefore necessary to perfect technology of postharvest treatment that must provide high quality of technological process implementation.

One of the machines of modern complex of the units for postharvest treatment of grain is cupelevator (noria). They are used for the transportation of the material in vertical direction. The construction of norias is simple enough, reliable and economical in operation that is stipulated by their wide use as compared to other transporting machines.

At the same time it is necessary to notice that norias have one substantial defect. This is significant injuring of the transported material [4, 6, 8].

One of the reasons of grain damage a cupelevator is back pouring of grain. At unloading it does not get in to the unloading pipe, but is poured by norias pipes to the zone of scoops loading.

Mainly the backlagging of grain arises at running up of the filled scoop into an overhead drum.

The developed construction of the working body of noria, protected by a patent on an useful model [2], that at the moment of running of the scoop into an overhead drum provides it`s turn aside opposite to the

direction of grain pouring out, and at the moment of scoops unloading the last turn toward the unloading pipe.

A cupelevator including the overhead drive and lower tension drums, hauling ribbon with the gimbaled scoops, is different that scoops are envisaged in the center of back wall on a flat hinge and provided with the resilient terminators of the inplane ribbon turn.

Figure 1 shows the structural scheme of the developed cupelevator [1]; figure 2 presents the position of the scoop at the moment of it's running into an overhead drum.

A cupelevator contains an overhead drive 1 and lower tension 2 drums, rounded by a ribbon 3 with scoops 4, located in the case consisting of head 5 with the unloading pipe 6 for unloading, bottom 7 with a loading tray 8 and midsections 9. By means of hinge 10, set on the bracket of ribbon 3, scoop 4 in the center of the back wall connected with the ribbon 3. On the edges of the back wall of scoop 4 elastic elements are set 12 and 13, also connecting the scoop and the ribbon.

A cupelevator works in the following manner. Grain from a loading tray 8 (fig.1) enters the bottom of the cupelevator 7. While the drive drum 1 rotates a hauling ribbon 3 with scoops 4, which are filled and moved to the overhead part of the elevator are put into operation.

At the moment of the scoop 4 running-on the overhead drive drum 1 due to the round form of the drum 1 there is an expansion of the elastic elements 13 and 12 (as shown on fig.2) and scoop 4 turns in relation to a ribbon clockwise. Such turn of scoop 4 helps the decline or removal (depending on the degree of the scoop filling) the amount of grain backloging, that will undoubtedly help the reduction of grain injuring.

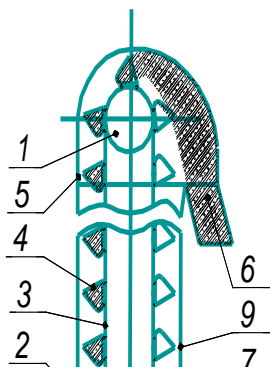


Fig. 1. Scheme of elevator

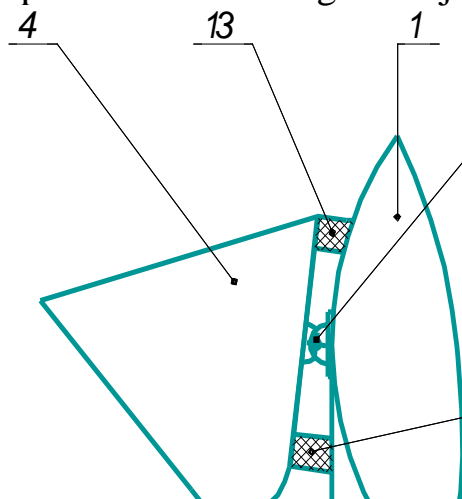


Fig. 2. Position of scoop in the moment of running of it into an overhead drum

1 - overhead drum; 2 - lower drum; 3 - ribbon; 4 - scoops; 5 - head of elevator; 6 - unloading pipe; 7 - bottom; 8 - loading pipe; 9 - midsections of the elevator; 10 - swivel mount; 12,13 - elastic elements.

The decline of grain injuring due to the reduction of backlogging is a technical result in the developed useful model.

The results of the tests of the serial and experimental scoops for the purpose of the reverse pouring of grain are presented in fig.3. It becomes picture evident, that the developed construction of scoop fastening to the ribbon provides the decline of backlogging as compared with the serial fastening. Thus more noticeable effect is observed at the ribbon rate movement of 2.8 m/s and more.

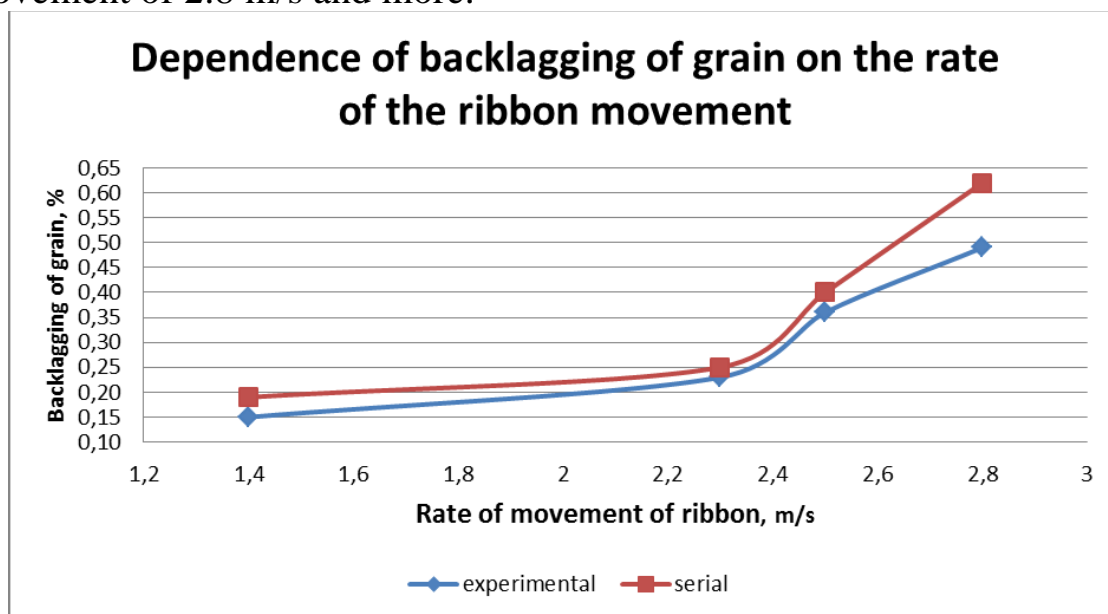


Fig. 3. Dependence of backlogging of grain on the rate of the ribbon movement

Список литературы

1. Пименов В.Б. Анализ травмирования зерна ковшовыми элеваторами и возможные пути его снижения / В.Б. Пименов, И.В. Шатохин // Воронеж, издательский центр «Научная книга», 2013. – 102 с.
2. Полезная модель № 140824 Россия, МПК⁷ В 65G 17/16. Ковшовый элеватор / И.В. Шатохин, М.Ю.Кузнецов. – № 2013157632/11, заявл. 24.12.2013; опубл. 20.05.2014 Бюл. № 14
3. Тарасенко А.П. Повышение производительности нории НПЗ-20 / А.П. Тарасенко, И.В. Шатохин // Передовой производственный опыт и научнотехнические достижения, рекомендуемые для внедрения: информационный сборник / Кочетков В.С. и др. – М. 1989.-Вып.8.-С.11-13.
4. Шатохин И.В. Влияние скоростного режима работы норий на их мощностные параметры / И.В. Шатохин, В.Б. Пименов // Аграрный журнал «Поле деятельности». – Волгоград, 2012. – № 9. – С. 46.
5. Шатохин И.В. Оценка дробления зерна различных культур

нориями / И.В. Шатохин, А.Г. Парфенов // Лесотехнический журнал. – 2015. – Том 5. – № 1 (17). – С.244-249.

6. Шатохин И.В. Снижение обратной сыпи зерна в ковшовом элеваторе за счет изменения крепления ковшей к ленте / И.В. Шатохин, М.Ю. Кузнецов // Молодежный вектор развития аграрной науки: материалы 65-й студенческой научной конференции. – Ч.1.- Воронеж: ВГАУ ВПО Воронежский ГАУ, 2014. – С.25-28.

7. Шатохин И.В. Техническая оснащенность – как один из факторов, производства зерна в отдельных почвенно-климатических зонах воронежской области / И.В. Шатохин, Г.И. Хаустова, Л.А. Шатохина // Вестник Воронежского ГАУ. – 2011. – Вып. (29). – С. 34-36.

8. Шатохин И.В. Технические решения ковшовых элеваторов, обеспечивающие снижение травмирования зерна И.В. Шатохин, В.Б. Пименов // Молодежный вектор развития аграрной науки: материалы 64-й студенческой научной конференции.-Ч.1.-Воронеж: ВГАУ ВПО Воронежский ГАУ, 2013.- С.21-23.

УДК 631.372:629.4.027.412

Leshcheva O. V.
Vorokhobin A. V.,

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE EFFICIENCY OF TRACTION-COUPPLING PROPERTIES OF WHEELED TRACTORS REGULATION IN THE UNIT

Аннотация. Представлены исследования по целесообразности оснащения тракторов устройством для корректирования вертикальных нагрузок, позволяющим регулировать тягово-сцепные свойства тракторов в составе прицепных транспортных агрегатов. Предложена схема устройства и приведены результаты исследований по оценке эффективности его использования.

Ключевые слова: трактор, тракторно-транспортный агрегат, корректирование вертикальных нагрузок, сцепной вес, тягово-сцепные свойства

A wide variety of ways to improve traction properties of wheeled

agricultural tractors contributed to the known limitations of working speeds and working width of machine-tractor aggregates, as well as the load capacity of vehicles. These constraints often do not allow to fully realizing the power of the engines power tractors. The traction units simultaneously with the increase in the use of engine power. It is necessary to increase the traction capabilities of the engine simultaneously. That is, to fully leverage the power of the engine, one needs to provide the necessary traction wheels traction with a supporting surface [1].

Traction properties of wheeled tractors can be improved by rational design layout, although this method is very limited, and to a greater extent by the use of special technical means. The majority of such ways of the traction characteristics improvement based on the increase in the maximum tangential force grip P_{ϕ} is equal to the product $\phi * G_{fr}$ where ϕ is the coefficient of friction: G_{fr} is the coupling weight of the tractor [2].

According to the above formula for determining the tangential traction, all methods can be divided into two groups. The first one includes those, which increase the coefficient of friction of the propeller with the ground or road. The second one includes coupling weight of the tractor.

It is possible to increase the coefficient of friction of the wheels with the soil by the use of grousers, wheel extenders, half-track running, wide and arched tires, All these methods mainly do not provide high performance or complicate the design of tractors and trailers, or worsen the manoeuvrability, speed qualities and reliability of the units [1, 3].

The second group deserves special attention of methods based on increasing the coupling weight of the tractor. The simplest of this group is due to the additional loads installed on the drive wheels or on the frame of the tractor. However balasting with special loads increases metal consumption of tractors. In addition, such loads in good working conditions must be removed as it deteriorates manoeuvrability, and transport of unwanted cargo increases fuel consumption, overloads the brake system and increases losses in the rolling and reduces the tractive efficiency of the tractor [1].

One of the promising ways of increasing the coupling weight of the tractor is a method based on the adjustment of the vertical loads (WHC) attributable to all wheels of the transport unit. This method works on the principle of force action of the trailer to the tractor, namely, to transfer some weight from the trailer to the towing vehicle [4].

I. P. Ksenevich [5] noted that for optimal use of engine power in a variety of conditions, it is necessary the operating and hitch weight to be adjustable, especially this refers to the traction units.

In addition, this correction in many cases can be achieved from the tractor cabin, without the time costs and efforts. The degree of such

correction is adjustable, which proves its viability and the advantages compared to the other methods of increasing the coupling weight.

The Department of "Tractors and Automobiles" of the Voronezh State Agrarian UNIVERSITY a device for correcting vertical loads on the wheels of tractor-transport unit (TTA) was developed. It allows adjusting the traction characteristics of the tractor. For a basis of the construction of this device patent RF № 2297938 was taken.

Fig.1 presents a diagram of the forces acting on the TTA when connecting tractor and trailer by the device for adjusting vertical loads. This unit has two power connections, one of which is the main (traction) force in its force and connecting the drawbar of the trailer with the tractor hydrocream, and the other one additional with the current effort and connecting the lower rod linkage with front axle of trailer. The change in forces acting in power relations is interrelated.

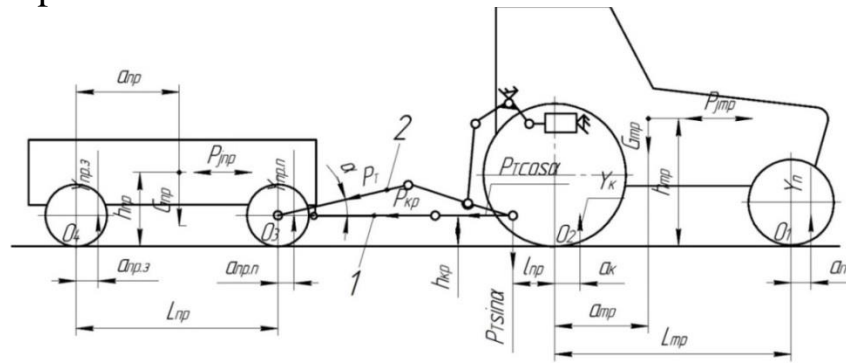


Fig. 1. Diagram of the forces acting on TTA when connecting a tractor with a trailer on tractive and weight adding relations.

With regard to the present scheme forces the expression to determine the vertical reactions of the road, respectively on the front and back wheels of the tractor and trailer for the general case of motion of TTA are the follows:

$$Y_{II} = \frac{G_{mp} \cdot a_{mp} - P_T \cdot (\sin \alpha \cdot l_{np} + \cos \alpha \cdot h_{kp}) - P_{kp} \cdot h_{kp} \pm P_{jmm} \cdot h_{mp} - M_{fmm}}{L_{mp}}, \quad (1)$$

$$Y_K = \frac{G_{mp} \cdot (L_{mp} - a_{mp}) + P_T \cdot (\sin \alpha \cdot (L_{mp} + l_{np}) + \cos \alpha \cdot h_{kp}) + P_{kp} \cdot h_{kp} \pm P_{jmm} \cdot h_{mp} + M_{fmm}}{L_{mp}}, \quad (2)$$

$$Y_{np.n} = \frac{G_{np} \cdot a_{np} - P_T \cdot (\sin \alpha \cdot L_{np} - \cos \alpha \cdot h_{kp}) + P_{kp} \cdot h_{kp} \pm P_{jnn} \cdot h_{np} - M_{fnn}}{L_{np}}, \quad (3)$$

$$Y_{np.3} = \frac{G_{np} \cdot a_{np} - P_T \cdot \cos \alpha \cdot h_{kp} - P_{kp} \cdot h_{kp} \pm P_{jnn} \cdot h_{np} + M_{fnn}}{L_{np}},$$

Y_{II} , Y_K , $Y_{np.n}$ и $Y_{np.3}$ - vertical reaction at the front and rear wheels of the tractor and trailer; G_{mp} , G_{np} - respectively, the weight of the tractor and trailer; L_{mp} , L_{np} - respectively, the longitudinal base of a tractor and trailer;

a_{mp} , h_{mp} , a_{np} и h_{np} - respectively the longitudinal and vertical coordinates of the center of gravity of the tractor and the trailer; P_{kp} , P_T respectively by the force in tractive and power relations supplementing weight; α - the angle of dorogawa connection; $\pm P_{jmm}$, $\pm P_{jnn}$ respectively the force of inertia of the tractor and the trailer; h_{kp} - the height of application of force in the main power connection; $M_{fmm} = Y_{\Pi} \cdot a_n + Y_{\kappa} \cdot a_{\kappa}$ $M_{fnn} = Y_{np.n} \cdot a_{np.n} + Y_{np.3} \cdot a_{np.3}$ - respectively the total moment of rolling resistance of the tractor wheels and the trailer.

Effort in additional power connection is decomposed into two components. Vertical ($P_T \sin \alpha$) is the part of weight that is transferred from the trailer to the tractor and reduces the horizontal force in the main (traction) power connection to the value $P_T \cos \alpha$.

Thus the level of loading (degree of correction) of the driving wheels of the tractor can be adjusted either by changing the effort in weight adding power connection or by changing the angle of its inclination.

The calculation results using expressions (1) to (4) with respect to the wheeled tractor of traction class 1,4 with the trailer mounted load capacity of 60 kN in conditions characterized by a rolling coefficient equal to 0,1, in the case of steady motion of the TTA presented in Fig. 2.

Vertical reaction on the rear wheels of the tractor (Y_{κ}) increases. The wheels are as a rule, the main drive ones. Vertical reaction on the rear wheels of the trailer ($Y_{np.3}$) practically does not change. In addition, there is an increase of total reaction on front wheels and rear wheels of the tractor ($Y_{mp.c}$), that is its operating weight increases. The greater the force and the angle of inclination to the horizon more power, the higher is the weight adding effect of the given device. Both of these parameters (P_T , α) are adjustable.

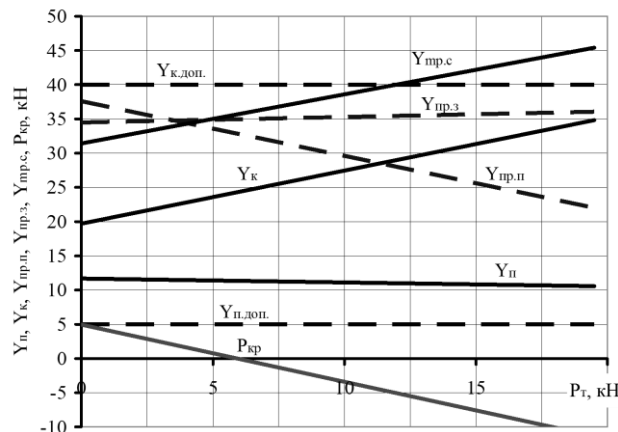


Fig. 2 shows that in increasing the efforts in additional connection vertical reaction of road on the front wheels of the tractor (Y_{Π}) and trailer is reduced.

The dependence of the vertical reactions of the road on the front and rear wheels of the tractor and trailer are connected by two power relations, from the change efforts in additional connection.

Fig. 2 also shows that the efforts of both the primary and secondary of power relations are interrelated: by increasing efforts in extra power connection there is a decrease in effort in the main power connection. Limiting factors the increasing efforts in extra power relations are the permissible load on the rear wheels of the tractor by capacity ($Y_{к.дон}$) and permissible load on the front wheels by a criterion of preserving a satisfactory controllability ($Y_{н.дон}$). Fig. 2 shows that in this example none of the limiting factors of the limited level is not achieved.

The Department of "Tractors and automobiles" of Voronezh State Agrarian UNIVERSITY carried out the experimental study of TTA, equipped with a device for adjusting vertical loads produced by the scheme shown in Fig. 1. The object of the test was universal tractor of 1.4 drawbar category in the unit of two-axle trailer with load capacity of 60 kN. The trailer to the tractor was connected by means of the experimental devices. The tests were conducted on soil with low bearing capacity and roads with dense dry soil. Experimental results are presented in fig. 3, 4 and 5.

In case of steady driving on roads with low bearing capacity the use the device for vertical loads correcting significantly reduced the slipping of the drive wheels of the tractor (Fig.3). The reduction of slipping was up to 40%. The effect when driving in good road conditions (dry soil road) is not obtained primarily because of the small values of slipping.

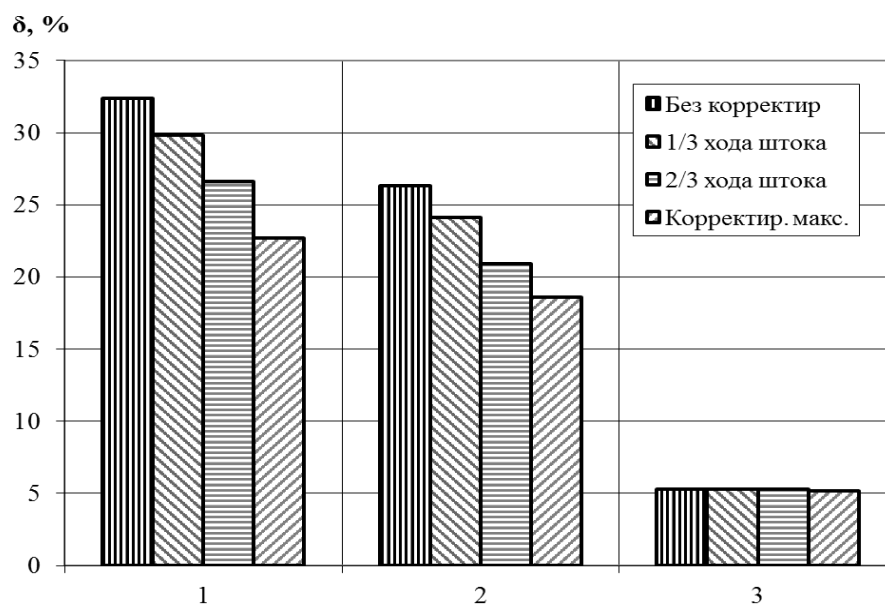


Fig.3 .Change of slipping of the drive wheels of the tractor in varying degrees of correcting vertical loads
1 – sand ; 2 – dirt road after rain; 3 – dry dirt road

In turn, the reduction of slipping of the drive wheels of the tractor has improved the speed and therefore the performance of TTA. In Fig. 4 shows changes in the productivity of TTA at different loading capacity of the trailer and different degrees of correction.

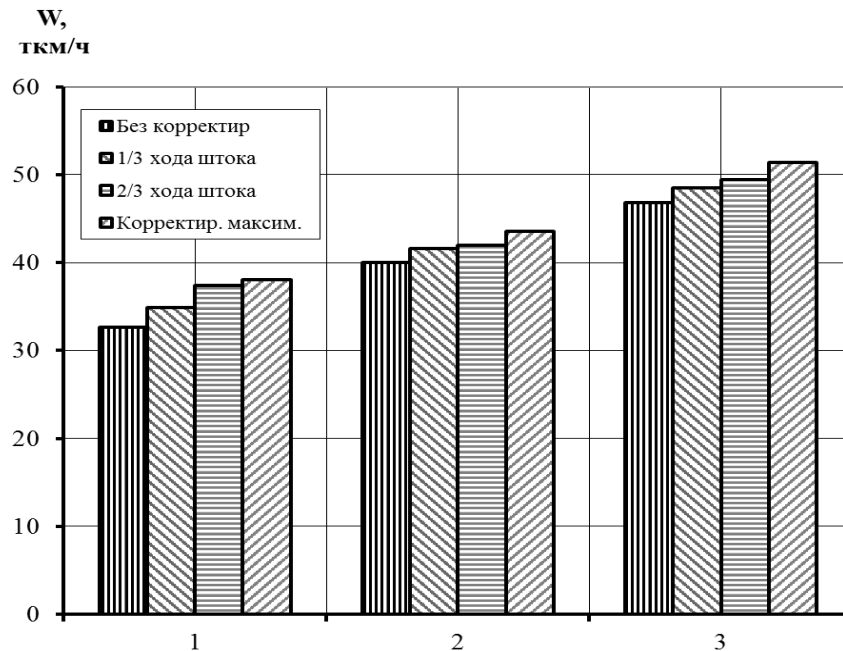


Fig. 4. Change in TTA trailed performance at different loading capacity of the trailer and varying degrees of vertical loads correcting.

Fig. 4 shows that with increasing load of the trailer the performance of TTA increases. Moreover, the increase in contributes to the coupling weight of the tractor, which was made possible through the use of the studies device for the adjustment of the vertical loads. Proved the increase in the carrying capacity of the trailer increased productivity by 50%, driving TTA regulation without coupling weight, by 41% (of 32.64 to of 46.08 tkm/h) and regulating coupling weight performance increased by 13% more (to 52,07 of 46.08 tkm/h).

It is established that at the increase of carrying capacity of the trailer by 50% and movement without coupling weight regulation, specific fuel consumption decreased from RUB 220.3 to 160,2 g/tkm, and the regulation of the coupling weight has allowed further reduction of specific fuel consumption with up to 133,4 160,2 g/tkm, which is 20%.

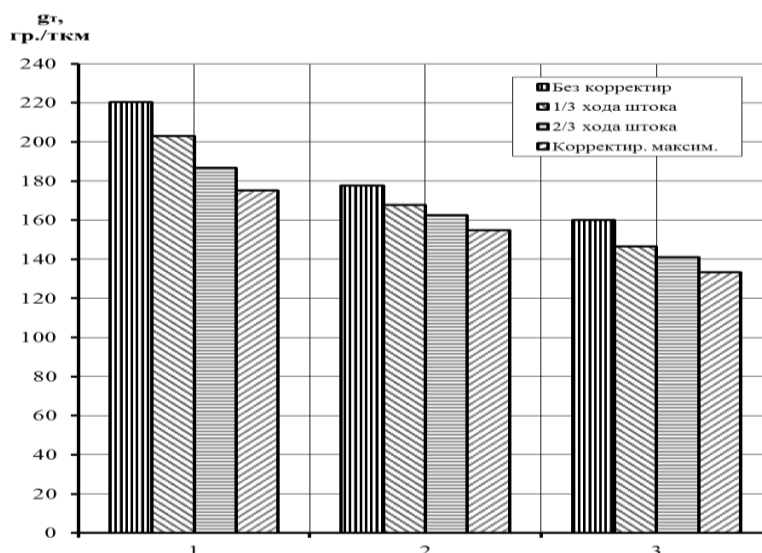


Fig. 5 shows the variation of specific fuel consumption with different loading capacity of the trailer and a different degree of regulation of the coupling weight.

The change in specific fuel consumption trailed TTA under different loading capacity of the trailer and different degree of regulation of the coupling weight

Thus, the results of the device research for correcting vertical loads, which allows to adjust the traction characteristics of the tractor showed a fairly high efficiency of its application in the movement of the tow TTA in complicated by cross road and field conditions. This efficiency ultimately is expressed the increasing of tow TTA performance by 15% on average and reducing of specific fuel consumption up to 20%.

Список литературы

1. Ворохобин А.В. Повышение эффективности использования тракторно-транспортного агрегата при корректировании вертикальных нагрузок на колеса: дис...канд. техн. наук: 05.20.01: защищена 19.10.2007: утв. 18.01.2008/ Ворохобин Андрей Викторович. – 2007. – 172 с.

2. Гребнев В.П. Тракторы и автомобили. Теория и эксплуатационные свойства: учебное пособие/ В.П. Гребнев, О.И. Поливаев, А.В. Ворохобин; под общ. ред. О.И. Поливаева. 2-е изд., стер.– М.: КНОРУС, 2013. – 264 с.

3. Поливаев О.И. Как улучшить тягово-сцепные свойства колесных тракторов/ О.И. Поливаев, В.П. Гребнев, А.В. Ворохобин// Сельский механизатор. - 2009. -№5.- С. 6 – 7.

4. Гребнев В.П. Эффективность оборудования колесных

тракторов тягово-догружающим устройством/ В.П. Гребнев, А.В. Ворохобин// Тракторы и сельхозмашины. - 2009. -№8.- С. 9-11.

5. Ксенович И.П. Об оптимальной массе трактора /И.П. Ксенович// Тракторы и сельхозмашины.- 1988.- №12.- С. 5-8.

6. Пат. 2297938 РФ, МПК⁷ В 62 D 53/04, В 60 D 1/00, А 01 В 59/04. Сцепное устройство для соединения колесного трактора с прицепом / В.П. Гребнев, В.И. Панин, А.В. Ворохобин (Россия). – №2005138232/11; Заявлено 08.12.2005; Опубл. 27.04.2007, Бюл. №12. – 5 с.: ил.

УДК 631.352, 631.363

**Lee A.,
Gorlova I.G.,
Usmonov K.E.**

Tashkent institute of irrigation and land improvements

RESEARCH OF PROCESS OF A WIPE OF BEANS OF SEEDS LUCERNES IN GRATING DEVICE

Аннотация. В данной статье рассматриваются теоретические исследования процесса вытирания бобов семян люцерны, в частности необходимое количество вытирания и скорости движения боба в терочном аппарате.

Ключевые слова. Устройство, неподвижный, бич, барабан, исследования, процесс, вытирания, бобы, семена, люцерна, скорость, движение, терочный, аппарат, уравнение, формула, анализ.

It is known that completeness and quality of a wipe in many respects depend on time of beans in the grating device because the more time they are in the device, the more they are exposed to wipe process.

Duration of axial movement of beans on a working surface of the grading device is defined by the formula [1]:

$$t_K = \frac{l_K}{V_{ai} \cos \beta_{\bar{\sigma}}}, (1)$$

where l_K - a way of passage of beans in the grading device, m;

V_{ai} - average speed of movement of beans in grater the device, km/s;

$\beta_{\bar{\sigma}}$ - an angle of rotation of beans during movement, degree.

Thus the quantity of wipes of beans is defined by a motionless

scourge and a rotating drum as:

$$N_c = \frac{t_K}{\Delta t_1} + 1, (2)$$

where Δt_1 - a time interval between wipes, with.

If to designate through V_{δ} speed of a drum, and distance between motionless scourges through S_c and the speed by V_{ai} beans during time Δt_1 take place a way:

$$\Delta l_a = V_{ai} \cdot \Delta t_1, (3)$$

If to take into consideration that the grating device scourges are motionless, and only the drum makes a rotary motion the drum surface for the same period of time takes place a way equal Δl_n :

$$\Delta l_n = S_c + \Delta l_a$$

$$\text{or } \Delta l_n = V_{\delta} \cdot \Delta t_1, (4)$$

From here we receive:

$$S_c + \Delta l_a = V_{\delta} \cdot \Delta t_1, (5)$$

Having solved the equation (5) rather Δt_1 we receive following expression:

$$\Delta t_1 = \frac{S_c}{V_{\delta} - V_{ai}}, (6)$$

Values t_K and Δt_1 in the formula (2) we take from expression (1) and (6) and as considering $S=L/Z$, we will receive a following equation by definition of quantity of a wipe:

$$N_c = \frac{Zl_K(V_{\delta} - V_{ai})}{V_{ai} \cdot L \cos \beta_{\delta}} + 1, (7)$$

where Z is the number of scourges, pc;

L is the length of a circle of a drum, m.

Average value V_{ai} it is found from the theorem of average values of function:

$$V_{ai} = \frac{1}{l_k} \int_0^{l_k} \sqrt{V_{H\delta}^2 \cdot}$$

where is $\sqrt{V_{HC}^2 + 2jl_k}$ the change in the speed of a bean in the grading device;

V_{HC} - initial speed of the bean, km/s;

j - acceleration of the bean, m./s²

Having solved the equation (8), we receive the formula for definition of the bean speed.

$$V_{ai} = \frac{1}{3jl_K} \left[\sqrt{(V_{н\bar{o}}^2 + 2jl_K)^3} - V_{н\bar{o}}^3 \right], (9)$$

Having substituted the received equation 9 in 7, we get:

$$N_c = \frac{3V_{\bar{o}}jl_K^2Z}{L \left[\sqrt{(V_{н\bar{o}}^2 + 2jl_K)^3} - V_{н\bar{o}}^3 \right] \cos \beta_{\bar{o}}} - \frac{Zl_K}{L} + 1, (10)$$

The analysis of expression (10) shows that the major factors influencing number of the wipes are a way passed bean in grater the device and speed of rotation of the drum (fig. 1).

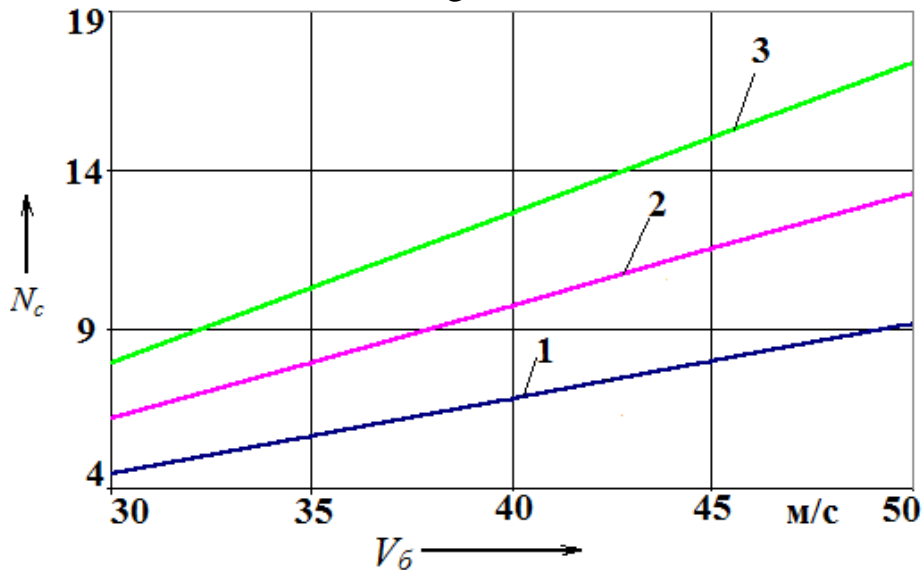


Fig. 1. Number of wipes bean seeds of lucerne (N_c) depending on speed of drum (V_6): 1 - $Z = 4$; 2 - $Z = 6$; 3 - $Z = 8$

From drawing 1 it is visible that at diameter of a drum equal 0.35 m, a way passed bean makes 1.1 m. Hence, for 5...6 multiple influences on beans, speed of a drum with four blades should correspond not less than 35...45 km/s; with six blades - not less than 30...40 km/s, with восемь blades - not less than 30 km/s.

Thus, considering that winged the fan, creating a stream of air for всасывания a biomass and a drum-obegajka is located on one axis, it is undesirable, that speed of a drum was less than 30 km/s, otherwise it will be impossible to create the necessary stream of air in the pipe.

Список литературы

1. Зенков. Р.Л. Механика насыпных грузов. – М.: Машиностроение, 1964. – 252 с.
2. Справочник по элементарной математике, механике и физике. – М.: Акалис, 1995. – 215 с.

Lee A.,
Sharipov Z.SH.

DETERMINATION OF PARAMETERS DISPENSER SORTERS

Аннотация. В статье рассматриваются теоретические исследования диэлектрической установки очистки семян люцерны.

Ключевые слова: исследования, формула, уравнения, бункер, барабан, терминатор, параметры, дозатор, сортировщик, семена.

At the outlet of the hopper installed limiter of a metal plate (segment BK), which under the influence of periodic blows the dosing drum performs oscillating movements between the dosing drum and the casing (the bottom of the hopper) (Fig. 1).

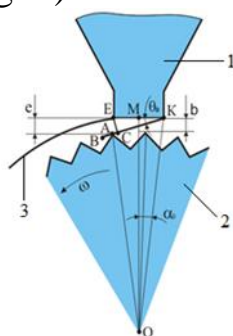


Fig. 1. The definition of the parameters of the dispenser:

$BK = l$ -length limiter; θ_0 -setting angle limiter; l_0 -length segment AK from the impact point A ; θ_t is the angle between the horizontal and stop in time t ; EC -distance between the housing and the stop; b -the distance between the dosing drum and the bottom of the hopper; α_0 -angle between the lines OK and OM ; β_t -angle AOM at time t
1-bin; 2-dispenser; 3-shroud.

Angle AOM (β_t) at time t is given by:

$$\beta_t = \omega t, (1)$$

And the angle α_0 of the tangents of the formula:

$$\operatorname{tg} \alpha_0 = \frac{a/2}{d/2 + b}, (2)$$

where β_t - angle AOM at time t , hail;

ω - angular velocity of the dosing drum in m/s;

b - the distance between the dosing drum and the outlet of the hopper.

Conversion of (2) leads to the following form:

$$\alpha_0 = \text{arctg} \frac{a}{d + 2b}, (3)$$

Assuming that the differential equation of the vibrational motion limiter is similar to the differential equation of a mathematical pendulum can be written [1]:

$$\ddot{\theta}_t = -k_y \sin(\theta_t - \theta_0), (4)$$

where k_y - proportionality factor characterizing the elasticity of the material stopper.

Since oscillation limiter can be regarded as very small, the angle difference may be represented as, when the differential equation takes the following form:

$$\ddot{\theta}_t = -k_y (\theta_t - \theta_0), (5)$$

Solutions of differential equations (5) are the functions:

$$\theta_t - \theta_0 = A \sin(kt + \alpha), (6)$$

$$\dot{\theta}_t = -Ak \cos(kt + \alpha), (7)$$

$$\ddot{\theta}_t = -Ak^2 \sin(kt + \alpha), (8)$$

Comparing the expression (5), (6) and (8) to determine the relationship coefficient of proportionality:

$$k = \sqrt{k_y}, (9)$$

According to the law of sines to the triangle AOK in the moment of impact $t=t_y$ we have [2].

$$\frac{d/2}{\sin(90^\circ - \theta_t - \alpha_0)} = \frac{\sqrt{(d/2 + b)^2 + (a/2)^2}}{\sin(90^\circ - \beta_t + \theta_t)}, (10)$$

After the conversion, the expression (10) takes the following form:

$$\frac{d}{\cos(\theta_t + \alpha_0)} = \frac{\sqrt{(d + 2b)^2 + a^2}}{\cos(\theta_t - \beta_t)}, (11)$$

Assuming that at the moment of impact, the angles are equal, i.e., the expression (11) can be written as:

$$\frac{d}{\cos(\theta_0 + \alpha_0)} = \frac{\sqrt{(d + 2b)^2 + a^2}}{\cos(\theta_0 - \omega t_y)}, (12)$$

Hence, from the expression (12) we find the time at the moment of impact of the drum of the metering restrictor plates:

$$t_y = \frac{1}{\omega} \left(\theta_0 - \arccos \frac{\cos(\theta_0 + \alpha_0) \sqrt{(d + 2b)^2 + a^2}}{d} \right), (13)$$

If $t = t_y$ we have $\theta_t = \theta_0$, the reforest:

$$\theta_t - \theta_0 = A \cdot \sin(\sqrt{k_y} \cdot t + \alpha) = 0, (14)$$

and the value of the initial phase is:

$$\alpha = -\sqrt{k_y} \cdot t_y, (15)$$

We find the derivative of the expression (14) in time:

$$\frac{-\dot{\theta}_t \sin(\theta_t + \alpha_0)}{d} = \frac{-(\dot{\theta}_t - \omega) \sin(\theta_t - \beta_t)}{\sqrt{(d + 2b)^2 + a^2}}, (16)$$

From formula (14) we have t :

$$\dot{\theta}_t = -A\sqrt{k_y}, (17)$$

Substituting (17) into (16) we get:

$$\frac{A\sqrt{k_y} \sin(\theta_0 + \alpha_0)}{d} = \frac{(A\sqrt{k_y} + \omega) \sin(\theta_0 - \omega t_y)}{\sqrt{(d + 2b)^2 + a^2}}, (18)$$

The period of oscillation is determined by the well-known formula:

$$T = \frac{2\pi}{\sqrt{k_y}}, (19)$$

A minimum of function (16) reaches a steering angle of 90 degrees:

$$kt + \alpha = (t - t_y) \sqrt{k_y} = \frac{\pi}{2}, (20)$$

The point in time during which the shot is determined from the expression:

$$t = t_y + \frac{\pi}{2\sqrt{k_y}}, (21)$$

At this point in time. Therefore, the size of the gap between the stopper and the casing would range:

$$a \sin(\theta_{\min}) \leq e \leq a \sin(\theta_0), (22)$$

The installation angle limiter should be selected so that the following inequality:

$$a \sin(\theta_{\min}) \leq 2b_c, (23)$$

$$2b_c \leq a \sin(\theta_0), (24)$$

From the expression (24) we find the value of the angle limiter

setting:

$$\theta_0 \geq \arcsin \frac{2b_c}{a}, (25)$$

Substituting the known values of the parameters and in the formula (25), by means of calculation to determine the angle setting stopper:

$$\theta_0 \geq 18^\circ 13'$$

Another blow of the metering drum delimiter happens after a time equal to:

$$\tau = \frac{2\pi z}{\omega q}, (26)$$

where q - the number of grooves in the metering drum;
 z - the number of grooves of the metering drum is passed between attacks on restrictive plate.

The time t_y and $t_y + \tau$ the angle should θ_t be the same to within π . Therefore:

$$\theta_0 = \theta_0 + A \sin(\sqrt{k_y}(t_y + \tau - t_y)) = \theta_0 + A \sin(\tau \sqrt{k_y}), (27)$$

Hence:

$$\tau \sqrt{k_y} = \pi, (28)$$

Substituting the value of τ from expression (26) into (28) we get:

$$\sqrt{k_y} \frac{2\pi z}{\omega q} = \pi, (29)$$

We find a positive value z that satisfies the equation (29):

$$z = \frac{\omega q}{2\sqrt{k_y}}, (30)$$

It should be noted that this equality of value accounts for approximately. In turn, the number of grooves in the metering drum is:

$$q = \frac{2\pi}{2 \arcsin \frac{i/2}{d/2}} = \frac{\pi}{\arcsin \frac{i}{d}}, (31)$$

According to the law of sinus to the triangle AOK in the moment of impact $t=t_y$ the expression of the angle of rotation will be:

$$\frac{\sin(90^\circ - \theta_t - \alpha_0)}{d/2} = \frac{\sin(\beta_t + \alpha_0)}{l_0}, (32)$$

or

$$\frac{\sin(90^\circ - \theta_0 - \alpha_0)}{d/2} = \frac{\sin(\omega t_y + \alpha_0)}{l_0}, (33)$$

After the conversion, the expression (33) takes the following form:

$$l_0 = \frac{d \sin(\omega t_y + \alpha_0)}{2 \cos(\theta_0 + \alpha_0)}, (34)$$

The length of the stop l must be greater than the length of the segment AK in the point of impact A :

$$l > \frac{d \sin(\omega t_y + \alpha_0)}{2 \cos(\theta_0 + \alpha_0)}, (35)$$

Substituting the values of the parameters:

$d = 120 \text{ мм}$, $\omega = 5,236 \text{ рад/с}$, $t_y = 0,0073 \text{ с}$, $\alpha_0 = 2^\circ$, $\theta_0 = 19^\circ$ in the formula (35), we find the length of the stop: $l > 4,74 \text{ мм}$.

Список литературы:

1. Зенков. Р.Л. Механика насыпных грузов. – М.: Машиностроение, 1964. – 252 с.
2. Справочник по элементарной математике, механике и физике. – М.: Акалис, 1995. – 215 с.

УДК 629.33:693.691

**Ovsyannikov D.V.,
Titova I.V.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

APPLICATION OF COMPOSITE MATERIALS IN THE AUTOMOTIVE INDUSTRY

Аннотация. В статье рассматривается применение композиционных материалов в автомобилестроении, особое внимание уделяется базальтовым волокнам. Ключевые слова: композиционные материалы, автомобилестроение, базальтовые волокна.

Technological progress creates the need for new construction materials, and to a great extent develops, due to the results of these

improvements. New materials, appearing as a result of the desire to improve the existing structures, offer great opportunities for new design solutions in technological processes. At present, the prospects for the progress in the automotive industry are associated with the development and application of composite materials.

Composites are metallic and nonmetallic bases with a certain distribution of hardened materials in chemistry according to the nature of the structure composite materials are divided into fibrous, hardened continuous fibers and filamentary crystals, dispersion hardened composite materials obtained by introduction of metal matrix dispersed particles of strengtheners, layered composite materials created by pressing or rolling of dissimilar materials.

The main advantages of the composites are high specific strength, high rigidity, high wear resistance, high fatigue strength.

The most frequent disadvantages of the composites are high research intensity and the high cost of production, the need for special expensive equipment and raw materials [1].

Initially, composite materials were developed for military and strategic purposes, but for a relatively short period of time, they have been used in shipbuilding, automotive industry, chemical industry, wind energy, aerospace industry and other fields.

Automotive industry is steadily developing despite the crisis. This is one of the basic sectors which play a crucial and formative role of modern civilization. The automotive industry is constantly improving the requirements for functionality, quality and safety of basic materials, and requires the creation of new composites [4].

In modern automotive industry composites are used in the creation of any vehicle device. There are concept cars, which body is entirely composed of composites.

Composite materials and products on the basis of continuous fibers and reinforcing fabrics are widely used for the production of external and internal parts of cars. The most common of them are bumpers, spoilers, deflectors; elements of vehicle interior: interior decorative panels; underbody protection and elements of the car body [2].

Modern composite materials from basalt fiber and carbon fiber fully meet the requirements of the automotive industry. Currently, the production of any part of the modern car cannot do without the use of composites. Almost every car manufacturer produces "concept cars", which body and units are almost entirely made of composites.

Composite materials used in the automotive industry are the

following:

- reinforcing fabric and products made of continuous fibers: spoilers, deflectors, bumpers, decorative panels, bottom, elements of the underbody protection

- composites for disc clutch (friction) and brake pads, as well as various engine seals

- reinforcing composite for tires - basalt fiber has the highest strength for "rupture".

- composite ply tires are cheaper, and in the process of recycling they produce less harmful emissions.

- polymer carbo fibers, as the cost of production decreases, are most often used in the production of chassis and the body. Carbo fibers are also suitable for the manufacture of ultra-reliable brake discs.

- composite materials are used for thermal insulation and sound insulation of the passenger compartment and engine. In recent years, sound insulation of muffler by means of needle-punched canvases of basalt fibers is produced.

Composite materials are materials of the future. When modern physics of metals explained the reasons for their plasticity, strength and its increase, systematic, intensive development of new materials began. This should lead, in the nearest future, to the creation of materials several times stronger than that of modern conventional alloys.

Examples of composites are aluminum reinforced with steel and beryllium filaments; reinforced born plastic, glass and carbon fibers, fabrics or bundles on their basis. Combining the volume content the components composites with the required parameters of strength, heat resistance abrasion resistance elasticity can be produced. It will be possible to create compositions with the required dielectric, magnetic, radio absorbing and other special properties [5].

Consider the composites and products on the basis of reinforcing fabrics and continuous basalt fibers. Compared to glass basalt fibers have higher rates of specific strength, which allows to produce the external car parts (spoilers, bumpers, fairings) being lighter and more durable.

Materials from basalt fibers have higher toughness and strength, damping capabilities. The specifications of the materials from basalt fibers are so high that they are made of bullet-proof vests. The above listed parameters are very important in the manufacture of automotive parts, providing their safety in collisions.

In addition, more external parts of cars from basalt fibers can withstand quite long-term operation under the influence of natural factors:

moisture, alkalis and acids, salt solutions.

Basalt fiber is chemically resistant; it allows manufacturing the composites based on inorganic binders having mainly alkaline reaction. The use of inorganic binders allows producing non-combustible composites based on basalt fiber. Relevance for application of materials from basalt fibers is of great importance due to the introduction of new US standards for use of non-flammable and non-toxic materials in the automotive industry. Similar standards are soon to be accepted also in Europe, and later in Russia.

The combination of properties and characteristics of basalt fibers hold the promise of creating new materials for the automotive industry, i.e. cell and bulk plastic constructions. These particularly durable materials with a minimum weight provide high structural strength and have additional heat and sound insulation characteristics. Constructions made from cell and bulk composite materials have high specific strength characteristics and are widely used in aviation. Even ordinary materials from plastic reinforced with 1.5 - 2% chopped basalt fiber increase their fracture and tensile strength by 17 - 30%.

The use of basalt fibers for the manufacture of structural composites in the automotive industry has great prospects:

1. Composites made of basalt fiber for thermal and sound insulation of the engine combine good thermal and acoustic performance, namely, low hygroscopicity, high vibration resistance, non-flammability and longevity. Meanwhile, the structures (parts) made from these materials also comply with the new US standards on use non-combustible materials in the automotive industry.

2. Needle-punched canvases of continuous basalt fibers are currently used for thermal and sound insulation of mufflers in modern models of "Toyota" company. The need for the use of basalt fibers in particular in the manufacture of mufflers associated with the application on new models of "Toyota" cars is closely connected with new modifications of engines with afterburning of exhaust gases. The temperature of the exhaust gases in the muffler increases. Glass fibers used earlier in the muffler cannot withstand high temperatures and are destroyed. Other positive properties of basalt fibers: vibration resistances, heat resistance with frequent changes of temperature appear which allows producing durable high-quality products.

3. Reinforcing materials are used for the manufacture of clutch discs (friction discs) and brake pads. Chopped basalt fibers are the most suitable material for reinforcement of friction and brake linings. The consequence is that withstands high temperatures without changing their physical

characteristics, obtain good frictional contact with metal and do not destroy it.

In the manufacture of heat-resistant sealing gaskets of muffler and engine basalt fibers are currently used they replace carcinogenic material from asbestos fibers.

4. Continuous basalt fiber is an indispensable material for the cord tires because it has a high tensile strength does not stretch under load, can withstand long-term alternating loads. Moreover tires with basalt cord are easier to recycle, i.e. grinding and re-use of rubber [3].

Further development of the automotive industry, increasing demands for quality and safety of the materials used requires the creation and application of new composite materials combining a number of positive characteristics. Composites based on basalt fiber quite completed correspond to these requirements because they have a number of unique characteristics and features, and also obtain the most optimal ratio "price and quality".

The application of composite materials in the automotive industry prove the application of composite materials to be a new qualitative leap in increasing the engine power, energy and transport systems, reducing the weight of machinery and instruments.

Список литературы:

1.Лахтин Ю. М., Леонтьева В. П. Материаловедение: Учебник для высших технических заведений. – 3-е изд., перераб. и доп. – М.: Машиностроение, 1990.

2.Материалы будущего: перспективные материалы для народного хозяйства. Пер. с нем./ Под ред. А. Неймана. – Л.: Химия, 1985.

3.Оснос С.П. Перспективы применения стеклопластиков в автомобилестроении www.polymer.ru

4.Политехнический словарь. Гл. ред. И. И. Артоболевский. – М.: «Советская энциклопедия», 1977.

5.Тарнопольский Ю. М., Жигун И. Г., Поляков В. А. Пространственно-армированные композиционные материалы: Справочник. – М.: Машиностроение, 1987.

УДК 621.367.3: 664.7

Parfenov A.G.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE REDUCTION OF SUNFLOWER SEEDS INJURY IN A BUCKET ELEVATOR.

Аннотация: В статье представлена работа по усовершенствованию конструкции верхней головки норрии с целью снижения обратной сыпи. На эту конструкцию получен патент на полезную модель за № 140052. На основании данного патента переоборудована норрия, в головке которой был установлен дополнительный горизонтальный ленточный транспортер.

Проведен анализ статистических данных посевных площадей подсолнечника центрального федерального округа за 2009, 2010 и 2011 гг. Установлено, что в Воронежской области посевные площади имеют постоянный рост. Также установлено, что подсолнечник является самой рентабельной сельскохозяйственной культурой в Воронежской области.

Нами были проведены экспериментальные исследования по выявлению величины обратной сыпи в ковшовом элеваторе, у которого в головке расположен ленточный транспортер.

Установлено, что ленточный транспортер, установленный в головке ковшового элеватора, способствует снижению обратной сыпи семян подсолнечника при скорости его движения более скорости ленты с ковшами.

Ключевые слова: ковшовый элеватор, верхняя головка, повреждение семян, дополнительный ленточный транспортер.

The object of the research was the process of unloading of sunflower seeds to the bucket elevators.

The research objective is the reduction of injury sunflower seeds in the bucket elevator by improving the design of the upper head.

Analyzing statistical data of the acreage of sunflowers CFD for 2011, 2012 and 2013, we have established that in the Voronezh region there has been a growth of the acreage of sunflowers during this period by 22.4 %.

We also found that on average the sunflowers are the most profitable crop in the Voronezh region (see tab.1). From 2011 to 2013, the profitability of sunflower seed production was on average 70.5 per cent.

While the grain crops only averaged -0.49 %.

Making conclusions we can say that today the sunflowers is the most priority crop in the Voronezh region.

Years	Including				
	Cereals	Sunflowers	Sugar beet	Potatoes	Vegetables
Profitability level, %					
2011	-0.7	65.6	31.4	24.9	17.6
2012	-6.9	80.8	4.5	12.6	15.2
2013	6.2	65.2	3.5	18.2	10.7
The average	-0.49	70.5	13.3	18.6	14.5

Table 1. Data on crop production in the Voronezh region.

One of the factors ensuring a sufficient number of seeds for consumption and for reproduction is the use for planting high-quality seeds. In this case, considerable importance is such an indicator of grain quality, as its damage.

Studying the literature, it was found that the share of the transporting devices accounted to 80.5 % of all damage by the line. And about 50% of the total injury to the grain flow line falls on the transporting machine (noria) [2]. I. A. Chudina [1, 2] found that in the elevator the grain is injured mainly due to the shock loads. No shock loads on the grain determines the correspondingly low degree of damage.

We have also established that the main reasons for the traumatizing of the seeds in the noria are:

- 1) Injury when loaded by impact with the buckets;
- 2) Injury during unloading due to the "reverse rash".

The analysis of the literature showed that when used for planting mechanically damaged seeds it decreases sharply the yield of grain and oil bearing seeds.

The generalization of the research results of many authors [3, 4, 5, 6] have shown that the seeds damage by the transporting elements of process lines for post-harvest processing can achieve the following values: norias – 4.0 to 12.0%; screw conveyors from 2.6 to 4.2%; scraper chain conveyors – from 2.88% to 10.5%; in pneumo transport – 17% and more.

Thus it follows that the reduction of seeds is a major issue, the need which caused large yield losses, the deterioration of the resistance of seeds to storage and reduction in quality of seed, and it is therefore necessary to explore the possibility of improving the quality of work primarily transporting cars and, in particular, norias [7].

Considering the fact that grain-cleaning lines usually present a larger number of elevators, the reduction of damage to the seed will contribute to a significant improvement in the quality of the processed material. For this purpose it is necessary to use them instead of the other conveying device or to improve the Elevator, providing a softer operating mode.

We have proposed the improvement of the design of the top head of the drum to reduce back rash and therefore, of injury to the grain. On this design we obtained the patent for useful model No. 140052 [8]. Scheme of an improved bucket Elevator presented in Fig. 1.

Bucket elevator includes upper 1 and lower 2 drums, tape 3, buckets 4 located in the casing consisting of a shoe with a socket 5 for download 6, the middle sections 7 and head 8 to the nozzle to load 9, which has an inclined belt conveyor 10 with the actuator. In the head 8 over the upper drive drum 1 has an additional horizontal belt conveyor 11.

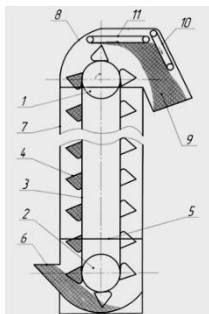


Fig. 1. Scheme of the improved bucket elevator.

Bucket elevator operates as follows. Grain from hopper 6 is supplied to the shoe bucket elevator 5. During rotation of the drive drum 1 is driven by a traction tape 3 with buckets 4. Filled grain bucket 4 move the tape 3 to the top of the driving drum 1. At the time of crowding of the bucket 4 on the top drive pulley 1 due to the occurrence of centrifugal forces begins the process of unloading of the bucket 4, the intensity of which increases with the diffraction bucket 4 upper drive drum 1.

Since the finding of the bucket 4 at the top of the drive drum 1 and of completion of unloading, the grain is fed to an additional horizontal belt conveyor 11, which excludes the possibility of its collision with the top of the head 8 and moves this grain to the elastic belt of the conveyor 10, which is located before nozzle 9 for discharging.

The exclusion of the reverse flow of grain and the possibility of collision of the grain with the top of the head of the elevator provides the reduction of injury.

Список литературы.

1. Горбачев И.В. Послеуборочная обработка семян трав / И.В. Горбачев // Сельский механизатор, 2008. - №11. - С. 18-21.
2. Пугачёв А.Н. Повреждение семян машинами/ А.Н. Пугачев. – Москва: Колос, 1976. - 320с.
3. Тарасенко А.П. Улучшение качества зернового вороха при уборке и послеуборочной обработке / А.П. Тарасенко //Техника и оборудование для села, 2009. - №6. -С. 28-30.

4. Тарасенко А.П. Снижение травмирования семян при уборке и послеуборочной обработке / А.П. Тарасенко. - Воронеж: ВГАУ. 2003. - 331с.

5. Чудин И.А. Использование норий на поточных зерноочистительных линиях / И.А. Чудин // Земля сибирская дальневосточная. – 1973. - №9. – С.36-38.

6. Шатохин И.В. Транспортирующие устройства зерноочистительных агрегатов-основные источники повреждения зерна / И.В. Шатохин, В.С. Анненков, П.В. Анохин // Молодежный вектор развития аграрной науки: материалы 65-й студенческой научной конференции. - Ч.1. - Воронеж: ВГАУ ВПО Воронежский ГАУ, 2014. - С.21-25.

7. Шатохин И.В. Качество работы ЗАВ-40 в колхозе «Большевик» Калачеевского района / И.В. Шатохин, В.С. Анненков, А.М. Гиевский // Молодежный вектор развития аграрной науки: материалы 65-й студенческой научной конференции. - Ч.1. - Воронеж: ВГАУ ВПО Воронежский ГАУ, 2014. - С.28-31.

8. Патент 140052 РФ, МПК В 65 G 17/36. Ковшовый элеватор [Текст] / Шатохин И.В. (RU), Парфенов А.Г. (RU); заявитель и патентообладатель ФГБОУ ВПО Воронежский ГАУ) (RU); заявл. 29.10.2013, опубл. 27.04.2014, – 4 с.

УДК. 631.22.019

Sannikov E. M.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

AUTOMATED SYSTEMS OF CONTROL AND MANAGEMENT OF ELECTRICAL EQUIPMENT AT AGRO-INDUSTRIAL COMPLEX ENTERPRISES

Аннотация: В данной статье приведены принципы работы автоматизированных систем контроля и управления электрооборудования на предприятиях АПК.

Ключевые слова: системы, автоматизация, электрооборудование, контроль.

Nowadays it is impossible to find any field of activity which is not automated or used without electrical and gaging equipment. It also

corresponds to modern automated systems of control and management of electrical equipment at agro-industrial complex enterprises. Almost all automated systems of control and management use universal microprocessor-based controllers, computers and other equipment. Meanwhile, implementation and use of this equipment and automation facilities requires organization of rational structure of technical processes production operational automatic management at the precise object and interaction coordination of separate sectors and enterprises in general. Automated system of control is developed to control the process. This system includes gage, booster, receiving signal from the gage and passing it after boosting to the special element, which realizes final operation of automated control - presentation of controlling value in form which is convenient for observation and registration of process data. Automated management system is used for partial or total control of the object or technological process. Such systems are widely used for automation, for instance, activation processes, adjustment of the rotation frequency and etc. Automated system of control and management is the usage of automated equipment and systems of control and management for partial or total person elimination and the rise of production and work quality.

Automation may have many levels of difficulty: from the ordinary equipment to multilevel automated systems.

the functions of the system of control and management are the following:

- automated management systems (operator performs control function of good condition of the system);

- decentralized (local) management systems (all functions of control and management is done by the operator);

- centralized management and control systems (control and management functions are performed by the operator and also means of centralized information gathering and partial processing are used);

- automation of management and control system is divided into one level and multi level systems.

on the lowest level of automation of management separate equipment and facilities management is provided by means of local systems of control and management.

on the top level of automated system of control and management of the major industrial complex we can see very difficult tasks to coordinate all the works of production and subsidiary units, distribution of loads and ensuring optimal indicators of enterprise work. That's why the development of structure and choice of technical facilities of atomization for the top step management should be performed subject to close correspondence between systems of management of technological

processes and production management. The solution of these tasks may appear in case of implementation of automated management systems, using modern computers.

As an example we can see that agro-industrial complex enterprises use additional lighting switched on in autumn and winter before sunrise, in a day time if it's dull, when natural lighting is not enough. Automated feeding systems are used in poultry farming. There are poultry factories with all automated process. We can see complex automation of management and control over machines and equipment with the help of software facilities. There is an automated microclimate supply at stock-raising farms. There are automated production lines of cow milking and initial processing; preparation and distribution of forage at livestock farms. Many farms have fully automated systems of water, air and heat supply.

Automated ventilation system in vegetable store allows to decrease agricultural production loss while storage. Complex automated units, electrical equipment and lines, which are used at initial processing of perishable agricultural goods enterprises considerably reduce loss, allow keeping quality and utility of manufacturing goods. Climate control systems used during cultivation provide plants optimum light conditions and air freshness. Most of the hothouses are equipped with the automatic water sprinkler. Hothouses with the artificial climate situated in the northern parts are used to grow vegetables, flowers and even fruit all the year round. Meanwhile, air and ground temperature, pressure and humidity are kept permanently with the help of automatic equipment of artificial climate and automated systems.

Constant electrical and water supply has a great importance for all agro-industrial complex enterprises as for any other sector. At the places which are far from the electrical supply, electric power is produced by local hydro electrical or diesel electrical stations or any other types of sources. Such electrical stations, as a rule, are absolutely automatic. So, start up and stop of primary engines, adjustment of power in the line, fuel supply, and short cut protection are carried out automatically by the program itself or by remote control signals. Water supply at the remote or mountainous pastures and agricultural complexes, where deep water is taken out to the ground surface area, it is done with the help of special pumps or any other equipment, acting by wind turbines, which are also automated.

Teleautomatics is widely used in the operation of electrical and water supply. Thought the instrumentality of teleautomatics it is possible to control equipment distantly: switch on and off all water sprinklers on the fields simultaneously, control water supply to irrigation canals, regulate operating conditions of artificial climate in hothouses and farms, turn on

and off separate electrical lines, change ventilation and thermal mode in vegetable store and other places.

Agro industrial complex enterprises widely use automated systems of control and management of separate technological processes as well as complex automation of the electrical equipment and facilities, and also production automated management systems.

Список литературы:

1. Гусев Н.В., Автоматизация технологических комплексов и системы в промышленности, Издательство Томский политехнический университет, 2013.
2. Минаев И.Г., Самойленко В.В. Программируемые логические контроллеры. Практическое руководство для начинающего инженера, Издательство АГРУС, 2009-102с.
3. Федоров Ю.Н. Справочник инженера по АСУТП: проектирование и разработка, М: Инфра-Инженерия, 2008.-928стр.
4. Воробьев В.А., Горбачев И.В. Практикум по механизации и автоматизации сельского хозяйственного производства, Издательство КОЛОС, 2009 .

УДК 568.244.4

**Timoshinov M.T.,
Kondrashova E.V.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

JUSTIFICATION OF CHANGES IN MAINTENANCE SERVICE

Аннотация: В статье рассмотрены основные причины отказов узлов и деталей автомобилей КАМАЗ-43118 и КАМАЗ-65225. Предложено выполнение дополнительных операций при ТО.

Ключевые слова: отказ, надежность, износ, тормозная система, средний мост, система электрооборудования, задний мост, коробка передач с двигателем.

Observations of operational reliability of KAMAZ-43118 and KAMAZ-65225 trucks revealed aggregates and systems that limit their reliability. Tables 1.1 and 1.2 present a list of units, assemblies and

systems which during the observation demonstrated the largest number of failures. The data in Table 1.1 prove that 96.2% of the failures throughout KAMAZ-43118 were mentioned in 7 of the listed units and systems. In KAMAZ-65225 - 75.8% of failures occurred in the units and systems listed in Table 1.2. Therefore it is advisable to clarify the modes primarily for these components and systems. The main causes of the engines failure of KAMAZ-43118 is a deterioration of the crank mechanism, damage of the cylinder head gaskets, ventilator belt break, spray nozzles wear, malfunction of the fuel pump and high-pressure water pump.

Number	Name of units and systems	Fixed number of failures	Number in% of total
1	2	3	4
1	Engine with the clutch	72	46.5
2	Brake System	27	17.4
3	Middle axle	15	9.7
4	Cabin	12	7.7
5	Electrical system	10	6.5
6	Rear axle	7	4.5
Number	Name of units and systems	Fixed number of failures	Number in% of total
7	Gearbox with motor	6	3.9
Total		149	96.2

Table 1.1 - Characteristics of the units and systems failures limiting the reliability of KAMAZ-43118

Number	Name of units and systems	Fixed number of failures	Number in% of total
1	Engine with the clutch	31	25.8
2	Rear Axle	20	16.7
3	Middle Axle	16	13.3
4	Brakes	16	13.3
5	Rear suspension	8	6.7
Total		91	75.8

Table 1.2 - Characteristics of the units and systems failures limiting the reliability of KAMAZ-65225

Failure of the braking system is mainly caused by the malfunction of the control valves, brake trailers, cranes and two-piece brake pad wear.

Most failures of middle and rear axle are due to the leak of oil from

the gearbox. Gearbox failures are due to the defects in the valve switching divider.

The largest number of failures is caused by the cockpit glass cleaner. The multifunction probability of other ones is insignificant.

The main causes of KAMAZ-65225 failure is the crank mechanism wearing, damage of the cylinder head gaskets, damage of the oil and water pumps in the engine, support platform wear, cracks in the hubs, oil leak in the rear and middle axles; brake linings wear, brake cameras energy batteries and control valves in the brake system malfunctions; springs wear, destruction of shoe rockers and linkage in the rear suspension.

In addition to the failure of units and systems limiting the reliability there were recorded failures in elements ensuring safety. Therefore to increase the trucks production reliably it is useful to provide preventive operations while conducting the trucks maintenance aimed at eliminating the failures during vehicles work on the line.

To justify such a list of operations the analysis of the causes of failures recorded at the assemblies and systems limiting the reliability of the vehicles, as well as failures at the elements affecting the safety of the motion were carried out.

As a result of the analysis the following operations are recommended to check:

- tightness of the trailer control valve, two section valve accumulator;
- state of the supporting platforms of the hubs, to tighten the wheel nuts;
- quality of spray nozzles;
- condition and tension of the fan belt;
- tightness of the pressure reducing valve by the control splitter gearbox;
- state of reactive the linkage;
- tightness of gears and hubs gland seals;
- pressure generated by high pressure fuel pump;

It is necessary to eliminate the faults.

The frequency of operations and the given list of terms are determined according to the conditions minimizing the cost of maintenance and the vehicle repair.

For the mechanisms affecting the traffic safety it is advisable to determine the frequency of maintenance due to the following formula:

After determining the frequency of operations aimed at the

reliability and safety increase these operations were included to the service type the frequency of which corresponds to the calculated values.

The maintenance service-1 included the following operations:

to check:

- tightness of the trailer control valve, two section valve accumulator;

- tstate of the supporting platforms of the hubs, to tighten the wheel nuts;

- condition and tension of the fan belt;

- tightness of gears and hubs gland seals;

It is also necessary to troubleshoot.

Maintenance service -2 operations included the following:

to check:

- tightness of the pressure reducing valve control splitter gearbox transmission;

- quality of spray nozzles;

It is also necessary to troubleshoot.

The operations carried out by the maintenance service -2 included the following operations:

to check:

- pressure generated by high pressure fuel pump;

- state of linkage reactive;

It is also necessary to troubleshoot.

Список литературы:

1. Совершенствование технического обслуживания и ремонта автомобилей [Электронный ресурс] / В.Г. Козлов [и др.] // Молодежный вектор развития аграрной науки: материалы 66-й студенческой научной конференции. - Воронеж: ФГБОУ ВПО Воронежский ГАУ, апрель, 2015. – Ч.1. – С. 204-212. URL: www.nauka.vsau.ru/2015/06/03.

2 Вопросы эксплуатационной надежности автомобилей / В.Г. Козлов [и др.] // «Международный журнал экспериментального образования»: материалы международной научной конференции «Проблемы агропромышленного комплекса», Тайланд (Паттайя), 19-27 февраля 2015 г. - №2 (часть 3). – С. 409-410.

УДК 631.632.3:633.1

**Haritonov M.K.,
Chernyshov A.V.,
Gievsky A.M.,
Baskakov I.W.**

**Agraruniversität Woronesh namens Peter des Großen,
Woronesh, Russland**

ANORDNUNG UND BAUPLAN VON ÄHRENSIEBEN IN SIEBGERÄTEN VON MÄHDRESCHERN

Аннотация. В статье представлены схемы размещения колосовых решет в решетных станах и условия их применения в зерноочистительных машинах различных отечественных и зарубежных производителей.

Ключевые слова: зерно, зерноочистительные машины, зерновой ворох, колосовые решета, решетный стан.

Eine gesicherte Versorgung von Nahrungsmitteln wird in Russland zurzeit vor allem durch eine stabile Entwicklung und Funktionieren des Agrarsektors gekennzeichnet. Die Getreideproduktion in unserem Land entwickelt sich besonders erfolgreich. Das Defizit an neuer Technik im Agrarsektor übt einen negativen Einfluss signifikant auf die Qualität des Getreides bei seiner Herstellung und Lagerung [2, 4]

Eine wichtige Etappe bei der Herstellung des Getreides ist dabei seine Bearbeitung nach der Ernte. Die eingebrachte Ernte bietet dabei ein Haufen, in dem die unbeschädigten Körner, schwächliche Körner als auch Unkraut, Pflanzenreste und Beimischungen überwiegen [6]. Sogar das Getreide von guter Qualität kann wegen einer erhöhten Feuchtigkeit und Selbsterwärmung seine Saat- und Lebensmitteleigenschaften verlieren [5].

Das Hauptziel der Bearbeitung des Getreides nach der Ernte liegt in der Herstellung solches Getreides, welches zum Verkauf, als Saatgut und als Futtermittel bestimmt ist. Es muss dabei den Regelungen und Anforderungen von Saatgut und zum Verkauf

erfüllen [2].

Die Getreidereinigungsmaschinen wenden unterschiedliche Trennungsmethoden des Getreidehaufens an. Eine weit verbreitete Methode der Trennung ist die Aufteilung nach der geometrischen Form. Die Siebe haben dabei unterschiedliche Form der Löcher. Die Größe dieser Öffnungen hängt dabei von der zu verarbeitenden Kultur ab. Bei der Verwendung von runden Sieböffnungen findet die Trennung nach der Breite des Kornes, bei den längeren Körnern - nach Dicke [1].

Das zweite Verfahren der Reinigung des Getreidehaufens ist die Aufteilung des Gemisches anhand des Luftstromes. Dabei setzt man den Luftdruckkanal ein, der für die Separation der leichten Beimischungen (die Samen der Wiederkräuter, gebrechliche Körner, mineralisches und organisches Staub) aus dem Getreidehaufen bestimmt ist.

Es existieren verschiedene Typen von Sieben, welche man in einen Siebrahmen der Getreidereinigungsmaschinen einsetzt. Das Verteilungssieb B1 teilt das Gemisch in zwei gleiche Fraktionen. Der Durchmesser der Öffnungen entspricht hier der durchschnittlichen Größe des Kornes im Haufen. Die Siebe W trennen das Getreide von den kleinen Zusätzen. Der Durchmesser der Öffnung entspricht hier dem kleinsten Korn.

Das Sortiersieb G trennt endgültig die Verunreinigungen vom Korn. Der Durchmesser seiner Öffnung ist kleiner als die durchschnittliche Größe des Kornes.

B2 trennt das Korn von den größeren Verunreinigungen. Nach dem Durchlaufen von B2 geht man davon aus, dass das Korn weiterbefördert wird, während größere Verunreinigungen durchgesiebt worden sind.

Nach dem agrartechnischen Standard darf der Hub des Getreidesiebes von über 0,5% des Kornes nicht zulassen.

Eine relativ einfache und effektive Methode der Erhöhung der Produktivität und der Qualität der Reinigung des Getreides ist die Verbesserung in der Konstruktion von Sieben. Die Lage der einzelnen Siebe zueinander ist auch wichtig [3, 5].

Betrachten wir die Lagepläne der Siebe, wie wir sie in unterschiedlicher Ausführung in den modernen Getreidereinigungsmaschinen finden.

In einem Aufbau mit vier Sieben und zwei Ebenen werden in der Regel die Siebe B2 in der oberen Ebene (aufeinanderfolgend) aufgebaut. Ein solcher Aufbau wird bei den folgenden Getreidereinigungsmaschinen verwendet (ZWS-20A, MS-4.5, MWO-20D, MWO-10) [1, 2, 5]

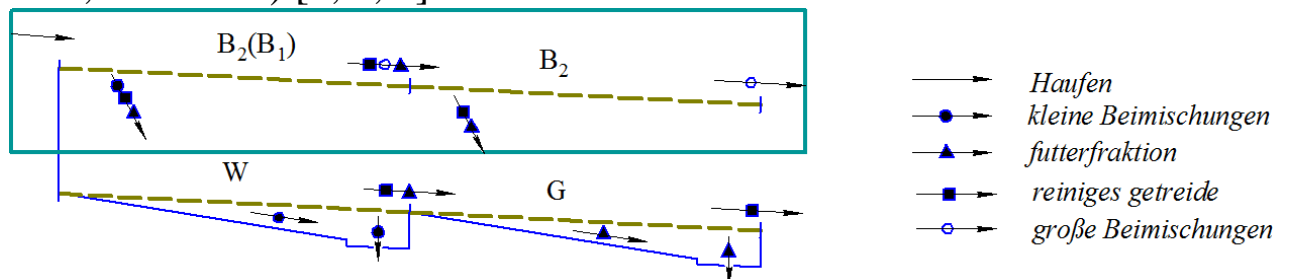


Abbildung 1 – Technologisches Schema der function des Siebrahmens der getreide reinigungsmaschine (ZWS-20A, MS-4.5, MWO-20D, MWO-10)

Diese Art der Aufhängung von B2 erlaubt eine gleichmäßige Weiterverteilung auf das Sieb W und das Sortiersieb G. Dies lässt in erster Linie die Erhöhung der Arbeitsproduktivität.

Die Aufgezählten Maschinen stellen eine Reinheit des Kornes sicher, welche der 2.Klasse von Saatgut entspricht und verbrauchen eine minimale Menge an Energie.

Список литературы:

1. Воронежсельмаш [Электронный ресурс]. – Электрон. дан. – Воронеж, 2016. – Режим доступа: <http://www.vselmash.ru>.
2. Гольтяпин, В.Я. Машины и оборудование для производства и послеуборочной обработки зерна: кат. / В.Я. Гольтяпин. – М.: ФГБНУ «Росинформагротех», 2013. –96 с.
3. Гиевский, А. М. Обоснование схемы размещения и соотношения решет в решетных станах / А.М. Гиевский, В.И. Оробинский, А.В. Чернышов // Лесотехнический журнал / Воронежская государственная лесотехническая академия. — 2013 .— №3 .— С. 36-46.
4. Оробинский, В.И. Оценка качества очистки зерна на семяочистительном линии фирмы LMC / В.И. Оробинский [и др.] // Вестник Воронежского государственного аграрного университета. – 2015. – № 4 (47) – С. 93-97.
5. Тарасенко, А.П. Фракционирование зернового вороха на решетках /А. П. Тарасенко [и др.] // Сельскохозяйственные машины и технологии. – 2012. – №5 –С.26-29.

УДК: 620.9.631.371

**Eshpulatov N.M.,
Salomov M.N.,
Fayzullaev B.P.**

Tashkent State Agrarian University

ENERGY CHARACTERISTICS IN ARTIFICIAL ENERGY SYSTEMS

Abstract: The concept "artificial energy system" is used in this article. With this end in view, it considers an power line consisting of a variety of energy converters and ending with energotechnological process. Energy characteristic expresses the dependence of the total amount of energy (power) consumed upon the output quantity. The article presents the empirical dependence of power consumption on the obtained result.

Keywords: Energy characteristics, artificial energy systems, volume of production, power consumption, effective power consumption, power loss, energotechnological process, technological environment, energy efficiency, energy intensity of elements, power lines, energy-output ratio of results, energy balance.

One of the basic methods of the assessment, analysis and control of power consumption modes as well as of the electrical power consumption rate setting in the agricultural and water resources sectors is plotting of energy characteristics.

These characteristics can show the dependence of power consumption, absolute or specific power consumption on a number of factors, in particular on the quantity of output (productivity), rate, pressure, and degree of grinding, qualitative measures of process raw materials etc. They can be expressed analytically or graphically and determined experimentally or by calculation.

Taking into account that the key production indicators based on which planning, accounting and control are carried out is the quantity of production according to which power requirement is to be determined, plotting of the energy characteristics showing the dependence of energy intensity on the production during a certain calendar period of time seems to make the most sense.

In general, energy characteristic is represented as follows:

$$\sum W = \omega_u A + \omega_{var} A + W_{nt} \quad (1)$$

where

$\sum W$ is the total amount of electric power consumed, kW•h;

ω_u is useful specific energy intensity, kW•h/unit;

ω_{var} is variable specific power consumption, kW•h/unit;

W_{nl} is no-load losses, kW•h.

Energy saving implies improving the efficiency of energy use by the consumer.

To develop energy saving methods, it is necessary to describe the energetic processes and conditions for their implementation. An artificial energy system (AES) of the consumer serves as the technical basis for the control of energy flow and various processes. The feature of the system is the presence of power lines through which energy flows to the point where it is used. The power lines end with energy technological process (ETP).

In addition to energy, technological environment is actively involved in the energy technological process. The energy impact on the technological environment creates the result for which energy is consumed. A line or area is formed in AES by a series connection of separate technical units (elements). For example, energy transfers, transformation, conversion into another form of energy. We assume that as it pertains artificial elements there is a certain relationship between P_f and P_{in} (the final and initial powers, respectively), the value of which will allow, under certain conditions, not measuring but predicting the value of one if you know the value of the other. Such a relationship can be established by carrying out special measurements on the element.

Stability of these dependencies (characteristics) testifies that the element has certain sustained ability of self-organizing during energy transfer. The extent of this ability is characterized by relative energy intensity.

In view of great importance of the $Q_f = f(Q_{in})$ characteristics for controlling and management of energy efficiency, it is appropriate to name it energy characteristics.

Since the energy characteristics of various elements may substantially differ from each other, it is impossible to plot similar characteristics made based on their lines. However, it is obvious that such characteristics exist, because it has been demonstrated that the current energy intensity values of the lines can be obtained through the current energy intensity values of the elements, and therefore its energy characteristics can be determined as well.

Approximation of all the characteristics through mathematical expressions will probably not make it easy to deal with them, as there is no regularity of the disturbance parameters, and a change in the function over time will make the summarized characteristics very complex. In these circumstances, the measurement-based method seems to be the most

preferred. We have considered the case of identification of the energy characteristics of a power line consisting of three elements. It is assumed that all the three elements have the same linear energy characteristics. Calculation of the energy intensity of the elements has given the following results: $Q_{e1} = 1.31$; $Q_{e2} = 1.32$; $Q_{e3} = 1.31$. In this case, the energy intensity of the whole line is $Q_e = 2.17$ (the results are given in relative units).

Conducted studies have shown that the energy intensity of the elements is variable, but the energy intensity of the entire line remains the same. This suggests that in order to stabilize the energy intensity of power lines over a wide range of power variation, linear energy characteristics of the elements are required; and to reduce the overall energy intensity, these characteristics must approximate to the one that produces the lowest energy intensity.

Given energy characteristics, one can assess energy technological processes. The main feature of ETP consists in the availability of a constant value of absolute energy intensity of the result Q_k^{sp} . Let us set the result intensity $r=dt/dt$, then the theoretical specific energy intensity per unit of the intensity of the obtained results can be described as Q_t^{sp} .

It is also known that there is no result of ETP at $P_f < Q_t^{sp}$. If nr results are obtained in ETP in unit of time, and this requires a power equal to $P_f > Q_t^{sp}$, the energy balance expression can be written as follows:

$$P_f = Q_t^{sp} n r Q_e \quad (2)$$

where Q_e is the energy intensity of the result $n > 1$.

The energy characteristics of the elements $P_f = f(P_{in})$ can be specified in the course of continuous or discontinuous (discrete) measurements of energy. These characteristics can allow controlling energy intensity, identifying measures for its reduction, and verifying the effectiveness of these measures. A very important benefit of the energy characteristics of the elements is that they can be plotted up to their connection to the line (energy diagnosis of the elements). This will allow predicting the processes running in the energy consuming systems and concretely defining an energy-saving tactics in good time.

References

1. Karpov V.N. *Energoberezhenie v obluchatelnykh elektroustanovkakh* [Energy saving in irradiation electrical facilities]. Teaching aid. Saint-Petersburg, St. Petersburg State Agrarian University Publ., 1991, 37 p. (in Russian)
2. Khashimov F.A. *Optimizatsiya ispolzovaniya energoresursov v tekstilnoy promyshlennosti* [Optimization of the use of energy resources in the textile industry]. Tashkent, Fan Publ., 2005, 250 p. (in Russian)

Секция III. Научно-исследовательский потенциал современной молодежи в аграрной экономической науке и управлении АПК
Section III. Research potentialities of young specialists in agricultural economy and management.

УДК: 631.162:65.011

Altukhova Y.

Reims Champagne-Ardenne University

L'ETUDE DES COMPTABILITES ENVIRONNEMENTALES AGRICOLES

Аннотация (резюме): В этой статье рассматриваются проблемы экологического учета в сельском хозяйстве.

Ключевые слова: экологический учет, Франция, сельское хозяйство.

À l'heure actuelle, on constate que l'impact environnemental de l'agriculture n'est pas moins important, et parfois même beaucoup plus important que celui des entreprises industrielles [3].

La production agricole est une nécessité vitale de tout système socio-économique. L'un des défis les plus importants de l'agriculture est l'approvisionnement en denrées alimentaires de la population et la fourniture des matières premières à l'industrie. La solution à ce problème, d'une part, est essentielle au fonctionnement normal de l'économie nationale, et d'autre part, est maintenant un problème extrêmement complexe.

Si on ne tient pas compte des conséquences écologiques de la production en agriculture, la quantité d'humus dans la couche arable diminuera considérablement. De grandes surfaces sont exposées à l'érosion du sol par le vent et l'eau. Beaucoup de pâturages sont détruits à cause de pacage du bétail incontrôlé. De même, la baisse de la production agricole dans les dernières années n'a pas eu pour corollaire la réduction de l'impact négatif sur l'environnement.

Il faut noter que l'intensification de l'agriculture, l'amélioration des terres sur la base de la mécanisation et des mesures chimiques ont des effets positifs mais seulement jusqu'à certaines limites. L'utilisation

excessive des nouveaux instruments et des outils de travail entraîne des conséquences écologiques négatives.

L'ingénieur-agronome Gérard Kafadaroff remarque dans son livre *Agriculture durable et Nouvelle révolution verte* [3, p. 10] que :

«[...] certaines pratiques agricoles sont une source de perturbations profondes pour l'environnement. Elles sont en partie la cause de la régression de la biodiversité du fait de la fragmentation des écosystèmes, de la contamination des eaux et des sols par les intrants (pesticides, nitrates, etc), et enfin de la baisse de niveau de certaines nappes phréatiques liée à un arrosage abusif. Partout, y compris en Europe, l'utilisation de l'eau des nappes phréatiques s'accroît alors que leur capacité de renouvellement va *decrecendo* ».

Ainsi, l'agriculture est confrontée à des enjeux environnementaux majeurs tels que la perte de biodiversité, l'utilisation des ressources naturelles allant parfois jusqu'à leur épuisement (dont la baisse du niveau de certaines nappes phréatiques), la pollution, notamment la contamination des sols et des eaux par les pesticides et les nitrates.

De fait, la situation difficile des producteurs ruraux sur le plan économique a causé un manque d'attention aux problèmes écologiques. Les systèmes naturels ne peuvent donc plus s'autorestaurer, ce qui influence le développement économique et social de la campagne.

De plus, les évolutions démographiques et économiques ont amené à la décroissance de la population agricole dans le milieu rural. Comme l'indiquent les auteurs du livre *Accompagner des groupes vers l'agriculture durable* [1, p. 10], « des espaces, banalisés ou abandonnés par l'agriculture, deviennent le support de nouvelles activités (comme celles de loisirs). De « nouveaux » acteurs interviennent, parfois porteurs de légitimités différentes de celles des agriculteurs ».

Pour prendre en compte tous ces enjeux et tendances, un nouveau modèle du développement est discuté, celui du développement durable. Dès lors, la notion de l'agriculture durable fait l'objet des débats des scientifiques, des praticiens, des régulateurs, de la société en général. Pourtant, il n'existe pas encore de définition universellement admise concernant ce concept. En effet, il existe beaucoup de publications concernant le sujet de développement durable, la sécurité écologique de la production, mais ces concepts sont souvent dénués d'application concrète, notamment en ce qui concerne le domaine agricole.

Mais la régulation de l'activité écologique et sociale, les normes écologiques de plus en plus strictes, la concurrence, les impôts liés à l'environnement, – tous ces facteurs causent des charges et des engagements nouveaux qui, à leur tour, influent sur le positionnement, la situation économique des exploitations et, par conséquent, sur

l'information publiée par ces entreprises.

Un rôle important dans l'évolution des comportements et des perceptions est joué par une information environnementale et économique pertinente et exhaustive. Il y a quelques années, cette information n'était accessible ni aux citoyens, ni même parfois aux professionnels.

Il est clair que les organisations polluant l'environnement et nuisant ou portant atteinte à la santé ou aux biens de l'homme, doivent présenter les informations concernant leurs activités. Le manque d'information légitime sur l'activité environnementale des organisations crée des risques pour les propriétaires et les investisseurs. Ayant financé telle ou telle production, ils peuvent éprouver des pertes sous forme d'amendes, de frais de liquidation des conséquences des catastrophes écologiques.

Ainsi, il est nécessaire d'avoir des outils qui permettront d'accompagner et d'analyser la mise en œuvre et le suivi de la stratégie du développement durable. A cet égard, la comptabilité environnementale devrait permettre à l'administration de l'entreprise aussi qu'au grand public d'obtenir l'information nécessaire pour la gestion de l'environnement et à la prise des décisions d'investissement.

L'attention portée par la société, les entreprises et l'État aux aspects écologiques et sociaux du processus économique s'accroît donc sans cesse, notamment au niveau de la comptabilité et de la diffusion d'information. Cette information est devenue partiellement obligatoire dans certains pays dont la France (avec la loi sur les Nouvelles Régulations Économiques).

Cependant, il n'existe pas encore de méthodologies ni de normes comptables universellement admises concernant l'impact de l'entreprise sur l'environnement.

Il y a environ quarante ans, les premiers travaux avec pour titre «comptabilité environnementale», «écologique» ou «sociale» ont vu le jour pour contribuer à la résolution de ces problèmes.

La recherche en comptabilité sociale et environnementale a évolué sur une période relativement courte, d'un domaine marginal d'intérêt et de pratique à un domaine vibrant et diversifié de la recherche, de l'enseignement et de la pratique [2, p. 187].

Nombreux sont les auteurs qui considèrent le niveau organisationnel comme essentiel pour le processus de transformation vers la durabilité. D'après Schaltegger et Burritt [4], il est nécessaire de mener des recherches théoriques qui soient utiles pour les dirigeants d'entreprise dans la pratique, et basées sur une orientation pragmatique. De plus, d'après Van Passel et al. [5, p.150], il existe peu d'études empiriques publiées sur le sujet de la mesure pertinente de la durabilité.

C'est pourquoi, notre recherche s'intéresse aux comptabilités environnementales, plus particulièrement aux comptabilités d'entreprises

agricoles, comme un instrument qui pourrait permettre aux dirigeants, aussi qu'au grand public de tenir compte de l'utilisation des ressources non seulement financières, mais aussi naturelles, humaines et sociales prenant en compte les enjeux posés à l'humanité.

Références:

1. Accompagner des groupes vers l'agriculture durable [2003], Educagri éditions.
2. Gray R. [2007], Taking a Long View on What We Now Know About Social and Environmental Accountability and Reporting. Issues in Social and Environmental Accounting 1 (2) : 169-198.
3. Kafadaroff G. [2008], Agriculture durable et Nouvelle révolution verte. Paris : Le Publieur.
4. Schaltegger S., Burritt R. L. [2010], Sustainability accounting for companies: Catchphrase or decision support for business leaders? Journal of World Business 45 (4): 375-384.
5. Van Passel S., Nevens F., Mathijs E., Van Huylenbroeck G. [2007], Measuring farm sustainability and explaining differences in sustainable efficiency. Ecological economics 62: 149-161.

УДК 338.43:339.138

Baydikova Y.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE ROLE OF MARKETING FOR THE ENTERPRISE AND ITS FEATURES IN AGRICULTURE

Аннотация. Данная статья посвящена анализу особенности маркетинга в сельском хозяйстве. В ней показано, что сложность агромаркетинга определяется многообразием методов, приемов и способов его осуществления из-за большого количества производимых продуктов, их целевого назначения и роли для потребителя.

Ключевые слова: агромаркетинг, сельскохозяйственное производство.

Today each company faces a lot of problem situations, is inherent in a market economy. The real problem of implementation of entrepreneurship is the issue of the search of effective demand. It is not

enough to produce goods, it is necessary to make a profit from the sale of the products.

Agricultural production has a number of specific features that influence the market situation, the behavior of farmers, functioning of agricultural market and related industries. These features are as follows.

1. Inter connections of production and economic processes with natural biological processes.

The close relationship of agriculture with the environment, diversity of soil and climatic conditions determine a specific, creative character of labor in agriculture. There is almost no division of labor in to managerial and executive, as the most effective in an employee is a combination of an entrepreneur-owner, manager and an executive worker. That is why in developed countries farming is developing. It is sense in a family farm that these qualities of agricultural workers are combined.

2. Another feature of agriculture is its seasonality.

Owing to seasonal activities there is an uneven use of labor and machinery, many material resources, and an uneven flow of income. Due to the highly seasonal and prolonged production cycle agriculture has a very large demand for loans.

3. Prolonged production cycle.

A special feature of agriculture is the fact that plants and animals grow relatively slowly. To accelerate this process virtually impossible. Therefore, regardless of the market situation, the volume of commodity supply of agricultural products can not be reduced or increased in a short period of time

4. Instability as regards weather conditions.

Agricultural production depends on weather conditions which humanity has not yet learned to monitor. Therefore, there are unavoidable fluctuations in yield and gross yield, which determine the inevitable fluctuations in volumes proposed in the agricultural market and, of course, revenue and profitability.

5. The difference in fertility of the land.

The fertility of the land in different and even in separate farm can vary significantly. Therefore, the same labor costs and monitoring in different plots produce different financial results. There is a problem of rent regulation and income, the problem of subsidies of some regions compared with others.

Marketing associated with agricultural products is more complex than industrial one. Complexity of agro marketing is determined by a variety of methods, techniques and methods of its implementation because of a large number of manufactured products, their purpose and role for the consumer. Some products meet the most basic needs, while others

complement them, and still others are related to the maintenance of prestige, aesthetic needs, and so on. Agro marketing complexity in the formation of small businesses lies in the fact that its functions are not performed by trained professionals, but by entrepreneurs themselves. [2]

An important feature of agro marketing lies also in the fact that its services often have to deal with essential commodities. Consequently, marketers must in a timely manner (taking in to consideration age, sex, national traditions, state of health) meet the needs, demands and interests of consumers. Goods are usually perishable, so are necessary promptness of delivery and quality packaging, good service support.

Due to the fact that many links in the AIC (agro-industrial complex) produce not final but inter mediate products, is particularly important marketing activity on their processing (primary or final). Often, primary processing is the main purpose of preservation of the producte and its quality rather than increasing its competitiveness in the market of the final product. The weak development of this sector is still the most vulnerable spot of the Russian agro-industrial complex.

Many features of agro marketing are related to the variety of forms of ownership, means of production, traded goods. This poses a multifaceted competition that is controlled not only by the demand of consumers and the possibilities of its fulfillment. Hence there is a diversity of strategies, tactics, forms, methods and techniques of marketing.

The specificity of Russia is a small proportion of the farm sector, which directly affects the organization of marketing activities.

The need for effective agro marketing is associated with foreign competition. Western companies use quite modern marketing provision, which further complicates the situation of the domestic agro-industrial complex.

Another feature of agro marketing is unevenness nonequivalence of different levels of development and marketing activity at different stages (production – processing - realization) of passing the goods to the consumer. Failure in only one link of the chain leads to poor marketing as a whole, which significantly reduces the efficiency of agrobusiness [1]

These features must be considered in the organization of marketing activities in agrobusiness in all elements of the marketing complex.

Список литературы:

1.Закшевская Е.В. Методологические аспекты планирования производства и сбыта агарной продукции на основе маркетингового подхода / Е.В. Закшевская, И.В. Рысикова, Т.В. Закшевская // Современная экономика: проблемы и решения. -№12(24). - 2011. - С. 131-142.

2. Коновалова С.Н. Влияние маркетинговой деятельности на эффективность управленческих решений в АПК / С.Н. Коновалова, Н.М. Шевцова // Современные тенденции развития маркетинга. Сборник докладов V международной научно-практической конференции. Липецк. Издательство АО «Типография «Труд» - Орел, 2015.- С. 59 – 62.

УДК: 330.341.1

Bobko A.S.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE PRODUCTION POTENTIAL OF THE COMPANY AND WAYS TO IMPROVE ITS USE.

Аннотация. Рассматриваются основные элементы производственного потенциала. Отмечается, что все они находятся не только в тесном взаимодействии, в определенной мере они взаимозаменяемы. Исследованы формы взаимозаменяемости элементов производственного потенциала, рассматриваемые главным образом как его важнейшие экономические характеристики. Данный подход позволяет в конечном итоге обеспечить сбережение производственных ресурсов в результате использования нового оборудования, передовых технологий, новых методов организации управления производством.

Ключевые слова: производственный потенциал, инфраструктурный потенциал, маркетинговый потенциал, трудовой потенциал, потенциал внеоборотных активов, потенциал оборотных средств, потенциал рабочих мест, инвестиционный потенциал.

As a basic part of an economic complex, the company concentrates in itself all the resources of production. Here, the main economic processes unfolding, creates and multiplies the national wealth is generated national income of society, provided the solution of economic and social problems are added production and social relations. In this regard, an objective assessment of production capacity of enterprises, as well as the parameters and characteristics of their productive capacities are not suitable for decision-making. Thus, the study of the productive capacity, aimed at finding ways to more effectively use it, is becoming increasingly

important, as the problem itself becomes of national economic significance.

Currently, the word "potential" is used to refer to the funds and sources inventory available and possible to be used to achieve a certain goal, solve a problem, and also features the individual, society and state in any area. In domestic scientific literature the concept of "production potential" was used by A.I. Anchishkin, who includes in it "a set of resources which in the course of production take the form of factors of production". This approach to the concept of productive capacity is widespread among researchers. There are two "resource" positions. The first - the production potential is a set of resources without regard to their relationship and involvement in the production process. The peculiarity of the second position is the interpretation of the productive capacity as a set of resources that can produce a certain amount of wealth.

In addition to the resource-based approach to defining the essence of productive capacities there are other approaches. Yu. Yu. Donets considers production potential synonymous with the production capacity of enterprises, associations, and therefore believes it is possible to define it as "the maximum possible annual, daily, hourly, or otherwise provided for a temporary unit volume of output, the concept is territorial in nature and is applied to a set of productions distributed in a particular area. " Based on these concepts, the production capacity includes a variety of resources: Sometimes they include only productive assets and capacities, sometimes, productive assets and skills of workers, sometimes, production funds, resources, management and organization of production, personnel, scientific and technical information. An analysis of the above points of view leads to the conclusion that the production potential of the managing system has a set of resources at its disposal for creative activity.

The relationship of industrial and economic potentials to determine the structure analysis of the economic potential.

The economic potential includes innovation, manufacturing, infrastructure, marketing and labor potentials.

The production capacity consists of the following components: capacity of non-current assets, the potential working capital, potential jobs, investment potential. In the diagram dashed lines indicate the functional relationships between components of the potentials.

The production potential is part of the economic potential. It is operable linked to employment, innovation and marketing potential. At the system level, it forms a production potential of jobs, which serve as a functional feedback labor potential. The result is a balanced flow redistribution and inventory system; potentials are structured. Determining the weights of the economic potential of the structure is an important

objective of scientific research, since it gives the opportunity to determine the state of the system and to make objective predictions.

The production potential was determined solely by quantitative characteristics - resource production. Resources include: non-current assets, current assets, investments denominated in value terms. Thus, we had to operate on a simple cost of resources, which in the production process is transferred to the finished product. Under certain conditions, it is regarded as the productive capacity.

However, in today's economy a quantitative estimate of productive capacity becomes insufficient. A single value of the resources does not provide information on the qualitative characteristics of production. This required the introduction of additional gauges of the relative productive potential, which should more accurately determine (increase or decrease) the effectiveness of quantitative characteristics.

Quantitative characteristics of productive capacity in terms of value are defined as non-current assets, current assets and investments.

Non-current assets are structured as follows: fixed assets, intangible assets and other non-current assets.

Current assets include working capital in inventories, current assets in production, finished goods, cash.

Investment is an independent unit structure, its classification is not considered in this paper.

The production capacity includes, in addition to the above quantitative characteristics, additional qualitative characteristics (indices), including: the index of non-current assets, the index of current assets, the index of investment, index of jobs, the index of the value added, index of industry development index of innovativeness index of market conditions. These indices reflect the "quality of supply" productive capacity.

As a result, we have two kinds of evaluations of productive capacities - both quantitative and qualitative, which complement each other. Consequently, generalized (integrated) production potential can be represented as the product of its quantitative characteristics of the index, which determines the quality of the production.

The production potential in terms of value is determined by the trend of its functions. As a trend we take the arithmetic average of the production capacity in value terms during the analyzed period.

The index of quality of the production potential is defined as the weighted average of the components of the index of qualitative characteristics.

Private quality index of industrial potential is defined as the ratio of the i -th quality parameter corresponding to the potential quality.

Examining the structure of the productive capacity of the complex

allows considering its components and performing relevant estimates of production at the level of the economic system. This structure is not contrary to the structure of the economic potential, it is its integral part and complementary, and therefore fully compatible with it.

The peculiarity of the proposed structure of the calculation of the production potential is the sharing of natural, cost performance and quality indices of the industrial potential, and comparability of the results made the transition to the parameters relative to the mapping of the economic system.

The first of the factors affecting the production potential is - production staff of the enterprise that drives the production of goods as a whole. By the ways in which the impact of production on the productive capacity of the staff can be attributed to direct effect on the means of production and labor, with the aim of working out production.

Another factor, by which the impact on the productive capacity of the staff is made, include the formation needs to encourage the development on a new basis. This means that the entire production process will be based on human influence.

The study of ways to influence the production potential developed tasks that help improve the efficiency of the production staff. These tasks include:

- Improving the management of the company and its organizational structure;
- ability to effectively manage in market conditions;
- creation of a favorable social and psychological climate in the enterprise;
- improving motivation;
- creation of a corporate structure.

Improving the management of the company and its organizational structure means that it is necessary to apply new control methods, both for the individual and for the management of the policy itself. But not only management practices play an important role in the establishment of production, one of the major parts, is an automated system for processing incoming information. But treatment must be fast, timely and reliable.

The ability to effectively manage in the market - is the ability to quickly make management decisions based on the available information, in a rapidly changing environment. It is necessary that all decisions help the company not only to withstand the fluctuations of the market, but also to promote their positions forward.

Creating a favorable social and psychological climate in the enterprise - This task includes the whole complex of measures aimed at keeping the team friendly, relaxed, not tense. This is the opportunity of

holding mass events in the enterprise, joint holidays, a staff psychologist, who helps to solve problems, etc.

Improving motivation. In this task, you can turn those material and material incentives that contribute to improving productivity. These include bonuses for overtime, bonuses for quality performance, awards, praise, recognition of the best employee of the year, etc.

Creating a corporate structure. It is revealing the style the company, how the company generates a style of behavior in the market.

The next factor affecting the productive capacity of the enterprise will be the reorganization of management. This factor includes principles to be followed by the enterprise for quality and quick execution of the task. These principles are as follows:

- All employees should know the purpose of their work. This means that people quickly and accurately do their jobs, know what is demanded of them;
- organization of the production should be transparent. In this case - the openness policy of the enterprise in the manufacturing process. There should be no secrets, only clear guidelines and objectives;
- subordinate should have only one leader. Subordinate employees should have only one supervisor, the employee performs only their required duties. If there are several leaders, he will have to fulfill not only the work that is not in his profile, but in the case - simultaneous orders from several leaders, so he will have to choose a priority task;
- at each work site there must be responsible people who take the final decision in the sphere of their competence. This principle is one of the most important, since only the person with the authority in the field of special education can properly assess the situation and take an appropriate action.

Another important factor in the productive capacity of the enterprise is the level of education of production personnel and the main purpose of exposing it should be something that should be done to maximize performance, specific skills and expertise of each individual employee. In all of this you need to remember about the information that plays a huge role in the organization of production. And if the information transmitted from worker to worker, is not reliable, it could lead to conflict situations that have a negative impact on the entire production.

Based on all of the above it is clear that the production potential - a great system that needs to be tightly controlled in order to function with maximum efficiency.

List of reference

1. Borisov AB Great Dictionary of Economics. - M .: Book World,

2003.

2. Kamenipera SE, Rusinov F.M, Organization, Planning, Management of Industrial Enterprises: a textbook for high schools. / - М.: Higher School, 2011.

3. Romanenko IV Enterprise Economy. - М.: Finance and Statistics, 2012.

4. Skliarenko VK, Prudnikov VM Business Economics: Textbook - М.: INFRA-M, 2012

УДК 338.43:633.1

Borisova E.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE FACTORS INFLUENCING INCREASE OF GRAIN PRODUCTION

Аннотация: в статье рассматриваются ключевые факторы повышения эффективности производства зерна. Приведен пример расчета покупки зерноуборочного комбайна.

Ключевые слова: эффективность, зерновое производство, лизинг, инвестиции

Grain crops are cultivated almost in all agricultural enterprises. The level of development of a grain farm at the level of the country predetermines its economic security. On the other hand, at the level of the enterprise it predetermines the extent of other branches development.

In general, successful functioning of grain branch depends on a number of key factors which are in close interrelation. Considering all complex of these factors, it is possible to increase the efficiency of grain production.

First of all, it is necessary to remember that all branches of plant growing depend on climatic conditions. Therefore one of the first ways of increasing grain production efficiency is a system of crop rotations. The best predecessors will help to receive higher productivity of cultures.

The use of seed farming practice in farms is also a positive moment at grain production phases. The agronomical service of enterprises has to be engaged in careful selection of seeds. The use of high-quality seeds resistant to different diseases provides a crop increase at a rate of 10 –

20%.

One of the most important factors of grain production increase is using mineral fertilizers. Unfortunately, nowadays we see a paradoxical situation about fertilizing grain crops. It should be noted, that a huge part of mineral fertilizers in Russia is exported while domestic agricultural producers feel their shortage. The majorities of farms don't use fertilizers at all or use them insufficiently.

In the modern world it is impossible to avoid the influence of such a factor as scientific and technical progress that captured all aspects of human activity. The agriculture is not an exception. Use of innovations and resource-saving technologies allows to increase productivity of grain crops in an intensive way. The harvesters developed in Penza region can serve as an example of innovations applied in the grain branch.

Using these harvesters reduces grain losses and decreases traumatizing a stalk. Besides, the farms using this innovation save the equipment and fuel. It means that 2 harvesters can replace 4 combine harvesters.

Resource-saving is a process of the most effective use of enterprise's resources. For example, material resources:

- fixed assets (buildings, constructions, agricultural machinery, equipment);
- current assets;
- stern, seeds and planting material, fertilizers, means of chemical protection of plants;
- fuel and energy (coal, peat, gasoline, electric power).

Resource-saving includes the following directions:

- Technical - improvement and modernization of equipment and its separate parameters;
- Technological – improvement of cultivation technologies, application of new technologies;
- Organizational –new systems of the organization of production, improvement of cultivated areas structure;
- Economic - an economic assessment and the analysis of the applied actions.

One of the directions of resource-saving technologies is energy saving and the system of the preserving agriculture. Energy saving is reached by scheduling the work of the power equipment, its coordination with requirements, use of modern glow lamps [4].

Harvesting as the final stage of grain production also has a key value. Decrease in production efficiency of grain is promoted by losses during harvesting. A rational choice of ways and terms of harvesting also has an important meaning. An increase of harvesting terms influences quality of

grain in a bad way. It means that the mass of grains decreases, their baking and flour-grinding get worse.

In Penza region peasants counted that out of 5 million seeds sowed per hectare about 4 million sprout. With an average mass of an ear of 8 g they should have received 32 c/hectare. But total productivity after harvesting was 1.5 times less. It was noted that a half of a biological crop was lost during thrashing [3].

The size of losses is predetermined by productivity of grain crops. For example, harvesting losses at productivity of winter wheat of 20 centner/hectare will be about 10%, and at productivity 32.7 centner/hectare – 18%. Therefore, farms need to consider this moment, cultivating cultures according to intensive technology. In this case harvesting the grain has to be made in the shortest possible time – 5-7 days. Reduction of harvesting terms is reached by a combination of separate harvesting and direct combining.

The enterprise has to possess high-quality processing and harvesting equipment to receive stable crops in established periods. According to the regional Ministry of Agriculture, in 2011 in Penza region an average productivity of the grain was about 20 centner/hectare. However, some farms reached 55 centner/hectare. Experts explain that this difference is due to application of high-yielding technologies and uses of modern processing equipment.

Unfortunately, technical facilities of our village are 3-4 times lower in comparison with western competitors working in more favorable weather conditions. The involvement of waste lands is going extremely slowly because of lack of equipment [2].

All this leads to reduction of a potential crop and, as a result, smaller efficiency of grain production. Research of activity of JSC “Petrovsky Agrokompleks” of Lipetsk region showed that the enterprise specialized in production of grain. The enterprise has an agrotechnical service which uses intensive technologies. They are the following: use of mineral fertilizers, cultivation and harvesting in optimum terms. Nowadays the enterprise is planning reconstruct of the grain thrashing floor. It will help to reduce losses by more effective purification of grain. However, the enterprise has only one combine harvester that means an extreme lack of grain-harvesting equipment.

Following the results of 2012 - 2013 agricultural years the position of the main grain-harvesting machine is taken by ACROS [1]. Therefore expediency of purchase of this combine harvester (chart 2) was calculated. Basic data is presented in the table 1.

Indicators	Values
1. Area of grain crops harvesting	3921
2. Actual productivity in 2013 year	34.9
3. Cost price of grain, rub/c	297.20
4. Market price of grain, rub/c	590
5. Term of the combine exploitation, (years)	10
6. Operational costs for the combine / cost price of grain	0.3
7. Coefficient of marketability of grain	0.70

Table 1. Basic data

Indicators	Values
Profit in the first year of combine exploitation	8 414 196.2
Profit in all years of exploitation	84 141 962.4
Price of demand at 16 % refinancing rate	15 549 019
Price of supply	5 988 275

Table 2. Calculation of efficiency of combine harvester's purchase

Calculations showed that the price of demand at a 16 percent rate will be 15 549 019 rub. The offered investments are expedient because the price of demand exceeds the price of supply. But it is necessary to carry out calculation of effectiveness of long-term investments.

Indicators	Values
1. Profit in all years of exploitation	84 141 962.4
2. Price of supply	5 988 275
3. Coefficient of effectiveness of long-term investments	0.41
4. A percent rate for the long-term credit, %	16 (0.16)

Table 3. Calculation of effectiveness of the long-term investments

It can be seen, that the coefficient of effectiveness of long-term investments is higher than a percent rate for the credit ($ROR=0.41 > Ns = 0.16$). Thus, purchase of a combine harvester is necessary and expedient. Leasing can serve as one of the most modern and favorable ways of the combine acquisition.

Summarizing the aforesaid it should be noted that enterprises will be able to reach the greatest return of the resources using all complex of the actions (technical, technological, organizational). Besides, it will help to increase production and efficiency of maintaining the grain branch.

Список литературы:

1. Компания Ростсельмаш. Главный комбайн страны / Компания Ростсельмаш // Агромир Черноземья. -2013. - №11 – с. 23
2. Кулик Г. Восстановить производство зерна – важнейшая задача / Г. Кулик // Экономика сельского хозяйства. – 2011. - № 3 – с.

42 – 50

3. «Российская газета». Использование инноваций повышает урожайность / Экономика сельского хозяйства. – 2012. – № 4. – с. 87-88

4. Щеглова С. Ю. Энерго- и ресурсосбережение в сельском хозяйстве. Обзор технологий. [Электронный ресурс]. – Режим доступа: <http://www.rae.ru/forum2012/13/560>, свободный

УДК 338.268

Volodin V.A.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE KEY FUNCTIONS OF BUDGET PLANNING IN A COMPANY

Аннотация: В данной статье рассматривается содержание бюджетного планирования, его важность как инструмента реализации стратегии предприятия, а также особенности процесса бюджетирования в России. Сравняются различные взгляды российских ученых на функции бюджетирования.

Ключевые слова: бюджетное планирование, функции, система и структура бюджетирования, экономическая нестабильность.

Under the present state of economic and political instability, constant macroeconomic reformations, and poor forecasting resources for demand dynamics the market has started requiring better competitiveness from both large and small companies which induces their intensive development and improvement. The companies constantly have to improve the accuracy of the undertaken financial operations with respect to the forecasted future changes and associated demands for monetary and material resources. Such necessity considerably increases the importance of budgeting and the company's expenditure control.

Almost all companies, regardless their organizational and legal form, structure, and type of property, plan their budget. In Russian business practice budget planning is often considered as the process of business plan provision with various cost sheets associated with it. However, this is the considerable deficiency of the modern companies which perform the budget planning based on out-of-the-date models and methods. According to the methodic recommendations for management accounting issued by

the Ministry for Economic development of Russia, budgeting is the process of planning the all resource circulation within the company for the given period of time in future or for the given project. [3]

Introduction of budgeting system helps creating efficient and quite integral management structure. Intelligently designed budgeting system helps both to solve the tasks of the operational management and to achieve strategic objectives set by the company's top management.

By present the existing economic situation is quite challenging and it encourages many companies not to delay the reformation of the business management methods and apply the most advanced and efficient management tools. One of such tools is the budget planning.

The key and most important feature of the budgeting is the possibility of expenditure control with allocation to the responsibility centers which allows boosting the management operation quality up to the completely new level, timely detection of the deficiencies in the company's operations, and identification of the reasons for the various indicator deviations from the desired values.

As any other management system, budgeting has certain functions performed in the business processes taking place within the company. [4]

Russian economists usually define four to six functions of budgeting which can be explained by the gradual alteration of the budgeting functions depending on the stage of its formation and implementation.

For example, E.S. Stoyanova considers 5 budgeting functions including planning, communication and coordination, objective achievement orienting, control, professional expertise improvement. At the same time she does not take into account the economic effect of the decisions made and the stimulation of personnel. [5]

I.T. Balabanov defines 4 budgeting functions which are planning, coordination, stimulation, and control. In his turn A.D. Sheremet adds two more to this list – business operation efficiency and managers' training.

Based on the analysis of the approaches mentioned above A.V. Voyko provides more thorough interpretation of the 6 budgeting functions:

- coordination and cooperation of the activities of the various units of the company;
- control of the current operations and provision of the plan fulfillment;
- planning of the financial and operational activities of the business for a certain period of time;
- basis for the plan fulfillment estimation by the responsibility centers and their managers;
- stimulation of the managers of all levels for the objective achievement by their responsibility centers;

- means of managers' training. [1]

The problem of the budgeting functions and their essence is rather disputable. Nevertheless, we are going to address the functions which seem most important from the practical point of view:

1) Financial planning function suggests planning of all monetary incomes and expenditures required for the company's development;

2) Financial accounting function means that all alterations of the incomes and expenditures as well as deviations from the plan are recorded in the management accounting, and due to this fact it becomes possible to perform analyses of any complexity;

3) Financial control function includes comparison on the set targets and obtained results, identification of weaknesses and strengths of the company;

4) Analytic function means strategy correction, setting new objectives, and analysis of operational alternatives;

5) Motivation function suggests that planning stimulates the personnel to more precise and defined objective setting, new and earlier overlooked operation directions are found;

6) Communication function includes coordination of plans between various units of the company, finding compromises, and assignment of responsibilities among the executors;

7) Coordinating function means coordination of functional blocks of operational planning. [2]

At present the finance management at the companies is often substituted by operational activities reacting to the arising financial problems. Lack of the clear idea of the company objectives, absence of well-thought-of policy aimed at the set objective achievement are the typical features of many Russian companies.

In the most of Russian companies budgeting process is inefficient because of the lack of knowledge and experience in regard of the specific characteristics of budgeting performance.

Список литературы:

1. Алпатова Э.С., Назмутдинова М.М. Назначение бюджетирования и его функции: теоретические аспекты / Э.С. Алпатова, М.М. Назмутдинова // Казань - Актуальные проблемы экономики и права – 2009 - №1 – С: 27-31.

2. Герасимова Л.Н., Родионова А.Ю. Процесс бюджетирования и его функции / Л.Н. Герасимова, А.Ю. Родионова // Москва - Интеллектуальный потенциал XXI века: ступени познания. – 2011 - №5-2 – С: 159-163.

3. Гусева А.Н. Система бюджетирования и оценка

финансовых результатов организаций сферы услуг: функции и задачи / А.Н. Гусева // Майкоп - Вестник Адыгейского государственного университета. Серия 5: Экономика. – 2011- №1- С: 149-154.

4. Назарова О.В. Бюджетное управление: его основные функции и принципы в рамках реализации стратегии компании / О.В. Назарова // Москва - Интеллектуальный потенциал XXI века: ступени познания. – 2015 - №27 – С:215-218.

5. Носкова Н.Ю. Гибкий бюджет как функция реализации контроля в процессе бюджетирования предприятия / Н.Ю. Носкова // Москва - Экономика, социология и право. Научно-информационный издательский центр "Институт стратегических исследований" – 2013 - №12 – С: 53-57.

УДК 336.77.067.32

Yoshida. H.

ReAnimedia, Ltd.

EFFECTS OF THE CRISIS OF 2007 ON FINANCIAL RISK MANAGEMENT

Аннотация: В статье рассматриваются рыночные и финансовые предпосылки возникновения ипотечного кризиса 2007 года в США и результаты его влияния на систему управления рисками финансово-кредитных организаций. Вносятся рекомендации по совершенствованию системы финансового риск-менеджмента, исходя из проблем, проявившихся в кризисной ситуации.

Ключевые слова: ипотечный рынок, рынок недвижимости, финансово-кредитные организации, риск-менеджмент

Particularly in the U.S. subprime mortgage market, mortgages were written with progressively more aggressive terms, often offered by substantially unregulated mortgage originators. There appears to have been a widespread assumption of continued rise in real estate prices, and there are indications that there was increasing fraud at a time of generally declining due diligence. Indeed, the terms of “subprime” mortgages changed over time and, equally importantly, consumer behavior with respect to default on mortgage debt changed in ways that were not anticipated by rating-agency or industry analysts.

In addition, some structural factors within the changing global

financial market landscape have been at work to give the current episode some unprecedented features. Over several years, the markets shifted to an “originate-to-distribute” model in which credit that once would have been retained by banks on their own books was converted into market products of increasing sophistication and complexity. Banks sought to optimize use of capital by getting assets off their books and accounting and regulatory standards encouraged recognition of upfront fee income.

The ability to distribute credit risk away from the banking system – through the use of structured products – to investors with an appetite for it has produced significant benefits for the functioning of financial markets, with positive economic impact. A shift of the dominant business model from “buy and hold” toward “originate-to-distribute” has allowed investors to gain access to a wider range of financial products, including tailor-made products, thus facilitating portfolio optimization through diversification and risk management through hedging.

For the “originate-to-distribute” model to work effectively, however, all participants must observe high standards of risk management and disclosure and have in place sound incentive structures. Also, credible and well-understood ratings are essential to help gauge relative risks. In the context of the unusually accommodating financial conditions of the few years through 2007, however, those basic requirements for a viable “originate-to-distribute” model too often were not met.

The ongoing turmoil is the result, calling into question many aspects of the “originate-to-distribute” model and structured products. It is clear that realizing the full constructive potential of that model will require focused attention to address shortcomings in market practices that were seen in the run-up to the turmoil.

Mortgages were the segment of the financial market where the “originate-to-distribute” model developed earliest and most extensively. In the United States, where subprime mortgages progressively came to assume an increasing share of the whole market in the past few years, such mortgages were securitized into a significant volume of structured products. Those developments reflected investors’ search for yield and market pressure by analysts and investors on firms for short-term results. In many cases, firms’ behavior was driven by incentive structures focused on short-term performance.

Since the summer of 2006, ratings of structured products have proved very volatile relative to their past performance and that of ratings on corporate and sovereign bonds. This reflects particular features (such as event triggers) of complex structures, the implications of which have been underestimated by firms, investors, and the rating agencies.

A rise in subprime delinquencies that accelerated toward summer

2007, along with multi-notch ratings downgrades in many mortgage-linked securities, led to elevated uncertainty about ratings, asset values, and creditworthiness of counterparties. This, in turn, contributed to plummeting liquidity for subprime-linked products and tainted the much larger markets for other structured products. Markets' attention then focused on conduits and SIVs, many of which were set up by banks to warehouse undistributed CDO tranches and funded by short-term ABCP. Investors, mainly in money-market funds, moved out of ABCP and other structured assets to such safer assets as Treasury bills or bank deposits. Denied funding and faced with very tight "triggers" potentially requiring wide liquidations of assets, certain conduits and SIVs came to the point at which they had to draw upon backstop bank lending lines or their sponsors chose to take the assets onto their balance sheets.

Disappearing marketability and sharply increased doubts about valuations of complex products and structured vehicles fed on each other to bring markets in certain asset classes to a virtual halt, with transactions that have taken place marked by huge discounts. Leading banks faced a surge in potential liquidity demands and were sometimes led, despite the lack of legal obligation, to bring assets onto their own balance sheets for reputational risk reasons or to avoid fire-sales. Faced with highly uncertain potential demands for liquidity, banks became reluctant to participate in money markets beyond very short terms. At the same time, non-bank participants in the money markets became highly averse to investing in credit instruments of private issuers beyond very short terms. With this, subprime credit problems turned into a systemic liquidity crunch, with term money markets being the center of the storm.

The experience of the crisis of 2007, though destructive, has shown some weaknesses in the market policies of financial organizations which can teach the others to avoid them in the future. The recommendations concerning market risk management should include the following:

(1) Firms should establish clear policies that define risk management as the responsibility of each institution's senior management, in particular the CEO, subject to the oversight of the Board. Senior management should be involved in the risk-control process, and both the Board and senior management should regard risk management and control as essential aspects of the business.

(2) Risk management should be a priority for the whole firm and not be focused only on particular business areas or made a purely quantitative oversight process or an audit/ control function. Mutually reinforcing roles within each organization are essential to creating a strong, pervasive risk culture.

(3) All employees in each organization should have a clear

understanding of their responsibilities in regard to the management of risks assumed by the firm and should be held accountable for their performance with respect to these responsibilities.

Firms should implement controls to ensure that the governance structure that has been adopted is actually implemented in managing day-to-day business. The regular and predictable functioning of risk management and governance structures is a fundamental element of effective risk management.

Список литературы:

1. Закшевская Е.В. Менеджмент: учебное пособие / Е.В. Закшевская, С.Н.Коновалова, Р.П.Белолипов. – Воронеж, 2013.
2. Сабетова Т.В. Управление риском неплатежей путем анализа и отбора потенциальных клиентов / Т.В.Сабетова // Прогрессивные методы финансово-учетного обеспечения оздоровления и устойчивого развития организаций АПК: Сборник научных трудов. – Воронеж, ФГБОУ ВПО ВГАУ, 2013.
3. Сабетова Т.В. Экономическое значение инвестирования в основной капитал российскими компаниями / Т.В.Сабетова, Н.М.Шевцова // Стратегия устойчивого развития регионов России: сборник материалов XXVII Международной научно-практической конференции. – Новосибирск: Изд-во НГТУ, 2015.

УДК 338.24:338.439.5

Zakshevskiy G.V.

Research institute of economy and organization of agroindustrial complex of the Central Chernozem area of Russian Federation, Voronezh, Russia

GOVERNMENT REGULATION OF AGRI-FOOD MARKET

Аннотация. В статье показана необходимость государственного регулирования агропродовольственного рынка. Определены меры и элементы механизма государственного регулирования.

Ключевые слова: государственное регулирование, государственная поддержка, агропродовольственный рынок, аграрная политика.

Theoretical understanding of importance of government regulation in

modern agricultural policy consists in ensuring efficiency and rationalizing its influence on socioeconomic processes. Today it has become obvious that self-regulatory mechanisms cannot work properly in agri-food market situation, which can be explained by drastic difference in production and consumption conditions in different countries. In this regard, efficient ways of regulating commodity-money relations on state level have been worked out.

Economic sense of government regulation of market processes consists in increasing productive efficiency and rational using of productive and labour resources, improving of competitiveness of domestic products. There are several key points in transition to rational government regulation. They are as follows:

- creating an organized structure of political aims during the running period and the long-term concept;
- comparing governmental initiatives with potential and multiplier effect of regulation;
- social assessment of costs of regulation and probable disruptive consequences, which serves as basis for maximization of social welfare function.

The concept of agricultural policy must conform to objective tendencies of developing of socioeconomic relations in economy. In Russia the issues of forming a rational and effective governmental policy are predetermined by internal economic problems (which include insufficient financing, dwindling production capacity, decreasing livestock population, etc.) and the external economic factors:

- imposing economic sanctions against Russia;
- rising in food prices on world markets;
- increased activity of Russian agricultural producers in the global market;
- providing stability of economic systems, critical overview of instruments and effectiveness of economic policy.

Rationalization process in agricultural economics policy presupposes that the state must not only determine the level of support to provide, but also the instruments of doing this, with expenses of each individual political instrument taken into account.

Calculation of state policy expenses makes optimization of applied system of regulation tools possible: income redistribution to the benefit of rural sector should be administered until marginal benefit corresponds with marginal costs of the redistribution policy.

During the process of government regulation, it is important to take into account uncertainty factors, which appear as a result of the existence of time lag, which is typical of agriculture, as well as external market (national currency rate change, world market price change) and climatic

factors (natural disasters, unfavorable or excessively favorable weather conditions).

We believe that three main aspects of food market regulation should be singled out. These aspects provide for the following:

- 1) the balance of demand and supply in the market at any particular time;
- 2) economic parity of all market participants, including raw material producers, its processors, importers and wholesale dealers;
- 3) food supply security of the country.

Overall, exercise of government policy in agriculture must be attended by considerate assessment of probable conflict of purpose and distortions, which arise in the regulation process.

In order to restore and preserve food independence, the government should make extensive use of safeguard measures of internal market, which both provide support to domestic manufacturers and allow for rational protectionism without violating international commitments.

Today, due to unfavorable political and economic climate in the world, development and taking a set of actions aimed at enhancing government regulation of food market must be carried out, such as:

- 1) stimulation of effective demand (arrangement of goods according to their consumption rate and improvement of their quality, development of consumer properties of agricultural raw materials);
- 2) domestic supplies market share gains (development of production programs and stimulation of production of deficient and strategically important products and raw materials);
- 3) antimonopoly regulation;
- 4) tariff regulation;
- 5) quota allocation and licensing of export and import;
- 6) quota allocation and licensing of production and sales;
- 7) economic incentive for production and marketing (taxation policy, concessional lending, freight rates, grants-in-aid and indemnities, subsidization, etc.);
- 8) creation of reserve funds and interventional regulation;
- 9) regulation of wholesale and retail trade;
- 10) participation in creating of logistics infrastructure.

One of the most important trends of agricultural policy rationalization in Russia is taking into account of particular regional characteristics.

In the system of governmental support funding sources in agriculture regional support system becomes dominant by directions and quantities of funding. The efficiency of regional policy lies in its flexibility, target orientation, ample opportunities of control over target usage of budgetary funds. Absence of the abovementioned prerequisites on the federal level

diminishes the efficiency of allocated budgetary funds.

Normal functioning of food market is impossible without a balanced union of interests of its economic entities – producers, purveyors, processors and consumers, therefore its government regulation must be based upon special-purpose approach. It allows for avoiding the uncontrolled and unsystematic use of financial and material resources, and combining the interests of the government and each participant of the federal, trans-regional and regional food programs.

The significant result of applying government regulation measures on agri-food market is the existence of stable prices for agricultural food and raw material.

Список литературы:

1. Soldatova I. The Management of the Agriculture of Russia While Maintaining Food Security in the Globalization / China-USA Business Review, USA, Vol. 10, №9, 2011, 122 p.

2. Закшевская Е.В. Повышение эффективности сельского хозяйства на основе совершенствования государственного регулирования аграрного рынка / Инновационно-инвестиционные преобразования в экономике агропромышленного комплекса: сборник научных трудов / Коллектив авторов. – Воронеж: ФГБОУ ВПО Воронежский ГАУ, 2012. – 350 с.

УДК 338.439

**Zakharova S. E.,
Zakshevskaya E. V.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

ECONOMIC EVALUATION OF PRODUCTION AND SALES OF GRAIN IN AGRICULTURAL ENTERPRISES

Аннотация. В данной статье дается оценка эффективности производства и реализации зерна на примере ООО "Агротех-Гарант" Нащёкино Аннинского района Воронежской области за 2012-2014 года.

Ключевые слова: зерно, производство, сбыт, эффективность, экономическая оценка

Because of the saturation of the market and increasing competition,

production does not determine the volume of sales vice versa the volume of sales is the basis for the development of the production program. The company should produce only those goods that it can sell. An environment characterizes the possibility of the organization to carry out its activities as long as possible in a rapidly changing milieu.

The volume of production and the volume of selling of the product are interconnected with indicators, though, in conditions of limited industrial possibilities and unlimited demand priority is given to the volume of production, which determines the volume of sales. We carried out a multipurpose assessment of activities of the company, connected with production and marketing at the company "Agrotech-Garant" in the village Nashchekino.

Branch and the type of the product	Periods (years)						On the average during 3 years, %
	2012.		2013.		2014.		
	Thousand Rub	%	Thousand Rub	%	Thousand Rub	%	
1 Plant cultivation	81277	61.4	73055	55.7	63751	46.1	54.3
Including : grain	21398	16.2	22526	17.2	26533	19.2	17.5
sunflower	16999	12.8	23901	18.2	10169	7.7	12.7
sugar beet	42767	32.3	26457	20.2	27039	19.6	24.0
Other branches of crop production	113	0.1	171	0.1	10	0.01	0.1
2. Animal husbandry	47763	36.1	50481	38.5	74437	53.9	43.0
including: milk	39616	29.9	41204	31.4	66318	48.0	36.6
Meat (alive mass)	7137	5.4	8209	6.3	7541	5.5	5.7
Other kinds of activity	3328	2.5	7632	5.8	578	0.4	2.9
In the whole about the company	132368	100	131168	100	138188	100	100

Table 1. Size and Structure of Sales from Realization.

The information which is represented in the first chart shows that the main share of revenues from sales in the milk was in 2014. It was 47.8%. These indicators show a high level of specialization, the share of grain and sugar beets account for more than 19%. The total land area remained unchanged in 2012-2014 and amounted to 4159 ha (Table 2).

Types of land	2012 .		2013 .		2014 .	
	ha	%	ha	%	ha	%
Whole area of land	4159	100	4159	100	4159	100
Total agricultural lands	4142	99.6	4142	99.6	4142	99.6
From them: arable	3646	87.7	3646	87.7	3646	87.7
hayfields	110	2.6	110	2.6	110	2.6
pasture	374	9.0	374	9.0	374	9.0
perennial plantings	12	0.3	12	0.3	12	0.3
Other land	17	0.4	17	0.4	17	0.4

Table 2. Square and Structure of the land in "Agrotech-Garant", Nashchekino.

The main channels of selling grain are presented only by two main industrial consumers of grain production in 2014 in Nashchekino. They are "Consulting" and "VlaSta". In 2014 year "VlaSta" bought 6000 centners of wheat, and the other firm Consulting" bought 4500 centners of barley.

The results of the effective activity of the company are presented in Table 3.

Indicators	2012	2013	2014	2014 % to 2012	2014 % to 2013.
Yields of wheat, cwt / ha	37	56	63	170.3	118.9
Yields of barley, cwt / ha	43	42	45	104.7	107.1
Revenue from selling (thous. rubl.)	129040	123536	138188	107.09	111.86
Whole cost price of products	84398	94695	102646	121.62	108.40
Gain (thous. rubl.)	44642	28841	35542	79.62	123.23
Level of profitability, %	52.89	30.46	34.63	-18.27	4.17
Including: milk	42.29	41.83	55.04	12.75	13.21
grain	94.17	80.41	60.49	-33.69	-19.92
sugar beet	54.81	15.14	23.38	-31.43	8.24

Table 3. The effectiveness of production and sales in LLC "Agrotech-Garant" Nascchekino

The data in Table 3 indicate that the profit of the company declined during the period in question because of rising production costs. The level of profitability of the enterprise decreased in comparison with 2012 by 18%. The same figure for milk has increased by 12.7%, grain and sugar beet has decreased by 33.7 and 31.4%.

Detailed data of effectiveness of selling of grain are shown in Table 4 and they indicate that barley is a more profitable crop than winter wheat. It has been mentioned that the cost of production has increased at the plant in recent years. The cost items were analyzed and the reasons for growth of the cost price of grain were indentified. (Table 4).

Agricultural crops	Quantity . (cwt)	Cost price (cwt.rub)	Price (1 cwt. Rub)	Complete cost price, (thous. rub)	Earnings (thous. rub)	Income	Payback, %
Wheat	24279	393.42	606.4	9584	14722	5138	153.61
Barley	23547	292.96	501.6	6948	11810	4862	169.98

Table 4. Realization of Grain Production at the Plant in 2014

According to Table 4, the highest share in the cost price of wheat and

barley occupy maintaining costs of fixed assets and other expenses.

Articles of expenses	Total (thous. rub.)	1 xwt. rub..	In % to the total
Winter wheat			
Expenses for payment with deductions for social needs	615	18.03	4.6
Seeds and Seedling material	583	17.09	4.3
Fertilizers	895	26.24	6.7
SZP	1712	50.20	12.8
Work and service	–	–	–
Expenses for insurance	220	6.45	1.6
Expenditures on the content of fixed assets	5135	150.56	38.3
Other expenses	4258	124.85	31.7
Total	13418	393.42	100
Barley			
Expenses for payment with deductions for social needs	686	24.81	8.5
Seeds and Seedling material	629	22.75	7.8
Fertilizers	305	11.03	3.8
SZP	719	26.00	8.9
Work and service	–	–	–
Expenditures on the content of fixed assets	2958	106.98	36.5
Other expenses	2803	101.38	34.6
Total	8100	292.96	100

Table 5. Structure of the Cost price of Wheat in 2014

Thus, production and marketing of grain were effective in 2014. However, the dynamics of its effectiveness varies widely, due to both the changing external environment and the internal problems of the enterprise. Especially it's necessary to allocate the presence of unused agricultural equipment which is on the balance. It affects the cost price of crop production. A low level of organization of production and operational administration lead to large losses of products, etc.

List of reference

1. Marketing / EV Zakshevskaya, RP Belousov, O. Firsov. The

editorship of the professor Zakshevskaya E. V. M. : Colossus, 2012. – p 247, p 126.

УДК 338.27:631.15(470.324) = 20

**Kuksin S.V.,
Zakshevskaya E. V.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

**FORECAST OF AGRICULTURAL PRODUCTION
DEVELOPMENT AND ALLOCATION IN VORONEZH REGION
FOR THE LONG TERM PERSPECTIVE**

Аннотация. Статья посвящена рассмотрению прогноза развития аграрного производства и его рационального размещения в Воронежской области. В процессе исследования изучены инновационные сценарии развития растениеводческой отрасли в Воронежской области до 2020 г. и на период до 2030 г., получены рекомендации улучшения территориально-отраслевого разделения труда в агропромышленном производстве.

Ключевые слова. Прогноз устойчивого воспроизводства, инновационный сценарий развития, природно-экономические микрзоны, сельскохозяйственное производство.

Currently the problem of agricultural production of the country are unfavorable conditions in the aftermath of the economic crisis, which are negatively reflected in dynamics of development agricultural, the balance of export and import of agricultural production, raw materials and products. Existing positive results on increasing the production of grain, sugar beets, sunflower seed, vegetables, poultry and pigs have not yet reached the evidence-based level.

The predominance of the plan for maximizing each region's own food almost destroyed the concept in specialized areas of agricultural production formed in the 70-80-th of the previous century. As a result food safety on many kinds of agricultural products and food has been lost in

Russia.

The assessment of the current state of agriculture shows that it still does not match the number of production, the level reached in the pre-reform period (especially animal products), institutional framework of a market economy is not well developed and economic instability of the industry still remains.

This situation causes the necessity to develop forecast completely new conceptual approaches to the development and is of major agricultural commodities, including adaptation to the market environment and evidence-based agriculture in the region that enable the producers to pass toward innovative development model.

Practice and research show that appropriate placing of agricultural production on soil-climatic zones and micro-zones is a powerful condition of the increase in agricultural production and lower costs per unit of manufactured products, increases profit per unit of land and other resources.

Scenarios and forecast of agricultural production development and allocation for the period of 2020-2030 will be formed from the strategic objectives defined in the Concept of long-term socially-economic development of the Russian Federation, "Russia's transformation into a global leader of the world economy, achieving the level of socio-economic development of highly industrialised countries".

In this regard, the most efficient means is to consider the innovative scenario for agriculture development till 2020 and till 2030 under the prevailing conditions let us consider on the example of plant breeding industry of Voronezh region.

The production of grain for micro-zones during the years of 1990-2012 has changed slightly, but with notable fluctuations in unfavorable years. The location of technical crops production such as sugar beets and sunflower seeds underwent significant change during this period. Thus the market environment was the incentive for farmers growing sugar beets and sunflower. As a result, the agricultural producers of almost all micro-zones of Voronezh region have increased the production of sunflower seeds as a more profitable crop in 1995, to the 1990 level by 1.3-2.3 times. In the following years they were forced to make certain amendments in the ratio of their production, as the unsustainable expansion of the area of sunflower has led to the reduced yields and reduction in the net income. The reduction of sugar beets acreage deteriorated financial situation of farmers,

as sugar beet even at the profitability of 5-10% produced 2-3 times more profit per 1 ha of crop than sunflower with the profitability of 15-20%.

For the enterprises of the east micro-zones (Ternovka, Novokhopersk, Borisoglebsk, Povorino, etc.) the increase of sunflower production justified to some extent within the boundaries of the maximal introduction of the crop into rotation in the future is appropriate. For farmers of North-West micro-zones (Ramon, Semiluky, Nizhnedevitsk, Repyovka, Ostrogozhsk, etc.) it is not rational, as they are located by the main consumer of milk and dairy products of the region -Voronezh and the climatic conditions of the micro-zones are not favorable enough for growing sunflower in Eastern, South-Eastern (Buturlinovka, Pavlovsk, Verhniy Mamon, Kalach, Vorobevka, etc.) and the South West micro-zones (Kamenka, Olkhovatka, Rossosh, Boguchar, etc.). Therefore, they will not be able to compete with agricultural producers of these micro-zones on the market of sunflower seeds. In the North-Western areas soil and climatic conditions are more favorable for the cultivation of cereals and sugar beets, which allows the companies towards get high profit from 1 ha and a significant amount of by-products as important forage for dairy cows.

The production of potatoes and vegetables is carried out mostly by households and is located in accordance with the sizes of the land areas of households. Commodity potatoes and vegetables production remained limited, only in part of the former specialized potato farms and does not play a significant role in forming the market for these products.

Analyzing the scenario, cropland under major crops in the region to 2020 and 2030 compared to the level of 2012 for the crops will increase to 1450 and 1500 thousand ha, sugar beet - 160 and 180 thousand hectares, vegetables - 25 and 30 thousand respectively.

As the placement of sunflower in the region now exceeds scientifically justified norms of 2% reduction by 2020, then 4% should be achieved by 2030. The area of potatoes will be 105 and 102 thousand hectares respectively.

In accordance with this plan the forecast structure of sown areas of the crops and gross production of the main types of crop products in the region in the medium and long term period are presented in tables 1, 2.

According to the forecast the amount of crop products will increase from 3111 thousand hectares in 2012 to 4,700 and 5,000 tons in 2020 and 2030, gross yield of sugar beets will reach 5000 and 6000 thousand tons,

sunflower - 800 and 900 thousand tons, potatoes - 1500 and 1400 thousand tons, vegetables - 500 and 600 thousand tons respectively.

The plan provides the solution of the problem rapid increase in the region of meat and milk production and, on that basis the increase of for these products demand combined with import substitution, providing food security.

Obtaining the planned volume of agricultural production Voronezh region will be able to export a certain volume of grain, vegetable oil, and other agricultural commodities.

Agricultural production in the region is currently characterized by economic and technological diversity. However in all the area there are deviations from the basic principles of production zoning, not concerning agro-climatic potential, market demands, to the requirements of the WTO are considered should there is no the necessary government support.

The authorities at all levels of management improve territorial and sectoral division of labor in agricultural production. To do this it is necessary:

- to change the state policy, aimed to self-sufficiency of the region with food, in order to better account for the benefits of territorial and sectoral division of labor in agricultural production, development of inter-branch exchange;

- to develop interregional exchange as a basis to create specialized areas for the production of certain agricultural products;

- to realize the benefits of territorial and sectoral division of labor in agricultural production by various target programs and investment projects.

Список литературы:

1. Прогноз развития и размещения сельскохозяйственного производства в Воронежской области до 2030 года. Коллектив авторов - Воронеж: Изд-во ГНУ НИИЭОАПК ЦЧР России, 2014. - 38с.

2. Стратегические направления развития экономики АПК Центрального Черноземья: сб. науч. тр. ГНУ НИИЭОАПК ЦЧР России Россельхозакадемия. Воронеж: ГНУ НИИЭОАПК ЦЧР России, 2012. - 235 с.

Name of intraregional micro-zones	Crops														
	cereals			sugar beets			sunflower			potato			vegetables		
	2012 (fact)	forecast		2012 (fact)	forecast		2012 (fact)	forecast		2012 (fact)	forecast		2012 (fact)	forecast	
		2020	2030		2020	2030		2020	2030		2020	2030		2020	2030
1. Northwest	216.4	227	234	15.4	17	19	64.9	63	62	22	24	24	5.5	6	7
2. Central	398.8	416	430	64.3	69	78	134.6	132	129	31.8	33	32	8.8	9	11
3. East	223.2	235	243	25.6	27	30	76.3	75	73	11.3	12	11	1.6	2	3
4. South East	281.1	294	305	22.3	24	27	106.1	104	102	20.7	21	21	4.2	5	5
5. South West	266.8	278	288	21.3	23	26	87.3	86	84	14.3	15	14	3	3	4
Total area	1386.3	1450	1500	148.9	160	180	469.2	460	450	100.1	105	102	23.1	25	30

Table 1 - Allocation of cultivated areas of major crops in the micro-zones of Voronezh region for 2020 and 2030, thousands of ha, (all categories of farms)

Name of intraregional micro-zones	Crops														
	cereals			sugar beets			sunflower			potato			vegetables		
	2012 (fact)	forecast		2012 (fact)	forecast		2012 (fact)	forecast		2012 (fact)	forecast		2012 (fact)	forecast	
		2020	2030		2020	2030		2020	2030		2020	2030		2020	2030
1. Northwest	578.2	879	935	747.2	590	708	133.2	120	135	310.6	327	305	90.1	114	137
2. Central	1105	1668	1775	3239.2	2565	3078	266.4	241	271	454.9	479	447	160.9	205	245
3. East	395.7	597	635	1005.7	795	954	150.7	136	153	164.8	174	162	26.3	34	41
4. South East	502.4	756	805	592.9	475	570	190.2	172	194	291.3	307	287	68.2	86	104
5. South West	529.7	800	850	728.7	575	690	145.7	131	147	202	213	199	47.8	61	73
Total area	3111.3	4700	5000	6313.7	5000	6000	886.2	800	900	1423.6	1500	1400	393.3	500	600

Table 2 - Allocation of gross production of the main kinds of crop production by micro-zones in Voronezh region for 2020 and 2030, thousands of tons (all categories of farms)

УДК 339.137.22

**Lebedev A.V.,
Fedulova I.Yu.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE STRUCTURE OF THE COMPETITION AND COMPETITIVENESS IN AGRICULTURE

Аннотация: В данной статье рассматриваются особенности конкуренции в сельском хозяйстве и факторы повышения конкурентоспособности как сельскохозяйственных товаропроизводителей, так и производимых ими товаров.

Ключевые слова: конкуренция, конкурентоспособность, сельскохозяйственные товаропроизводители, пять сил конкуренции, конкурентные преимущества

The term “economic competition” is originated from the Latin word «concurrere» (meaning “to collide”, “to compete”) and means struggle or rivalry in some area suggesting gaining some benefit in case of victory. A.Smith interpreted the competition as a type of behavior when individual sellers and buyers vie with each other in a market for the most advantageous terms of sale or purchase, correspondingly [Zakshevskaya, 2013]. He also believed that the competition of the very “invisible hand” of the market coordinating the activities of its participants, and its key objective is the maximization of profit from the current operations.

The Russian economist R.Fathutdinov introduced the following definition of economic competition, “Competition is the process of a subject’s control over its competitive advantages in order to achieve the victory or other objectives as the result of a rivalry with its competitors for the best satisfaction of the objective and/or subjective needs of the market in observance of the legislation in force or under the natural conditions” [Fathutdinov, 2008]

The world-famous expert in the matters of economic competition M.Porter suggested the concept of five competitive forces which provide the determinants of the greatest effect upon the companies under the terms of market competition [Porter, 1998]. According to this concept, the competition conditions in a certain market can be described as the result of interaction of the following competitive forces – the existing and operation companies, entrance of new competitors, suppliers, consumers, and

substituting goods.

From the economic point of view the competition can be scrutinized in three key aspects:

1. as the intensity of the competition within a market;
2. as the self-regulating element of the market mechanism; and
3. and the criterion defining the type of the industry segment.

Market competition is the reasonably required media providing for normal development of market economy as a system. Even though the term “competition” is sometimes used with negative meaning similar to “confrontation” alluding to the waste of resources for this activity, the market without competition is impossible as an economic system. As for the estimation of this phenomenon, it depends more on the methods applied rather than the essence of the phenomenon itself. On the other hand, lack of competition of any description (for instance, in case of natural monopoly) is also considered as negative situation, as under the terms of absence of threats the companies have no considerable stimuli for improvement of their operations.

Differences of the approaches of economists to the definition of the essence of competition are also marked in their study of the category “competitiveness”. The key aspects of competitiveness can be enunciated as follows – multivariance; relativity; various approaches to estimation and analysis at its different levels (goods, company, industry, country). Nevertheless, some of the advantage points are quite similar for a company and a country [Sabetova, 2015]

R.Fathutdinov defines the competitiveness as the feature of an object describing the degree of satisfaction of a certain need compared to the best similar objects represented in the given market [Fathutdinov, 2008].

The features of the competition in the agriculture are determined by its specific character. Among these features for this sector we can point out multistructurality, where there are manufacturers (and consequently – competitors) of various proprietary forms and scale of operation. The structure of the sectoral competition here can be presented as follows:

- 1) agricultural manufacturers, including:
 - agricultural companies of various proprietary forms;
 - peasant farm enterprises;
 - commodity private farm holdings;
- 2) non-commodity private farm holdings, which can be both consumers and manufacturers satisfying their own demand;
- 3) import from other countries and regions.

As well as in any other market, the five competition forces affect the agricultural sector, but in different degrees due to various circumstances – price disparity, local monopsony, types of commodities and required

resources, etc. The scheme of this competition is presented in the figure 1.

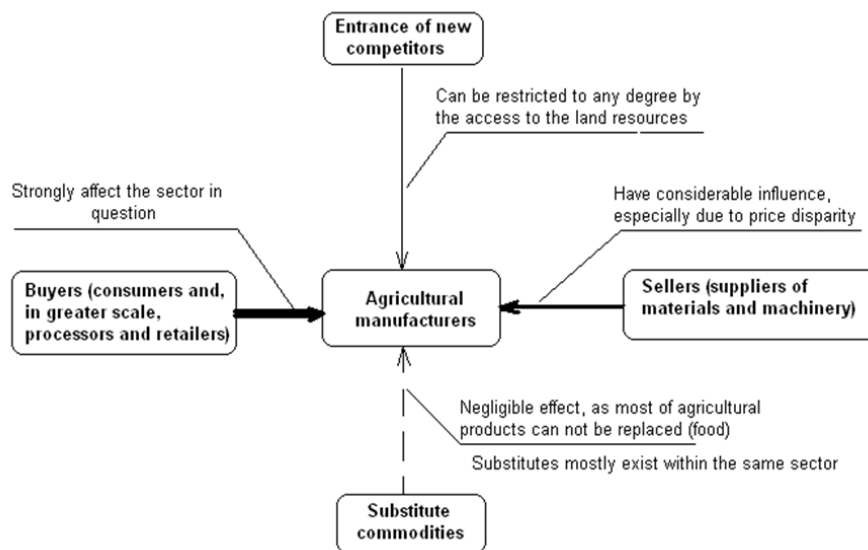


Fig. 1 – Scheme of the five competition forces for agriculture

Among the peculiarities of the competition within agricultural markets the following are the most noticeable:

1) the strongest of the five competition forces are the buyers (mainly processors, manufacturers) which often become local monopsonists;

2) typically, there is in-sector competition with non-commodity private farm holdings providing for the needs and demand of their members for the same products as the larger manufacturers produce (besides, they affect both agricultural manufacturers and processors as they usually produce the final consumable product (foods) for themselves and sometimes – for scores of their relatives living in town);

3) partly internal consumption of the produced commodities, sometimes – with minimum attention to their production cost;

4) considerable effect of natural (and thus – uncontrolled or partly controlled) factors;

5) natural difficulties in production flexibility increase (in terms of time lag, for instance, due to seasonality in crop growing or to the period required for an animal maturation in livestock breeding; in terms of quality, for instance, such parameter as fibrin content in wheat seeds cannot be changed immediately or even rapidly).

On the other hand, we see certain opportunities for agricultural companies aiming at the improvement of the competitiveness of their commodities, such as:

1) “green” (environmentally clean) production – the food produced by such methods is much more valuable for the consumers, especially for export to other countries;

2) introduction of new crops and animals to be processed into

“exotic” food – again, with higher price;

3) start-up of in-situ processing that reduces the agricultural company’s dependence on the monopsonistic processors and allows organization of more flexible and probably “green” production;

4) breeding of animals with shorter natural maturation period (poultry, rabbits);

5) protected ground vegetable growing with longer vegetation period.

The competitiveness of the companies in agricultural sector greatly depends on the competitiveness of their products. Nevertheless, we may suggest the following ways to increase the advantages, besides the stated-above positions concerning commodity competitiveness:

1) purchase and introduction of multifunctional machinery, lean production, and energy-saving technologies;

2) improvement of the labour resources qualification and motivation;

3) vertical and horizontal integration including both agricultural and processing companies and intermediaries.

Thus, the competitiveness of the companies in the agricultural sector and the goods they bring to the market may be improved, though this requires more or less considerable investments and sometimes – governmental support.

Список литературы:

1. Porter, M. Competitive Advantage: Creating and Sustaining Superior Performance. — New York: The Free Press, 1985 (2nd ed. — New York: Free Press, 1998. — 592 p.

2. Закшевская Е.В. Повышение финансовой устойчивости и деловой активности сельских товаропроизводителей на основе антикризисного прогнозирования и планирования / Е.В.Закшевская, Т.В.Закшевская // Вестник Воронежского государственного аграрного университета. - 2012. - № 1. - С. 116-122.

3. Маркетинг: Учебное пособие / [Е.В. Закшевская [и др.]; Под ред. Е.В. Закшевской. – М: КолосС, 2013. - 247 с.

4. Сабетова Т.В. Привлекательность территорий и ее взаимосвязь с развитием сельского хозяйства на примере Воронежской области / Т.В.Сабетова / Актуальные вопросы экономики и современного менеджмента: Сборник научных трудов по итогам международной научно-практической конференции. - Самара, 2015. - С. 248-253.

5. Фатхутинов Р.А. Управление конкурентоспособностью организации / Р.А. Фатхутинов; 3-е изд., перер. и доп. – М.: Маркет ДС, 2008. – 426 с.

6. Шевцова Н.М. Comparison Of Central Black-Soil Area

Regions In Terms Of Competitiveness / Н.М.Шевцова, Т.В.Сабетова / Институциональные и инфраструктурные аспекты развития экономических наук: Сборник статей Международной научно-практической конференции. - Уфа, 2015. - С. 217-220.

УДК 911.3:630

Marunich N.A.

Pridnestrovian State University after T. G. Shevchenko

ECOLOGICAL AND ECONOMIC EVALUATION IN ENERGY RUBLES IN ORDER TO FIND WAYS OF MANAGEMENT

Аннотация. В ходе энергетического анализа функционирования лесных геосистем с целью определить энергоэффективные технологии природопользования, была выявлена необходимость введения в практику эколого-экономической оценки - понятия «Энергорубль Приднестровской Молдавской Республики». Универсальность предложенного метода состоит в том, что выполнять расчеты по затратам, можно в любом государстве, с целью поиска путей рационального хозяйствования.

Ключевые слова. Энергетический анализ, рациональное природопользование, эколого-экономическая оценка, энергорубль Приднестровья.

Introduction

The most acute problem is the rapid increase in energy consumption of mankind. It can be assumed that the contribution of the effects of energy production and consumption in the destruction of the environment almost basic. Understanding disaster looming over mankind confronts science urgent, huge social significance of the problem at the global level - to develop a new methodology for the meek of the market and, based on the creation of new technology the world of the future of humanity - peace meek. This technology will be required to ensure not only a reasonable level of profitability of business and the welfare of society, but mainly the high efficiency of natural resources, especially in the field of energy [1,2,3,4].

Materials and methods

In the energy analysis of the functioning of forest geosystems to find energy-efficient, sustainable technologies in the management of forest

ecosystems of, identified the need for the introduction of the practice of environmental-economic evaluation of the concept of "Energoruble Pridnestrovian Moldavian Republic."

Thus, in order to comply with the new trends in the energy-metrological economy and taking into account the factors of the practical application of the principles of ecological and energy analysis to evaluate the proposed "Energoruble Pridnestrovian Moldavian Republic" by analogy with the Russian Federation [5], that is:

Denomination - invariant 1 penny -1,000,000.0 - joules; 3 pennies - 3,000,000.0 - joules; 5 cents -5,000,000.0 - joules; 10 cents - 10000000.0 - joules; 20 cents - 20000000.0 - joules; 50 cents - 50000000.0 - joules; 1 ruble - 100,000,000.0 - joules; 3 rubles - 300,000,000.0 - joules; 5 rubles - 500,000,000.0 - joules; 10 rubles -1,000,000,000.0 - joules; 25 rubles - 2500000000.0 - joules; 50 rubles - 5000000000.0 - joules; 100 rubles - 10,000,000,000.0 - joules.

That is, in one "Energoruble Pridnestrovian Moldavian Republic", the invariant is 100.000.000,0 joules, which may correspond to the estimated 2,5 kWh of electricity produced in Pridnestrovian (this kind of energy is electricity produced in the Republic). This system is invariant applicable for almost any country in the world.

Results and its discussion

As a result, any energy consumption for manufacturing processes or other energy assessment of the functioning of the system we can convert at par "Energoruble Pridnestrovian Moldavian Republic" and if you want to count on lower costs to the formula in real currency of any country (in the formula is an example for Pridnestrovian):

$$Z = E/E_r * K * S,$$

Where: I - the cost in real currency at the current time, Pridnestrovian Moldavian Republic rubles;

E - the energy cost of the process, technology, etc. in joules;

E_r - invariant one "Energoruble Pridnestrovian Moldavian Republic rubles" (100.000.000,0 Joules), J;

K - number of kilowatts of electricity in one "Energoruble Pridnestrovian Moldavian Republic rubles " kilowatt hour;

S - the cost of one kilowatt electricity rubles Pridnestrovian Moldavian Republic rubles, Pridnestrovian Moldavian Republic rubles, rubles.

As a practical example of the proposed evaluation system will conduct the calculation of economic efficiency technologies reforestation (previously assessed techniques and reforestation conducted energy analysis of selected technologies) [6] in the "Energoruble Pridnestrovian Moldavian Republic", obtained this are shown in figure 1.

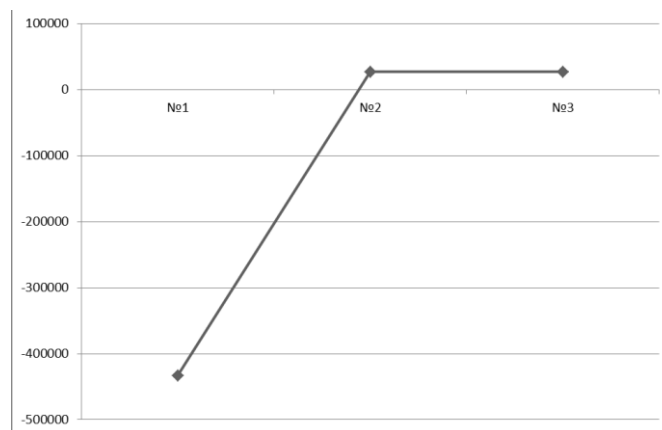


Fig. 1. The effectiveness of reforestation technologies per 1 ha in the "Energoruble Pridnestrovian Moldavian Republic"

Thus, the proposed technology reforestation in comparison with other applied technologies of reforestation in the Republic will, on average (including loss reforestation technology № 3) profit of $25.049.560,66 * 10^5$ joules or the proposed system invariant $25.049,56$ "Energoruble Pridnestrovian Moldavian Republic " 1 ha the restored forest communities, in addition, this technology restores the forest geosystems Republic on natural type with predominant species common oak, biodiversity and the natural environment and forest communities, including more efficient use of the energy of the natural rent is the technology of environmental management.

The versatility of the proposed environmental and economic assessment is that perform calculations on the costs of certain processes and phenomena that can be anywhere in the world in any state, and proposed formula can allow through the market cost of energy to calculate the invariant in the currency of that finally give the opportunity to see the real picture of the economy and take an appropriate decision in the interests of the right of the national economy.

Conclusions

In this case the economic evaluation in the energy rubles, quite dramatically shows the loss ratio is not good housekeeping in the last century, the technology of reforestation number 1 profitable, but profits secured currency "paper" is not supported by real values, that is, short-term market conditions showed the imaginary profits approach and forest natural environment, the addition of a natural forest geosystems Pridnestrovian suffered losses on unprofitable and pay bills. That energy and metrological evaluation can show the real, not a distorted picture of the ecological and economic way to select the management, as for the actual losses are not imaginary, and have to pay for frequent lifting not account, in this case, to pay the lost and destruction of biodiversity is no longer possible.

Список литературы:

1. B.I. Kochurov, V.A. Smirnov. The effectiveness of regional nature. Regional relations "people - territory - resources - the economy." Creative activity of the population. The virtues of the people. // Economic strategy. Number 3, 2007 (53). S. 32-44.
2. B.I. Kochurov, V.A. Lobkovsky, A.Y. Smirnov. The effectiveness of regional nature: methodological approaches / Problems of regional ecology number 3, 2008. S. 61-70.
3. B.I. Kochurov, V.A. Lobkovsky, A.Y. Smirnov, L.G. Lobkovsky, L.N. Belyaeva, N.V. Yakovenko. Development ekoterritory of nature and culture in the financial crisis // Herald of the International Academy of Sciences. Special Issue 2009. S. 26-29.
4. B.I. Kochurov, A.N. Sokolov. The criteria for comparing the efficiency of energy resources, "limits to growth", or the economy, "the meek" // Problems of regional ekologii № 1, Moscow, 2013. S. 115-123.
5. [Electronic resource] // - Access: <http://www.ffaa.info/str1.html>
6. I.N. Mayatsky. Technology restore forests with a predominance of oak. Ecological problems of Pridnestrovian Bendery. 2010. - S. 79-94.

УДК 338.1:636.2(470.32)

Maslova V. A.

Voronezh State Agricultural University named after Emperor Peter the Great, Voronezh, Russia

STATE AND TENDENCIES OF DAIRY CATTLE BREEDING DEVELOPMENT IN THE CENTRAL BLACK SOIL REGION

Аннотация. В данной статье рассматриваются вопросы, отражающие положение отрасли молочного скотоводства в областях Центрально-Черноземного региона, выявляются наиболее существенные тенденции в производстве молока, обосновываются факторы, ограничивающие возможности сельскохозяйственных товаропроизводителей по наращиванию молочного производства.

Ключевые слова. Молочное скотоводство, Центрально-Черноземный регион, тенденции развития, лимитирующие факторы.

The dairy cattle breeding are one of the main branches of agricultural production. Development of this branch is connected not only with the

production of valuable food, but also with optimum use of such types of agricultural grounds as haymakings and pastures. Besides, Cattle is an excellent source of organic fertilizers. Without using them it is difficult to provide reproduction of fertile lands. Besides, we would like to highlight the social importance of dairy cattle breeding. Development of dairy production provides creation of quite a large number of workplaces in the village and promotes growth of country people's income. It is connected with high labour input of branch.

In the conditions of planned economics each agricultural enterprise had a dairy and commodity farm, and production of milk was subsidized by the state.

Radical economic reforms connected with privatization of economics and sharp reduction of all economic processes' regulation caused an increased tendency of dairy herd's reduction. The same reasons for the reduced production of milk are in general across the Russian Federation and in the areas of the Central Black Soil region (figure 1).

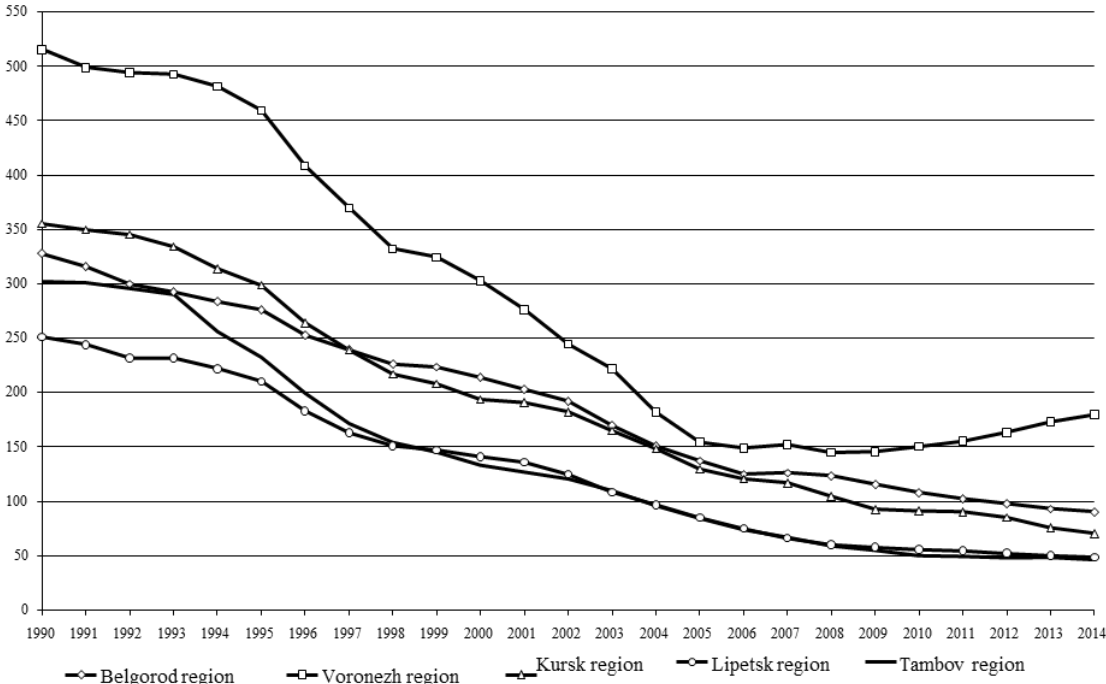


Fig. 1 - A livestock of cows in farms of all categories of the CBS areas, thousands of heads.

If on an average across the Russian Federation in 2014 in comparison with 1990 the livestock of cows decreased more than by 2.4 times (from 20.56 millions of heads to 8,5 million), on an average in the CBS – more than by 4 times. "Leaders" in this field are Tambov (by 6.5 times), Lipetsk (by 5.14 times) and Kursk (5.05 times). Only in Voronezh region, since 2009 we can see a steady growth of a livestock of cows (from 144.8 thousands of heads in 2008 to 179.5 thousands of heads.).

The reduction of milk livestock wasn't compensated by growth of dairy efficiency of cattle. It objectively caused the reduction of milk production in all regions of CBS, except Voronezh region (table 1).

Indicators	1990	On average in a year in the period:				
		1991-1995	1996-2000	2001-2005	2006-2010	2011-2014
Belgorod region	1024.7	839.3	623.4	615.1	557.4	545.9
Voronezh region	1496.4	1102.6	791.9	727.2	651.7	748.7
Kursk region	962.4	740.8	486.2	423.9	397.3	367.8
Lipetsk region	716.3	560.1	389.4	369.8	303.6	265.5
Tambov region	802.0	602.1	347.3	301.8	263.3	221.9

Table 1 – Production of milk in farms of all categories, thousand tons
It is calculated according to Russtat [5]

It should be noted that the main decline in production of milk fell on the agricultural organizations: in Tambov region – by 8,8 times, in Kursk – in 4,1, in Lipetsk – by 3 times.

Such a decline in the production of milk led to the point when in the last years Lipetsk and Tambov areas started more importing milk and dairy products than exporting (table 2).

Regions	2000	2005	2010	2011	2012	2013	2014
Import							
Belgorod region	113.9	238.5	262.6	276.8	238.8	278.9	265.5
Voronezh region	32.5	459.9	416.2	397.8	408.1	397.1	323.3
Kursk region	23.7	50.3	40.7	44.8	54.0	65.4	88.3
Lipetsk region	9.7	43.3	130.0	144.0	158.9	177.8	192.9
Tambov region	16.3	72.1	117.7	109.2	93.9	82.2	77.5
Export							
Belgorod region	301.7	352.8	364.1	380.4	348.1	387.1	368.3
Voronezh region	87.1	439.3	422.9	413.0	434.0	433.4	390.5
Kursk region	74.0	106.2	101.6	98.0	117.6	109.9	117.1
Lipetsk region	38.5	64.9	91.2	116.2	132.3	128.0	143.1
Tambov region	23.5	79.1	85.3	79.7	77.4	69.3	73.4
Of balance							
Belgorod region	187.8	114.3	101.5	103.6	109.3	108.2	102.8
Voronezh region	54.6	-20.6	6.7	15.2	25.9	36.3	67.2
Kursk region	50.3	55.9	60.9	53.2	63.6	44.5	28.8
Lipetsk region	28.8	21.6	-38.8	-27.8	-26.6	-49.8	-49.8
Tambov region	7.2	7.0	-32.4	-29.5	-16.5	-12.9	-4.1

Table 2 – Import-export of milk and dairy products (in terms of milk of the established fat content), thousand tons
It is calculated according to Russtat [5]

The fall of milk production against the background of a low level of the population's income caused a low level of its consumption (table 3).

Regions	2000	2005	2010	2011	2012	2013	2014
Belgorod region	213.4	225.5	265.6	259.0	262.2	261.6	261.1
Voronezh region	237.8	233.7	254.5	263.0	267.0	268.6	269.9
Kursk region	215.6	220.5	235.6	237.0	244.1	243.6	228.1
Lipetsk region	236.3	219.6	225.5	228.6	230.3	232.3	232.4
Tambov region	191.8	196.4	193.4	185.4	178.0	178.8	179.1

Table 3 – Consumption of milk and dairy products (in terms of milk of the established fat content) per capita, kg

It is calculated according to Russtat [5]

Thus, according to the recommendations of the Ministry of Health and Social Development [2] the consumption of milk and dairy products in terms of milk has to constitute from 320 to 340 kg. The World Health Organization of the UNO recommends to consume 360 kg.

Orientation to modernization of dairy cattle breeding based on the loan of foreign technologies, the milking equipment, forage equipment, selection achievements, etc. shows that ensuring competitiveness of domestic milk and growth of investment appeal of the branch is impossible without the essential state support and wide use of innovations [4].

The major factors constraining the development of dairy cattle breeding are the following:

- a high capital intensity of the branch at a high cost of investment resources and long payback periods of investments;
- monopolism of the overworking enterprises in the market of milk and a serious pressure upon small processors on the part of network structures;
- the deepening disparity of prices on milk and the resources necessary for its production;
 - instability of purchase prices on milk;
 - low level of natural fodder grounds efficiency;
 - limited opportunities of increasing a genetic potential of a dairy herd and introducing innovative developments, etc.

At the same time it should be noted that nowadays in the Russian Federation there are quite favorable prerequisites of the development of dairy cattle breeding. We can see an active process of modernization of existing farms and the construction of new dairy complexes; an increase in demand for sour-milk and ecologically safe dairy products is observed. The selection work aimed at increasing a productive potential of dairy cattle has been sped up; leasing of breeding dairy cattle is developing; the guaranteed support of the branch within the State program for 2013-2020 has been declared; there is a high potential of natural fodder grounds,

which hasn't been realized yet.

Essential reserves of growth of the milk production efficiency are in the optimization of food supply of the branch, the reduction of forage losses and its qualities. Other important issues are an increase of diversification of forage, deepening of dairy specialization of agricultural producers, development of the relations of production cooperation and agro-industrial integration, improvement of agrarian structure of economy and providing a rational combination of large, average and small forms of managing [1].

We can achieve the improvement of quality management of dairy production using modern information technologies and the formation of an adequate system of information support [3].

Farms of the population can become an additional source of accumulation of volumes of milk production. But this can become possible if there is a possibility of preparation of high-quality rough and juicy forage and a pasture of cattle during spring and autumn periods on the improved pastures; the formation of infrastructure of milk preparation at support prices; possibilities of acquisition of the breeding young by the population with a high dairy potential on favorable terms; the organization of an effective system of zoo veterinary service of farms of the population; ensuring access to preferential credit resources, inclusion farms of the population to a system of subsidizing commodity milk production [4].

Список литературы:

1. Алексеева Н.В. Перспективы развития аграрной структуры регионов Центрального Черноземья / Н.В. Алексеева // Вестник Воронежского государственного аграрного университета. – 2014. – Вып. 4. (43). – С. 197-204. (1,00 п.л.)
2. Рекомендации по рациональным нормам потребления пищевых продуктов, отвечающим современным требованиям здорового питания: утверждены приказом Министерства здравоохранения и социального развития РФ № 593н от 2.08.2010 г. [Электронный ресурс] // Информационно-правовой портал Гарант. – Режим доступа: <http://www.garant.ru/hotlaw/federal/281637/>
3. Улезько А.В. Приоритетные направления инновационного развития регионального АПК / А.В. Улезько, А.В. Климов, Д.И. Бабин // Региональная инновационная система: состояние, проблемы, направления формирования: сб. науч. тр. – Елец: ЕГУ им. И.А. Бунина, 2013. - С. 132-141.
4. Улезько А.В. Современное состояние производства молока в Воронежской области / А.В. Улезько, А.А. Тютюников, А.С. Ясаков // Потенциал развития российского АПК: сб. науч. тр. по итогам работы межрегион. науч.-практ. конф. – Воронеж: ВГАУ, 2013. – С.

245-250.

5. Центральная база статистических данных [Электронный ресурс] // Официальный сайт Федеральной службы государственной статистики. – Режим доступа: [http:// www.gks.ru/dbscripts/cbsd/#1](http://www.gks.ru/dbscripts/cbsd/#1)

УДК 330.34:631.11

Meshkova I.N.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE QUESTION OF CHOICE DEVELOPMENT STRATEGY OF AGRICULTURAL ENTERPRISES

Аннотация. В статье рассмотрены проблемы выбора стратегии развития сельскохозяйственных предприятий, представлены подходы к задачам их обоснования. Классифицированы эталонные стратегии с точки зрения возможности их применения в качестве базовых для сельскохозяйственных предприятий.

Ключевые слова: стратегия развития сельскохозяйственных предприятий, базовые и эталонные стратегии, Закон о стратегическом планировании, классификация эталонных стратегий.

The large number of researches is devoted to problems of choice development strategies of the enterprises. It's connected with the value of strategic planning as instrument of enterprise development. Strategic planning hasn't included in the practice of the majority subjects of agribusiness yet. However, without the development of science-based development strategy it's impossible to overcome the crisis and lay the foundation for the advanced development of the agricultural sector.

In economic literature there are several approaches to problems of justification of development strategy of enterprises.

One scientist considers that the basis of the development strategy should be based on the market position of the company. It includes three main variants for development of the market strategy.

The first of them is connected with leadership in minimization of costs of production, the second – with specialization in production, the third – with fixing a particular market segment and focus the company on it.

The first relates to the leadership to minimize production costs, and

the second - with specialization in production, the third - with the fixing a particular market segment and focus the company on it. [3]

Other groups have offered to take into account structural changes in the external environment, the third note importance of high-quality changes in region economy [2].

The problem of choosing the development strategy of the enterprise belongs to problems of decision-making with alternative options. To make a choice of the best strategy, the person making this choice has to have a clear view of the purpose which achievement will be served by the chosen alternative. Thus it is necessary to define criteria by which the assessment of alternative options will be carried out.

In practice, to determine the general direction of development of the enterprise should be applied reference or base development strategies. Within basic strategy some components are formed: the main directions of the general development are specified; strategic spheres of activity are defined; ways of achievement of goals are located.

Basic strategy of planning have to be realized in organic interrelation with system of the functional strategies reflecting concrete ways of achievement of the planned purposes of separate divisions and services of the enterprise [1].

We have analyzed formation of strategy at the level of the agricultural enterprises.

In order to study the influence of external operating conditions of the agricultural enterprises, we took the Ternovsky district of the Voronezh region as object of research.

The area has pronounced agrarian specialization. The agriculture is presented by 16 agricultural enterprises, 52 country (farmer) farms and personal farms. The main direction of agricultural production is the plant growing.

In cattle breeding decrease in a livestock of a cattle is still not stopped, takes place low efficiency of cattle.

Investment attractiveness of the area for many years remains rather low. That is connected, first of all, with the advancing level of development of the neighboring territories, a low level of development of transport infrastructure of the area, limited number of highly qualified personnel.

To assess the strategic management and to identify the main factors affecting the economic efficiency of the region, we used a methodology of PEST- analysis. The technique purpose is detection of the political, economic, social and technology factors rendering crucial importance on activity of the area.

Among political factors, changes in a trade policy of the state and its restrictions on import (tab.) have the greatest impact.

From economic factors the greatest threat is posed by change of exchange rates, rates of inflation and the income of the population.

In group of socio-cultural and technology factors it is necessary to allocate such factors as improvement of a level of quality of life of the population and progress in efficiency of use of raw materials and materials.

The analysis showed that the development strategy and planning of future activities of the Ternovsky district must take into account the impact of these factors. It is also necessary to make efforts for decrease in their negative impact to efficiency of activity.

Description of a factor	Influence of a factor	Mark					Average mark	Average weighted mark
		1	2	3	4	5		
Political factors								
Stability of the political power and government	2	2	1	2	3	2	2.0	0.16
Tendencies to regulation of branch	2	2	3	3	2	3	2.6	0.21
Quantitative and high-quality restrictions of import, trade policy	2	4	3	2	4	3	3.2	0.26
Economic factors								
Rate of inflation	2	3	4	4	3	3	3.4	0.27
Exchange rates	3	5	5	4	5	5	4.8	0.58
Level of the income and its distribution	2	3	4	4	2	3	3.2	0.26
Growth of employment of the population	1	2	3	3	3	3	2.8	0.11
Socio-cultural factors								
Relation of consumers to import goods and services	1	2	2	3	2	1	2	0.07
Relation of consumers to natural products	1	2	3	3	2	2	2.4	0.10
Improvement of a level of quality of life of the population	2	3	3	3	3	2	2.8	0.22
Technology factors								
Level of innovations and technological development of branch	2	1	2	2	1	1	1.4	0.11
Access to the latest technologies	2	1	1	2	2	2	1.6	0.13
Progress in efficiency use of raw materials and materials	2	2	3	2	2	2	2.2	0.18
General total	25	-	-	-	-	-	34.4	-

Table 1 – An assessment of probability of change factors included in PEST analysis

Thus, the development strategy is the most important component of

activity of the agricultural enterprise. In modern conditions the main goal of strategy consists in achievement of long-term competitive advantages which will provide a survival and steady functioning of the enterprise in the future.

Список литературы:

1. О стратегическом планировании в Российской Федерации. Федеральный закон от 28 июня 2014 г. N 172-ФЗ (дата обращения 15.10.2015).
2. Анохин Д.С. Формирование стратегии развития сельскохозяйственных предприятий в системе отраслевого стратегического планирования. Автореферат дис. канд. эк. наук. – Ставрополь: СГАУ, 2013. – 22 с.
3. Виханский О.С. Стратегическое управление: учебник / О.С. Виханский – 5-е изд., перераб. и доп. – Москва: Гардарика, 2014. – 296 с.
4. Долятовский Л.В. Метод выбора оптимальной стратегии развития фирмы // Инженерный вестник Дона. – 2013. – №6. – С.25-28
5. Терновых К.С. Планирование на предприятии АПК / К.С. Терновых, А.С. Алексеенко, А.С. Анненко и др.; Под ред. К.С. Терновых. – Москва: КолосС, 2007. – 333 с.
6. Пошаговая инструкция по проведению PEST-анализа. [Электронный ресурс] URL: <http://powerbranding.ru/biznes-analiz/pest/example/> (дата обращения 15.10.2015)

УДК 338.984

Milovidov A.A

Research institute of economy and organization of agroindustrial complex of the Central Chernozem area of Russian Federation, Voronezh, Russia

IMPROVING BUSINESS PLANNING IN ENTERPRISES

Аннотация. В статье показана необходимость бизнес-планирования. Определены практики и процессы бизнес-планирования.

Ключевые слова: бизнес-планирование, бизнес-план, предприятие, менеджмент.

Business planning is an independent type of planning activities,

which is directly related to business.

Foreign practice of running companies, which achieved significant business success, among many management methods used by uses business planning. Leaders of these companies have mastered the basic methodological approaches to business planning and effectively implement their system logic in their daily management activities. Thanks business planning they learned to distinguish the main development priorities, monitor and effectively manage resources, predict likely changes in business, address the issues of funding. Systematically conducted research activities of foreign firms show that the causes of the absolute majority of bankruptcies are failures or lack of business planning.

However, the use of business planning for the development and validation of management solutions in Russian enterprises - is an exception rather than a rule. Many entrepreneurs do not yet have a possibility, and some just cannot deal with business planning at least for a year. Practice shows that most managers still do not know methodology and philosophy of business planning and are skeptical about its usefulness. At the same time the need for a radical change in management is long overdue. A large part of industrial enterprises "lies" and branches of light and food industry revived mainly owing heightened market conditions. At the same time they use the same inefficient management. Possible adverse changes in market conditions and economic conditions in the country, lack of development of the Russian financial and credit markets will not allow "stagnation" management of even prosperous companies to maintain their potential.

Today the Russian market is developing rapidly, and it's becoming increasingly difficult to make enormous profits, focusing on some chance and improvisation. The planning process helps businesses to think and prioritizes management efforts between problems solve and also rationally allocate the necessary resources and optimize the economic performance of the firm. It is better to postpone the ill-considered action, requiring a lot of resources than to face a situation of failure because of their lack of implementation. As a rule, a major resource is funds, the lack of which often leads to a revision of the company's strategy. Here, the key role belongs to the financial section of the business plan. The use of decision-making support model brings enterprise management to significantly algorithmized process similar to the management of complex technical systems.

Consequently, we found out that the business plan together with the model becomes a tool for forecasting performance of the company and management. Participation in the implementation of the business plan of management personnel at various levels helps it define its role in the business and improve the efficiency of operations and mutual coordination,

and ultimately teaches and develops organizational skills of the management. Teaching Management in the market is essential for effective development.

In this regard, there is one more argument in favor of the development of the business plan of the company. For management value of the process of preparing a business plan is no less important than the business plan itself. Instead of training on expensive real life experiments, the business plan enables management to avoid some fatal errors cost a few hundred hours of concentrated analytical work. Only understanding this allows you to come to the effective use of business planning in the management practice.

In a market is impossible to achieve sustainable business success if you do not plan its development, effectively constantly accumulate information on your own conditions and prospects, on the state of the target markets, the situation with your competitors and so on.

Not only must you accurately understand your needs for the future in material, labor, intellectual and financial resources, but also provide their sources, be able to identify the effectiveness of the use of resources in the enterprise.

Today, most commercial companies have no formal plans adopted, there is no required scheduling mechanism: different kinds of norms, standards and so on. Planning is replaced by a different kind of decisions of the owner also those or other directions of economic activity, which are usually designed for the next period and do not provide orientation for the future. This is due to the rapid changes in the market sense situation and economic conditions, small number of managerial staff in small businesses, the authority with substantial experience in economic management, although the practice often of executives at large enterprises, having brings them to a deadlock.

Thus, the essence of business planning is manifested in solving strategic and tactical challenges facing the company, in an objective assessment of their own business firms, and in that the business plan is an essential tool for project and investment decisions in accordance with the needs of the market and the current economic situation.

Список литературы:

1. Акофф Р. Планирование будущего корпорации. - М.: Прогресс, 2010.
2. Алексеева М. М. Планирование деятельности фирмы. - М.: Финансы и статистика, 2007.
3. Алексеева М.М. Планирование деятельности фирмы: Учебно-методическое пособие. – М.: Финансы и статистика, 2007

УДК 636.084.11

Miroshnikov A. S.

Research institute of economy and organization of agroindustrial complex of the Central Chernozem area of Russian Federation, Voronezh, Russia

FEATURES OF FEEDING CALVES IN THE FIRST DAYS OF LIFE.

Аннотация: В данной статье представлены проблемы развития новорожденных телят из-за не правильного кормления. Предлагаются эффективные способы кормления телят от рождения до полного взросления.

Ключевые слова: пищеварительная система, продуктивность животных, выращивание телят.

Rearing calves remains the most challenging area in the work of a livestock specialist since the level of morbidity and mortality has been high. So far calves in contrast to the young pigs and poultry have a complex multi-chamber stomach, also comprising intervals (tripe, mesh, book) that develop during the milk period and to a large extent determine the specificity and complexity of approaches to feeding calves.

The formation of calves, the type of metabolism and the development of the digestive system are influenced by many factors. However, the most practical interest is the question of how the feeding of calves with some or other fodder affects the phenotype and the level of subsequent productivity of adult animals.

Recently there appeared in the literature the term "acceleration" of the rumen, which implies the need to increase the total area of stimulation of the mucous membranes (increase of absorption capacity) and the rapid increase of its volume from an early age of calves.

Highly effective approaches to feeding calves intended to "accelerate" the rumen should be based on specialists, clear understanding of the nature of changes in their digestive system, according to the growth and development. In the process of transformation of the type of digestion in young cattle there are three periods.

The first one is monogastric or propylactic period (about three weeks) that the rennet-enteric (intestinal primary) type of digestion, characteristic of monogastric animals (pigs, dogs, and so on.).

The second is a mixed development period of stomach (from three to four weeks to complete weaning), that is in addition to the primary digestion there processes of formation of mucous stomach (rumen, books, nets), the rate of which, especially the rumen depends on the type of fodder fed.

The third is the period after drinking milk (from the time of weaning age and older), when the type of ruminant digestion dominates the primary intestinal.

You can talk about the three most effective methods aimed at an accelerated development of pancreatic digestion in calves. This means early teaching them to mixed fodder; constant access to fresh water; Artificial fauna by feeding rumen contents of healthy and mature animals. Additional factors that facilitate the normal development of the digestive system as a whole, can be attributed to the use of feeding calves with probiotics, prebiotics, acidifiers, coccidiostats, enzymes and other additives. And no one doubts this

Early Schooling calves to granular Prestarter additives, Prestarter dry mixtures. Hay traditionally used in the feeding of calves is a good source of natural fauna rumen. However, it is almost not digested by calves at the of up to a month, and then it's digestibility gradually increases. But of the effect whole hay on the development of the rumen walls (absorption capacity) is inferior to quality grain concentrates. So at the beginning of this century, many researchers have begun to recommend to feed calves with hay only at the age of 1 - 1.5 months. According to the US experts, if the initial dry fully mixed diet (granulated alfalfa, bran, cereals, etc.) contains more than 25% neutral detergent fiber (in terms of crude fiber - more than 13%), then they can do without hay.

In a newborn calf the rennet occupies almost 60% of the total volume of the stomach, and in an adult animal - only 7-8%. A different pattern is observed in the rumen: in a newborn calf it reaches 25%, and in an adult animal - up to 80%.

In the United States, where they milk more than 9,000 kg of milk per cow, even at the end of the last century attention was focused on the fact that weaning calves from the mother's milk later than 8 weeks leads to higher costs. According to the American breeders, weaned calves diet

based on forage and concentrates is generally cheaper than milk and its substitutes. In addition, as long as the young consume milk, their growth is limited. Their weight increases after weaning, provided the calf is properly adapted to the diet of roughage. The same conclusion was reached by Russian scientists who have studied feeding the fodder Prestarter "Fast and the Furious" and starter K711 to calves of black-motley breed with the future productivity of cows of more than 7000 kg of milk per year and steers, fattened to produce white veal.

Permanent access to fresh clean water. Water entering directly into the rumen unlike milk is of great importance for the development of a tiny calf. Rumen of 1 kg of live weight calves consume 3-4 times more water than adult animals with the rate. If there is a sufficient amount of water, in the rumen there may be intensive bacteria that cleave digestible carbohydrates of the feed, resulting in formation of volatile fatty acids acetic, propionic and butyric. They irritate the intestinal wall, stimulate the growth of the villi. The sooner the calf begins to drink water, the faster he will develop a rumen. The animal will start to eat more herbal feed. This fact is clear enough, but in many households it is the lack of water consumption that is the cause of problems in the young. An average demand of calves in water is about 10% of weight.

It is especially important to observe an uninterrupted supply of water in summer, as well as at night, when they receive a ration, against the background of growth of palatability at the age of three weeks. In case of partial transfer to another type of feeding, the amount of water youngsters drink can be significantly increased. During weaning from milk calves can drink more than 9 liters of water per day.

Due to lack of moisture calves become sluggish, less active, which is accompanied by diarrhea, that can't be treated medically.

Fauna Typically, useful cellulose lytic organisms begin to colonize the rumen from the second week of life. The walls of the rumen at this time are too thin and smooth, the villi are not formed yet.

To populate the rumen of a calf with microflora, it is necessary to provide nutrients. If it is fed with milk only or substitute for, thanks to the formation of esophageal reflex trough these products get directly into the abomasum. Increased consumption of the feed mixtures by a calf in early life leads to a better functioning of the rumen both through the microbial population and the suction function. With the growing consumption of the starting diet the secretion of the pancreas, will increase, in particular, the development of pancreatic amylase enzyme, which is needed to degrade

starch. The development of the rumen leads to greater consumption and better assimilation of grain starting diet, which results in more intensive growth of the calf.

A well-functioning rumen can also serve as an important line of defense against intestinal pathogens that cause diarrhea in calves.

Список литературы:

1. Комбикорма 2015 И. Панин Искусство составления рационов кормления. Стр. 59.

2. Комбикорма 2014 А. Чулков «Разгон» рубца у телят – фундамент для реализации генетического потенциала. Стр. 51.

УДК 338.26.015

Panin A.I.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

ASSESSMENT OF FACTORS OF MACRO-ENVIRONMENT OF THE ENTERPRISE WITH APPLICATION OF THE TECHNIQUE OF PEST ANALYSIS

Аннотация. В данной статье дается оценка макро-экономических факторов типичного сельскохозяйственного предприятия Воронежской области. Оценка основана на результатах PEST-анализа. Определяются наиболее важные факторы, влияющие на экономическую эффективность предприятия.

Ключевые слова: стратегическое планирование, PEST-анализ, качественный анализ, макро-экономические факторы, оценка эффективности изменение степени влияния факторов, сельскохозяйственное предприятие, Воронежская область.

One of the most important conditions of implementation of strategic planning at the enterprise and identifications of the major factors having impact on economic efficiency of functioning of the studied commercial organization is the general assessment of factors of environment. [4, page 189]

This assessment includes: 1) carrying out a qualitative analysis of the macro factors of the company using the procedure PEST-analysis; 2) assessment of the probability and extent of changes in the importance of factors included in the PEST-analysis; 3) assessment of materiality of analyzed environmental factors for the enterprise. [1, p. 204]

The objective of this research was identification of the major factors of a macro-enterprise rendering crucial importance on results of its financial and economic activity. The typical agricultural enterprise of the region – ACM "Ternovskaya" of Ternovsky district of the Voronezh region was chosen as an object of research. [3, page 31-35] Results of PEST analysis are presented in table 1.

Socio-cultural factors	Political factors
<ul style="list-style-type: none"> - The developed network of social establishments - Level of the natural and mechanical movement of the population - Improvement of a level of quality of life of the population - High consumer demand - Relation to natural and environmentally friendly products 	<ul style="list-style-type: none"> - Legal acts of local authorities and central government - Support from the state - Implementation of the municipal target program on the territory of the municipal area - Antimonopoly Legislation - Monetary policy
Economical factors	Technological factors
<ul style="list-style-type: none"> - Existence of large transport arteries - Growth of employment of the population - Taxation level - Rate of inflation - Level of the real income of the population and their distribution - Competition in the industry 	<ul style="list-style-type: none"> - The level of innovation and technological development of the industry - Access to the latest technologies - The degree of use, deployment and transfer of technology - Progress in efficiency of use of raw materials and manufactured materials

Table 1 - Key environmental factors influencing the activity of ACM "Ternovskaya" identified with the help of PEST – analysis

In table 1 all the factors were grouped into four social and economic spheres. That allowed us to apply a system approach to selection of factors, to exclude their duplication, to gain a clear idea about strengths and weaknesses of the studied organization in each of the spheres considered.

Nevertheless, it is obvious that both groups, and separate factors are characterized by a different degree and importance of influence on efficiency of activity of the enterprise studied.

In this regard, collection of information on dynamics and nature of change of each factor, and also an assessment of the importance and extent of influence of each factor became the following stage of carrying out PEST analysis.

Description of a factor	Influence of a factor	Expert review					Average rating	Estimation adjusted for weight
		1	2	3	4	5		
Political factors								
Regulations of local authorities and central government	3	5	5	4	3	5	4.4	0.53
Support from the state	3	3	3	3	2	3	2.8	0.34
Implementation of the municipal target program on the territory of the municipal area	1	2	1	2	2	2	1.8	0.07
Socio-cultural factors								
Requirements to quality of production	2	2	2	3	2	1	2	0.16
Relation to natural and environmentally friendly products	1	2	3	3	2	2	2.4	0.10
Improving the quality of life of the population	2	3	3	3	3	2	2.8	0.22
Economic factors								
Rate of inflation	2	3	4	4	3	3	3.4	0.27
Competition in the industry	2	2	2	3	1	2	2	0.16
Income levels and distribution	2	3	4	4	2	3	3.2	0.26
The growth of employment		1	2	3	3	3	2.8	0.11
Technological factors								
The level of innovation and technological development of the industry	2	1	2	2	1	1	1.4	0.11
Access to the latest technology	2	1	1	2	2	2	1.6	0.13
Progress in the efficiency of the use of raw materials	2	2	3	2	2	2	2.2	0.18
Grand total	25	-	-	-	-	-	32.8	-

Table 2 – The assessment of probability of change and degree of the importance of the factors included in PEST analysis

In the calculation of table 2 indices, the power of influence of each factor was evaluated according to a scale from 1 to 3, wherein:

1 point means that the impact of the factor is small, any change in the factor does not significantly affect the company's activities;

2 points - only significant change of the factor affects the sales and profits of the company;

3 points - the impact of the factor is substantial, any fluctuations cause significant changes in the sales and profits of the company.

The assessment of probability of fluctuation of factors was carried out by means of a method of an expert assessment [2, page 158]. Thus, the five-point scale was applied where:

1 point means the minimum probability;

5 points mean the maximum probability of change of the

environmental factor studied.

During synthesis of the data presented in table 2 the assessment of importance of influence of the considered factors in table 3 was carried out.

Factor	Estimation adjusted for weight	Factor	Estimation adjusted for weight
Political		Economical	
Regulations of local authorities and central government	0.53	Rate of inflation	0.27
Support from the state	0.34	Income levels and distribution	0.26
Implementation of the municipal target program on the territory of the municipal area	0.07	Competition in the industry	0.16
		The growth of employment	0.11
Socio-cultural		Technological	
Improving the quality of life of the population	0.22	Progress in the efficiency of the use of raw materials	0.18
Requirements to quality of production	0.16	Access to the latest technology	0.13
Relation to natural and environmentally friendly products	0.10	The level of innovation and technological development of the industry	0.11

Table 3 - Assessment of materiality of factors affecting the economic efficiency of the enterprise

On the basis of the data obtained, it is possible to draw a conclusion that among political factors changes in regulations of local authorities and the central management can have the greatest impact.

Among economic factors the greatest threat is posed by inflation rates change and changes in level and distribution of the population income.

In the group of welfare factors the improvement of the level of quality of life of the population has the greatest impact.

Among technological factors it is necessary to pay attention to such factors, as progress in efficiency of the use of raw materials and manufactured materials.

Therefore, when working out a strategy of development and planning further activity of ACM "Ternovskaya" it is necessary to take into consideration the influence of the listed factors and to make efforts to decrease their negative influence on the results of financial and economic activity of the organization studied.

Список литературы:

1. Басовский, Л.Е. Современный стратегический анализ: Учебник / Л.Е. Басовский. – М.: НИЦ ИНФРА-М, 2014. – 256с.
2. Гиляровская, Л.Т. Анализ и оценка финансовой устойчивости коммерческого предприятия / Л.Т. Гиляровская. – СПб.: Питер, 2010.

– 256с.

3. Панина, Е.Б. Диагностика финансового состояния предприятия и оценка вероятности его банкротства / Е.Б. Панина, А.И. Панин // Перспективы развития экономики и менеджмента: сборник научных трудов по итогам Международной научно-практической конференции 3 июля 2015г. (г. Челябинск). – Н.Новгород: Изд-во ООО «Ареал», 2015. – С. 31-35.

4. Панина, Е.Б. Перспективы и стратегия развития Павловского района Воронежской области в сфере сельского хозяйства / Панина Е.Б., Панин А.И., Якушова Е.И. // Актуальные проблемы социально-экономического развития экономических систем [Текст]: материалы V Всероссийской научно-практической конференции 18 – 19 декабря 2014г. / редкол.: С.В. Семененко [и др.]. – Воронеж: Издательско-полиграфический центр «Научная книга», 2015. – С. 188 – 197.

УДК 339.137.22

**Saprykin V.R.,
Zakshevskaya T.V.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

REASONS FOR THE MARKETING DECISION CONCERNING IN-SITU MILK PROCESSING

Аннотация: В статье рассматриваются возможности предприятия – производителя молока по его переработке, выявленные в ходе маркетингового исследования. Дана оценка конкурентных преимуществ, которые предприятие получает в результате внедрения собственной переработки, а также экономическая оценка результатов этого внедрения по трем вариантам с разными масштабами и спецификой производства продукта.

Ключевые слова: молоко, сыр чечил, потребление, собственная переработка

Contemporary global economic and politic conditions cause the risk of failure of Russian agricultural manufacturers to fulfil 6the required indicators of National Programmes for self-sufficiency with milk and dairy products. That is why the design of the measures for efficiency growth in dairy sub-complex of agriculture becomes the one of utmost importance.

We can be sure that the self-sufficiency level for milk in Russia in 2013 was one of the lowest among the other agricultural products - 77% while the Doctrine of Food Safety requires at least 90%.

At the level of companies we also can undertake some steps toward the satisfaction of the population's demand for dairy products and the improvement of a company's competitiveness. The object of our research was "Agrofirma "Tikhiy Don", Ltd., located in Zadonsk district of Lipetsk region. During the last four years milk took about 20 % in the structure of market goods cost of this company.

The company has very limited choice of market outlets for milk (see fig. 1). In fact, there is only one such outlet as the sales to the company's employees should be considered as non-profit, for the price of milk here is equal or below its cost.

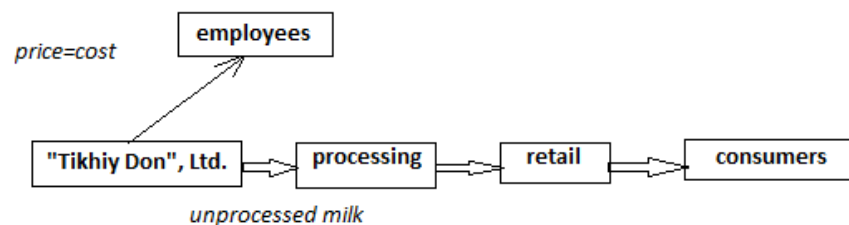


Fig. 1 – Market outlets for milk, "Agrofirma "Tikhiy Don", Ltd.

Milk is not a highly profitable commodity for the company, but the general tendency is positive. Price of milk has been growing much faster during the last four years than its cost, so, as the result, the profitability level increased by 16 percentage points.

The key principle of marketing is to present such commodity to the market which the consumer wishes to buy in order to satisfy his needs, instead of trying to sell the commodity which the company managed to produce regardless the existing demand. That is why to make the decision concerning which commodity "Agrofirma "Tikhiy Don", Ltd. should bring to the final consumer market, we first of all have done the market research.

By means of circulating the questionnaire through Internet social networks, we interrogated 248 people in Zadonsk, Yelets, Lebedyan', and Usman' districts of Lipetsk region. Starting our research we assumed three possibilities for in-situ milk-processing for the company in question – production of preserved milk products (tinned milk and dry milk), production of fermented dairy food (such as yogurt, fermented baked milk, etc.), production of cheese. The first group of products was dismissed by the very first question as it was found out that some part of the population does not buy preserved milk products at all. So, we had to choose between the second and third decisions and the choice was made based on the ways of the product consumption. The research demonstrated that there are various ways to consume cheese and it may even be given to children

(except for babies, of course).

Thus, we decided on the traditional Armenian smoked Chechil cheese (also known as “plated cheese”). It was found out that 28.2 % of people included in the research buy this cheese quite regularly, the majority consumes it as a snack, with beer or for a light meal without any connection with alcohol (fig. 2).

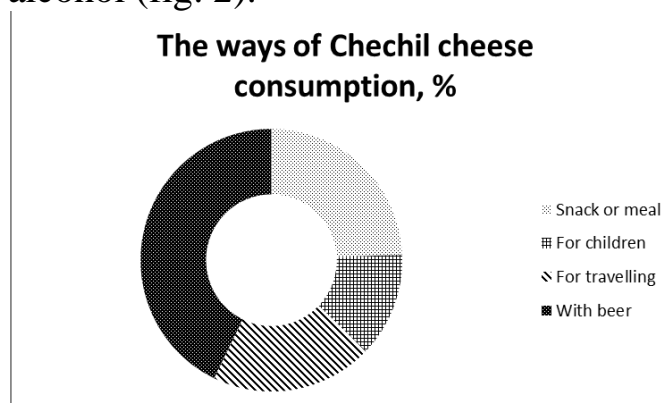


Fig. 2 – Distribution of Chechil cheese consumers in terms of consumption ways

As a result of our research and also based on the information we possess about the market situation and specific features of production and storing of cheese, including smoked cheese, we drew certain conclusions concerning competitive advantages and disadvantages of this method of milk processing for the conditions existing in Lipetsk region. The advantages and disadvantages of the suggested project of Chechil cheese production by “Agrofirma “Tikhiy Don”, Ltd., are shown in the table 1.

Item	Advantages	Disadvantages
Competition	Almost no barriers for market entry	Many competitors, small business
Demand	If we consider the sample to be representative, the Lipetsk region market capacity (excluding Lipetsk itself) is 1289 tons per year	Should all produced milk be processed production is 85.65 t per year (6.6 % of the market capacity)
Product features	The commodity has quite lengthy sell by (up to 90 days for smoked cheese), convenient small packages of – 0.1-0.4 kg	
Price	Our price can be comparatively low Small packs reduce the negative impression of the price per kilogram as the buyer just does not notice it	As any other cheese this product is rather expensive with retail price 600 – 750 rubles per kg
Sale	Due to long sell by and absence of special requirements for storing any way of delivery within the region is available	

Table 1 – The advantages and disadvantages of the project of Chechil cheese production by “Agrofirma “Tikhiy Don”, Ltd.

As the table 1 demonstrates, the advantages are more numerous and important than disadvantages, so we suggest this product for “Agrofirma

“Tikhiy Don”, Ltd., for entering the final consumer market.

The key disadvantages concern price, while the lack of ambition to seize a considerable market share can be interpreted a competitive advantage for this company.

We suggested three variants of in-situ milk processing (table 2).

Variant #	Description
1	One-shift operation of the processing shop, 250 days per year, processing of 3200 centners of milk which is about half of the annual production of the company. The rest is to be sold unprocessed. The product is smoked plaited cheese
2	Processing of all produced milk with simple equipment (without purchase of a processing complex). Two-shifts operation of the processing shop, 8 hours a day, 268 days per year. The product is smoked plaited cheese, 200-300 g packs. Total cost of the equipment including the smokery is 380 ths rubles
3	Processing of all produced milk with purchase of a processing complex. Total cost of the equipment is 750 ths rubles. Two-shifts operation of the processing shop, 6 hours a day, 285 days per year. The product is unsmoked cheese in various forms – plaits, sticks, threads, etc.

Table 2 – Description of the three variants of in-situ milk processing by “Agrofirma “Tikhiy Don”, Ltd.

According to the performed survey, depreciation period for the required equipment is 5 years. However, despite considerable credit interest and the necessity to repay the debt within one year, the payback period was calculated to be 0.1 – 0.2 year for all three project variants (or 1.5 – 2.5 months). Profitability levels for the project variants are expected to be: for the variant 1 – 43.4 %, for the variant 2 – 56.2 %, for the variant 3 – 88.4 %.

Список литературы:

1. Боковая Н.В. Основы экономических исследований / Н.В.Боковая, О.В.Беспалова, М.Н.Волкова. – Воронеж, 2011.
2. Закшевская Е.В. Менеджмент: учебное пособие / Е.В. Закшевская, С.Н.Коновалова, Р.П.Белолипов. – Воронеж, 2013.
3. Закшевская Е.В. факторы повышения эффективности сельского хозяйства и развития сельских территорий / Е.В. Закшевская, Е.Н.Теплинская // Экономика и управление в аграрной сфере АПК: проблемы и решения: Сборник научных трудов. - Воронеж, 2013.
4. Маркетинг: Учебное пособие / [Е.В. Закшевская [и др.]. – М: КолосС, 2013.
5. Медеяева З.П. Концептуальные подходы к обоснованию стратегии развития региона / З.П.Медеяева, О.А.Барулева, И.И.Босая // Гуманизация образования. - 2014. - № 4.
6. Сабетова Т.В. Экономическое значение инвестирования в основной капитал российскими компаниями / Т.В.Сабетова,

Н.М.Шевцова // Стратегия устойчивого развития регионов России: сборник материалов XXVII Международной научно-практической конференции. – Новосибирск: Изд-во НГТУ, 2015.

7. Федулова И.Ю. Инвестиционная стратегия предприятия как составная часть стратегии развития / И.Ю.Федулова // Производственный менеджмент: теория, методология, практика. - 2015. - № 2.

8. Федулова И.Ю. Тенденции и результаты инвестирования в инновационную деятельность / И.Ю.Федулова, Н.М.Шевцова // Стратегия устойчивого развития регионов России. - 2015. - № 27.

УДК 330.111.4:33 0.14

Semenova Y.S.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

PROBLEMS OF CAPITAL STRUCTURE

Аннотация: Статья посвящена проблемам структуры капитала предприятий. Рассмотрены подходы к содержанию понятия структуры капитала, отражена сущность проблемы управления структурой капитала в аграрных коммерческих предприятиях.

Ключевые слова: капитал, структура капитала, предприятие, управление структурой, методы оптимизации.

One of the main goals that financial management of agrarian commercial enterprises sets is to provide sufficient and stable financing for their activity. Building an efficient capital structure for these companies is one of financial management's greatest challenges. This issue arouses obvious interest, for current economic managing conditions require a new approach to company management and, accordingly, to capital structure formation. Building an efficient capital structure is therefore the primary task for agro-industrial commercial enterprises.

Capital structure affects financial stability, potential clashes of interests of the owners, managers, creditors, as well as the value of the companies.

According to I. Blank [1], capital structure is the ratio between all the forms of a company's own and borrowed financial resources which the

company uses in its economic activities to back up the assets.

At present, most of economic scientists like I. Blank [1], A. Gavrilova [3] and others, are inclined to the opinion that the notion of capital structure should view all kinds of own and borrowed capital of the company. This makes it possible to significantly expand the area of an enterprise's financial activity for hands-on use of this theoretic concept, for it allows studying the special features of large as well as medium-sized and small-scale businesses whose access to the capital bond market is limited, alongside with providing these enterprises with recommendations. Besides, the above-mentioned interpretation allows connecting more closely the efficiency of investments with the efficiency of the capital assets they are invested in.

The question whether capital structure management in agrarian commercial companies is possible and expedient has long been disputed by the scientists.

Forming the optimal capital structure, i.e. establishing the most profitable ratio between a company's own and borrowed assets, presents the key issue of financial management. Many financial scientists dedicated their works to its solution, first and foremost M. Miller and F. Modigliani [2], who came to the conclusion that "in an efficient market, disregarding taxes, transaction costs and asymmetrical information, when individuals and firms can undertake financial transactions at the same prices, capital structure does not affect the overall valuation of the firm." This conclusion is grounded as follows. As the loan financing share increases, the financial leverage effect grows as well. Accordingly, the capital value grows and all the advantages of loan financing are nullified.

The essence of capital structure management lies in determining the ratio of using own and borrowed capital, that would provide the optimal proportion of the return on equity level and the financial stability level, i.e. would maximize the company's market value.

Today there are works that reveal some authors' opinions of capital structure optimization methods.

For instance, A. Gavrilova [3] enumerates the following capital structure optimization methods:

- based on maximization of the projected rate of return on equity;
- based on the analysis of the "earnings before interest and taxes – earnings per share" correlation;
- based on the capital value minimization.

The ultimate variant of the company's capital structure is formed in consideration of the above-mentioned criteria.

The following quantitative and qualitative criteria for optimal capital

structure justification are in use in special literature:

1. capital value minimization;
2. positive value of the financial leverage effect (the first concept);
3. return-on-equity maximization;
4. permissible level of the financial independence loss risk
5. preservation of the accepted capital structure type in assets funding policy;
6. the size of the net result of investment exploitation threshold value;
7. availability of credit to the extent required, etc.

Nowadays agrarian commercial organizations have no precise recommendations on capital management. Companies make the Production-financial activities plan. It is not recommended to put any capital calculations in the financial part of the plan.

There have been developed Methodic recommendations on the company's financial policy development which have been approved by Order №118 of the Russian Ministry of Economics of October, 1, 1997 "About confirming Methodic recommendations on the reform of enterprises (organizations)". It is advisable to use these recommendations for organizing modern financial management systems (financial management) in a company, as well as for developing a company's financial policy. The above-mentioned Methodical recommendations comprise a number of financial ratios and their standard values which are recommended for analytical work / activity analysis.

Financial accounting of agrarian commercial organizations contains the "Net assets" financial indicator which presents the real value of the organization's property, which is determined annually net of the company's liabilities and is calculated as the difference between the book value of all the assets and the liabilities of the company.

As can be seen there are no regulating documents for capital management in agro-industrial enterprises.

Список литературы:

1. Бланк И.А. Финансовый менеджмент / И.А. Бланк. – К.: Ника-Центр, 2010. – 478 с.
2. Ушаева С.Н. Капитал: содержание, формы, подходы к определению оптимальной структуры / С.Н. Ушаева // Вестник челябинского государственного университета. - 2008. - №1(102). - с. 163-173
3. Финансовый менеджмент: учебное пособие / под ред. А.Н. Гавриловой – 5-е изд., стер. – М.: КНОРУС, 2008. – 432 с.

УДК 338.43:338.242.4

Stashevskiy V.V.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE STATE AND NECESSITY OF GOVERNMENTAL SUPPORT OF RUSSIAN AGRICULTURE

Аннотация: В данной статье проводится анализ современного состояния, проблем и перспектив государственного регулирования агропромышленного комплекса Российской Федерации. В ходе исследования были выявлены потребность и значение государственной поддержки сельскохозяйственных товаропроизводителей в сложившихся условиях хозяйствования.

Ключевые слова: агропромышленный комплекс, государственное регулирование, государственная поддержка, продовольственная безопасность

The agro-industrial complex is considered as the strategic group of economic sectors and the basis for food safety provision for the country which is now under the conditions of intensive competition with foreign manufacturers whose goods are produced with great help in the form of governmental transfers. It increases the imports of goods, agricultural raw materials, equipment and machinery for agricultural production [2].

The development of Russian integration in global economy requires creation of effective public mechanism of governmental regulation of agricultural production and its international activities at the both national and regional levels. Such mechanism should be based on innovations and current legislation and be aimed at the realization of Russian economic interests and food safety of the country providing at the same time fast and efficient integration into the global food market. Whichever type of market activity of the global scale Russia would choose to realize, it will face the necessity for interaction, cooperation, and competition with foreign companies. The effect of such interaction, in its turn, requires governmental control and support for the agro-industrial complex, study of the international experience of such support and appliance of the most effective examples conformed to national specifics.

Russian agriculture shall take its place in the global economy developing the branches where our country has comparative advantages. The facts represented in the figure 1 prove the existence of great potential

in Russian agro-industrial complex.

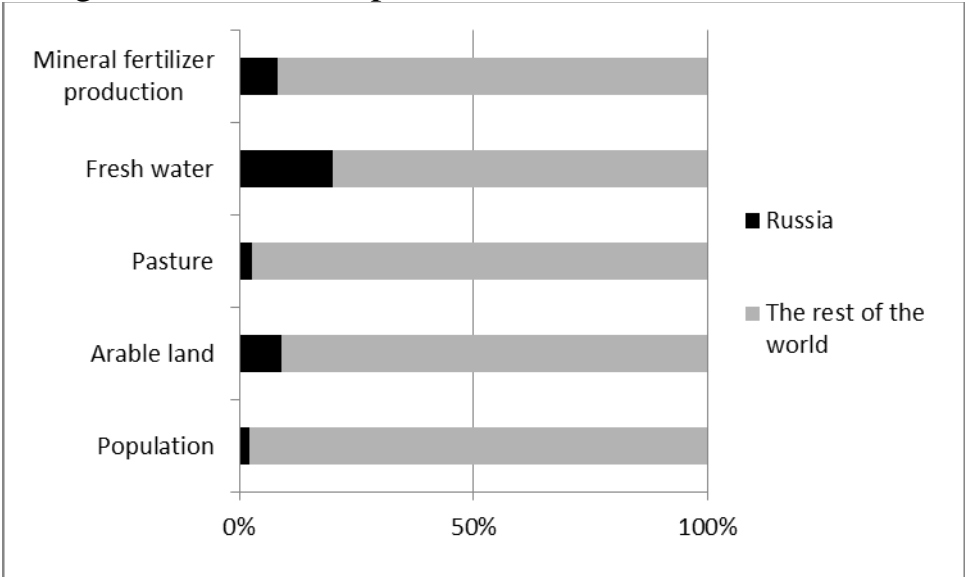


Fig. 1 – The potential of Russian agro-industrial complex

Despite this potential our country cannot achieve good competitiveness for its agricultural products without complex and reasonable economic and agricultural policy [2]. This policy should definitely include governmental support for agricultural manufacturers and probably also for processing companies, traders and manufacturers of machinery and equipment. Such support system is to be based on the principles shown in the figure 2.

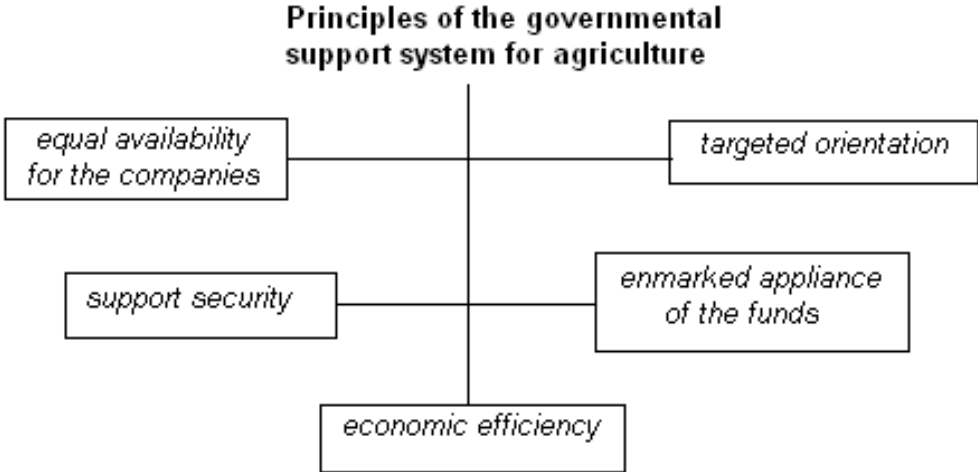


Fig. 2 – Principles of governmental support for agriculture

Among the planning and realizing of the anti-crisis means for agriculture and agro-industrial complex in general required for our country after entering WTO E.F Kartashov points out the three groups presented in the table 1 [4].

Group	Description	Examples
General means	Complex character and the objective of overcoming the technical backwardness and poor investment prospects	Credit and investment support and guarantees, agricultural insurance, development of agricultural science, etc.
Protective means	Domestic market protection means especially against import of products manufactured using governmental guarantees and direct transfers	Direct prohibition, strict veterinary and phytosanitary control, customs duties and other payments, direct transfers for the branches and companies participating in import-substitution
Development means	Domestic market development means	Control of processing and trading companies, reduction of the price disparity, etc.

Table 1 – Groups of anti-crisis means for agriculture

Still one of the most problematic aspects of the economic policy in agriculture is the methods for efficient distribution and use of the funds allocated for support of the agricultural manufacturers. Various approaches to unbiased estimation of the effect from the budget funds allocation are suggested, but the unified methods and indicators are still not agreed on. The lack of the methodic basis for support efficiency estimation leads to decrease of the control in this area. The situations where the funds are being ineffectively used or even not used at all can be observed as well as fund distribution among unviable or ineffective subjects.

Thus we can make the following conclusions. Governmental regulation of the economic processes in the agro-industrial complex and support for agricultural manufacturers and sometimes for processing, trading companies or other participants of this complex are truly necessary and also typical not only for the Russian Federation. Russian agriculture possesses good natural and industrial potential despite the lingering crisis, which may enable its innovative development and high competitiveness. However, Russian and foreign business practice proves that without governmental control and support at national, regional and local levels this potential cannot be fully realized. At the same time the definition of the indicator composition is required to assess the effect of such support, and through this – to improve the whole complex of the measures used for direct and indirect influence on the agro-industrial complex in order to achieve maximum and sustaining positive results.

Список литературы:

1. Волкова А.Г. Формирование кластеров на субрегиональном уровне как инструмент преодоления кризиса на территории / А.Г. Волкова, Т.В. Сабетова // Стратегическое развитие АПК и сельских территорий РФ в современных международных условиях: Материалы международной научно-практической

конференции, посвященной 70-летию Победы в Великой Отечественной войне 1941-1945 гг. (3-5 февраля 2015). Том 4. – Волгоград, 2015. - С. 184 – 187.

2. Карташов Е.Ф. Государственное регулирование внешнеэкономической деятельности агропромышленного комплекса региона / Е.Ф. Карташов // автореф. на соиск. уч.ст. к.э.н. – Казань, 2013. – 19 с.

3. Лебедев А.В. Некоторые особенности конкуренции в сельском хозяйстве / А.В.Лебедев, Т.В.Сабетова // Институциональные и инфраструктурные аспекты развития различных экономических систем: сборник статей Международной научно-практической конференции (10 декабря 2015 г., г. Челябинск) / в 2 ч. Ч. 1. - Уфа: АЭТЕРНА, 2015. – С. 258 – 261.

4. Федулова И.Ю. Тенденции и результаты инвестирования в инновационную деятельность / И.Ю.Федулова, Н.М.Шевцова // Стратегия устойчивого развития регионов России. - 2015. - № 27. - С. 70-74.

УДК 336.64

**Tkacheva Y.V.,
Marysheva Y.V.,
Ryabykh M.E.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

STRATEGIC ASPECTS OF CRISIS FUNCTIONING OF COMMERCIAL ORGANIZATIONS

Аннотация. В статье рассматриваются стратегические особенности функционирования организаций в кризисный период. Авторами предлагается подход оценки и выбора стратегического направления деятельности по типу балансирования потребностей и возможностей организации в покрытии их расходов.

Ключевые слова. Стратегия, финансовое равновесие, кризис, экономические циклы.

The feature of modern economy is its high susceptibility to the macroeconomic crises, which periodicity and depth depend on many factors. In spite of the fact that economies are searching of the lost height

after the world financial crisis of 2008 (Great Recession), world is on verge of new concussions.

The theory of crises designates four its kinds according to their periodicity [6]. There are four types of macroeconomic cycles:

1. Short-term cycles are Kitchin cycles. They are conditioned by the vibrations of world gold supplies every 3 – 4 years);
2. Medium-term cycles are Juglar cycles. They form in the money and credit in circulation every 7-11 years;
3. Long-term cycles are Kuznets swing, which relate to the building sphere, their periodicity is from 15 to 25 years;
4. Supercycles and Kondratiev waves periodicity varies from 45 to 60 years.

At the same time behavior of organizations of different industries and stages of development differs strongly and the chosen strategy of development determines it.

From the economic point of view strategy means long-runmost fundamental and important options, plans, intentions of enterprises' management in regard to production, income and charge, budget, taxes, capital investment, prices and other economic parameters [4]. All these elements can't be realized without a financial component. Zaporozhtceva L.A. marks that financial strategy can be realized by the effective attraction and using of financial resources, co-ordination of their flows, providing of necessary financial safety on the basis of running account of external and internal environment factors' changes [7].

In spite of the fact that internal crises regularity is conditioned by the theory of life cycles, the choice of behavior strategy is determined by resources requirement and possibility of their generating and attraction. Requirement and sources of their providing equality which gives to enterprise an ability to develop in accordance with prescribed parameters is named a financial balance. Inability of requirement and sources of its coverage balancing shows up in unprofitability of industrial and commercial activity, which forms financial insolvency of various degree. The financial insolvency is a result of the system of charge compensation action, which means that every ruble we've got accords the volume of charge or laid volume of profit.

There is the system of income and charge, which reflects their structure on the sign of the functional forming on a figure 1 [5]. According the economic maintenance a net profit is the cleared financial result of enterprise industrial and commercial activity. It performs the duty of own source of development and founders and shareholders reward providing, then it is a purposeful index, characterizing business expediency for a financial management. This statement is reflected at comparison of level

component profitability and branch component profitability.

Income and charge elements							
Proceeds	Value added	Gross-result of investment exploitation	Net-result of investment exploitation	Profit before tax	Net profit	Dividends (preference and usual shares) as payment to the owners on the allocated capital	
						Funds and backlogs of enterprise as sources of development and enterprise property height	
						Other as sources for providing of persons interests, who aren't connected with enterprise's ownership	
							Taxes and other payments from a profit as payment for commercial activity on the state territory
							Percents for a credit as payment for external capital
							Amortization as a cost of past labour
							Remuneration of labor with social withholdings as a cost of labour force
							The taxes not plugged in a prime cost as payment for different resources
							A cost of the purchased materials and services as payment for goods and services to the suppliers and contractors

Figure 1. The system of charge compensation of commercial organizations

The volume of income determines potential possibilities of internal and external resources attraction [3], as far as it provides coverage of charges on percents and crediting or coverage of expectations of owners.

We generalized the basic approaches to determination of enterprises strategies and providing of financial balance (B.A. Raisberg [1], etc.), we built the matrix of strategies of enterprises activity balancing (table 1). Strategy is determined by balancing character and level of charge compensation, terms and amount of intermediate points of result achievement.

Type of balance		Requirement volume	
		maximum	minimum
Mobilization of sourcing	minimum	“Prosperity”	“Waiting”
	maximum	“Aggressive development”	“Surviving”

Table 1. Strategies of requirement and enterprise financing possibility balancing

If attracted sourcings minimum and maximum requirement volume is

equal so an enterprise will use strategy “Prosperity”. It is characterized by possibility of hasty growth at increasing income.

If the same requirement volume is covered by the maximal volume of sourcing so an enterprise will use strategy of “Aggressive development”. It supposes high risk without any possibility of reserve sources attraction [2]. This fact especially sharply shows up on a cutting charge background.

Strategy “Surviving” implies providing of minimal requirement volume by maximal income of enterprise. Also this strategy shows differently directed dynamics of financial results’ increase. “Surviving” is near to bankruptcy and doesn’t have a long-term prospect, but many industries of unproductive sphere of economy stand like this long time.

“Waiting” is the most short-term strategy, because enterprises resort to it only in case of complete vagueness of economic situation. This strategy means that an enterprise doesn’t use all present sources and can also output it from a turn.

Actually a problem of the financial providing of enterprises activity can be taken to balancing of capital requirements and possibility of its attraction in crisis conditions. As a result bankruptcy, restructuring, targeted financing and credits, investment projects will determine the financial resources’ cost. Possibility of their attraction depends on ROA, however the resources’ cost rises practically always in crisis conditions. This fact brings to the height of the required level of profitability. If an enterprise has found this balance, its activity will be effective.

Thus, enterprise guidance and management independently decide what charges they can limit or ignore, but the consequences of exceeding of requirement above possibilities lead to the crash and disuse of the whole potential menaces the profitability decrease and interest losing of the subjects of the compensation charge.

Список литературы:

1. Курс экономики: Учебник / Под ред. Б.А. Райзберга.– М.: ИНФРА-М, 2004. – 672 с

2. Запорожцева Л.А. Стратегия устойчивого развития предприятия с учетом уровня его экономической безопасности / Л.А. Запорожцева // Социально-экономические явления и процессы. - 2014. - Т. 9. - № 10. - С. 47-54.

3. Ткачева Ю.В. Выручка как объект операционного анализа / Ю.В. Ткачева, Ю.В. Марышева, М.Е. Рябых // Финансовый вестник ВГАУ. - 1 (29). - 2014. - С. 21-29.

4. Райзберг Б.А. Современный экономический словарь /Б.А. Райзберг, Л.Ш. Лозовский, Е.Б. Стародубцева.- М.: ИНФРА-М, 2011

5. Ткачева Ю.В. Формирование несостоятельности

сельскохозяйственных предприятий в системе показателей финансового менеджмента / Ю.В. Ткачева // Финансовый вестник ВГАУ. - 2 (28). - 2013. - С. 31-35.

6. Liudmila A. Zaporozhtceva Conceptualization Lifecycle of Business Incubators / A.V. Agibalov, J.V. Tkacheva // Mediterranean Journal of Social Sciences – Vol. 6, No. 6 S7 (2015). – p. 300-308.

7. Запорожцева Л.А. Стратегическая экономическая безопасность предприятия: методология обеспечения. – Воронеж: Воронеж.гос. аграр. ун-т, 2014. - 261с.

УДК 658:331=20

Tyrnova E.S.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

INCREASING OF LABOR PRODUCTIVITY IS THE BASIS FOR ECONOMIC GROWTH OF COMPANIES.

Аннотация. В статье уточняются показатели производительности труда, раскрывается их роль для экономики предприятия. Проведен анализ производительности труда для ФГУП им А.Л. Мазлумова Россельхозакадемии, определены факторы, способствующие ее росту в будущем.

Ключевые слова: трудовые ресурсы, показатели производительности труда, мотивация труда.

Nowadays, the success of the company is measured not only by the figures of profit and loss, but also the efficient use of resources. One of the main indicators characterizing the performance of an enterprise is productivity. This is an economic category, which expresses the degree of fruitfulness of purposeful activity of employees. As productivity growth finds its concrete expression, particularly, in reducing the cost of living labor, so it is accepted to study the productivity of human labor and to determine the level of productivity of gross output per unit of expended living labor. While analyzing the use of labor resources other factors are considered:

- labor productivity per year (rub. / pers .);
- labor productivity per hour (cwt, tn, etc.);
- production by a human per year, a day;
- staff turnover.

An analysis of the use of labor resources at the enterprise named after A.L. Mazlumov in Ramon district, Voronezh region, is presented in the article. The company employs various groups of workers: skilled, presented by the leadership of various levels, experts, employees, skilled personnel in crop and livestock production, and unskilled (seasonal workers whom the company hires for an additional period of harvest).

To establish conformity of an employee with his or her position and tariffing, the company organizes certification of managers, professionals and employees. According to the results of the rating the Commission makes a recommendation to the employee's function suitability and the relation to this or that category of wages. Results of certification are reported to the director of the company during a week.

Let's examine the composition and the structure of labor resources of the company in Table 1. The tendency of total reduction of employees has been traced during recent years. The number of employees decreased by 26 people in 2014. This reduction mainly has touched upon such categories as tractor drivers from 20 to 17, specialists and employees from 18 to 14 and from 27 to 23. The number of other categories of employees was reduced significantly or remained unchanged. In 2014 the specific gravity of employees constituted 17.6 %, tractor drivers - 13.1% , specialists -10.8%.

Categories of employees	Periods						2014 г. % к 2012
	2012		2013		2014		
	чел	%	чел	%	чел	%	
Total (in the company)	156	100	154	100	130	100	83.3
Including employees engaged in agriculture	145	92.9	143	92.8	120	92.3	82.7
From them: tractor - drivers	20	12.8	18	11.7	17	13.1	85.0
operators of machine milking	11	7.1	11	7.1	9	6.9	81.8
cattlemen	8	5.1	8	5.2	11	8.4	137.5
Employees	27	17.3	27	17.5	23	17,6	85,2
Including: company leaders	7	4.5	7	4.5	7	5.3	100.0
Specialists	18	11.5	18	11.7	14	10.8	77.8
Part-time employees	8	5.1	8	5.2	7	5.4	87.5
Employees of trade and service	3	2	3	2	3	2.3	100.0

Table 1 Composition and Structure of Labor Resources of the Enterprise

To determine the level and dynamics of labor productivity at the enterprise it's necessary to calculate natural and cost parameters (Table. 2).

Indicators	Years		
	2012	2013	2014
The cost of gross output per employee, ths. Rub. / Person	623.7	328.0	582.5
Gross output has produced per 1 pers.rub. (in comparable prices)	399	213	448
Work done by an employee per year., pers.	2096	1935	1985
The level of the annual fund of working hours,%	1.0	0.90	0.95
The branch of crop growing			
There was received 1 pers., an hour.	3.8	2.1	3.1
- grain	2.5	2.4	2.1
- sunflower	-	-	0.7
- rape	-	-	-
The branch of animal breeding			
There was received 1 pers., an hour.	0.2	0.2	0.3
-milk	0.12	0.1	0.1
- growth of the cattle	0.02	0.15	0.02
- weight of calves at birth	-	-	-

Table 2 Indicators of Labor Productivity.

The data in table 2 show that the level of using the annual fund of working period is closed to 1, it indicates about complete use of labor resources in the economy. Efficiency of the labor resources has decreased. In 2014, there was produced on one employee at 7% of gross output less than in 2012. There is no clear tendency neither cost nor natural indicators. Motivation to work in the enterprise is carried out by two methods, economic, moral and psychological.

Economic methods are: bonuses of managers, professionals, workers of the main production are produced at the end of the year, depending on the achieved results of the enterprise, the size of the profit.

The moral and psychological methods are: the central office has a board of "Honour" with photos of the best employees. In addition, the stand for congratulations is organized, where congratulations with holidays, birthdays and special events are placed regularly. The Head of the company is actively practising meetings with workers at informal parties where he congratulates his colleagues on current holidays, successful activity, etc. The atmosphere at work is warm and friendly. The administration of the company is leading regular work to improve conditions of work and rest. Such activity promotes growth of labor productivity.

Список литературы:

1. Макарьева В.И., Андреева Л.В. Анализ финансово-хозяйственной деятельности организации. - М: Финансы и статистика, 2004 г.– 264 с.

2. Минаков, И.А. Экономика сельскохозяйственного предприятия - М.: Колос, 2004 г. - 528 с.

3. Шепеленко Г. И. Экономика организации и планирование производства на предприятии. — М.: Инфра-М, 2003 г. -148 с.

УДК 338.43:637.1

Ugraitskaya O.A

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

INDICATORS AND FACTORS OF EFFECTIVENESS OF INTERSECTORAL INTERACTIONS IN DAIRY-GROCERY SUBCOMPLEX OF AGRARIAN AND INDUSTRIAL COMPLEX.

Аннотация: В статье рассмотрено значение молочно-продуктового подкомплекса, приведены основные факторы его эффективности, а также рассмотрены особенности функционирования, которые оказывают влияние на конъюнктуру рынка.

Ключевые слова: эффективность, молочно-продуктовый подкомплекс, продукция, взаимодействие, эластичность, конъюнктура, экономика.

Dairy-grocery subcomplex is the backbone subcomplex in agrarian economy of Russia. This is confirmed by the fact that the production of milk involves more than 90 % of agricultural organizations. In the structure of gross agricultural production dairy cattle includes .17 %, dairy products occupy the third place in the commodity structure of retail trade turnover of food products.

There is a need for a comprehensive study of the category of efficiency in the specificity of dairy product subcomplex in th conditions of market relations. The efficiency of interactions in dairy-grocery subcomplex is determined by the diversity of inter-sectoral and inter-farm relations which have a significant impact on the efficiency of milk and dairy products production and ultimately on the degree of satisfaction of the population needs in dairy products. Features of functioning of dairy product subcomplex have a significant impact on the economic activity of agricultural producers, dairy processing companies, market processes, market situation for milk and dairy products, the degree of the population

demand satisfaction in dairy products and most importantly on the economic efficiency of dairy product subcomplex as a whole.

Consider the following features:

- economic process of reproduction in a dairy-grocery subcomplex is closely associated with the natural process of animal development.
- low elasticity of offers adaptation to market conditions with higher prices because of the long term acquisition of high-yielding livestock animals and ROI;
- velocity of money circulation in dairy cattle breeding is significantly lower than in other industries due to the considerable duration of the production cycle;
- prices in the industrial sector are growing much faster than in agricultural one resulting in disparity of prices for milk and dairy products and the cost of the resources needed for their production;
- demand for the resources in dairy cattle breeding is directly dependent on the demand for dairy products;

This fact will allow the regulation and improvement of the forms of intersectoral interactions in dairy - grocery subcomplex aimed at observance of economic interests of its counterparties, increasing the efficiency of their activities.

Many factors influence interactions efficiency in dairy-grocery subcomplex on the level of inter-branch efficiency. There arises the necessity of their study, identification and classification.

The following groups of factors should be considered:

- economic efficiency: pricing; marketing channels; degree of fulfilment of contractual obligations; dynamics of production volumes in the industries.
- factors of technological efficiency: the use of modern technologies; productivity of cows; level of mechanization and automation of production processes; the seasonality of milk production; forage; breeding work.
- legal factors regulate the legal framework within which the entities operate a dairy product subcomplex.
- natural climatic and environmental factors.

At the present stage inter-sector interaction in milk-food subcomplex are in the unbalanced condition. The main reason for this the disproportion between the market position of agricultural producers and milk processing enterprises. This disparity arose because of their different concentration on the regional market of milk and led to the monopoly of processing enterprises. Artificial reduction of the purchasing prices for raw milk led to the fact that the production of this product became unprofitable. The functioning and development of cross-sectoral interactions must be based on the following principles: equality of subjects of interdisciplinary

interactions, liability of the partners, according to the legislation, interest in developing and strengthening long-term cross-sectoral interactions; the increase of each business entity efficiency of activity.

Список литературы:

1. Аграрная экономика [Текст] : Учебник 2-е изд., перераб. и доп. / под ред. М.Н. Малыша. – Спб.: Изд-во «Лань», 2002. – 688 с.
2. Аничин В.Л., Чугай Д.Ю. Государственное регулирование развития молочно-продуктового подкомплекса [Текст] // Достижения науки и техники. – 2008. - № 9. – С. 5-6
3. Аничин В.Л., Чугай Д.Ю. Методика формирования закупочной цены на молоко-сырье [Текст] // Бюллетень научных работ. Выпуск 15 Белгород. – Издательство БелГСХА, 2008. – С. 177-180
4. Асташов Н.Е. Организация сельскохозяйственного производства: учебник для вузов [Текст] / Н.Е. Асташов. – Изд.2-е, испр. и доп. – М.: Академический Проект; Альма Матер, 2007. – 463 с.
5. Ахмедова Л.М. Экономические отношения в сфере производства и переработки молока [Текст] : дис... канд. эконом. наук / Л.М. Ахмедова. – М., 2004. – 138 с.

УДК 336.126:657.6

Ugraitskaya L.A.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE MAIN ELEMENTS OF THE DEFINITION OF "AUDIT OF EFFICIENCY OF BUDGETARY FUNDS USE "

Аннотация: В статье дано определение понятия «аудит эффективности», рассмотрены цели и задачи. Приведены методы и процедуры, которые используются в процессе планирования, проверки, подготовки и оформления результатов аудита эффективности, а также основные его элементы.

Ключевые слова: аудит эффективности, экономика, инновация, управление, контроль, результативность.

The efficiency of a nation is determined primarily by how it uses its resources, both material and financial, entrusted to it for management by

the society.

At present Russian economy suffers considerable losses due to low financial, budgetary and tax discipline, insufficiently effective work of the state financial control system.

The real factors constraining the economic system development of the country are, as a rule, misuse of money and material resources, theft and corruption.

Improving the efficiency of budget spending is one of the most important tasks facing the organs of the state power. That's why in many foreign countries the performance audit is for a long time one of the most important types of control.

The concept of performance audit was developed in 1977 at the meeting of the International organization of Supreme Audit Institutions (INTOSAI). [3]

The performance audit is a special type of financial control for achieving economic and social final results. The results are determined by examining the target and effective execution of the budget by control measures.

The objects of performance audit are the state authorities of the Russian Federation being the main managers of the budgetary funds.

Performance audit of public funds includes the following elements:

1) checking the efficiency of financial resources used by the object of performance audit on achieving the final results of its activity;

2) test the performance of various resources (human, financial, material).by the auditee

3) test the performance of the auditees on the implementation of its tasks, the achievement of actual results compared to the planned performance by reference to the amount of allocated resources.

Currently the Audit Chamber of the Russian Federation developed the financial control Standard 104 "Audit of the efficient use of public funds".Clause5.3.1of the Standard states that the criteria of efficiency are "qualitative and quantitative characteristics of the organization, processes and results of the use of public funds and (or) activities for scans, which show what the organization should be and what results are necessary for the effective use of public funds".

This Standard does not provide the clear criteria and specifications for a particular industry It is determined that "the evaluation criteria of the efficiency are selected for each goal of the performance audit" (clause 5.3.1). [2]

Thus Professor Yashina N. I. in her article pays special attention to the performance audit concerning the use of public funds in the educational sphere. In his opinion for the quality educational services it is necessary to measure the indicators of two types: efficiency of use of budgetary funds

allocated to higher educational institutions and their efficiency. The indicators of efficiency of use of budgetary funds affect the final result from their expenditure. This result is defined and measured by the indicators unique to the industry.

The indicators of efficiency of use of budgetary funds are considered as intermediate that is the ability of higher education institutions to provide services to ensure the needs of the population in professional education. They are only internal indicators of quality training of future specialists. And the quality of public expenditure in higher education is measured not only by the efficiency but also by the ultimate results.

The efficiency of public expenditures on education should be determined by the indicator which determines the final results. To argue that external socio-economic impact of low cost is obtained when the University graduates are demanded on the labor market.

The availability of professionally trained teachers, modern logistics and quality management of the educational process indicate only rational and efficient use of public financial resources. [5]

The most important in the audit of the use of public funds and public expenditure are not only the findings of audits and recommendations to improve the efficiency of use of budgetary funds by organizations.

An effective and functioning system of financial control should provide quality management of the budget and to increase the efficiency of budget management.

Список литературы:

1. Бюджетный кодекс Российской Федерации" от 31.07.1998 N 145-ФЗ (ред. от 26.12.2014, с изм. от 08.03.2015) (с изм. и доп., вступ. в силу с 01.03.2015)

2. Стандарт финансового контроля 104. Проведение аудита эффективности использования государственных средств" (вместе с "Порядком действий в процессе организации и проведения аудита эффективности") (утв. Решением Коллегии Счетной палаты РФ, протокол от 09.06.2009 N 31К (668))

3. Дроботова Е. В. Аудит эффективности бюджетных средств [Текст] / Е. В. Дроботова // Молодой ученый. — 2014. — №19.

4. Карепина О.И. Развитие аудита эффективности государственных расходов ("Международный бухгалтерский учет", 2014, N 30)

5. Яшина, Н. И. (д-р. экон. наук). Определение результативности расходов на образование для обоснования эффективности использования бюджетных средств / Н. И. Яшина // Финансы и кредит. - 2006. - N 21. - С. 2-8. - (Бюджетная политика).

Секция IV. Вклад молодых ученых в инновационное развитие ветеринарной медицины и технологий животноводства.

Section IV. Contribution of young scientists into development of veterinary medicine and technology of animal husbandry.

УДК 636.4.053:612.017.11/12:636.087.7(476)

Andreytchik E.A.

Mikhaluk A.N.

Sviridova A.P.

Poplavskaya S.L.

Grodno State Agricultural University, Grodno, Republic of Belarus

INDICATORS OF NATURAL RESISTANCE AND IMMUNOLOGICAL REACTIVITY OF THE ORGANISM OF PIGLETS WITH USING OF THE FEED ADDITIVE CARDIORENAL

Аннотация. Применяемая лечебно-профилактическая кормовая добавка на основе грибов рода Cordyceps Кордицехол качественно улучшает белковый состав крови, что выразилось в повышении глобулиновых фракций при одновременном снижении концентрации альбумина за счет активизации секреторной и всасывательной функции эпителия слизистой оболочки кишечника.

Ключевые слова. Поросята-отъемыши, кормовая добавка, кровь.

Industrial raising of livestock requires an advanced search methods and tools that increase resistance, activating growth and development, reducing the incidence of newly born calves. In this regard, relevant is the discovery ROSTO – immune correcting supplements by which can effectively increase the metabolism, stimulate immune reactivity, eliminate

immunodeficiency and restore animal performance to the target level with high efficiency of o feed rations nutrients use. In our opinion, biologically active additives on the basis of mycelium of medicinal mushrooms, which have not only nutritional value but also medicinal properties are promising [1, 4].

Influence of biologically active additives on the basis of medicinal filamentous fungi on macroorganism, its nonspecific resistance, metabolism, morbidity, safety and productive quality of animals remain poorly understood. Such research has a certain theoretical interest and practical importance in the farm animals breeding [2, 3].

In this regard, the aim of our research was to test the efficiency of the treatment-and-prophylactic fodder additives of antioxidant and immune correcting actions Cardiorenal on piglets.

To conduct production trials of treatment-and-prophylactic fodder additives of antioxidant and immune correcting action on the basis of fungi of the genus *Cordyceps Cordicehol* at the pig farm branch "Jeludocki Agrocomplex" OJSC "Agrokombinat "Skidelsky" Shchuchin district of Grodno region two groups of weaned piglets of 50 animals each: control and experimental were formed. Control animals were kept in conditions of technologies adopted on the farm on the background of the common veterinary measures. The animals of the experimental group in addition to the basic diet received feed additive *Cordicehol* by adding it in drinking water before or after feeding for 30 days in an amount of 30 ml per 1 head per day.

The analysis of the indices of immune biological reactivity of the organism of piglets showed that at the beginning of the research (table. 1) the concentration of total protein in blood of pigs of both groups was about the same level being in the control one 61.91, in the experimental group it was 59.96 g/l. Albumin content in animals of the experimental group was slightly lower than in the control one.

By the end of the studies in the serum of the animals in the experimental group a trend towards an increase in the concentration of total protein by 3.1% in comparison with the control group was observed. The significant differences on this indicator were observed. Together with the increase in total protein content in blood of piglets of the experimental group there was the redistribution of protein fractions in the direction of increasing globulins with concurrent decrease in the concentration of albumin.

Group	Indices						
	protein/	/albumi	α -	β -	γ	FAL,%	BACK,
		ne g/l	globuline	globuline	globulin		%
	At the beginning of the experiment						
control	61.91 ±2.06	24.86 ±1.46	11.29 ±0.70	14.73 ±0.81	10.63 ±0.80	31.30 ±1.96	44.30 ±2.32
experiment	59.96 ±2.98	23.64 ±2.48	10.97 ±0.58	12.50 ±0.69	11.26 ±0.72	32.2 ±2.11	46.70 ±2.86
	At the end of the experiment						
control	63.71 ±3.02	26.26 ±0.52	12.13 ±0.30	13.00 ±0.30	11.50 ±0.31	32.40 ±1.90	45.60 ±2.96
experimrnt	65.73 ±2.91	24.31 ±0.50*	13.57 ±0.31*	13.65 ±0.31	13.77 ±0.33**	34.10 ±1.70	48.10 ±2.78*
* — P<0.05 ** — P<0.01							

Table 1 - Indices of immune biological reactivity of the organism of piglets weaned during the experiment

Thus the content of α – globulin increased by 11.8 % (P<0.05) in the experimental group, that of β -globulin increased by 1.05% respectively compared with the control one. As for γ -globulin the concentration increased by 19.7 % (P<0.01) in the group treated with the feed additive Cordicehol in comparison with the control group and was 13.77 g/l.

The decrease of albumin in serum is quite often observed. Sometimes this is due to the increased capillary permeability and the release of albumin in lymph and intercellular space. However in this case it is associated with the increase in other fractions, γ -globulins in particular. The studies have shown that the amount of albumin decreased from 26.26 g/l in the control group to 24.31 - in the experimental group, or 8.9 % (P<0.05 Phagocytic activity of leucocytes increased from 32.4 % in the control group to 34.1 % in the experimental group. The analysis of humoral factors of protection revealed that the piglets of the experimental group had a higher bactericidal activity of serum. So this ratio increased to 48.10 % (P<0.05), in the animals treated with the feed additive Cordicehol, while in the control one it remained at the same level – 4.60 %.

The use of therapeutic-prophylactic fodder additives Cordicehol for the piglets of the experimental group had an impact on the performance of white blood, that is, the number of lymphocytes. On the first day T - and B - lymphocytes were within the physiological norm (table. 2). On the 30 day of the research there was a trend to the increase of T-lymphocytes in all the groups. In the experimental group the number of T-lymphocytes was 3.8% higher than in the control one. The content of b-lymphocytes in the experimental group increased by 8.3 % in comparison with the control group.

Indice	Group		
		1	30
T-lymphocytes, 10 ⁹ /л	control	2.82±0.13	3.15±0.12
	experimental	2.79±0.14	3.27±0.14
B-lymphocytes, 10 ⁹ /л	control	0.35±0.02	0.36±0.01
	experimental	0.33±0.03	0.39±0.01*
*-P < 0.05			

Table 2 - Content of T - and b - lymphocytes in the blood serum of the piglets

Literature data and the research enable to assume that pathogenic microflora is most strongly exerts its pathogenic action in the organism of piglets with low resistance. Extracting with fees, such microflora is gradually accumulated in the environment of the pigs especially if the room is rarely cleaned. With the accumulation of microorganisms with high virulent strains in the environment, toxicogenic, hemolytic and other pathogenic properties in piglets dysbiosis of "exogenous" origin becomes predominant, and the accumulated microflora can act as local infection [5].

Thus the applied treatment-and-prophylactic feed additive of antioxidant and immune correcting action on the basis of fungi of the genus *Cordyceps Cordicehol* improves the protein composition of the blood, which resulted in the increase in globulin fractions accompanied by the reduction of the albumin concentration due to activation of the secretory and suction functions of the epithelium of the intestinal mucosa.

Список литературы

1. Бабицкая, В.Г. Новые биологически активные добавки на основе глубинного мицелия базидиальных грибов / В.Г. Бабицкая, В.В. Щерба, Т.С. Гвоздкова // Успехи медицинской микологии: материалы Четвертого Всероссийского конгресса по медицинской микологии, М: Национальная академия микологии, 2006. – Т.7. – С. 178-180.
2. Гарибова, Л.В. Пищевая и лечебно-профилактическая ценность съедобных грибов / Л.В. Гарибова // Успехи медицинской микологии: материалы Пятого Всероссийского конгресса по медицинской микологии, М: Национальная академия микологии, 2007. – Т.9. – С. 236-237.
3. Исангалин, Ф.Ш. Поиск метаболитов энтомопатогенных грибов с фармакологическими свойствами / Ф. Ш. Исангалин, В.И. Артюхин, В.Е. Лиховидов, Н.И. Косарева, Н.А. Коробова, Е.В.Быстрова // Успехи медицинской микологии: материалы Четвертого Всероссийского конгресса по медицинской микологии, М: Национальная академия микологии, 2006. – Т.7. – С. 241-242.
4. Огарков, Б.Н. Пути создания некоторых лекарственных

препаратов из микро- и макромицетов / Б.Н. Огарков, Г.Р. Огаркова, Л.В. Самусенок // Успехи медицинской микологии: материалы Третьего Всероссийского конгресса по медицинской микологии, М: Национальная академия микологии, 2005. – Т.5. – С. 206-210.

5. Mycelium cultivation, chemical composition and antitumor activity of a *Tolyposcladium* sp. Fungus isolated from wild *Cordyceps sinensis* / P.H. Leung [et al] // J. Appl. Microbiol.- 2006. – Vol.101.- P. 275-283.

УДК 636.082.2:636.2

Artyomov Ye.S.
Vostroilov A.V.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

ROYAL FAMILY OF RED-MOTLEY BREED OF CATTLE OF THE VORONEZH TYPE

Аннотация: В статье рассмотрены маточные семейства Воронежского типа красно-пестрой молочной породы крупного рогатого скота и изменчивость их уровня и характера молочной продуктивности отдельных представительниц поколений.

Ключевые слова: маточные семейства, молочная продуктивность, Воронежский тип, генеалогия.

A dairy cattle breeding in Russia is one of the most important branches of animal husbandry. In this regard, an important reserve for increasing milk production and efficiency of livestock in cattle farms is the creation of high productive cattle breeds by their improvement.

The system of setting the species based on their specialization and adaptability to climatic conditions is called rock zoning. Its purpose is more intensive and thorough use of pedigree and breeding quality animals. It takes into account natural and economic conditions of the areas and the specialisation of the farms.

The basis of the principle of selection and consolidation of the rocks to certain areas and districts is—the operational need and economic feasibility.

Intensive breeding work on the improvement of red-spotted dairy breed of cattle aimed at the development of a type adapted to the

conditions of Central black earth region was conducted in Voronezh region.

In this regard in November 2007 the FGU "State Commission of Russian Federation for Testing and Protection of Selection Achievements" approved "Voronezh" type red-spotted cattle dairy breed the farm-originator – GPP "Druzhba" of Voronezh region.

For the complete development of the Voronezh type red-spotted dairy breed of cattle it is necessary to carry out the work on the development of new factory lines and royal families in the factories engaged in breeding of this type of cattle breed. In this connection particular significant is the work on laying and improving one specific and important parts of the herd, that of mother families.

When breeding families in the herd hereditary quality of the best queen bees are distributed and more opportunities for the assessment of their breeding qualities by their ancestors descendants and lateral relatives productivity are created. An indicator of the sustainability of heredity should serve as the homogeneity of the Royal family on breeding features, the similarity of daughters and mothers. In the analysis of the forms of inheritance high frequency of dominating mothers is important.

In the herd GPP "Druzhba", Pavlovsky district of Voronezh region we have identified more than two hundred royal families and related groups of red-and-white dairy breed.

The selection of the families was done according to the results of the analysis of genealogies and statements for the last 18 years. In this regard, we have found that there are breeding families in the herd containing from 5 to 13 lactating offspring. The most numerous are the following families: Ulitka 4299, Cheburashka 4246, Umnitsa 7848, Lastochka 8837.

In addition to the large number of families of particular interest was the level and character of variability of indicators of milk production, the representatives of separate generations.

On the basis of the analysis of the level and nature of milk production it can be stated that for GPP "Friendship" there should be broader use for their own reproduction of queen cows from such families as the Ulitka 4299, Lastochka 8837, Bubočka 291, Zorya 3732, Taliya 3831, Valyuta 4565, Buryonka 779, Pryalka 676, Polyasha 517, Resnichka 7165, Korzinka 3074, Naslednitsa 7, Rooyen 1859, Gorcina 03788, Dulcina 6647, Yunost 3660, Visa 5603, Povest3005. In these families the increased milk production was observed depending on the generation. Milk yield at the 1st lactation of the daughters of the above mentioned families is at the level of 2118-4993 kg, granddaughters – 4204-6566 kg and great-grandson– 5240-8556 kg respectively. Thus for two generations the level and nature of milk productivity of the most promising representatives of

families grew by 3122-3563 kg, i.e. almost doubled.

In this regard we recommend further improvement of the breeding potential of the Voronezh type red-spotted dairy breed of cattle, using progressive royal families: Ulitka 4299, Lastochka 8837, Bubochka 291, Zorya 3732, Taliya 3831, Valyuta 4565, Buryonka 779, Pryalka 676, Polyasha 517, Resnichka 7165, Korzinka 3074, Naslednitsa 7, Rooyen 1859, Gorcina 03788, Dulcina 6647, Yunost 3660, Visa 5603, Povest 3005.

Список литературы:

1. Артемов Е.С., Продуктивные качества и воспроизводительные функции быкопроизводящей группы коров красно-пестрой породы / Е.С. Артемов, А.В. Востроилов, А.Г. Нежданов // Вестник Воронежского государственного аграрного университета. – 2011. – № 1. – С. 70-74.

2. Востроилов А.В., Воронежская область – зона цельномолочного скотоводства / А.В. Востроилов, Е.С. Артемов // Актуальные проблемы животноводства, ветеринарной медицины, переработки сельскохозяйственной продукции и товароведения: Материалы научно-практической конференции профессорско-преподавательского состава и аспирантского состава факультета технологии животноводства и товароведения и факультета ветеринарной медицины. - Воронеж: ВГАУ. – 2011.

3. Востроилов А.В., Новый «Воронежский» тип красно-пестрой молочной породы крупного рогатого скота / А.В. Востроилов, Е.С. Артемов // В сборнике: Обеспечение продовольственной безопасности России. Если не мы, то кто?! Материалы международной научно-практической конференции, посвященной 140-летию со дня рождения профессора Ильи Ивановича Иванов. – 2010. – С. 74-78.

4. Востроилов А.В., Особенности продуктивных качеств «Воронежского» типа красно-пестрой молочной породы крупного рогатого скота / А.В. Востроилов, Е.С. Артемов, Е.А. Коротких // Вестник Мичуринского государственного аграрного университета. – 2010. – № 2. – С. 111-115.

5. Лободин К.А., Молочная продуктивность и воспроизводительная способность красно-пестрых коров Воронежского типа / К.А. Лободин, А.Г. Нежданов // Вестник Воронежского государственного аграрного университета. – 2011. – № 4. – С. 84-86.

6. Москаленко Л.П., Особенности и эффективность селекции высокопродуктивных коров с учетом ряда признаков : монография /

Л.П. Москаленко, Н.А. Муравьева, Н.С. Фураева. – Ярославль: ФГБОУ ВПО «Ярославская ГСХА». – 2012. – 146

7. Продуктивные качества основных генеалогических линий воронежского типа красно-пестрой молочной породы / А.Н. Аристов, А.В. Востроиллов, Е.С. Артемов, В.И. Слободяник, Б.В. Ромашов // Вестник Воронежского государственного аграрного университета. – 2012. – № 1. – С. 27-31.

УДК: 636.2.082:612

Artyomov Ye. S.
Vostroilov A. V.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

ECONOMIC USE OF COWS OF RED-MOTLEY DAIRY BREED IN PEDIGREE FACTORIES OF VORONEZH REGION

Аннотация: В статье дана характеристика молочной продуктивности основных генеалогических линий коров Воронежского типа красно-пестрой молочной породы крупного рогатого скота, разводимых в условиях Воронежской области.

Ключевые слова: молочная продуктивность, долголетие, Воронежский тип, генеалогия, линия

In November 2007 the FGU "State Commission of Russian Federation" approved "Voronezh" type red-spotted dairy breed of cattle for testing and protection of selection achievements. According to the results of the testing the Voronezh animal type in 2007 for distinctness, uniformity and stability they outnumbered red-motley breed by most productive traits. In particular, the superiority of cows in live weight amounted to 86.0 kg, of bulls-manufacturers by 67.9. The superiority in the milk yield of cows increased by 149.2 kg. The protein content in milk has increased by 0.14%. Industrial use of cows on the GTF "Druzhba" Voronezh region (originator farm) was 3.2 and 3.5 of lactation, which is 0.5 of lactation higher than in the base population of red-motley breed.

In modern conditions of dairy cattle breeding the productive longevity of cows largely determines the rational use of pedigree resources

of the breed and as a result the economic efficiency of milk production.

However as the world experience and the experience of the leading breeding farms of Russia show, the higher the genealogical capacity of the animals the lower is the period of their economic use.

In this regard to improve the red-motley breed cattle and in particular that of "Voronezh" type it is important not only to increase the productivity level but to increase the period of their use.

We have analysed the duration of the cows use at the leading plants of Voronezh region: PZ "Druzhba" and PZ "Bolshevik". The analysis included 3544 cows eliminated from these herds with the completed lactation within the last 15 years. This livestock belonged to three main genealogical groups: Montvik of Chiftain, Reflection of Sovering and Vis Back Ideal. Moreover, in each genealogical group offspring from the bulls, both local and imported has been produced.

The results of milk productivity and productive longevity of the analysed population depending on the genealogical affiliation and origin of the bulls are presented in table 1, 2 and 3.

	local bulls			imported bulls		
	heads	% of retirement by the 1 st lactation	milk yield for 305 days of lactation	heads	% of retirement by the 1 st lactation	milk yield for 305 days of lactation
1	2	3	4	5	6	7
1	853	-	5540	403	-	6124
2	681	20.2	6352	289	28.3	6385
3	435	49.0	6535	204	49.3	6431
4	392	54.0	6728	173	57.0	6485
5	251	70.5	6023	111	72.5	5935
6	106	87.5	6129	75	81.3	5844
7	85	90.0	6012	8	98	6123
8	41	95.1	5944	3	99.3	5422
9	15	98.2	6105	-	100	-
10	3	99.6	5632	-	-	-
11	-	100	-	-	-	-
average productivity	-	-	6134	-	-	6269
average age in lactations	-	-	2.82	-	-	2.66
life productivity	-	-	17298	-	-	16675

Table 1 – Production Longevity of Montvik Chiftain Line

lactation	local bulls			imported bulls		
	heads	% of retirement by the 1st lactation	milk yield for 305 days of lactation	heads	% of retirement by the 1st lactation	milk yield for 305 days of lactation
1	841	-	5561	415	-	6183
2	673	19.9	6284	275	33.7	6244
3	442	47.4	6425	166	60	6301
4	384	54.3	6531	133	67.9	6105
5	273	67.5	6108	89	78.5	6083
6	124	85.2	6002	56	86.5	5425
7	71	91.5	5958	34	91.8	5623
8	23	97.3	5998	14	96.6	6003
9	12	98.5	5551	2	99.5	4740
10	7	99.1	4893	-	100	-
11	-	-	-	-	-	-
average productivity	-	-	6079	-	-	6141
average age in lactations	-	-	2.81	-	-	2.49
life productivity	-	-	17082	-	-	15291

Table 2 – Production and Longevity of Cows of Reflection Sovering Line

lactation	local bulls			imported bulls		
	heads	% of retirement by the 1 st lactation	milk yield for 305 days of lactation	heads	% of retirement by the 1 st lactation	milk yield for 305 days of lactation
1	628	-	5935	404	-	6284
2	471	25.0	6401	294	27.2	6725
3	395	37.1	6637	183	54.7	6503
4	308	50.9	6585	154	61.8	6591
5	254	59.5	6415	103	74.5	6123
6	93	85.1	6218	64	84.2	5935
7	72	88.5	6006	7	98.2	6111
8	14	97.1	5934	1	99.7	5240
9	8	98.7	6106	-	100	-
10	1	99.8	5924	-	100	-
11	-	-	100	-	100	-
average productivity	-	-	6315	-	-	6429
average age in lactations	-	-	2.90	-	-	2.50
life productivity	-	-	18314	-	-	16073

Table 3 – Production and longevity of cows line Vis Back Ideal

These tables indicate significant differences in the duration of use of the cows produced from local and imported sires. So along the lines of Montvic Chiftain this difference amounted to 0.16 lactation, Reflection of Sovering 0.32 and Vis Back Ideal 0.4 lactation. Thus there is a clear trend in the changes of average milk production and lifetime productivity. Thus the average milk yield of cows produced from local bulls in all three groups is lower than in the offspring from imported stock by 62-135 kg. Lifetime productivity is higher by 623 -2241 kg.

All this indicates the need for wider use of local bulls of milk breed in the regional breeding farms. This will allow the prolongation of economic use of the cows and the increase lifetime milk productivity.

Список литературы:

1. Артемов Е.С., Продуктивные качества и воспроизводительные функции быкопроизводящей группы коров красно-пестрой породы / Е.С. Артемов, А.В. Востроилов, А.Г. Нежданов // Вестник Воронежского государственного аграрного университета. – 2011. – № 1. – С. 70-74.

2. Востроилов А.В., Новый «Воронежский» тип красно-пестрой молочной породы крупного рогатого скота / А.В. Востроилов, Е.С. Артемов // В сборнике: Обеспечение продовольственной безопасности России. Если не мы, то кто?! Материалы международной научно-практической конференции, посвященной 140-летию со дня рождения профессора Ильи Ивановича Иванов. – 2010. – С. 74-78.

3. Востроилов А.В., Особенности продуктивных качеств «Воронежского» типа красно-пестрой молочной породы крупного рогатого скота / А.В. Востроилов, Е.С. Артемов, Е.А. Коротких // Вестник Мичуринского государственного аграрного университета. – 2010. – № 2. – С. 111-115.

4. Продуктивные качества основных генеалогических линий воронежского типа красно-пестрой молочной породы / А.Н. Аристов, А.В. Востроилов, Е.С. Артемов, В.И. Слободяник, Б.В. Ромашов // Вестник Воронежского государственного аграрного университета. – 2012. – № 1. – С. 27-31.

УДК 636.2.082:612

Artymov Ye. S.

Krupicin V. V.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

REPRODUCTIVE QUALITY of RED-SPOTTED DAIRY BREED CATTLE IN LISKINSKY DISTRICT OF VORONEZH REGION

Аннотация: В статье проанализированы воспроизводительные функции коров красно-пестрой молочной породы крупного рогатого скота разводимой на территории Лискинского района Воронежской области.

Ключевые слова: красно-пестрая порода крупного рогатого скот, репродуктивные качества.

Economic efficiency of dairy cattle breeding, the realization of genetic potential productivity and intensity of breeding activities are based on the elevated level of cow fertility and the safety of the young animals [2].

To evaluate the fertility of the breeding stock in dairy cattle a large number of indicators are used. The most common and often used in zootechnical science and practice are the following: the age at first insemination of heifers and the age of calving cows, the duration of service-period and the parturition period, the number of inseminations for fertilization (insemination index), the output of calves per 100 cows, embryonic loss, viability of calves, etc. But even in the comprehensive and careful consideration of the state of fertility of cows rather not-just to set the optimum values of indices of reproduction, which are caused, on the one hand by biological features of the animals and on the other hand by economic feasibility [1, 6].

The most important problem in dairy cattle breeding is to combine the cow high milk yield with its good fertility.

Red-spotted dairy breed of cattle district covers more than 50 % of the total number of propositioning dairy cattle in Liskinsky district.

Great importance is given to the production process intensification to reduce the unproductive period of the breeding stock. The solution of

this issue is based on intensive cultivation and the timely insemination of heifers. So the introduction of heifers older than 20-24 months into the herd accompanied by their low fertility, high embryonic losses, mass manifestation of pathological birth, postpartum, death of offspring and high culling of cows and heifers [5].

The traditional system of dairy cattle reproduction involves the insemination of heifers of early maturing breeds at the age of 16-18 months and the first calving at 25-27 months (or 750-810 days), heifers mid 19-20 months, slowly ripening at 22-24 months. To achieve this aim we studied and analysed the reproductive function of the cows and heifers. In the study the age at first insemination the heifers up to 18 months amounted to 44.8 % of the total number, from 18 to 24 months to 54.9 % and older than 24 months is only 0.3 %, and the average age at the first calving amounted to 871 day (more than 29 months).

At first insemination live weight of heifers and in some farms is the fundamental basis, without regard to the age. It is further manifested in the longevity, productivity and constitutionally in exterior features. The live weight of heifers at first insemination should be 70 to 75% of the live weight of the mature cows. In our case the live weight of heifers at first insemination is 377 kg, accounting for 72 % of the live weight of the mature cows.

The indicator of the cows service-period duration is excessive (not more than 90 days). This indicates the poor state of reproductive functions. The too long service period is associated with the increased milk productivity of the cows.

The dry period is the most stressful in the cycle of reproduction. Perfect feeding conditions in this period, affects the growth and development of the foetus, the resistance of calves to disease in the first days of life, future milk productivity of the cows. Moreover, poor launching of the cows in this period contributes to the emergence of mastitis (up to 30% of cases). If such disorders are noted the development of both antenatal and after generic breast edema [3, 4]

The optimal duration of the dry period should be considered 45-65 days [6].

In our studies, the duration of the dry period is within 61 days.

Timely culling of animals within the dry period of more than 90 days increases the average annual milk yield of the cow by 80 kg [4, 6]

Milk productivity depends on the age. The highest productivity is observed in cows at the age of 5-6 of calving. In our case the average age of the herd is 2.74

After analysing the reproductive qualities of the cows of red-motley breed of dairy cattle it should be noted that all indicators are normal or not significantly exceed the norm, except for the duration of the service period which is significantly higher and amounted to 131 days (45.6 % higher).

Indicators of reproductive ability of the cows to a large extent determine the economic effect of dairy cattle breeding. Low indices of reproductive capacity have held back the reproduction rate of the herds and thereby reduce the possibility of selecting animals by the main breeding features.

In addition, the status of sexual function and the value of fertility are influenced by such factors as feeding, management, season, herd size, etc. In this regard, the question of choosing the optimal parameters of reproduction in the herd should be decided with consideration of the peculiarities and specific conditions of each farm

Список литературы:

1. Артемов Е. С. Продуктивные качества и воспроизводительные функции быкопроизводящей группы коров красно-пестрой породы [текст] / Е. С. Артемов, А. В. Востроилов, А. Г. Нежданов // Вестник Воронежского государственного аграрного университета. – 2011. – №1. – С. 70-74.

2. Востроилов А. Роль маточных семейств при создании высокопродуктивного скота в ГПЗ «Дружба» Воронежской области /А. Востроилов, Е. Артемов // Молочное и мясное скотоводство. – 2008. – № 2. – С. 5-7.

3. Копытин В. К. Мастит у коров [текст] / В. К. Копытин, О. Г. Новиков // Ветеринария. – 1999. – №2. – С.12-14.

4. Лободин К. А. Молочная продуктивность и воспроизводительная способность красно-пестрых коров воронежского типа [текст] / К. А. Лободин, А. Г. Нежданов // Вестник Воронежского государственного аграрного университета. – 2011. – № 4. – С. 84-86.

5. Нежданов А. Г. Профилактика бесплодия и воспроизводства крупного рогатого скота [текст] / А. Г. Нежданов, В. П. Иноземцев //Ветеринария. – 1999. – №5. – С. 3-7.

6. Повышение воспроизводительной способности молочных коров [текст] / Под ред. А.Е. Болгова, Е.П. Кармановой.- СПб.: «Лань», 2010. – 224 с.

УДК 619:616+636:612.1/8:636,5

Atanov I.N.
Lopatin V.T.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

EXPERIENCE OF BIRDS CANNIBALISM TREATMENT IN JSC "CHICKEN KINGDOM" OF CMR "NOVOZHIVOTINNOE"

Аннотация: В статье представлены результаты лечения каннибализма птиц на базе птицефабрик ОАО «Куриное Царство» ЦРМ «Новоживотинное»

Ключевые слова: Расклев, каннибализм, анамнез, витамины, аргинин, клоака, ацидоз.

Poultry farming is an intensive industry that is characterized by high fertility and precocity of poultry. Food with excellent taste (eggs and meat) and raw materials (down, feathers, etc.) is produced from birds.

Cannibalism is not an illness, but behavioral responses to changes in the birds to external and internal factors. Sometimes it is called an offset feeding behavior: the birds peck each other body parts, pull out and eat or peck and eat the eggs. [4]

The intensity of chicks illumination, at the starting point of egg production in cloaca, that of cloacal ring tense and clearly visible blood vessels. The appearance of blood attracts the attention of other chickens and can serve as the start of pecking. [1]

An important place in the etiology is given to protein metabolism. Acute shortage of protein in the diet or intense short (7-10 days) overfeeding oath proteins of animal origin, followed by the lack of feeds almost always leads to mass pecking. Protein overfeeding breaks acid-base balance in the body toward acidosis, resulting in Vitamin A, degradation, lack of which contributes to the defeat of the mucous membranes especially the cloaca. The reducing arginines on total protein in birds lead to feather eating and cannibalism. [2].

The study of the of various schemes efficiency of cannibalism among chickens in a poultry farm was carried out on "JSC "Chicken Kingdom" of CMR "Novozhivotinnoe", Voronezh region, Ramon district.

The birds were placed in fourteen typical cases where major repair of roves was provided, automated equipment, feeding system, ventilation, water supply was installed. Heating was carried with natural gas.

Reproduction of parent stock young birds is produced by the daily import of pedigree cattle from Holland Cross.

The young birds are placed in poultry houses located in separate areas and grown at outdoor content on deep litter (sawdust). Feeding of birds was provided with centrally made forage produced on Podgorensky feed mill owned by the "Chicken Kingdom"

Epizootic situation at the farm is safe. The poultry is timely vaccinated. During transportation the chickens suffered from stress. Due to a defective diet protein metabolism was disturbed causing affects the cloaca mucous membranes defeat resulting in the pecking.

The aim of the study is to eliminate the causes of cannibalism and identify the most efficient treatment.

We used two schemes on two control groups of 10 chicks. The first one included: premix "Pecking Battle" which was added to the feed at the rate of 15g. 150g.of feed. The composition of the premix includes vitamin- mineral complex, amino acids and easily digestible animal protein and antioxidant. Magnesium and vitamin complex, easily digestible protein increase the nutritional value of the feed, minerals, vitamins and amino acids normalize metabolism. Water was also added to water-soluble mineral chickens supplements - Miksoligo Plus 1ml / 1 liter water for five days. [3]

In the second scheme the treatment also used Miksoligo Plus. The affected areas of the body, were smeared with a solution of chicken ASD-3, which was diluted with sunflower oil in the ratio of 1: 3 1.ASD contributes to the rapid process of regeneration of the affected tissues, has a pungent smell, harmful to poultry. Vitamin complex supplement –amino acid VetBiovit at the rate of 1 kg 0,6gramm is added to the feed. On the first experimental group on the first day of treatment three died chicks were found as a result of chicken pecking. On the second day of treatment, the situation has improved, and the chicks were less aggressive. On the third day, the chickens were calm, cannibalism was not observed. [3]

The results of the test scheme №2 showed that on the first day of treatment two dead chicks were found. In the treatment of the affected part of the body with a solution of ASD-3 it was observed that the drug has a sharp smell deterrent effect. On the second, and the following days the situation has improved.

The research has established the efficiency of cannibalism treatment among chickens in both groups. Among the favorable signs of the recovery were signs of metabolism, sedative effect normalization, stress relieve, cannibalism elimination.

The results of the study proved the efficiency of both schemes of treatment.

Список литературы:

1. С. Садчиков, Н. Сушкова, И. Мельникова, Б. Бессарабов - болезни птиц, 2007г.
2. Г. Г. Щербаков, А. В. Коробов, Внутренние незаразные болезни животных, 2002г
3. <http://www.vetlek.ru/>
4. <http://zooresurs.ru/>

УДК 619:616.995.1:639.1(470324)

Breslavitsev S.A.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

MAIN HELMINTHOSES IN WILD HOOFED ANIMALS OF VORONEZH REGION: RETROSPECTIVE ANALYSIS

Аннотация: Воронежская область расположена преимущественно в лесостепной зоне, лишь небольшая часть на юге области находится в степной зоне. Характерной экологической чертой данной территории является наличие островных лесов, в условиях которых в настоящее время обитают 4 вида диких копытных: благородный олень, лось, косуля и кабан. В этих условиях, особенно на заповедных территориях, дикие копытные, как правило, являются видами-эдификаторами и существенно влияют на структурные элементы экосистем и целом на их облик. Под влиянием диких копытных и прежде всего при их высокой численности на уровне лесостепных экосистем наблюдаются ярко выраженные сукцессионные процессы, включая и процессы увеличения численности паразитических червей. В этой связи, изучение фауны и сообществ гельминтов диких копытных имеет важное научное и практическое значение.

Ключевые слова: гельминтофауна, экстенсивности инвазии, индекс обилия, трематоды, облигатный хозяин, ларвальные формы, цестоды, сагалетки

Modern helminth fauna of wild ungulates in Voronezh region was formed at the turn of 60-70s of the last century. The leading role in increasing the number and dispersal of ungulates in the region was played by the Voronezh reserve, which was the main source (reserve) of these animals at the regional level. Currently the study area of the helminth

fauna of wild ungulates is represented by 36 species, respectively nematode – 27 species, trematodes – 6, cestodes – 3 [2, 3, 4 our data].

The main helminths of ungulates assigned to species parasitizing two or more host species and with high rates of occurrence and the intensity of infection. One of the dominants in the structure of helminth communities is the *Dicrocoelium lanceatum*. Trematode is observed in all investigated species of wild ungulates. The assessment of indicators of occurrence (extensiveness, EI) and population index of relative abundance (abundance index, IO) *D. lanceatum* on the background of fluctuations in ungulate populations. We calculated the average values of extensiveness and abundance index, maximum and minimum values corresponding to high and low ungulate population.

The results of the research present that the highest mean values of EI (57.2%) and IO (9.8 copies) for *D. lanceatum* was detected in red deer. At the peak the number of deer EI increases more than 30% (up to 91.1%), and IO is almost 3 times (up to 25.2 ind.). Currently these values are the minimum: EI–25%, IO–0.3 copies the Second position in terms of occurrence is the ROE (the average of EI–46.2%), however, the value of IO (average of 7.8 copies) corresponds to the third position and lower than the boar. The next level of EI is the elk (average of 28.6%), IO (average of 5.2 copies) corresponds to the fourth position. For wild boar compared to other ungulates registered relatively low indices of EI (mean 23.8%), however, IO the boar occupies the second position (8.9 copies). And at the peak of the number of wild boar observed at this time, revealed the highest values of density (IO) of the trematodes. Therefore, at present in the natural environment of the Voronezh region, the wild boar, being the most numerous species among wild ungulates plays a leading role in the circulation of *D. lanceatum*.

Parafasciolopsis fasciolaemorpha – obligate owner is a moose, this trematode infestation in the study area reaches relatively high values (EI–85.3%).

Among the cestodes in wild ungulate species the most important are the larval form of *Taenia hydatigena* (larvae) and *Echinococcus granulosus* (larvae). Dominant is *T. hydatigena* (larvae), which is registered in all species of wild ungulates. Mean annual rates of infected ungulates *T. hydatigena* (larvae) were: deer – 19.9%, elk – 86.2 per cent, ROE was 24.3%, wild boar – 25.3%.

Levels of infection of *E. granulosus* (larva) of wild ungulates are low and consist of: a deer – 4.2%, elk – 1.5%, wild boar – 2.9%.

In the study area (Voronezh region) from wild boars registered three metastrongyloid: *Metastrongylus elongatus*, *M. pudendotectus*, *M. salmi*. The infestation of these animals metastrongylidae ranges from 70% to absolute values, including the highest rates of EI and the intensity of

infection (AI) were observed in pigs, yearlings, respectively, EI–98,6-100%, AI–140-1500 copies for 2012-2015 in the Voronezh reserve are marked by the deaths of metastrongylus 30-50% wild boar yearlings. In this regard metastrongylus causes considerable damage to the reproduction and breeding of wild boars in hunting areas and other natural areas. Currently of practical importance are questions of treatment and prophylaxis of helminths of wild ungulates [1].

Список литературы:

1. Мануйлова О. // Охота – национальный охотничий журнал. 2012, №9. С. 44-47.
2. Мертц П.А. // Сборник работ по гельминтологии. – М.: Наука, 1948. – С. 53-57.
3. Ромашов. Б.В. // Труды Воронежского государственного заповедника. Вып. 27. 2012.– С. 165-183.
4. Ромашов В.А. // Ведение заповедного хозяйства в лесостепной и степной зонах СССР. Воронеж, Изд-во: Воронеж. ун-та, 1979. – С. 67-72.

УДК: 619:598.617.1:636.085.55

Zelina Yu. M.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE EFFICIENCY OF THE USE OF DIFFERENT COMPOSITIONS OF MIXED FODDERS IN THE DIETS OF QUAILS

Аннотация: Перепеловодство является одним из источников удовлетворения потребности людей в такой ценной продукции как яйца, мясо и расширяет ассортимент птицеводческой продукции за счет производства высокопитательных, диетических продуктов питания. Биологические особенности перепелов позволяют в короткие сроки и с минимальными капитальными вложениями сделать эту отрасль одной из наиболее рентабельных в птицеводстве.

Ключевые слова: перепела, перепеловодство, кормление, комбикорм, рацион, ксибетен – ксил, кормофит 5000.

The research was carried out on the basis of JSC "Voronezh quail

farm" of Novousmansky district of Voronezh region, which now provides the flagship position in Voronezh region in the quail industry in Russia.

The annual average number of quail is more than 1million. In the quail farm 2 breeds of quails are kept: the Estonian –egg and Canadian Pharaoh – meat one.

They are kept in specialized multi-tiered battery cages, which are located in the room in 3 – 4 rows of 40 cages in series.

Gross yield of eggs per day is about 180 thousand eggs. Feeding of birds is mechanized. Adult birds are fed 2 times a day, at the same time, not disturbing the date established for the distribution of forage.

Complete forage prepared at the fodder shop of the company.

Forage for quails meets three basic requirements: balanced, energy-dense, the required degree of grinding. But due to the economic crisis in the country changing the composition of animal fodder periodically occur due to the lack of individual components. As a result, productivity of birds also changes.

After analyzing the dynamics of quail egg production, we identified a certain correlation in the composition of fodder and productivity of birds.

When using fodder No. 1, the quail which composition is presented in table 1, the productivity was at the level of 55.5%.

The Composition Of Fodder	No. 1 Feed	No. 2Feed
Wheat	30.00%	36.50%
Corn	36.42%	18.46%
Wheat bran	5.00%	-
Peas	8.00%	-
Meal sunflower SP 26 %, UK 22%	7.00%	-
Sunflower oil	2.40%	3.50%
Salt	0.30%	-
MCP	2.00%	2.00%
Limestone flour	6.50%	2.50%
Shelly flour	1	3.50%
A7-7 4 Weeks the hen	1.40%	0.80%
Meal sunflowerSP 32%, UK 21	-	19.00%
Yeast SP 42%	-	7.00%
Xiamen - KSIL	-	0.01%
Carotene 5000	-	0.01%
Sodium sulfata	-	0.22%
Sand and	-	0.30%
Bypass to	-	0.20%
Soybean meal JV 44%		6.00%

Table 1 – Recipes of mixed fodders

When the birds were fed with diet No. 2 containing fodder additives, such as Xiamen – KSIL, carotene 500 laying hens and a bypass, the efficiency was 63.3 %. They provide diet digestibility, the increased availability of phosphorus from the fodder ingredients and reduce the body need for indispensable glucogenic amino acids.

The economic assessment of the efficiency of different composition of mixed fodder use, prepared at the poultry farms in the diets of quails-hens proved the use of fodder No. 2, which includes fodder additives, Xiamen–KSIL, carofit-5000 and the bypass to reduce the cost of 1 kg of the fodder of own cooking while raising quails hens egg-laying by 7.8%. The cost of the fodder spent on producing 10 eggs appeared to be lower. Consequently, the proportion of feed costs in the cost of production decreased by 0.7 rubles per 10 eggs or in the calculation per 1,000 eggs.

Список литературы:

1. Методическое пособие по технологии производства мяса перепелов разных пород с применением в рационах белковых экструдированных кормов и ветеринарно-санитарные показатели качества мяса в зависимости от сроков убоя./Котарев В.И., Аристов А.В., Каширина Н.А., Семин А.И., Родина И.А., Мармурова О.М.-Воронеж: ФГБОУ ВПО Воронежский ГАУ, 2012.-37с.

2. Методическое пособие по технологии выращивания перепелов и ветеринарно-санитарно-санитарной оценке мяса-сырья для детского питания/Котарев В.И., Аристов А.В., Каширина Н.А., Семин А.И., Родина И.А., Мармурова О.М.-Воронеж: ФГБОУ ВПО Воронежский ГАУ, 2012.-33с.

3. Кормление перепелов Котарев В., Семин А., Аристов А., Каширина Н., Долженкова И. Птицеводство. 2007. № 6. С. 32-33.

4. Кормление сельскохозяйственных животных. Учебное пособие / А. В. Аристов, Н. А. Кудинова, Т. И. Елизарова; Воронеж: ФГБОУ ВПО Воронежский ГАУ, Воронеж, 2009.

УДК 619:616.62-003.7:636.8

Kartashov S.S.
Lopatin V.T.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

TREATMENT OF UROLITHIASIS IN CATS IN A VETERINARY CLINIC "ANIMAL HEALTH".

Аннотация: В статье представлены результаты лечения мочекаменной болезни у кошек в условиях ветеринарной клиники «Здоровье животных»

Ключевые слова: мочекаменная болезнь, минеральный обмен, анамнез, лейкоциты, диета, струвиты.

Pathology of the urinary system, primarily urolithiasis, is one of the most frequently referrals to a veterinary clinic. Urolithiasis along with the diseases of cardiovascular system, tumors and traumatic lesions is a major cause of deaths both of male and female cats aged from one to six years old.

Urolithiasis is a system often chronic disease characterized by the formation of sand and stones in the urinary tract, particularly in the bladder and manifesting dysuria, pollakiuria, ischuria, urinary colic, recurrent hematuria and crystalluria.

Urolithiasis is polyetiological disease of the whole organism. Both endogenous and exogenous factors, infection, metabolic activity of the parathyroid glands, lack of dietary retinol calciferol, water hardness, feeding with poor-quality dry and canned food, dressings, and others influence its development.

Cats after castration suffered from mineral metabolism, causing them intensively urinary and phosphate rocks and sand formation in the bladder. That causes great suffering to the animal.

The factors of stone formation are long periodic urine stagnations, followed by its alkalinity, precipitate salts and stones formation.

The study on the diagnosis and treatment of urolithiasis was conducted in a veterinary clinic "Animal Health" of the city of Voronezh.

Clinical case №1

Purebred four years old cat castrated at the age of nine months.

The anamnesis revealed the cat night urination in small amounts, urine being light pink. Appetite preserved. The feed is home-made from

the table.

The results the urine investigation showed the following:

Microscopy: a large number of white blood cells (++) squamous epithelium (+) struvites (+)

Biochemistry: glucose (++++), protein (++) , bilirubin (+), white blood cells (+++)

Kantariya 2ml (for seven days) was administered subcutaneously Nospanum 0.5 ml administered intramuscularly, Baytril 2.5% 1 ml (for five days) was administered subcutaneously.

Bladder irrigation solution with furatselina was made through a urethral catheter.

After a course of antibiotic treatment at home the given diet was assigned: (Hills c / d, s / d; Royal Canin urinary s / o; Purina ur), Kantara in tablets of 1.5 tablets twice a day for two weeks.

Clinical case №2

Scottish Fold two years one month old cat castrated at the age of seven months.

From the anamnesis it was found that on the third day urinating problems appeared. On the first day the urine was yellow turned to bright red during the next few days. On the third day of the disease, urination was absent. The cats were fed with Felix wet feed and Whiskas dry one.

Loksikom 1ml (two days) was put in to the oral cavity, Nospanum 1 ml (for two days) was administered intramuscularly Kantariya 2ml (for three days) was administered subcutaneously, Baytril 2.5% 1 ml (for five days) was administered subcutaneously katozal 10% 1 ml to 10 ml of Ringer's solution (for three days) was administered intravenously.

An attempt to catheterize failed. Ultrasound diagnosis of the bladder was carried out: the wall is thickened; the bladder content is in the form of flakes (sand). Urethrotomy was prescribed to the animal.

After the course of antibiotic treatment at home the following diet was assigned: (Hills c / d, s / d; Royal Canin urinary s / o; Purina ur), Kantara in tablets of 1.5 tablets twice a day for two weeks.

Clinical case №3

Four years, eleven months old cat castrated at the age of seven months.

The anamnesis revealed the following: a year ago the cat was treated from urolithiasis. Recently hindered urination appeared urine was light pink appetite saved. There was no vomiting. During the last six months the cat was fed with dry fodder with chicken Perfect Fit (adult cats)

Microscopy urine: struvites (++++), leukocytes (+) erythrocytes (+++)

Biochemistry: protein (+++), blood (+++), leukocytes (++) , pH 7

Loksikom 1ml (for two days) was set in the oral cavity Nospanum 1 ml (for two days) was administered intramuscularly Kantariya 2ml (for five days) was administered subcutaneously sinuloks 0.4 ml (for five days) was administered subcutaneously katozal 10 ml to 1% 10 ml of the p-th ringer (for three days) was administered intravenously. Bladder irrigation with furatselina using a urethral catheter was conducted.

After a course of antibiotic treatment at home the following treatment was assigned: (Hills c / d, s / d; Royal Canin urinary s / o; Purina ur), Kantara in tablets of 1.5 tablets twice a day for two weeks.

Conclusions and recommendations:

As a result of the study we recommend the following treatment scheme in cats with urolithiasis:

1. The elimination of urine and restoration of the urinary tract patency;

2. Antibiotic therapy;

3. Antispasmodic drug (no-Spa);

4. NSAIDs oral suspension for cats Loksikom;

5. Kantar as a main drug in the treatment of urolithiasis (homeopathic preparation);

6. Maintenance therapy (NaCl 0.9%, pp Ringer, vitamin preparations);

7. Dietetics takes an integral part in the treatment and prevention of urolithiasis. Due to its composition dietetic feeds to reduce the concentration of minerals in the urine and its acidity is optimized according to the type of sand. After the recommended period of dietary feed application it is recommended to turn to none- diet feeds of the same company, appropriate to the animal age and life style. It is recommended to resume dietary feeds according to the indications or prophylactically - every six months.

Список литературы:

1. Донская Т. К. /Болезни собак и кошек. Комплексная диагностика и терапия болезней собак и кошек : учеб. пособие / Т. К. Донская [и др.]; под ред. С. В. Старченкова. -- СПб.: Специальная Литература, 2006. -- 655 с.

2. Справочник по болезням собак и кошек. Серия «Ветеринария и животноводство», Ростов н/Д: «Феникс», 2000, -- 352 с.

3. <http://www.vetlek.ru/>

УДК: 615.211.599.75.

Komanov V.V.

Troyanovskaya L.P.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

USE OF THE DRUG "VITAFOL" FOR WATER AND GENERAL ANESTHESIA, IN SMALL PETS AT OUTPATIENT CARE AT EDUCATIONAL VETERINARY CLINIC OF VSAU

Аннотация: Одной из главных проблемой в Российской Федерации является недоступность ряда препаратов, используемых для анестезии животных, т. к. они являются запрещенными. Вопросы анестезиологии в клиниках у мелких животных сегодня являются достаточно острыми и актуальными, что связано с возросшим уровнем хирургической помощи животным, расширением спектра и объема оперативных вмешательств, появлением новых методов лечения, позволяющих даже в критических ситуациях сохранить жизнь пациенту.

Целью нашей работы было изучить действие препарата «Ветофол» для общей и водной анестезии мелких домашних животных с намерением сокращения времени пребывания животного в послеоперационном периоде.

Научно-исследовательская работа проводилась на базе учебных клиник Воронежского ГАУ в период с 28 июля 2014 г. по 8 февраля 2015г

Ключевые слова: анестезия, Ветофол, Фармакология

One of the main problems in Russian Federation is the unavailability of a number of drugs used for anesthesia of animals, i.e. they are forbidden. Questions of anesthesiology in clinics in small animals today are quite urgent due to the increased level of surgical care to animals, spread of spectrum and volume of surgical interventions, the advent of new therapies, allowing even in critical situations to save patient life [1].

General anesthesia is an invasive procedure that causes a number of patho-physiological reactions in the body and especially strong depression of the nervous system. Poor quality or insufficient in strength anesthesia can greatly complicate the work of the surgeon or cause the death of the

animal [2]. Currently a new drug has appeared in the pharmaceutical market which is unique of its kind, affordable and very convenient to use.

The aim of the study was to examine the effect of "Vetofol" drug for general anesthesia and water anesthesia in small animals to reduce the postoperative period for the animal.

The research was carried out in the educational clinic of Voronezh State Agricultural University during the period from July 28, 2014 till February 8, 2015

Trade name "Vetofol» (Vetofol) drug has International unproprietary name of Propofol. Dosage form is an emulsion for intravenous use.

Vetofol in 1 ml of the active substance contains propofol - 10 mg Excipients: lecithin (lipoid E-80) - 12 mg Glycerol - 22.5 mg, soybean oil - 100 mg of sodium hydroxide (in an amount necessary for correcting the pH to 6.0-8.5) and water for injection - up to 1 ml. Externally, the formulation is an emulsion is a milky-white with a yellow or cream color.

Vetofol is used in dogs and cats for general short-term anesthesia (especially when you want to exit a short period of the animal from anesthesia), for the induction and maintenance of principal anesthesia.

Contraindications to its use for animals are the increased individual sensitivity to the drug (including medical history), severe decompensated diseases of cardio vascular and respiratory systems. Vetofol should not be used for anesthesia to pregnant females (if you plan to preserve offspring), the drug can be used for induction of anesthesia for caesarean section in females. It should be used with caution for animals with hypovolemia, diseases of the kidneys, liver and lungs.

At the drug overdose cardiovascular and respiratory systems depression can be observed. In these cases artificial ventilation of lungs, medicines increasing the blood pressure and blood liquids are prescribed.

The effect of the drug at its first application and the cancellation has not been found.

To maintain general anesthesia additional fractional doses of Vetofol are recommended until the desired effect considering the reactions of the animal.

Vetofol is compatible with drugs used for sedation with muscle relaxants, inhalational anesthetics and analgesics; undesirable pharmacodynamic interaction is not notes.

Vetofol is not intended for productive animals.

The animals which are kept in VSAU veterinary clinics, as well as those of local population participated in the experiment. Totally 60 animals

participated in the experiment:

1. ovariohysterectomy - 14 operations (10 cats aged from 8 months to 5 years and 4 dogs aged from 12 months to 4 years).

2. removal of tumors - 12 operations (5 cats aged from 5 to 15 years and 7 dogs from 4 to 12 years),

3. removal of teeth - 8 operations (4 cats aged from 6 to 10 years and 4 dogs in age from 8 months to 8 years),

4. castration - 10 operations (8 castration in cats aged from 8 months to 1.5 years and 2 dogs from 8 months to 1 year).

5. osteosynthesis - 5 operations (2 cats at the age of 8 months and 3 years and 3 dogs aged from 7 months to 4 years),

6. teeth brushing - 4 operations (2 cats at the age of 3 years and 4 years and 2 dogs at the age of 4 years and 5 years),

7. amputation of limbs (1 dog at the age of 6),

8. grooming of cats (5 haircuts cats aged from 1 year to 12 years),

9. relief of ears - 5 operations (dogs aged from 1.5 months to 1 year).

The drug was used to animals by intravenous dose in mg per 1 kg of body weight per hour.

Analyzing the results, we found that postoperative anesthesia reduced from 2 to 5 minutes depending on the animal species, breed and physiological state of the animal. Comparisons were made with the used by VSAU veterinary clinics surgeons drug "Zoletil» (Zoletil - means for general anesthesia of cats and dogs at doses of 0.1 ml per kilogram while staying in the postoperative anesthesia from 2 to 6 hours).

At the background of "Vetofol" drug application animal almost immediately comes out of the anesthesia, and the residence time in the postoperative anesthesia is significantly reduced. The drug can be recommended for caesarean section, endoscopy, intubation pulmonary, radiology, shearing cats and teeth brushing.

Список литературы:

1. Ветеринарная анестезиология. Автор: Стекольников Анатолий Александрович, Нечаев Андрей Юрьевич и др. Редактор: Ломакина С. А. Издательство: СпецЛит, 2010 г.

2. Анестезиология. Под редакцией А. Р. Айткенхеда, Г. Смита, Д. Дж. Роуботама. Перевод с английского под редакцией проф. М. С. Ветшевой А Москва, 2010 г.

Kuznecova D.A.

**Agraruniversität Woronesh namens Peter des Großen,
Woronesh, Russland**

DIE ENDOMETRITIS BEIM RIND – PROBLEME RECHTZEITIG PROPHYLAKTIEREN!

Akute Endometriden stellen nach der Abkalbung eine weit verbreitete Erkrankung in vielen Milchviehbetrieben und Liefersperren für die Milch dar. Sie verursachen hohe wirtschaftliche Verluste durch Behandlungskosten. Entzündungen des Uterus spielen eine entscheidende Rolle bei der Verminderung der Reproduktionsleistung. Die Tiere besamen in erster Abkalbung von 45 bis 65 Tage nicht. Die Zwischenkalbezeit zwischen zwei Abkalbungen bleiben mehr als 365 und 390 Tagen liegen. Die Fruchtbarkeitsabgänge betragen 15 Prozent. Da beim Ablösen des Endometrites der Krankheitsabwehrmechanismus der Gebärmutter eine wichtige Rolle spielt, müssen das Immunsystem und die Leber der Kuh einwandfrei funktionieren. Leberprobleme während der Galtphase ziehen daher häufig Nachgeburtshaltungen nach sich. Jener Zeitabschnitt vom Abgang der Nachgeburt bis zu dem Zeitpunkt, an dem sich die Sorgen auf ihr anatomisches und funktionelles Ausgangsstadium zurückbilden, wird als Nachgeburtperiode oder auch Puerperium bezeichnet.

Die Ursache der Gebärmutterentzündung (Metritis) ist auch die Fütterung in der Gravidität und nach dem Abkalben. Negative Faktoren sind schlechte Futterqualität: Krippenausputz, schlechte Silage, überständiges, verpilztes Heu, Proteinüberschuss in der Ration, Spurenelementmangel (insbesondere Vitamin-E-/Selenmangel), sekundärer Spurenelementmangel bewirkt durch hohen Rohaschegehalt (verschmutzte Silage, Krippenausputz), Giftstofffutter, kalziumreiche Ration (mineralisierter Krippenausputz der Laktierenden, kein spezielles Galtmineralsalz, Phosphor), Kali-Überschuss, der sich im Gras befindet und andere.

Zu den Risikofaktoren für das Entstehen einer Endometritis gehören mangelnde Hygiene bei der Geburtshilfe, Nachgeburtshaltung, Gebärmutter Subinvolution, Schweregeburten, Tot- und Mehrlingsgeburten sowie Stoffwechselstörungen. Das steigende Alter der Kuh, hohe Leistung, Überfütterung in der Zeit des Trockenstehens, frühzeitiges Wiedereinsetzen der Ovaraktivität und verlängerte Tragzeit werden ebenso diskutiert man wie der jahreszeitliche Einfluss.

Um die Geburt herum ist der Körper durch die körperlichen

Anstrengungen und die hormonelle Umstellung besonders anfällig für Krankheiten, oft entsteht ein Teufelskreislauf. Das beginnende Milchfieber oder ein Energiemangel im Anfangsstadium einer Ketose führen zusammen mit Haltungsmängeln wie Überbelegung in der Abkalbebucht zu Stress, der wiederum die Reinigung der Gebärmutter verhindert. Eine aufmerksame Tierbeobachtung ist daher unabdingbar.

Die Basis für eine problemlose Nachgeburtsphase wird dabei bereits vorher gelegt - bei der Abkalbung und Trockenstehzeit. Ist die Kuh bei der Abkalbung in einer guten Körperkondition und sind sie in der Vorbereitungs fütterung optimal versorgt worden, kommt es darauf an, Stressfaktoren bei der Kalbung zu minimieren. Eine eitrige Form der Gebärmutterentzündung, die mit Ausfluss verläuft und eine veränderte Zellzusammensetzung in der Gebärmutterschleimhaut ist, führt zur Unfruchtbarkeit. Man darf diese Gebärmutterentzündungen also nicht mit den akuten Gebärmuttererkrankungen frisch abgekalbter Kühe verwechseln, die häufig schwer krank sind und Fieber haben. Wenn bei der Geburtshilfe oder bei der Nachuntersuchung nicht sauber gearbeitet wurde oder wenn die Nachgeburt nicht abgeht, haben Bakterien wie *Arcanobacterium pyogenes*, Streptokokken, Staphylokokken, *Escherichia coli*, Chlamydien oder Mykoplasmen ein leichtes Spiel. Sie dringen im noch offenen Geburtskanal über die Scheide in die Gebärmutter ein und finden dort durch die Plazentaresten und das Blut ein gutes Milieu vor.

Um die Krankheit rechtzeitig zu diagnostizieren, muss man neben der Kontrolle des Ausflusses auch das Messen der Temperatur mindestens eine Woche nach dem Kalben messen. Das tägliche Beobachten von Tieren und Fiebertemperaturen in den ersten fünf bis zehn Tagen durch den Landwirt ist eine einfache Methode, um frühzeitig akute Gebärmutterentzündungen, Mastitiden und andere Krankheiten zu diagnostizieren. Solche Entzündungen treten vor allem nach Schweregeburten, Zwillingsgeburten und geburtshilflichen Eingriffen auf. Die normale Körpertemperatur beim Rind (rektal im Mastdarm gemessen) schwankt je nach Gesundheitsstatus, Alter und Tageszeit zwischen 37,5 °C und 39 °C. Tiere mit einer Körpertemperatur über 39,5 Grad Celsius sind umgehend dem Tierarzt vorzustellen. So wird die Spirale von Erkrankungen nach der Geburt: Milchfieber, Nachgeburtsverhaltung, Metritis, Ketose, Labmagenverlagerung recht wirksam vorgebeugt. Kühe mit Fieber haben eine Metritis (oder Mastitis), kranke Kühe ohne Fieber Stoffwechselprobleme wie Ketose oder Milchfieber.

Wird eine Metritis nicht rechtzeitig erkannt und behandelt, kann sich nach zwei Wochen eine chronische Gebärmutterentzündung bilden.

Daher stehen bei der Prophylaxe für die eitrige Endometritis die

Versorgung und das Management der Transitkuh neben einer sachkundigen und hygienisch einwandfreien Geburtshilfe im Mittelpunkt. Wichtig ebenso: die Optimierung der Futteraufnahme und der Energieversorgung bei der frisch abgekalbten Kuh. Denn nur bei Kühen, die gut fressen, ist das Immunsystem in der Lage, die Gebärmutter vor Infektionen zu schützen und Keime zu beseitigen. Vermieden werden sollten verdorbene Silage, Schimmelpilze oder feucht gewordenes Kraftfutter. Man soll auf eine ausreichende Vitamin- und Mineralstoffversorgung achten. Die Trockensteher-Ration muss die Kalziumzufuhr reduzieren, um die Freisetzung aus den Knochen und die Aufnahme im Darm zu verbessern. Vitamin D-Gaben vor der Geburt und orale Kalziumgaben um den Geburtszeitraum verbessern die Milchfiebersituation ebenfalls. Nach der Geburt muss sofort auf Laktationsfütterung, also maximale Futteraufnahme umgestellt werden. Die Ration sollte selbstverständlich wieder käuergerecht sein, also genügend Rohfaser enthalten. Sowohl die Eiweißübersversorgung als auch ein Proteindefizit sollte vermieden werden. Besonderes Augenmerk ist auf eine angepasste Mineral- und Vitaminversorgung zu legen, besonders Selen, Mangan, Vitamin E oder β -Carotin. Sie gelten als Fruchtbarkeitsminerale und -vitamine. Dazu zählt vor allem eine Vitamin E und Selensubstitution 2-3 Wochen vor dem Geburtstermin. Ausreichende Versorgung mit Kalzium nach der Geburt, beziehungsweise eine Verabreichung von Vitamin D₃, welches für die Rückresorption von Kalzium aus dem Darm sorgt, eine Woche vor der Geburt. Ausreichende Bewegungen der Trockensteherzeit, sowie sollten Stressfaktoren sollten vermieden werden.

Selbstverständlich redend gehört auch die Optimierung der Haltungsumwelt zur guten Rinderhalter Praxis: Licht, Luft, sauberes Wasser, angepasste Tierzahlen und durchdachte Treibbewege heißen hier die Stichworte. Die Abkalbebox sollte nicht überbelegt sein, um Stress um die Geburt zu vermeiden. Eine Geburt braucht Zeit und Geduld: Vom Platzen der Fruchtblase bis zur Geburt des Kalbes können bei Kühen bis zu drei Stunden und bei Färsen bis zu sechs Stunden vergehen. In dieser Zeit sollte noch keine Geburtshilfe angewendet werden. Ist Geburtshilfe notwendig, so gilt ein absolutes Hygiene-Gebot. Die äußere Scham muss gewaschen und desinfiziert werden, Einmalhandschuhe sind selbstverständlich. Bezogen auf die Ätiologie muss Prävention auf die Verhinderung von intrauterinen Infektionen während der Abkalbung und zu Beginn des Puerperiums geachtet sein. Von großer Bedeutung ist ein ungestörter Abkalbeverlauf in einer sauberen Umgebung.

Einen komplizierten Mechanismus, den viele Faktoren (insbesondere auch Fütterung und Geburtshilfe) beeinflussen, muss sich

diese feste Verbindung vor und nach der Geburt lösen. Viele haben nachher Gebärmutterentzündung und nehmen schlecht wieder auf. Ein vollständiger Nachgeburtsabgang ist für die Kuh daher extrem wichtig. Manche Menschen haben ein gutes Auge dafür, kranke Tiere sofort zu erkennen. Diese Mitarbeiter im Unternehmen zu kennen und weiter zu schulen ist eine relativ einfache Aufgabe, in der aber gleichzeitig sehr viel Potential steckt. Da sich alle Frischabkalber in einer Gruppe befinden, ist die täglich mehrmalige Tierkontrolle wenig zeitaufwendig. Dabei können Erkrankungen und Stoffwechselprobleme frühzeitig erkannt werden und erkrankte Tiere sofort dem Tierarzt vorgestellt werden. Die beiden bedeutendsten Störungen sind die Nachgeburtsverhaltung und die akute fieberhafte Entzündung der Gebärmutter. Beide Erkrankungen können in der Folge zu verlängerten Rastzeiten und verlängerten Zwischenkalbezeiten führen, welche die Ökonomie der Fruchtbarkeit negativ belasten. Das frühzeitige Erkennen von Erkrankungen ist dabei der Schlüssel für eine erfolgreiche tierärztliche Behandlung. Man kann nicht genug betonen, dass dieses Konzept gerade bei laktierenden Kühen außerordentlich wichtig ist.

Literatur

1. Bauer L. Endometritis (Gebärmutterentzündung) beim Milchvieh// gügggrüggüü aktuel 2 /2007 L. 9.
2. Beetz O., Pfützner A., Sabin M., Sabin H.- J., Heuwieser W. Behandlung der akuten Endometritis beim Rind //Grostierpraxis 1/ 2002 L.14-18.
3. Berger Y. Wenn die Kuh abnimmt, nimmt sie nicht auf // Landfreund 3 /2011 L. 58-56.
4. Berger Y. Falls sich die Nachgeburt nicht löst// Toro 7 /2014 L. 20-21.
5. Berger J. Unsichtbar unfruchtbar // Toro 3 /2011 L. 22-23.
6. Berger Y., Tischer M. Nachgeburtsverhaltung: Ursachen in der Trockenstehphase suchen // Tiergesundheit 4/2013 L. 17- 19.
7. Heike E. Was ist rund um die Kalbung zu beachten //Tiergesundheit aktuel 2/2011 L. 2-7.
8. Padberg W. Untersuchungen zur Wirksamkeit biologischer Arzneimittel zur Endometritisprophylaxe beim Rind/ Dissertation/Berlin/2008 L. 134.
9. Sontheimer A. Metritis und Stoffwechselstörungen nach der Geburt vermeiden//Tiergesundheit aktuell 1/2015. L. 2-5.
10. Sontheimer A. Verschlechterte Fruchtbarkeit Metrites und Stoffwechselproblem sind moglicht Ausloser //Landpost 3/2015. L. 14-15.

11. Wesenauer C., Kaiser S. Die Nachgeburtphase beim Rind – Probleme rechtzeitig erkennen! // Rind aktuell 2 /2008 L. 39-38.

УДК: 619:618.11-008.6:636.22/.23

**Mitina A.O.,
Skorikov V.N.,
Malanych E.V.**

**All-Russian Veterinary Research Institute of Pathology,
Pharmacology and Therapy, Voronezh, Russia**

OVARIAN FUNCTIONAL DISORDERS IN COWS OF VARIOUS CLASSES OF ETHOLOGICAL ACTIVITY

Аннотация: В статье рассматриваются вопросы взаимосвязи с классами их этологической активности с проявлением функциональных расстройств яичников коров. Показано, что животные с ультраактивным и активным типами нервной системы, устойчивее к нарушениям функции яичников животных инфрапассивной и пассивной групп. Выявлено, что патология гонад у коров в виде их гипофункции и кистозных изменений чаще всего регистрируются у коров инфрапассивных (26,5% и 8,2%) и пассивных (20,5% и 7,7%) групп.

Ключевые слова: Коровы, классы этологической активности, дисфункция яичников.

One of the main places among causes restraining maximal realization of reproductive and productive potential of cattle breeding stock is occupied by postpartum ovarioopathies, most often diagnosed as ovarian hypofunction in cows [3, 6, 9].

Frequency of sexual gland hypofunction in cows after postpartum period can reach from 19-23% to 46-50% [1, 10] and frequency of ovarian cysts may be from 17.8% to 19.5% [7, 8].

Most scientists suppose that unbalanced feeding, adverse conditions of keeping and exploitation, seasonal and climatic factors are the causes of ovarian dysfunction [3].

However, animals have different reaction on the impact of adverse environmental factors even when the conditions of feeding, hygienic parameters and keeping are the same [4].

Physiologic processes and adaptive reactions in animals' organisms,

their productive traits, and reserve or compensatory capacities, disorders of internal organs are mostly determined by central nervous system [5]. Therefore, it is recommended to consider animals' higher nervous activity types or behavioral responses as the most available for broad-scale researches in selective work under formation of highly productive herds [2].

The aim of our work was to study the degree of spread of ovarian functional disorders in cows of various classes of ethological activity.

Materials and methods. The researches were realized on the basis of Co ltd. "Luch" with tie housing system in Rossoshansky rayon (Voronezh oblast) in 2014-2015 during autumn and winter period. 200 Simmental cows with an average annual dairy productivity of 5288 kg were the object of inquiry. The research included down-calving cows of deadwood period. Behavioral responses of incalvers were evaluated according to V.I. Velikzhanin's method. Three hour observations of animals before, during and after morning feeding were realized during three days. According to the results of observation the animals were divided into 4 groups: ultra-active, active, passive, infra-passive.

Clinical and obstetrical (transrectal and echographic) studies were realized after calving in the dynamics of postpartum period to evaluate the state of uterus and ovaries. Ovarian dysfunction was diagnosed in those animals that did not demonstrate sexual cyclicity 2 months after calving.

Transrectal palpation diagnosed the absence of corpus luteum and the presence of follicles of small and average sizes. The absence of corpus luteum and mature follicles with the size of 0.5-0.7 cm were the criteria for the diagnosis by echography.



Fig. 1. Ovarian hypofunction

Follicular cysts under echographic examination are determined as single or multiple thin-walled fluid (non-echogenic) formations of a rounded, oval or irregular shape with a zone of echo-signal enhancement along back surface with the diameter of 20.4 ± 6.0 mm.

Lutein cysts in the echograms are visualized as single fluid (non-echogenic) formations of a rounded or oval shape with a zone of echo-signal enhancement along back surface with the diameter of 30.08 ± 0.98 mm. The border of echo positive lutein tissue is distinctly visualized on the surface of the wall of the cyst under multiple view scanning.



Fig. 2. Ovarian dysfunction

Results. There were 17 (8.5%) ultra-active, 46 (23%) active, 39 (19.5%) passive, and 98 (49%) infra-passive animals out of 200 examined COWS.

Pathology	UA		A		P		IP		Total	
	n	%	n	%	n	%	n	%	n	%
Total number of cows	17	100	46	100	39	100	98	100	200	100
Hypofunction	3	17.7	6	13.0	8	20.5	26	26.5	43	21.5
Ovarian cysts		5.8	1	2.2	3	7.69	8	8.2	3	6.5

Table 1. The spread of dysfunction in cows according to classes of ethological activity

As shown in table, 21.5% of animals had ovarian hypofunction. The highest percentage of hypofunctions was in animals from infra-passive group. It was 1.3 times higher than in animals from passive group and 1.5 times higher than in cows from ultra-passive group. Ovarian dysfunctions occurred 2.0 times more often in active group than in infra-passive group.

Among all examined animals 6.5% had ovarian cysts. The greatest occurrence was registered in animals from infra-passive group. This group had 1.1 times more follicular cysts than passive group and 1.4 times more follicular cysts than ultra-passive group. This index in active group was 3.8 times lower in animals from infra-passive group.

Conclusion. The risk of ovarian functional disorders development is greatly determined by typological peculiarities of higher nervous activity and behavior of animals. According to the degree of cows' resistance to

reproductive organs diseases the animals are divided into active, ultra-active, passive, and infra-passive. Therefore, it is desirable to take into account ethological types for the prophylaxis of ovarian functional disorders.

Список литературы:

1. Горпинченко Е.А. Фармакокоррекция воспроизводительной способности у коров при гипофункции яичников.: дис... канд. вет. наук: 16.00.07./16.00.04./ Горпинченко Е.А. – Краснодар. 2008г. 134ст.
2. Кокорина Э.П. Определение типологических особенностей высшей нервной деятельности коров и их связь с молочной продуктивностью //Вопросы физиологии с.-х. животных.- М.Л.,1957.С.40.
3. Нежданов А.Г. Гормональные и витаминные препараты для повышения оплодотворяемости и профилактики бесплодия у коров/ А.Г. Нежданов// Сб. науч. тр. ВНИИНБЖ: Болезни органов воспроизводительной системы и новорожденного молодняка. – 1979. – Т.3. – с.24 – 27.
4. Смирнова Е.В. Гормонально-метаболический статус глубокостельных коров разных типов этологической активности и их репродуктивное здоровье:дис...к.в.н./Е.В. Смирнова.- Воронеж,2013г.-161с.
5. Смирнова Е.В. Воспроизводительная функция у коров разных типов этологической активности.Ветеринария.2013.№5.С. 33 – 37.
6. Черемисинов Г.А. Разработка и совершенствование гормональных методов регуляции и стимуляции воспроизводительной функции коров //Диссерт. докт. вет. наук. Воронеж.: 1975. – 338 с.
7. Berger G. Zur Häufigkeit und Therapie der Ovardystrophie bei Kühen//Mh. Vet. Med. 1986. V.41, №57. S. 481-484.
8. Borsberry S., Dobson H. Periparturient diseases and their effect on reproductive performance in five dairy herds// Vet.Rec. 1989. V.124. P. 217-219.
9. Silvan E., Moldovan H. Cencerati privind oportunitatea interventurilor profilactice – curative in perioada puerperala: La vacesimpozionul <<Probleme de ameliorare, tehnologie de crestere s' patologie la taurine si ovine>>. 1980. – P. 152 – 158.
10. Gumen A. Follicular size and response to ovsynch versus detection of estrus in Anovular and Ovular Lactating Dairy Cows / A. Gumen, J.N. Guenther, M.C. Wiltbank.// J. Dairy Sci. – 2003 (2004). – Vol.86. – N.10. – P.3184 – 3194.

УДК: 619:615.28:616.233-002:636.5

Popova O.V.

**L'Université agraire de l'empereur Purre le Grand de Voronej,
Voronej, La Russie**

**L'ÉTUDE DE L'INFLUENCE DES SOUCHES H ET VG/GA
«AVINEW» DU VIRUS DE LA MALADIE DE NEWCASTLE SUR
LE DÉVELOPPEMENT D'EMBRYONS DE POULET**

Аннотация: Болезнь Ньюкасла - опасная высококонтагиозная вирусная болезнь птиц отряда куриных, единственной мерой профилактики которой является активная иммунизация птицы. Остаточная реактогенность вакцин против ньюкаслской болезни и их способность вызывать осложнения значительно варьирует в зависимости от вакцинного штамма вируса.

Ключевые слова: Вирус болезни Ньюкасла, развивающиеся куриные эмбрионы, остаточная реактогенность, вакцины, реакция гемагглютинации.

La maladie de Newcastle est une particulièrement dangereuse infection virale des oiseaux, principalement de la volaille, caractérisée par l'encéphalite, de multiples points d'hémorragies, lésions des organes internes et une baisse de productivité. La maladie est endémique dans de nombreux pays du monde et cause d'énormes pertes économiques. Lors de la confirmation de ce diagnostic non seulement l'activité économique d'un élevage de volailles est limitée, mais tout le commerce international des volailles et produits des volailles d'un pays dans lequel cette infection est trouvée chez les oiseaux domestiques peut être suspendu.

Cette maladie est causée par le virus hémagglutinant de la famille des Paramyxoviridés, du genre Rubulavirus. Ce virus est assez résistant aux intempéries. Il est désactivé par la chaleur à 56⁰C/3 h ou 60⁰C/30 mn, à pH acide. Le virus est sensible à l'éther, désactivé par le formol et le phénol. Il résiste pendant de longues périodes à température ambiante, notamment dans les matières fécales.

Sensibles sont de nombreuses espèces d'oiseaux, aussi bien domestiques que sauvages. La mortalité et la morbidité varient selon les espèces et en fonction de la souche virale. Parmi les volailles, les poulets sont les plus sensibles, les canards et les oies sont les moins sensibles. Le portage de virus peut exister chez les psittacidés et chez certains autres oiseaux sauvages.

Transmission peut être directe et indirecte. Transmission directe implique le contact direct avec les sécrétions, notamment les matières

fécales des oiseaux infectés, transmission indirecte passe par les objets contaminés (aliments, eau, locaux, instruments, vêtements, etc).

Les sources de virus sont les sécrétions bronchiques, matières fécales, toutes les parties de la carcasse. Les virus sont excrétés pendant la période d'incubation et sur une période limitée au cours de la convalescence. Certains psittacidés excrètent des virus par intermittence pendant plus qu'un an.

Le tableau clinique de la maladie est varié. Signes respiratoires et nerveux comprennent le dyspnée et toux, ailes tombantes, pattes traînantes, torsion de la tête et du cou, déplacements circulaires, dépression, manque d'appétit, paralysie complète.

En outre, la maladie se caractérise par les signes variables: diarrhée aqueuse verdâtre, gonflement des tissus périoculaires et du cou, arrêt partiel ou total de la production d'oeufs. Les déformations des oeufs sont caractérisées par la coquille rugueuse et fine, et qui contiennent un albumen aqueux.

Il n'existe pas de traitement. La vaccination avec des vaccins à virus vivants peut réduire considérablement les pertes dans les élevages de volailles et c'est une mesure principale de prévention de cette maladie dangereuse. Les vaccins sont fabriqués à partir de différentes souches de virus: La Sota, Avinew, H, B1, Bor-74 et les autres.

On sait que la vaccination affecte l'état de santé des volailles et leur immunité. Généralement, les phénomènes négatifs ont été observés à une période de formation de l'immunité, c'est-à-dire dans un délai de 3 à 10 jours après la vaccination. Toutefois, la vaccination ne doit pas présenter de danger pour les oiseaux et ses effets indésirables devraient être minimes en comparaison avec un résultat positif.

Les réactions indésirables après la vaccination contre la maladie de Newcastle sont souvent appelées réactions respiratoires postvaccinales. Elles se produisent grâce à la virulence résiduelle des souches, c'est-à-dire leur capacité à endommager les cellules des muqueuses des voies respiratoires, ce qui réduit considérablement les fonctions de protection de la muqueuse contre les infections secondaires. Obtenus par différents chercheurs les résultats montrent que l'utilisation, même des plus doux de la souche vaccinale, comme Hitchner B1, peut provoquer l'apparition de l'infection à E. coli.

La principale préoccupation lors de la création des programmes de vaccination contre Newcastle est de réduire la sévérité des réactions respiratoires postvaccinales. Les dernières dépendent en grande partie du choix de la souche vaccinale. Depuis qu'on a commencé à appliquer constamment la vaccination contre la maladie de Newcastle, il est assez difficile d'évaluer le résultat positif de l'utilisation de différentes souches, car l'absence de la maladie de Newcastle est une norme, en particulier dans

les régions prospères.

Avec ce but, nous avons la recherche de l'influence de deux courants de vaccins contre la maladie de Newcastle sur le développement d'embryons de poulet. Le travail est effectué sur la chaire de parasitologie et épizootologie de l'Université agraire de Voronej en 2015.

Dans le cas d'études, les vaccins suivants ont été utilisés:

1. «Avinew», le vaccin lyophilisé sec contre la maladie de Newcastle (la souche VG/GA) de la production de «Merial» (France), flacon de 2000 doses.

2. Le vaccin sec contre la maladie de Newcastle (la souche H) de la production de «BiAgro» (Vladimir, Russie), le flacon de 100 doses.

Pour déterminer les effets de ces souches VG/GA et H sur le développement d'embryons de poulet nous avons formé 3 groupes de 10 embryons de 10 jours d'âge, le 4^e groupe de 4 embryons de poulet a été intact. Sélectionnés pour l'expérience, des embryons de poulet ont été soumis à l'ovoscopie pour le contrôle de la viabilité.

Le premier groupe a été vacciné par la souche vaccinale H à la dose de 50 doses de virus dans 0,2 ml de sérum physiologique dans le sac allantoïdien. Le deuxième groupe d'embryons a été vacciné par la souche VG/GA dans les mêmes doses et volumes. 3^{ème} groupe a été vacciné par 0,2 ml de sérum physiologique. Le groupe intact ne s'est rien injecté.

Après l'infection, les embryons de poulet ont été placés dans le thermostat à une température de +37°C pour l'incubation dans un délai de 120 heures avec contrôle de mortalité tous les jours.

À l'expiration de la durée de l'incubation (120 heures), les embryons survivants de poulet ont été placés pendant 24 heures dans un réfrigérateur à une température de +4°C, après quoi ont été disséqués pour étudier les signes de la multiplication du virus, mise en scène de la réaction d'hémagglutination en la présence des virus hémagglutinants et des analyses bactériologiques.

Nous avons noté l'activité hémagglutinante du liquide allantoïdien de tous embryons de poulet morts et vivants dans la réaction d'hémagglutination avec les globules rouges du coq (5% suspension), qui ont reçu de la méthode courante.

D'abord une réaction d'hémagglutination mise en oscillant de la méthode sur la lame à l'aide de 5% de matières en suspension de globules rouges d'un coq sur le sérum physiologique, puis le déploiement de la réaction d'hémagglutination avec 1% d'une suspension de globules rouges dans les dilutions du liquide allantoïdien de 1:2 à 1:2048.

Pour la mise en scène de la réaction d'hémagglutination lamineuse (l'identification rapide des virus) sur une lame de verre portent une goutte de liquide allantoïdien et de 5% d'une suspension de globules rouges, ont balancé pendant 3 min et ensuite tenu compte de la réaction; avec une

réaction positive venant d'agglutination au virus de globules rouges et se sont apparus de grands flocons de l'éveil de liquide.

Pour la recherche bactériologique d'embryons de poulet tombés ont été utilisées des cultures sur la gélose peptonée et le bouillon peptoné.

Le moment 72 heures après l'infection a été marqué par la mort de 6 embryons du groupe 1 (souche N), 2 embryons de poulet sont morts à travers les 96 heures, à seulement 80%. Lors de l'abattage spécifique pour le virus de la maladie de Newcastle, les modifications pathologiques: des embryons gonflés, sur la tête et le corps de masse pétéchiées. Les survivants embryons de poulet ont également observé une hémorragie massive sur la tête et le corps de l'embryon, les embryons ont été de plus petite taille par rapport aux embryons état intact du groupe.

Dans le groupe des embryons infectés par la souche de VG/GA, 96 heures après l'infection, 1 embryon a été mort (10%). Cet embryon n'a pas été détecté visuellement pour des changements pathologiques, marqués par un léger décalage en taille, en comparaison avec les embryons de poulet, l'état intact du groupe.

Dans le groupe des embryons de poulet, qui ont été vaccinés par le sérum physiologique dans le délai d'incubation des morts n'ont pas été trouvés, des visuels, des changements pathologiques étaient absents, leur taille correspond à la taille des embryons de poulet du groupe intact.

Le groupe des embryons intacts n'a pas eu des morts, n'a pas été noté de changements pathologiques visuels sur le corps de l'embryon, la taille des embryons de poulet correspond à la durée de l'incubation (15-journées journalières des embryons de poulet).

Dans le premier groupe (la souche N), la réaction d'hémagglutination a été positive lorsque la dilution de 1:2 à 1:1024 a été faite dans le matériau viral de tous les embryons de poulet.

Dans le second groupe (la souche VG/GA) une réaction d'hémagglutination a été positive dans le matériau de la 1ère, l'embryon de poulet mort et 3 survivants dans les dilutions de matériau de 1:2 à 1:256.

La réaction d'hémagglutination avec du matériel provenant d'embryons de groupe de poulets, qui a été vacciné par le sérum physiologique et du groupe intact a été négative.

Résultats de la recherche bactériologique des embryons de poulets morts lors des cultures sur la gélose peptonée et le bouillon peptoné ont été négatifs.

Par conséquent, l'inoculation de 50 doses de vaccin virus N provoque la mort de 80% des embryons de poulets, caractérisé par des changements pathologiques et une réaction positive de l'hémagglutination dans les dilutions jusqu'à 1:1024, alors que la souche vaccinale VG/GA «Avinew» a été moins virulente pour les embryons de poulet, a causé la perte de 10% seulement des objets d'essai et de la réaction positive de l'hémagglutination

dans des dilutions de virus à 1:256.

Ainsi, sur la base de la recherche, nous avons constaté que la souche du virus VG/GA «Avinew» en comparaison avec la souche de virus vaccins H a 8 fois moins de propriétés pathogènes pour le développement des embryons de poulet et 4 fois moins intense, se propage lors d'un même infectum.

Par conséquent, le vaccin contre la maladie de Newcastle à partir de la souche VG/GA «Avinew» est plus douce, ses propriétés réactogènes sont plus modérées. Son utilisation réduit considérablement la probabilité d'éventuelles réactions postvaccinales chez la volaille vaccinée.

Références

1. Atlas des maladies animales transfrontalières P. Fernandez, W. White; Ed.: 2011.
2. Influenza aviaire et maladie de Newcastle: Un manuel de diagnostic de terrain et de laboratoire. - Springer Paris, 2013.
3. Allan W.H., Lancaster J.E. Vaccins contre la maladie de Newcastle: productions et utilization/ Rome: Organisation des Nations Unies pour l'alimentation et l'agriculture, 2011; p. 166-175.

УДК 636.082.2:631.082.31

Shmykova V.S.
Pelevina G.A.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

ANALYSIS OF DAIRY EFFICIENCY OF SIMMENTAL BRED COWS IN THE CENTRAL BLACK-SOIL AREA

Аннотация: В статье представлены результаты опытов по сравнительной оценке продуктивных качеств коров симментальской породы отечественной и австрийской селекции.

Ключевые слова: молоко, отечественный симментал, австрийский симментал, быки – производители, селекция, удой, массовая доля жира, сухое вещество, осеменение, жировые шарики, обрат.

Modern development of dairy cattle breeding, due to the introduction of the advanced milk production technology with a high level of mechanization and automation of labor-intensive processes exacerbated the

problem of choice used in the Russian cattle breeds and choosing the path of perfection. In this context, the task of obtaining a constitutionally strong animals capable, not only to realize their high genetic potential for productive qualities in industrial milk production technology, but at the same time to maintain good fertility and long term economic use. [1]

One of the main breeds for milk production in the farms of the Central Black Soil zone of Russia is Simmental breed, but its population is steadily declining.

The increase of the Simmental cattle population is possible only if in the coming years its genetic potential in terms of milk production and the ability to milk protein to industrial technology use will increase.

Currently, in many farms of the Central Black-Soil area seed bulls of Austrian and German selection for the increase of productive qualities of domestic livestock are used.

The LLC "Manino" of Kalacheevskiy district is also used sperm bulls of Austrian bulls for domestic breed cows in insemination.

The experiment was carried out on a comparative evaluation of milk production and milk quality of Simmental domestic cows and Austrian selection ones. The data are presented in Table 1.

Index	Domestic Simmental	Austrian Simmental
Milk yield per lactation, kg	4406±82	5062±174
Fat content,%	3.97±0.02	4.53±0.07
Milk fat, kg	170±2.4	220±4.7
Mass fraction of protein,%	3.20±0.03	3.25±0.02
Milk Protein, kg	137.7±2.1	149.4±6.2
Dry substance, %	12.52±0.17	13.23±0.19
Ash, %	0.65±0.04	0.66±0.12
Density, g/cm ³	1.028±0.0015	1.031±0.0025
Titrateable acidity, °T	16.85±0.08	16.92±0.08
Calcium, mg	1.33±0.05	1.73±0.02
Phosphorus, mg	1.10±0.03	1.10±0.04

Table 1 - Milk yield and milk composition of Simmental domestic cows and Austrian selection cows

As can be seen from the data on production and milk composition Simmental breed cows of domestic selection are somewhat inferior to the Austrian selection by milk yield, mass fraction of fat, dry matter, density, content of calcium.

The milk density in both groups was due to physiologically norms: 1,028 g/cm³ and 1,031 g/cm³, while the acidity of milk amounted to 16,85⁰T from domestic breed of Simmental cows and 16,92⁰T from Austrian selection.

Further, we conducted the study on the size and number of fat

globules in milk and seek in both groups of Simmental cows (Table. 2).

The results obtained showed that the use of Austrian bulls - manufacturers sperm in insemination of Simmentals domestic breed cows had an impact on the size and number of fat globules.

Technological evaluation of milk was carried out by its separation. For this purpose the same amount of 110 kg of milk of both groups of animals were selected. The data are presented in Table 3.

Index	Domestic Simmental	Austrian Simmental
The size of the fat globules in milk, mkm	2.4625±0.19	2.893±0.203
The size of the fat globules in skimmed milk, mkm	2.1	2.06
Number of fat globules in milk, 109/ml	3.97±0.245	4.56±0.113
Number of fat globules in skimmed milk, 109/ml	0.18	0.19

Table 2 - The size and number of fat globules in milk and seek

Index	Domestic Simmental	Austrian Simmental
Weight Milk, kg	110	110
An cream, kg	6.62	9.28
Out cream, %	6.01	8.43
Obtained skim milk, kg	103.38	100.72
Yield skim milk, %	93.98	91.56
Fat cream, %	38.72	39.76

Table 3 - Assessment of technological properties of milk

As a result of separation two factions seek and cream were identified. The amount of cream, the fat content of milk obtained from the cows was higher in Austrian selection to 2.66 kg and 1.04% respectively.

Thus, the use of Austrian bulls seed improves the technological properties of the milk. Therefore, genetic potential of Simmental cows as for their milk productivity level can be increased using Austrian bulls seed for fertilization.

Список литературы

1. Костомахин Н.М. Скотоводство / Н.М. Костомахин. – СПб.: Лань, 2007. – 432с.
2. Стрекозов Н.И. Молочное скотоводство России: настоящее и будущее / Н.И. Стрекозов // Зоотехния. – 2008. - №1. – С.18-21

***Секция V. Научно-техническое обеспечение технологии
производства и товароведения сельскохозяйственной
продукции***

***Section V. Scientific and technical support of agricultural
production technology and commodity expertise.***

УДК 637.542.12

**Gornaleva S.V.,
Kurchaeva E.E.,
Manzhesov V.I.**

**Voronezh State Agricultural University after Emperor Peter the
Great, Voronezh, Russia**

**THE DEVELOPMENT OF COMPOSITE MIXTURES FOR
ENRICHMENT OF FOOD PRODUCTS**

Аннотация. В статье показана эффективность использования композитных смесей, полученных на основе пищевых волокон топинамбура, моркови и концентрата белков люпина при создании комбинированных мясо-растительных паштетов. Установлено, оптимальные дозировки разработанных композитных смесей для внесения в состав фаршевых систем в количестве 5,5 и 9,5% соответственно.

Ключевые слова: композитные смеси, мясные паштеты, функциональный продукт

In Russia special actuality acquires the possibility of using composite mixtures based on legumes and carbohydrate-containing raw materials particularly root vegetables such as Jerusalem artichokes and carrots (due to their high nutritional value and functional and technological properties) in the composition of meat systems. These cultures are also a source of food fibers (FF) and significantly contribute to improving the resilience of the human organism to the harmful effects of the environment and possess sorption properties [1].

Creating compositions on the basis of plant resources of different nature will contribute to the stabilization of the quality of meat systems, which is relevant at this stage of development of the meat industry.

The prospects of development of compositions with high functional

properties to achieve operational and preventive goals in various food systems are urgent nowadays, especially while developing meat systems of combined type. In this regard, there is a need to create compositions with certain functional properties governing the quality and grading of the drawbacks of raw meat. In this aspect, at creating composite systems of functional property used worldwide and second culture for the production of grain is the lupine, which contains complete protein (27-30 %), starch (55 - 60 %), has a high capacity for swelling and is a promising raw material for production of different forms of protein additives, including isolates and concentrates.

The aim of this work is the development and study of properties of compositions based on vegetable resources with functional properties in the aspect of use in the technology of emulsified meat products. In accordance with the purpose the following tasks were solved: - to develop composite mixtures on the basis of functional ingredients of different origin, - to investigate the effect of composite mixtures on the functional – technological properties of meat systems; - to study the physico - chemical properties of emulsified meat products [2].

As the objects of study we used a composition obtained on the basis of food fibers of Jerusalem artichoke (TU 912-004-97357430-09 "Cellulose of Jerusalem artichoke"), carrots (carrot fiber LP) and Lupin protein concentrate. Food fibers included in the composition of cultures also contribute to the prevention of chronic infections, remove of heavy and toxic elements, pesticide residues, radionuclides, nitrates, nitrites from the body and, thus, cleanse it.

It is known that the introduction of food fiber in the formulation of meat products positively affects not only their biological value but also on the functional-technological properties of the meat stuffing systems, due to the high water binding and emulsifying ability.

The ability of fiber to absorb significant quantities of moisture causes their effective use as a stabilizer of cell structure.

Composite mixture 1 "LPJAF" (based on a concentrate of proteins of lupine and food fiber Jerusalem artichoke) in a ratio of 3:1 and the composite mixture 2 "LPCCF" (on the basis of Lupin protein concentrate and carrot fiber) in the ratio 3.05 has high water binding capacity of 435 and 450 %, which is comparable to water binding capacity (WBC) of soy protein concentrates.

Fat binding ability (FBA) of composite mixtures is 274 and 280 %, whereas in protein concentrates, this figure is significantly lower (from 100 to 150 %).

The developed composite mixtures were used as a functional additive in the composition of forcemeat at the development of emulsified meat

products – meat pate (with the replacement of meat raw materials for the composite mixture in the amount of 5.5 and 9.5%, respectively).

Meat pastes enriched by mixtures are characterized by physico-chemical indices presented in table 1.

Figures	Meat paste "Functional" (with the introduction of 5.5% mixture " LPJAF ")		Meat paste "Balance" (with the introduction of 9.5% mixture " LPCCF ")	
Moisture, %	62.6		62.8	
Protein, %	13.5		15.2	
Fat, %	10.5		6.7	
Carbohydrates, %	9.0		14.0	
Ash, %	1.2		1.3	
Amino acid composition, g/100 g protein				
The Amino Acid	Content	Amino acid score, %	Content	Amino acid score, %
Leucine	8.2	117.14	8.6	122.8
Isoleucine	3.9	97.5	4.46	111.5
Lysine	8.4	152.7	8.70	158.2
Methionine + cystine	4.2	120.0	4.50	128.6
Phenylalanine + tyrosine	7.6	126.7	8.3	138.3
Threonine	5.12	128.0	5.5	137.5
Tryptophan	1.5	150.0	1.68	168
Valine	5.1	102.0	5.80	116
Biological value, %	-	73.25	-	76.35

Table 1 – Physico – chemical characteristics of mwat pastes

As it can be seen from table 1 the developed products are characterized by high nutritional and biological value and can be recommended for the enrichment of food rations of different population groups.

**Работа выполнена при поддержке фонда РГНФ по проекту
№ 14-02-00040.**

Список литературы:

1. Ясакова Ю.В. Влияние функциональных композитных смесей с пребиотическими свойствами на функционально - технологические свойства и ароматобразование колбасных хлебов/ Ю.В. Ясакова, Е.Е. Курчаева, И.А. Глотова, О. И. Ходыкина - Актуальные направления научных исследований XXI века: теория и практика. - 2014. - Т. 2. - № 4-3 (9-3). - С. 487-491.

2. Максимов И.В. Пути рационального использования растительного сырья при производстве функциональных продуктов/ И.В. Максимов, Е.Е. Курчаева, В.И. Манжесов - Современные наукоемкие технологии. - 2009. - № 4. - С. 20-22.

УДК 568.244.4

Pronina A.V.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

CHEESE PRODUCTION WITH VEGETABLE INGREDIENTS

Key words: Amaranth flour, squalene, vegetable component, cheese product

Efficient functioning of food enterprises, taking into account upcoming price rise, will depend on their potential to find and make good use of proteins for food processing in order to provide supplying of the consumer with cheap and high-nutritious products. To meet this demand, a new policy of vegetable protein production and application should be implemented.

Amaranth flour has high biological value and is rich in mineral elements such as calcium, magnum, phosphorus, C and PP vitamins. It also contains a lot of protein and fiber.

Amaranth flour exceeds several times all other vegetable products in the content of such important biologically active substance as squalene.

Squalene regulates metabolism, normalizes cholesterol level, protects cells from toxins, produces regenerating effect and has antioxidant immunomodulatory action.

Making soft cheese product with amaranth flour.

It is known that milk with high fat content, when used in cheese production, leads to the increase in protein and fat disposal.

That is why it is reasonable to use milk of lower fat content to produce cheese mass. However, the resulting low-fat product is usually of poor taste, and, therefore not popular among consumers.

As for the additional vegetable component, it is not only cheaper, but

also more nutritious, as apart from vegetable fat, starch, vitamins, bioactive substances, it contains such essential food fibers that are not present in cheese mass. Moreover, non-milk components make it possible to use fewer high-cost raw milk ingredients per unit of production. The resulting product is therefore cheaper and functionally more beneficial.

Technological objective is achieved through optimization of cheese production process. The usual algorithm is as follows:

- 1) pasteurization of normalized mixture;
- 2) adding acid destabilizer;
- 3) holding;
- 4) coagulation of protein;
- 5) separation of whey;
- 6) formation;
- 7) auto-pressing of cheese mass;
- 8) salting;
- 9) cooling;
- 10) packing;
- 11) storing.

It is completed by the following scheme.

Low-fat separated milk and hydro-thermally treated flour are mixed with cheese mass. The mixture is then cooled down to 50 degrees Celsius. After that fat is added to the cheese mass in the three-step mode: 1) firstly, with milk; 2) secondly, with amaranth flour; 3) thirdly, if necessary, fat is added directly into the cheese mass plus flour mixture.

Here is the example of implementing the described mode.

1) We take 100 kg of 1% fat milk, heat it and at 95 – 98 degrees Celsius and, by thermo-acid mode, extract about 9 kg of cheese mass, which is mixed with hydro-thermally treated grain.

2) 3 – 7 kg of grain are washed and, after separating of water, covered with 10 liters of 25 – 30% fat fresh, skimmed or whey cream.

3) The mixture is then loaded into autoclave, pressure is lifted up to 126 and temperature up to 130 degrees Celsius, then the 30/20/10 minutes scheme is applied (heating, holding, cooling).

4) Then the pressure is discharged, and amaranth flour is mixed with cheese mass and cooled down to 50 degrees Celsius by flake ice, cold air or brine of about minus four to plus four degrees.

5) The sample is taken and fat content in cheese product is analyzed. Should there be detected a deviation from present 45% fat in dry matter,

the missing amount of melted whey butter, sweet butter or vegetable oil is added to the cheese product.

6) Cheese product is cooled down and shaped up in horizontal formation machine. (e.g. 41051 by a Hungarian firm “Complex”) in the form of a sheet, premolded at 5-10 KPa during 10-15 minutes, after which cheese product is cut in portions of corresponding size and is placed into forms for molding.

7) Cheese product is molded at 15-20 KPa during 2 hours with 3-4 overpresses.

8) Then more salt is added if necessary up to 3,5%, and after 2-3 days of holding cheese product is packed under vacuum with reinforced heating and sent for sale. If cheese designed for ageing, the heads (slabs) are transfixated with 3mm diameter stainless needles under a layer of bacterial starter culture for small semi-hard cheese products or brine-ripened cheese products on raw whey. After taking needles off the product the starter mass is barometrically pressed into punctures in the cheese. Cheese slabs are taken from the starter culture and left for ageing for 15-25 days. Attendance is analogous to the one typical of soft cheeses. The final product is a well-ripened cheese product of higher price category.

To sum everything up, let us conclude that the basic technical results are:

- 1) Reduced protein and fat disposal into whey;
- 2) Gaining functionally useful cheese product containing flour rich in
 - Vitamins;
 - Microelements;
 - Vegetable and food fibers;
 - Saving the amount of raw milk per unit of production.

Список литературы:

1. Бобылин В.В. Теоретическое обоснование и исследование закономерностей формирования мягких кислотно-сычужных сыров / В.В. Бобылин // Автореферат диссертации доктора технологических наук, - Кемерово: Колос, 2001. - 47 с.

2. ГОСТ Р 53512-2009 - Национальный стандарт Российской Федерации. Продукты сырные. Общие технические условия – введен 1 января 2011 г – 11 с.

3. Горбатова, К.К. Химия и физика молока / К.К. Горбатова. - СПб.: ГИОРД, 2003. - 288 с.

УДК 637.542.12

**Rysantceva A.O.,
Kurchaeva E.E.,
Glotova I.A.,
Uhina E.Y.,**

**Voronezh State Agricultural University after Emperor Peter the
Great, Voronezh, Russia**

NEW FOOD PROTEIN NANOCOMPOSITES FOR EMULSIFIED MEAT PRODUCTS

Аннотация. В статье показана эффективность использования фермента трансглутаминазы (ТГ) для интенсификации структурообразования в комбинированных мясо-растительных системах. Изучены функционально-технологические свойства модельного фарша с 50 % заменой основного сырья мясом птицы механической обвалки с добавлением цельносмолотой муки из семян люпина в количестве 5,0 % и коммерческим ферментным препаратом REVADA TG 11 в количестве 0,3 % к массе сырья. Установлено, что данные дозировки функциональных компонентов способствуют повышению функционально-технологических свойств фаршевой системы – максимальные значения влагосвязывающей и водоудерживающей составляют 85,5 и 78,5% соответственно.

Ключевые слова: фермент, колбасный хлеб, функциональный продукт

The requirement of the consumer market is the manufacture of meat products of available price segment with traditional organoleptic characteristics: not only the color, taste, aroma, but texture, all well. A compromise solution in this area is the use of structure-forming plant additives in meat technology [1].

For intensification of structure formation in the combined meat-vegetable systems is prospectively the use of biocatalysis. The enzyme transglutaminase (TG) catalyzes the reaction of acyl migration, introducing covalent ϵ -(γ -glutamyl) lysine links between proteins and producing polymers of high molecular weight [5]. Modification of proteins by TG allows you to change their solubility, hydrating, thermostability, and their gelling, rheological properties, emulsification and rennet coagulation in the

case of dairy products [2, 4].

Thus, the urgent task is to develop new food protein nanocomposite for use in technology of emulsified products. Elements of the new concept for the creation of combined meat products on the basis of emulsions are alternative herbal ingredients and processing methods of enzymatic processing of combined food systems with transglutaminases.

As objects of research we used poultry of mechanical deboning, mid-back, semifat trimmed pork, pine flour obtained by grinding the seeds of the lupine varieties of Desnyansky selection GNU Institute of lupine (Bryansk), an enzyme (TG) transglutaminase "REVADA TG 11" (BDF Natural Ingredients, S.L., Spain).

For the foundation, acting as control, was used minced meat loaf "Zakaznoy". We studied functional and technological properties of the model minced meat with 50 % replacing of the basic raw material by mechanically deboned chicken meat with the addition of lupine flour in the amount of 0-10 % and commercial enzyme preparation REVADA TG 11 in the amount of 0.1 to 1.1 % to the weight of meat.

For displaying the enzymatic effect the stuffing was maintained at a temperature of +2°C for 24 h [3]. It is established that the control samples had loose, pasty consistency, and experienced - tight and elastic. The maximum values of moisture-binding and water-holding capacity are for 85.5 and 78.5%, respectively. They are achieved with the introduction of hydrated flour in the stuffing in the amount of 5.0 % and enzyme preparation in the amount of 0.3 %. Thus the mass yield of product is increased from 110 to 120 %, the products are characterized by high juiciness.

On the results of these surveys was developed the formulation and technological scheme of the production of meat loaf, and was carried out the experimental-industrial production of meat loaf "Liskinsky" on the basis of the Individual Enterprise "Protein-Voronezh" using 5 % lupine flour and 0.3 % enzyme preparation TG to the weight of the main raw material. Control sample was developed with the addition of 1 % egg protein as the gelatinizer.

The results of the complex physico-chemical, technological and organoleptic studies have shown that experimental samples of meat loaves made with vegetable protein and enzyme preparation transglutaminase "Revada TG 11", were the same on main indices as control products, and according to a number of indices had the advantage. A positive test result was the increase of the yield of meat

loaves up to 120 % due to the increase in the mass fraction of protein due to the introduction of lupine flour and enzyme transglutaminase.

Thus the new food protein nanocomposites with the use protein-glutamine γ -glutamyltransferase enable the efficient use of low-grade meat and alternative vegetable raw materials in technology of emulsified products with high nutritional and biological value.

Список литературы:

1. Bazarnova Y.G. Protein-Containing additives for meat products. / Bazarnova YG, Echevsky A.И. //Ingredients and additives. - 2004, No. 1-С. 23-26.

2. Ames N.; Rhymer C.; Rossnagel Century; Therrien, M.; Ryland D.; Dua, S.; Ross K. Utilization of Diverse Hulless Barley Properties To Maximize Food Product Quality. // Cereal Foods World; St. Paul, 2006; Vol.51 No. 1. p. 23-28.

3. Birol K. Effect of microbial Transglutaminase and sodium caseinate on quality of chicken done kebab // Meat Science. 2003, 63. - p.98-101.

4. Chiya Kuraishi, K. Yamazaki, Y. Susa. Transglutaminase: its utilization in the food industry. // Food reviews international. 2001, 17(2). - p. 221-246.

5. Evolutionary-biological peculiarities of transglutaminase. Structure, physiological functions, application Shleikin A.G., Danilov N.P. Journal of Evolutionary Biochemistry and discrimination. 2011. So 47. No. 1. S. 1-14.

6. Ясакова Ю.В. Влияние функциональных композитных смесей с пребиотическими свойствами на функционально - технологические свойства и ароматобразование колбасных хлебов/ Ю.В. Ясакова, Е.Е. Курчаева, И.А. Глотова, О. И. Ходыкина - Актуальные направления научных исследований XXI века: теория и практика. - 2014. - Т. 2. - № 4-3 (9-3). - С. 487-491.

7. Максимов И.В. Пути рационального использования растительного сырья при производстве функциональных продуктов/ И.В. Максимов, Е.Е. Курчаева, В.И. Манжесов - Современные наукоемкие технологии. - 2009. - № 4. - С. 20-22.

УДК: 664.346

Fedorova V.A.
Butova S. V.
Shakhova M. N.
Vorontsov V. V.
Fomina N. A.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

**USE OF FUNCTIONAL INGREDIENTS IN PRODUCTION
MAYONNAISE SAUCES ON THE EXAMPLE OF APPLE
POWDER.**

Аннотация. В качестве источника пищевых волокон в производстве майонезных соусов предложено использование яблочного порошка. Исследованы его физико-химические показатели. Выявлено, что в результате добавления яблочного порошка майонезный соус приобретает функциональные свойства.

Ключевые слова: майонезный соус, клетчатка, пищевые волокна, яблочный порошок, функциональные ингредиенты.

The concept of healthy food, and also the requirement of science about food create need of new approach to improvement of composition, properties, technologies of foodstuff which have to satisfy needs of a human body for the main feedstuffs and energy, and also to promote prevention alimentary of dependent diseases, keeping health and longevity. At the same time the food has to be various, tasty, safe and correspond to national habits and traditions [1].

Today in the center of attention of the Russian and foreign scientists there are a creation of functional foodstuff, development of their structure and technology.

According to GOST 52349-2009, functional the product intended for the systematic use as a part of dietary intake by all age groups of the healthy population, lowering the risk of development of the diseases connected with food, keeping and improving health at the expense of existence in its composition of physiologically functional food ingredients [2].

Today in Europe output of functional products reaches 30% of total amount of all realized food. Production of such products also gradually increases in Russia.

Functional foodstuff belongs to the new generations of foodstuff which resulted from development of basic researches in a number of science areas (chemistry, food technologies, etc.).

Fats and oils are obligatory components of food, sources of energy, and also suppliers of irreplaceable physiologically functional ingredients, such as nonlimiting fatty acids, fat-soluble vitamins, sterols, phospholipids. The content of fats in a food intake makes 30-35% of the general caloric content. Therefore the share of products in the oil and fat industry in the total amount of segments of the market of foodstuff makes 10-13%, before the oil and fat industry, taking into account a role of fatty products in food and continuously increasing volumes of their production, there are tasks demanding development of new innovative solutions for release of products of a functional purpose [3].

Because of the current trends of formation of a healthy food allowance, creation of products of new generation of a functional purpose and popularity of mayonnaise, many domestic and foreign scientists devoted the researches to creation of oil and fat emulsion sauces with a functional orientation [4].

Traditional raw materials for production of mayonnaise are the refined deodorized liquid vegetable oils (sunflower, soy, olive, cotton), egg products (egg powder, egg yolks), powdered milk, mustard powder, flavoring additives (salt, sugar), starch, water. Some ingredients are undesirable to the use in food as can provoke developing of sharp or chronic diseases (obesity, intolerance of lactose, an allergy, digestive tract diseases, etc.) [5].

Today new compounds and technologies of fatty products of a functional purpose are developed, which are sources not only a giro - but also water-soluble physiologically active ingredients, such as polynonsaturated fatty acids, vitamins, food fibers, full-fledged proteins, mineral substances, etc.

For emulsion fatty products (such as mayonnaise, sauces, spreads) the range of the enriching physiologically functional ingredients considerably extends, thanks to existence of fatty and water phases. There is a possibility of creation of products which have the balanced structure of polynonsaturated fatty acids, of family ω -6 and ω -3, contain a fatty - and water-soluble vitamins, proteinaceous ingredients, mineral substances, food fibers, prebiotics, probiotics.

Combined use of food fibers, carotinoids, tokoferol, allows receiving new types of the functional mayonnaise and sauces which aren't containing egg products (cholesterol). Food fibers are useful to health as act as detocsicant, normalize amount of cholesterol in a human body, increase resistance to an allergy.

Use of food fibers in feeding is approved by the organizations of health care of many countries, such FDA, the American association of cardiologists (AHA), the European commission on functional foodstuff (FUFOSE), Ministry of Health of Japan.

Apple food fibers are an innovative product. It is possible to distinguish the following from the properties of apple powder declared by the manufacturer:

- antiallergic means;
- a prophylactic during the work in harmful conditions;
- promotes a conclusion of salts of heavy metals, nitrates and radionuclides from an organism.

As a part of apple powder a large number contains such substances as pectin, cellulose, polyphenols, vitamin C, vitamin P (table 1). The sugar containing in apple powder is invert, that is consists of almost equal parts of glucose and fructose. Invert sugar when cooling doesn't crystallize. This feature of sugar is used at production of various dishes and especially confectionery.

The cellulose which is a part of apple powder from salvage of juice production is soluble. Absorbing a large amount of water, it turns into jelly. Because of large volume it fills a stomach that creates feeling of saturation. Thus, without consumption of a large number of calories the feeling of hunger disappears quicker.

The most powerful antioxidant is the vitamin C containing in apple powder. He participates in regulation of oxidation-reduction processes, a carbohydrate exchange, coagulability of blood, regeneration of fabrics; increases resistance of an organism to infections. The main nutritious substance antioxidant is the vitamin E containing in apple powder. Also apple powder contains a number of microcells, necessary for a human body (potassium, calcium, magnesium, sodium, iron, etc.) which provide constancy of osmotic pressure, acid-base balance, processes of absorption, secretion, blood formation, a fibrillation.

At addition in mayonnaise sauce of apple powder the ready-made product gets gentle and cream color, smack of sunflower oil disappears, there is slightly sourish pleasant smack.

Indicator	Value
Vitamin C	5.7 mg / 100 gm
Cellulose	18.0%
Potassium	194.0 mg / 100 gm
Sodium	60.7 mg / 100 gm
Calcium	146.0 mg / 100 gm
Magnesium	81.7 mg / 100 gm
Mass fraction of moisture	9.0%

Table 1. Physical and chemical indicators of apple powder

Список литературы:

- 1) Концепция государственной политики в области здорового питания населения России на период до 2020 года // Пищевая промышленность. – 2010. – № 3. – С. 15-16
- 2) ГОСТ Р 523492005. Продукты пищевые функциональные. Термины и определения. – Введ. 2006.07.01. – М. :Стандартинформ, 2005. – 8 с.
- 3) Елисеева Н.Е. Разработка технологий функциональных жировых пролуков жировой природы с пищевыми волокнами и биологически активными веществами автореф. дис. канд. Техн. Наук. – Москва: ГОУ ВПО «МГУПП» и ГУ НИИ Питания РАМН, 2008.
- 4) Сорокина, В.В. Разработка технологии и оценка потребительских свойств фракционированных функциональных фосфолипидных продуктов: автореф. дис. канд. техн. наук: 05.18.06 / В.В. Сорокина. – Краснодар, 2004. – 143 с.
- 5) Берестова А.В., Зинюхин Г.Б., Межуева Л.В. Особенности технологии пищевых масложировых эмульсий функционального назначения // ВЕСТНИК ОГУ. – 2014. - №1. – С. 150-155

УДК 669.713.7

Chegerjeva K.L.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

DIAGNOSTICS OF LUNG CANCER USING OF THE DEVICE «ELECTRONIC NOSE» TYPE.

Аннотация. Быстрый прогресс в области электронных средств зрения и слуха поставил перед учеными и инженерами задачу освоения рынка технических средств, подобных носу человека. Традиционный подход заключался в повышении селективности высокочувствительных сенсоров. Именно на этом направлении были получены практически значимые результаты в области, иммуноферментного и лиганд-рецепторного анализа.

Ключевые слова: Рак легкого, диагностика, выдыхаемый воздух, газовый анализ, сенсоры, «электронный нос», биомаркеры.

Lung cancer occurs rapidly, therefore its successful treatment requires early diagnosis. The progression of the disease leads to changes in

metabolism, the appearance specific substances in expiration called biomarkers of the disease. The definition of these substances will allow diagnosing the disease.

The work on the creation of multi-touch systems to identify odors is published [1-3]. Such a device allows receiving and accumulating the information about the smell testifying cancer. Such devices are called "electronic nose" [4, 5]. Diagnosis in this case involves the application of long term clinical trials of this particular device, and the transmission of information to another similar device is impossible. In this study, a different approach to "teaching" the device of "electronic nose" type is presented. Clinical trials were carried out with the participation of chromato-mass-spectrometer, allowing identifying biomarkers and creating a reference mixture of substances allowing "teaching" of the device of "electronic nose" type without a series of clinical trials for each of the devices.

The study identified volatile organic compounds, which are observed both in healthy human breath, and in the air, exhaled by cancer patients [6, 7]. The concentrations of these substances are different. Compounds that are usually found at concentrations of 1-20 ppb in healthy human breath increases to a concentration of 10 and 100 ppb in patients with lung cancer, for example 2-butanone, 2,2,3-trimethyl-hexane. Among the biomarkers are the compounds for which, on the contrary, the decrease in the concentration of substances in cancer patients is resisted, for example, methyl hydrazine, ethyl alcohol, dimethyl ether, 1, 3-pentadien [6-9].

Optimum modes in the determination of carbon monoxide in the air using semiconductor gas sensors. Are identified It was that when determining the 100 ppm CO, the dependence of the responses of the sensors based on tin dioxide on temperature had a minimum and a maximum, as in classical isotherm of sorption. (Fig.1).

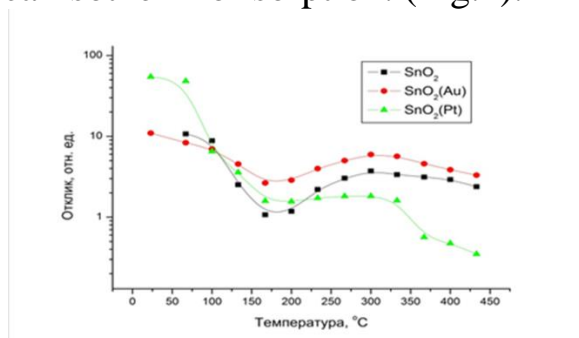


Figure 1 – dependence of the responses of the sensors based on tin dioxide on the temperature.

The minimum responses of the sensors were observed at the temperature of about 150°, and the maximum at room temperature and at temperatures of about 300°C. However, the response time at room temperature is high (Fig. 2).

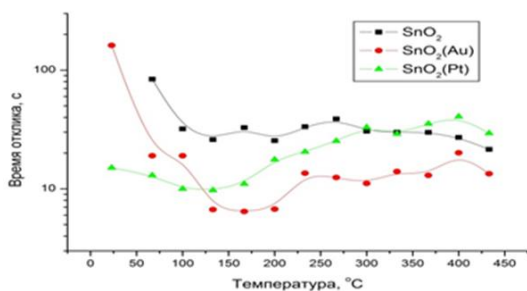


Figure 2 – dependence of the response time of sensors based on tin dioxide on the temperature

For the best results in magnitude and response time short alternate heating and cooling should alternate. In determining the 500 ppm CO in air at different temperatures sensor based on tin dioxide with the addition of 3 % platinum, a maximum was observed at a temperature of about 130°C, and further did not change (Fig. 3), at a temperature of about 100°C - sensor response is minimal.

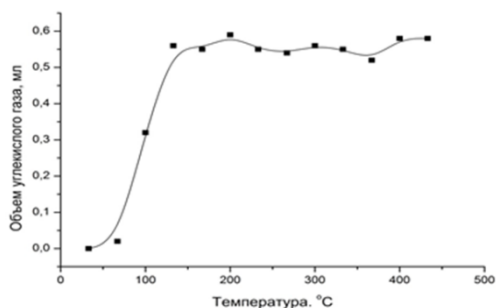


Figure 3 – the dependence of the volume of the reaction product of the oxidation of CO by oxygen of the air from the temperature sensor based on tin dioxide with the addition of 3 % platinum.

The definition of CO at low temperatures by the sensors based on zinc oxide is impossible, they don't show the responses exceeding the noise level (Fig. 4).

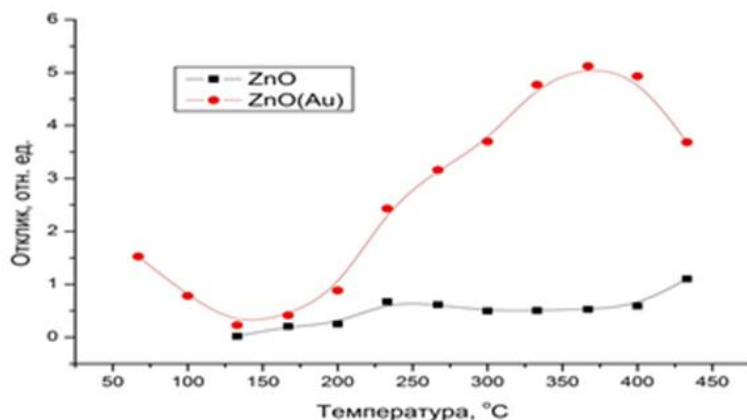


Figure 4 – Dependence of the response of sensors based on zinc oxide of the temperature.

Optimal for them is 350°C, by the low temperatures the response time is very high (Fig. 5).

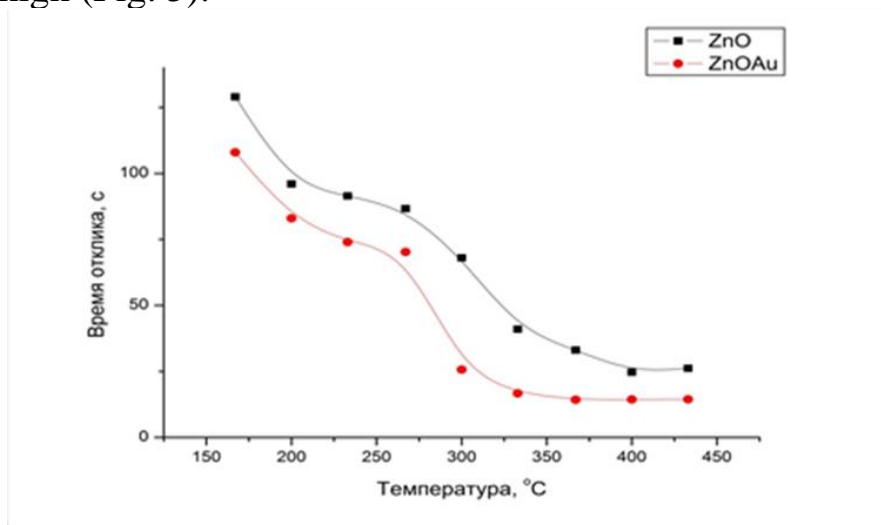


Figure 5 – dependence of the response time of sensors based on zinc oxide by the temperature

Conclusion

The use of "electronic nose" in medicine is one of the most interesting areas of application. It is important that sensitive device allows not only to identify the disease, but also points to the organ, where is the hearth of oncology. The creation of the device of "electronic nose" type for early detection of cancer will allow more efficient treatment.

Thus this work is of great social importance.

Список литературы:

1. Chen-LY Jeng-PT Chang-MW Yen-SH. Rationalization of an Odor Monitoring-System - A Case-Study of Lin-Yuan-Petrochemical-Park.// Environmental Science & Technology. 2000. V 34. Iss 7.

2. Mielle-P Marquis-F. An Altemative Way to Improve the Sensitiviti of Electronic Olfactometers// Sensors and Actuators B-Chemical.1999.V 58. Iss 1-3.

3. Pavlou-AK Tumer-APF. Sniffing Out the Truth-Clinical-Diagnosis Using the Electronic Nose// Clinical Chemistry and Laboratory Medicine. 2000. V 38. Iss 2.

4. Петров В.В., Сергиенко Д.В., Коробкова А.И., Мясоедова Т.Н. Разработка технологии получения высокочувствительных газовых сенсоров на основе оксида циркония для гибридных сенсорных систем [Электронный ресурс] // «Инженерный вестник Дона», 2012, №4. – Режим доступа:

<http://www.ivdon.ru/magazine/archive/n4p2y2012/1362> (доступ свободный) – Яз. рус.

5. Лукаш С.И. Проблемы диагностики некоторых заболеваний по выдыхаемому воздуху // Комп'ютерні засоби, мережі та системи – 2010, - №9, С. 62-71.

6. Peng G., Tisch U., Adams O. and all. Diagnosing lung cancer in exhaled breath using gold nanoparticles // NATURE NANOTECHNOLOGY. 2009. V 4. P. 669-673.

7. Xiao-An Fu, Mingxiao Li, Ralph J. and all. Noninvasive detection of lung cancer using exhaled breath // Cancer Medicine. 2013. P. 174-181.

8. Pennazza G., Santonico M., Chiurcob D. and all. Chemical Sensor Approach to Volatile Phenotyping of Respiratory Diseases // Procedia Engineering. 2014. V. 00. P. 1-4.

9. Hakim M., Broza Y., Barash O. and all. Volatile Organic Compounds of Lung Cancer and Possible Biochemical Pathways // American Chemical Society. 2012. V.112. P. 5949-5966.

УДК: 621.3+664.8

Eshpulatov N.M.

Tashkent State Agricultural University, Tashkent, Uzbekistan

INTENSIFICATION OF WITHDRAWING PROCESS OF JUICE USING OF ELECTROTECHNOLOGICAL METHODS

Abstract: The article analyzes the advantages of using the method of electro-juice extraction - electropasmolysis in juice production line of fruit and vegetable enterprises of agro-industrial complex.

Keywords: energotechnological process, energy efficiency, energy analysis, juice extraction, current output, electropasmolysator.

Electrical energy is a leader in the industry and has a distinct advantage over all other forms of energy. It can be transmitted through the wires over great distances with relatively low losses and conveniently distributed among consumers. This energy with the help of relatively simple devices can easily turn into any other form of: mechanical, internal (body heat), the energy of light.

In modern conditions the rising cost of energy is becoming particularly urgent. The assessment of energy efficiency of industrial technologies in agriculture improves the efficiency of its use by the consumer.

Power consumption at the consumer is a universal indicator determining, ultimately, the entire production energy efficiency. Energy analysis of the processes is a mechanism that contributes to the formation of energy-saving technologies, enabling more efficient use of energy resources.

Technological line of industrial agribusiness should be viewed as an energy line, consisting of individual elements - electrotechnological equipment [3].

Electroplasmolysis relates to electric-treatment processes and is designed to intensify the pressing method of extracting juice from plant material [4].

Current output of vegetable raw materials depends on the initial degree of permeability of the plasma membrane and proto on the ability of the latter to resist external influences in the process of pre-processing and compression. Therefore, any external influences aimed at damage to cell structures and increase their permeability, should lead eventually to higher returns juice [4]. Processing fruit berries (pulp) electric shock, accompanied by a detachment of the protoplast cells and cell membranes and increase juice yield. When electroplasmolysis occurs the partial softening and the cytolysis of peel fabrics appear. Due to increases the permeability of cell membranes, that soothes the diffusion by them content in surrounding liquid medium [1].

Electroplasmolysator is an apparatus designed for electric processing of fruits and vegetables. In electroplasmolysator the amount of the affected cells increases 3-4 times compared to usual fragmentation [1, 2].

For juice production line of complete sets of equipment used without pulp, provide the necessary training materials, the extraction and processing of juice.

The first step is a sink, which is carried out in two series-mounted washers: washed fruit inspecting, removing infected fruit pests and diseases. After washing the fruit is ground to disk or grating crushers: pome (apple, quince, pear) on particle size - 2 - 6 mm, rose - 1 - 2 mm. Stone fruit and berries are treated in roller mills. Crusher must be adjusted so as to prevent crushing of the fruit seeds. The content of the crushed seeds in pulp - not more than 15 %, a small number improves the taste and smell of the juice. Plums at splitting should only be flattened without losing its integrity. Ripe raspberries, strawberries and blueberries cannot break up.

Some fruits and berries crushing is not enough to obtain juice. To facilitate the exit of juice, they need additional processing, which process comprises heating or electric shock. Enzyme preparations are not applied. The treated pulp is fed to the molding, which is used hydraulic press packet batch or continuous - tape or screw. Screw presses produce juice with a high content of suspended solids, so they are used for squeezing juice from a limited range of raw materials - grapes, pomegranates and other berries and fruits. Belt presses give good results in the pressing of apples.

In the production of apple juice clarified strained juice. When preparing juice for baby food, lighting can be done by gluing using a 1% solution of gelatin or gelatin and tannin. Unclarified juice to remove part of proteins and other labile colloids instantaneous subjected to heating to a temperature of coagulation proteins 85 - 90°C, then rapidly cooled to 30 - 35 °C and is separated. The clarified juice is filtered and sent to the heating and prepackaging. Unclarified juice is heated after the separation. Filled containers are sealed and sent for sterilization (pasteurisation), which is carried out at 85, 90 or 100° C depending on the acidity of the juice and the container capacity, sterilization duration - 10 to 20 minutes. In a large container with a capacity of 2, 3 and 10 dm³ can be filled juices so-called hot filling without subsequent sterilization. When hot filling juice is heated up to 95 - 97°C with automatic temperature control and immediately poured into the prepared hot jars sealed with boiled lids. Capped jars for 20 minutes, placed on the upper side of the unfilled space sterilization packaging, after which cold air is blown to reduce the harmful effects of heat on the juice quality.

Raw materials of the containers unloaded in the washer. Washing is carried out in two series-mounted fan washers. If the raw material is processed with the stalk, then it passes through the machine to remove the stalks. Then inspect the fruit on a conveyor belt and fed into the crusher elevator. Juice released from the fruit during the fragmentation, is isolated from the pulp in strainer and diverted into a collection vessel with a filter. Partially dehydrated pulp is charged through the dispenser in a hydraulic press. Pressed juice is pumped into the collection vessel with a filter. Going into the tank through a filter, the juice is produced from the sediment. From the filter capacity juice is pumped into collections, measuring tanks for mixing the juice with other juices or sugar in the production of blended juices. Obtained according to the formulation mixture is heated in the preheater tube bundle, is kept at this temperature for a necessary time in holder then fed through an intermediate tank for filtration in a filter press. The filtered juice is heated to pasteurization temperature, and immediately filled into bottles prepared [5]. The introduction of this technology electroplasmolysator scheme will improve

the quality of the products and increase its shelf life while increasing production efficiency. Works in this direction are quite promising and relevant.

Roller electroplasmoliser A9-QED consists of a housing, receiving the discharge bins, the drive unit and the electrode chamber comprising two electrodes insulated from the roll body, connected with the actuator. The electrodes are powered by three-phase AC voltage of 380/220 V.

The gap between the electrodes and the frequency of their rotation regulated depending on the feedstock. Electroplasmoliser equipped with blade scrapers to clean the electrodes and a removable blade attachment for loosening of raw coca. Raw material is loaded into the hopper elevator and gets on the electrodes rolls that rotate oppositely. Passing through the nip between the rolls, the raw material is subjected to an electric current. After treatment, the pulp pump is fed into the press. Application of the electroplasmoliser makes it possible to increase the yield of red currant juice from 55 to 71% relative to the raw material. The performance of the electroplasmoliser A9-QED on 7 t / h, of apples in the berries it is 2-3 t/h. rotation frequency of electrodes is 18-35 min⁻¹, the gap between the electrodes varies from 2 to 20 mm.

The most efficient is the treatment of the raw material in the case where the electric treatment of the pulp is taken to a liquid phase portion of the body or on the stack centrifuge. It is also possible after processing pomace press to recover additional quantities of juice.

Alternating pulses cause the translational vibrations of ions, resulting in a viscous heating of meso plasma. Due to this fact, coagulation of the protein occurs and tonoplast plasmolemma protein form clusters and channels ensuring the removal of juice during processing. Because of this selective heating of pulp increases the total temperature not higher than 3-5 ° C, which favorably affects the quality of the finished product.

As a result, it was found that the best environment for a pulse plasmolysis own vegetable juice. The range of treatment options is as follows: the current density of 0.01-0.5 A/cm²; duration of treatment with 0.05-10; pulp ratio - Juice 0.1 (0.5-5); grinding particle size of 0.1 - 1 cm; feed speed of the processing zone in electrical 0.1-3 m / s and a temperature of 60 ° C [4].

Exit juice beet under pulsed plasmolysis with pressing the pulp, *ceteris paribus* depends on the pressure and the fineness. A more fine grinding juice yield increases with increasing pressure. However, the maximum juice yield in conventional compression is much less than the pulse plasmolysis.

A similar pattern is observed for pulse plasmolysis apples. For

example in apples at a pressure of about 10^6 Pa, and a high degree of crushing the juice yield is 67-68%. The combined impact on the pulp of the same order, and electrical pulses can increase juice yield up to 78% almost regardless of the degree of crushing.

The final yield of juice is not dependent on electric start processing (is the same), but varying the treatment periods, the speed can be changed in various process stages.

Characteristic for electropulse plasmolysis is that of juice yield, and hence the depth of plasmolysis process to a much lesser degree dependent on the pulse energy than the voltage gradient. Here there is a direct effect of the electric current with the power to influence the structure of protoplasm. [4]

Findings

Electroplasmolysis is an energy efficient way to extract juice from fruits and vegetables. Analysis of the literature shows that as a result of increasing the yield of the grape juice materials 8-10%, the cost of 1 ton juice is reduced by an average of 3.8-4.0%. The recoument from electroplasmolisators introduction in the technological lines processing raw material is less than 0. 4 years. Performed in work patent-information research found that process use of electroplasmolysis makes it possible to increase terms of storage of goods by the way to reduce probability of microbial spoiling. The conducting research activity in the given direction is presented to fairly perspective and topical for the enterprises of agroindustrial complexes.

Literature:

1. Kishkovsky Z.N., Merzhanian AA wine technology. - M .: Light and food industries, 1984. - 504c.
2. Flaumenbaum B.L. Technology canning of fruits, vegetables, meat and fish-M .: Kolos, 1993. - 320C.
3. Bezzubtseva M.M., Volkov V.S., Pirkin A.G. Energy processes in agriculture. - St. Petersburg: SPbGAU, 2011. - 265s.
4. Bezzubtseva M.M. Electrotechnology and electrotechnological installation. - St. Petersburg: SPbGAU 2012.
5. G.I. Kasyanov The technology of baby food, 2003.- 224p.
6. Panfilov V.A. Processing lines of food production, M., 1993.- 288s.

***Секция VI. Землеустройство, кадастр и управление
водными ресурсами в современных условиях
Section VI. Land survey and water resources management
today.***

УДК: 628.12:631.6:631.171

**Abdullayeva D.A.,
Erzakova R.K.**

Tashkent Institute of Irrigation and Land Reclamation

**OVERVIEW OF AUTOMATION TECHNOLOGY
REQUIREMENTS WHEN CREATING MONITORING SYSTEMS
AND OPERATIONAL MANAGEMENT OF THE DOWNHOLE
PUMPING UNITS**

Abstract: This article is devoted to studying the technological requirements of automation of water wells, in particular vertical drainage which can operate in a dual-action and should be characterized by the necessary parameter information in the information monitoring and management.

Keywords: technology, automation, water wells, information, parameters, monitoring, control.

There is shortage of water resources in our country. Great importance is attached to water-saving irrigation technology crop. In literature various methods and devices allow producing economical watering. Such methods include the watering hose from the device, irrigation technology using siphons, irrigation trays, watering using a stationary, semi-stationary pipes, drip irrigation technology, irrigation and other watering. [2] All of these methods in this way or another allow saving water, conducting normalized watering, and some actually improve the quality of irrigation, such as drip irrigation. However the possibility of saving irrigation water from surface water sources may be limited and the farmers will always seek to autonomous sources of underground water.

Development and improvement of automation of the processes of water for irrigation in farms with drainage wells requires the fulfillment of certain requirements imposed on the formation of the process technology. These requirements include research objects control as control system

structure in the production system of water intended for the process of intake of the well and moving water. On this basis in the future special technical means for automation of the process, information, monitoring and control can be designed.

The feasibility of using such wells to prevent, salinity and obtaining underground water for irrigation proved in practice irrigated agriculture in the United States, India and Pakistan. In these countries, it is considered that the application of vertical drainage only as a means of land reclamation is economically unjustified. [1] Using wells dual action (of course, where on the hydrogeological conditions as applicable) for full interception of groundwater irrigation is possible, as with their help it is possible to control underground tanks, remove the growing season for annual revenues. Questions of construction and hardware construction of wells can be solved. Largely resolved are the issues of equipment pumping units [1]. However, the requirements for means of automatic control, to the indicators and sources of information in terms of parametric monitoring required several changes as well as dual-action technology solves problems and lowering of groundwater and reuse. Below are the technological requirements for system monitoring and control of pump units. In managing the operation of the pumps (submersible mostly) be guided by the requirements of technological modes, namely dewatering and irrigation; Installation work in a rural area for which the "characteristic" of the situation, "disappearances" phase, undervoltage, damage to the pump leading to congestion and automation must ensure reliable protection from them; one must maintain control of the actual load of the motor so as to harmonize the action of protection shall operate an adjustable set point; short circuit protection; Falling dynamic water level in the well, which ensures normal operation and pump motor should be triggered protection "dry run" [3]. It is necessary to conduct the control of water quality and exceeding the established norm to protect the irrigated area by salinity. All these kinds of protections are not renewable under automatic control, i.e, automation equipment must be ruled out restarting the pump unit when any of these protections. In the process, there are episodes of short-term power failure and recovery that should not lead to a halt of the process, i.e. the pump must be restarted. For the case, in the operation of several wells, automation should provide alternate start pumping units after exposure, due large inrush currents and an increased load on the transformer substation, if the pump motors are connected to a single substation. The period should be restarted by the time for each individual engine.

List of literature:

- 1.S.Sh.Mirzaev, A.H.Karimov, based on joint use of ground and

surface water for irrigation. T. Phan. 1989

2.P.Arakelov, Perfection furrow irrigation. T.Mehnat 1989

3.M.Z.Gankin, comprehensive automation and process control of water systems. M. Agropromizdat. 1991

УДК: 504.064.45

**Abutaeva A.G.,
Aznagulov D.R.**

Bashkir State Agrarian University, Ufa, Russia

THE RECYCLING IN UFA

Аннотация: В городе Уфа довольно остро стоит проблема с переработкой и утилизацией твердых бытовых отходов. Приведены организации, занимающиеся решением этой проблемы, а также указаны рекомендации по предотвращению загрязнения окружающей среды.

Ключевые слова: переработка отходов, полигон, загрязнение, вторичное сырье.

Over the past 10 years in Ufa amount of debris has increased by more than 2 times and reached 2.9 million m³ per year. This shows the urgent need to improve the recycling process, thereby result in a minimum amount of garbage sent to landfills. [1]

In Ufa there is a single landfill. It is located in the town of Cherkassy. Officials plan to expand the landfill, but against the landfill resuscitation plans in Cherkassy act environmentalists. Polygon arose in the 20th century, it was forced to become garbage collectors in connection with the closure of the landfill "Kamyshlinsky-2", as the scum of the export of a large city there was nowhere. For a long time the existence of the dump heap formed multimeter, this was nowhere to go. Periodically waste buried and rotting sometimes decades. Due to the fact that the current Ufa landfill has no waterproofing, it is the main pollutant of soil, water, air. Substance formed as a result of decay with the passage of groundwater in Shugurovku falls and then goes into the river Ufimka. [2]

The acute problem is the industrial waste, creating a high risk to public health, since such waste have several hazardous properties such as toxicity, flammability and explosiveness. The lack of initiative of enterprises to invest money in the creation of technological processes,

including recycling and disposal of industrial and municipal solid waste, leading to a rapid increase in the volume of the contents of the landfill. This makes it necessary to reduce the volume of incoming waste. Imperfect system of control of waste and is the cause of transport placing them on the ground, do not allow contamination with toxic substances, such as the banks of reservoirs, suburban forests, fields, etc. Pollution places such as garden plots, near the roads and railways or places involving the rest of the population for the most part are due to the environmental illiteracy of the people.

Waste problem affects not only environmental issues, but also economic. Recycling - an additional source of raw materials. With it you can significantly reduce the consumption of natural resources, which also have limitations.

Processing plants and dense polyethylene plastic used mainly. A large amount of waste is sorted in Ufa and then exported for processing outside the republic of Tatarstan, Chelyabinsk, Sverdlovsk and other areas. Only small amounts of cardboard, tires, PET, polyethylene and plastics are accepted for recycling in some cities of Bashkiria. "Spetsavtohozyaystvo cleaning the city" is by far the main sorter garbage in Ufa. In the production of waste sorted by 7 types of cardboard, aluminum cans and broken glass thermo, film (stretch), color film, PET tara.

With the export of waste to the landfill in the city is no problem. More than 80 garbage trucks working at the enterprise "Spetsavtohozyaystvo" and 20 is in reserve. This ensures timely removal of waste from the city. But there is a problem of recycling of obsolete household appliances and electronics. According to the Ministry of Environment of Belarus, collecting batteries in the country quite successfully engaged in a network of points of "Bashvtortsvetmet", LLC "Timurlan" (regional representative of Tyumen battery plant), as well as some small businesses. Ufa no organization licensed to work with Freon, so recycling of refrigeration equipment remains the most challenging and costly.

To solve the problem of increasing the amount of waste in the city of Ufa administration plan to set up processing plants, do not render harm to nature, completely rejecting the idea for the construction of the incinerator. With the help of this plant can significantly reduce the amount of waste, but in doing so there is a high risk of pollution of the atmosphere with toxic emissions produced during high-temperature combustion. Creating organizations for the collection and recycling ensure the availability of jobs, thereby reducing the unemployment rate in the capital.

To increase the necessary secondary raw materials should be selected to start the garbage directly into the container locations before the arrival of garbage trucks. As a rule sorted municipal solid waste takes into account the waste of organic origin. [3]

To ensure the use of harmless waste in Ufa is necessary to organize the following activities:

- Decrease in volumes on the landfill of industrial and household waste, reducing the amount of waste disposal facilities, preventing their losses during transportation and storage in landfills;

- Expansion of the settlements of separate waste collection and recycling of secondary raw materials;

- The introduction of resource-saving and environmentally friendly waste treatment technologies;

- Prevention of the birth of unauthorized dumps;

- Development of organizational and technical measures to prevent environmental pollution.

In solving the problem of the use of waste is necessary to introduce methods that take into account environmental aspects, as well as leading to savings and benefits. Overview of the waste impact on the environment, the use of modern environmentally friendly technologies, normative legal regulation in the field of waste use - the basis of an effective waste management system based on the solution of environmental and sanitary problems, reduce the generation of waste volumes, return them to the economic cycle as a secondary material resources and reducing the volume of their placing in landfill sites (landfills) MSW.

Список литературы:

1. Деловой экологический журнал. - 2007. - № 1. - С. 30-33.
10. Кокотов, Б. В. (кандидат юридических наук ; Ген. директор Центра правового обеспечения природопользования). / Б. В. Кокотов;

2. Коммерсантъ (Уфа) №120 от 05.07.2011, стр. 8;

3. В.С. Дементьев «Обращение с отходами в Приволжье». «Экология производства», №5-2004, М Отраслевые Ведомости, с.60-61.

УДК 504.064.47

**Aznagulov D.R.,
Abutaeva A.G.**

Bashkir State Agrarian University, Ufa, Russia

DOMESTIC WASTE MANAGEMENT IN BIG CITIES.

Аннотация: В данной статье рассмотрена история обращения с ТБО в РФ. Проанализирован экономический эффект прямого и двухэтапного вывоза отходов ТБО. На основе приведенного расчета, сделаны выводы, позволяющие решить проблемы с утилизацией отходов ТБО.

Ключевые слова: МПС, двухэтапный вывоз, ТБО, мусороуборочные машины.

Nowadays the main problem of waste utilization was embodied in Conception of solid waste facility in R.F. (approved by Ruling board Russia State system N17 from 22 Dec. 1999 year). The problem of domestic waste removal and refuse at long distance assume significance. It is related to the fact that urban population of Ufa is growing yearly. Statistics proves that distance of waste removal is growing by 1.5 km yearly, according prime cost of transportation growing by 10-15%. [1]

The real method of reduction expenses of transportation is passage to the stage removal of domestic waste using W.O.S and modern refuse collection vehicles (MAZ MKT-110).

The implementation of two stage removal of domestic waste can reduce expenses on 35% and also reduce atmospheric emissions.

Concentration of domestic waste in R.F. in 1998 year was about 30mln.tonnes, in 2007 year was about 38mln.tonnes, with adding requirement of concentration of domestic waste, predicting growing of concentration in 2016 year to 46mln.tonnes. The basic mass of waste transporting on waste deposits and ranges, it takes more than 40000ha of land besides about 50000ha is the area of close polygons and waste

deposits.

In Ufa, as in many Russian cities, the main system of waste removal is the system of irremovable waste containers (metallic or plastic containers with capacity 0.75m³) and r.c.v. for land filling.

Let's analyze the car KAMAZ KO-440-5, caring capacity is 8.5 tones, this implies that the car must transport the waste on the range, served on average 29 containers. Removal of waste takes a lot of time due to a large extension of the city.

This implies that the round trip takes a long time, in consequence arise the problem of landfilling out of time.

Russian research demonstrate efficiency of solution such problem of landfilling in big cities.

Let's analyze W.O.S. in Kazan for matching productivity is 380000 tones in year. Calculate efficiency of using two stage lands filling, use the method of Municipal Engineering Academy n.a. K.D.Panphylov.

№	Indicator name	Unit	Direct waste removal	Two stage removal of waste
1	Working capacity of W.O.S.	kt	-	380.0
2	Removal of waste capacity	kt	380.0	380.0
3	Refuse collection vehicles		-	KO-424
4	Refuse transport vehicles		KO-424	MZKT-7321
5	Range of export -to polygon -to W.O.S.	km	15	150
6	Tariff for collection and remove waste to W.O.S.	rub/t	-	232.4
7	Tariff for overload waste to W.O.S.	rub/t	-	84.0
8	Tariff for collection and remove waste to polygon	rub/t	785.7	-
9	Tariff for waste removal from W.O.S. to polygon	rub/t	-	156.0
10	Tariff for waste disposal on the polygon	rub/t	60.6	60.6

Basic data for calculation of ecological efficiency. [2]

In fact the average annual cost of collecting and waste by two stage technology is

$$31=V1*(T1+ T2+ T3+ T4)$$

Where: V1 – removal of waste capacity;

T1 – is tariff for collection and waste removal from collection

place of W.O.S.;

T2 – tariff for overload waste to W.O.S.;

T3 – tariff for waste removal from W.O.S. to polygon;

T4 – tariff for waste disposal.

On this basis,

$$380000*(232.4+84+156+60.6) = 202.54 \text{ mln.rub}$$

As a result the average annual cost of direct waste removal is:

$$32=V1*(T5+ T4),$$

where T5 is the tariff for collection and removal of waste from collecting point to polygon. In fact

$$380000*(785.7+60.6) = 321.59\text{mln.rub}$$

So annual economic factor to one W.O.S. productivity is 380000 tons a year

$$321.59-202.54=119,05\text{mln.rub}$$

This calculation proves high economic efficiency of two stage waste removal.

Without a doubt, W.O.S. mustn't be placed near disposal of the waste objects, otherwise the effect of vehicle operation will not be achieved at second stage.

W.O.S. must be placed nearly the place of waste collection. To use specialization of refuse collection vehicles maximum at both stage.

Using refuse collection vehicles expedient at all way from collecting place to disposal object. [3]

Zoom in W.O.S., namely large, to the area of waste disposal cannot always be first, than the performance of the Ministry of Railways, the greater the area of the city is involved in the sphere of its influence, and in the cities it is difficult to find a free space for W.O.S.

In conclusion it should be noted that in the cities, where economically feasible transition to a two-step removal of solid waste, there is some rational distribution of the zone. The main factor in the location and size of W.O.S.is dependent on: the amount of MSW, the number of facilities for the disposal of waste away from the area of waste disposal, technical and economic indicators and collecting garbage trucks and heavy-W.O.S.

Список литературы:

1. Вестник Волги. выпуск 6, 2007 г.
2. Абрамов Н.Ф., Гуров Д.Ю., Соколов А.Д./ Чистый город. 2003 г. №1.
3. Минигазимов Н.С., Мустафин Р.Ф., Акбалина З.Ф./ Санитарная охрана территорий и управление отходами производства и потребления. 2015 г.

УДК 504.4.062.2

**Aznagulov D.R.,
Abutaeva A.G.**

Bashkir State Agrarian University, Ufa, Russia.

**THE STOCK OF WATER IN THE SNOW, AS THE MAIN
FACTOR, OF THE FORMATION OF THE SPRING RUNOFF
PONDS AND RESERVOIRS IN BASHKORTOSTAN**

Аннотация: в статье ставится задача рассмотреть эффект снегомерных съемок, проводимых в РБ. Снегомерная съемка имеет большое значение при эксплуатации водохранилища. Результат осуществлен на принятых данных водохранилищ на период 2014-2015г.

Ключевые слова: половодье, водохранилище, снегомерная съемка, инфильтрация.

Currently in Bashkortostan there are about 443 ponds and reservoirs, reservoir 119 has a volume of more than 1 million m³. The largest reservoirs are Pavlovskoe with the capacity of 1400 million m³, Nugushskoe 400 million m³, 134 million m³ of von Karman, Yumaguzinskoe-300 million m³. An important event in the operation of ponds and reservoirs is the spring floods. The sources of spring flood runoff are snow and rain nutrition during snowmelt.

Formation of spring flood runoff is determined by the following factors: snow reserves in the basin, precipitation, dropping out during the formation of floods, loss of runoff infiltration, evaporation from the snow

surface, the depth of soil freezing, the snow melting intensity and others.

Study forming a drain factors necessary for the spring flood forecasting and flood maximum volume of expenditure to optimize the mode of operation of hydraulic structures during filling and drawdown of reservoirs during the spring floods. For large reservoirs (Pavlovskoe, Yumaguzinskoe etc.), the forecast for the spring flood (volume flow, maximum discharge) is made BashGidromet. He reflected on the ballot number 8, which is compiled annually on March 25. For ponds and reservoirs of smaller volumes, according to the rules of operation of reservoirs, water reserves in the snow cover determines the service operation of reservoirs. Subsequently the knowledge of snow cover before the flood, and the actual amount of flooding, accumulated in the bowl of the reservoir and discharge through culverts (bottom outlet, flood spillway) allow to calculate the flow rate from the formula:

$$K=W_n / W - \text{flow rate (1)}$$

W_n - the volume of flood

W - water supply in the snow

The larger the observation period, the more reliable is the runoff coefficient. Thus, knowing the mean annual runoff coefficient and water supplies before the snow melts, it is possible to predict the amount of spring tide, picking up analogue year. Investigations were carried out on the ponds and reservoirs under the jurisdiction of the Ministry of Agriculture of the Russian Federation and on the balance sheet consisting of Federal State Institution Bashmeliovodhoz management. In Bashkortostan there are 8 of these ponds and reservoirs. In Zauralskaya zone Abzelilovsky District is a pond Chebarkul on the river Yangel: the reservoir has a volume of 34.2 million m³, surface area at normal water level = 1550 hectares, a pond is located near the highway Askarovo Magnitogorsk. A few kilometers from the pond Chebarkul located Gusevskoe reservoir on the river Tyrki, the reservoir has a volume of 1.65 million m³ and a surface area at normal water level = 107 hectares.

In Khaybullinsky District located Dergamyshevskoe reservoir Dergamysh on the river; pond has a volume of 1.9 million m³ and a surface area at normal water level = 3.5 hectares.

In the Ural steppe zone in Davlekanovsky District is a pond on the river Sazlykul. The pond has a volume of 1.34 million m³ and a surface area of 92 hectares.

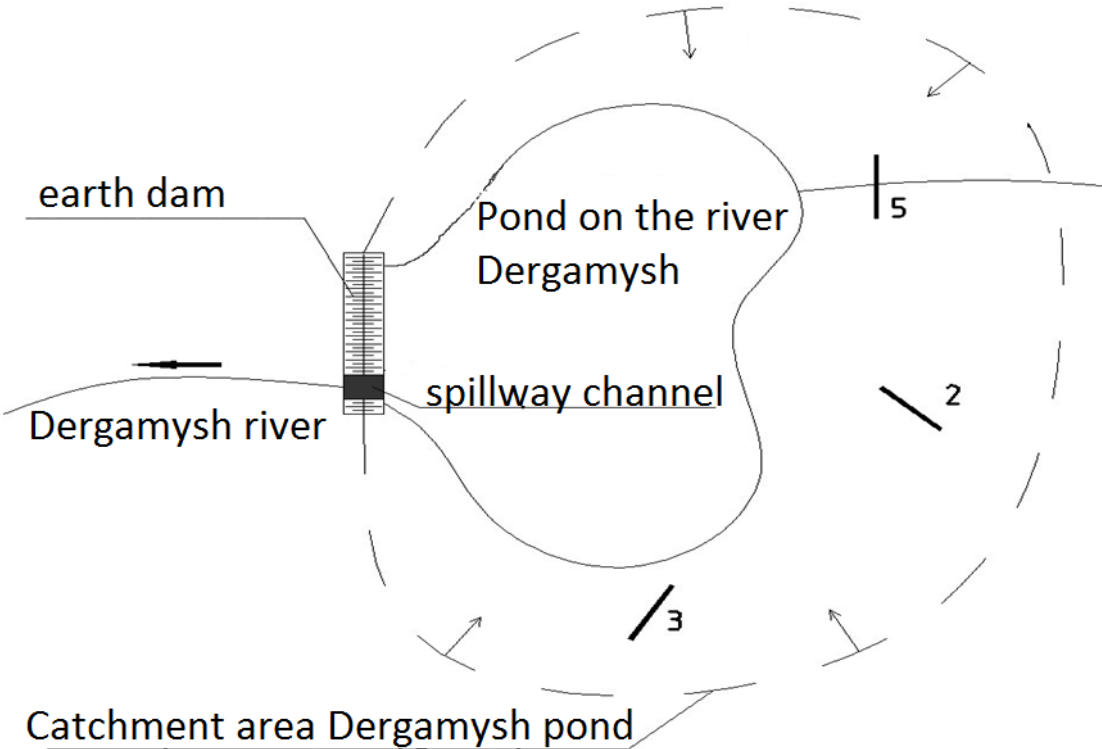
In Yuzhnolesostepnoy zone RB Chishminsky District is a pond on

the river Kaygalysh; pond has a volume of 0.405 million m³ and a surface area at normal water level is 23 hectares.

In Kushnarenkovsky District Kushnarenkovsky reservoir on the river Sychevka; the reservoir has a volume of 1.065 million m³, surface area at normal water level is 26.2 hectares.

In Bakalinsky District located Bakalinsky reservoir on the river Mata. The reservoir has a volume of 3.55 million m³. and surface area with normal water level 112.2 hectares.

In Dyurtyulinsky District Staroyantuzovskoe reservoir on the river Yevbaz. The reservoir has a capacity of 1.9 million m³. surface area of 70 hectares.



The figure shows a diagram of the definition of snow cover in the catchment area of the Dergamyshesкое reservoir.

Dashed line designated catchment area Dergamysh pond, which is 162 km². The black segments with numbers 3.2.5 marked target. Number of target depends on the catchment area (1 alignment 50 km²) alignment length being 2 km. Black solid line represents the mirror Dergamysh pond. To determine the water reserves in the snow held route snow survey, which should include all the elements of relief: Hillside, hollow, hollow, beam, and a variety of land located in the catchment area (forest, field, meadow). In the production of snow- in

the forest every 10 meters of snow stakes portable M-104 measure the height of the snow cover, and every 50 meters determine the density of the snow. In the field: every 20 meters measured depth of snow cover, and after 200 meters - snow density. For this purpose, the weight is marching snow-gauge VS - 43, consisting of a metal cylinder and weights. Cylinder snow sample taken was weighed and the density was calculated.

Employees of Federal State Institution of management Bashmeliovodhoz routed snow-filming from 10 to 14 of March. The smallest snow cover recorded in Abzelilovsky District. In the catchment area of the reservoir Gusevskoe she was 17 cm, and the biggest in the catchment area of the reservoir Bakalinsky she was 40 cm.

Smallest snow density in the Trans-Ural area on the lake Chebarkul (density 0.22 g / cm³) and Gus Reservoir (0.20 g / cm³), and the highest density of snow on the ponds Sazlykul (0.31 g / cm³), and on the river Kaygalysh (0.31 g / cm³).

As a result, a layer of water in the snow cover on Bakalinsky reservoir was 104 mm and exceeded 3 times Gusevskoe reservoir. A layer of water in Gusevskoe reservoir was 34 mm.

In 2015, the volume of supply of water accumulation in the catchment area below all reservoirs below the water reserve in 2014

So, in 2014 in Gusevskoe reservoir volume of water accumulated in the catchment area was 2.6 million m³, while in 2015 it amounted to 2.0 million m³.

It should also be noted that in 2015 the catchment area of the lake Chebarkul supply of water in the snow was only 21.8 million m³, this figure is close to the minimum.

Observation period lasted for 3-10 years.

In 2015, the supply of water in the snow on all the reservoirs was below the historical averages.

The following table presents data on the reservoirs of the Republic of Bashkortostan.

№	water sources	The average height of snow cover, cm	The average density of the snow cover, g/cm ³	A layer of water in the snow cover, mm	The catchment area, km ²	The volume of water accumulated in the catchment area, million m ³					Volume for normal water level, million m ³	The actual amount before the flood, million m ³
						2015	2014	Average	Minimum	Maximum		
1	Lake Chebarkul	19	0.22	42	516	21.8	30.4	37	21.7	59.4	34.2	
2	Gusevskoe reservoir on the river Tytky	17	0.20	34	58	2.0	2.6	3.4	2	5	1.65	
3	Dergamyshskoe reservoir on the river	28	0.25	70	162	11.3	13.1	11.6	3.8	17.5	1.9	
4	Kushnarenkovskoe reservoir on the Sychevka	33	0.27	89	24	2.1	2.5	2.5	1.6	3.4	1.065	0.142
5	Pond on the river Sazlykul	27	0.31	84	27	2.3	2.8	3.1	1.6	5.3	1.34	0.63
6	Pond on the river Kaigalysh	30	0.31	93	22	2.0	3	2.9	2.0	3.7	0.405	0.045
7	Staroyantuzovskoe reservoir	32	0.28	90	173	15.6	20.6	18.3	12.6	28.3	2.7	
8	Pond on the river Evbaza	34	0.30	102	57	5.8	6.8	5.9	3.5	9.2		
9	Bakalynskoe reservoir on the river Mata	40	0.26	104	160	16.7	18.7	18.2	9.6	31	3.55	

Table 1. Data of the reservoirs in the Republic of Bashkortostan

According to the data given in the table can hold preliminary forecasts.

With the runoff coefficient equal to 0.6, it can be established that at Gusevskoe reservoir drawdown to the level of the dead volume is completely accumulates in their entire volume of the cup spring flood.

Runoff coefficient of 0.6 multiplied by the volume of water storage 2 million m³, of 1.2 million m³ (projected runoff), and the volume at normal water level is 1.65 million. m³. The volume at the level of the dead volume = 0.3 million m³. the volume of the transformation of 1.35 million. m³.

For example, Bakalinsky District flow volume is 0.6 multiplied by the volume of water storage of 16.7 million m³, and will be 10 million. m³ (projected runoff), when triggered, the level of the dead volume of 0.5 million. m³. accumulate in the pond can be 3.05 million. m³.

Consequently the remaining 7 million m³ will passed through the crossing structures, which should be ready to pass the spring flood.

In conclusion, it should be noted that this observation demonstrates

the need for snow surveys. Snow surveys is the most effective way in determining the amount of melt water from the catchment area of the reservoir, and plays an important role in the operation of the reservoir.

Список литературы:

1. Бочкарев Я.В., Овчаров Е.Е. Основы автоматизации и автоматизация производственных процессов в гидромелиорации, — М.: Колос, 1981. — 336 с.
2. Быков В.Д., Васильев А.В. Гидрометрия. — Л.: Гидрометеиздат, 1977 — 447 с.
3. БашГидроМет / бюллетень №8, 2014г.

УДК 250034

Akmalov Sh.B.,
University of Science and Technology Villeneuve d'ASCQ,
Tashkent, Uzbekistan

Gerts J.V.,
Tashkent Institute of Irrigation and Melioration, Tashkent,
Uzbekistan

Omonov D.B.
Tashkent State Agrarian University Tashkent, Uzbekistan

**MONITORING THE NATURAL FACTORS INFLUENCES TO
VEGETATION DEVELOPMENT BY USING MODERATE-
RESOLUTION IMAGING SPECTRORADIOMETER (MODIS)
IMAGES WITH OBIA METHOD IN UZBEKISTAN**

Abstract: In the study, natural and anthropogenic effects on vegetation are discussed and degree of their influence is shown in Syrdarya province (Uzbekistan). A statistical model of integrated meteorological and hydro- remote sensing data was developed. By the use of this model the correlation of various natural factors in vegetation period was analyzed and scale-dependency of spatial relationships between NDVI and three climatic factors were investigated. MODIS NDVI images have been used for the study area and OBIA method was applied via eCognition software.

Key words: Syrdarya, Remote Sensing, Object Based Image Analysis (OBIA), eCognition, Moderate-Resolution Imaging Spectroradiometer (MODIS), NDVI

Introduction. Agriculture is a vital industry in Syrdarya province

(Uzbekistan) and it plays a key role in supporting the greatest part of population. However, hot summer winds drain the soil and harm the plants. Intense evaporation in summer causes salinization and other negative processes on the surface of the field (Tukhliev and Kremensova, 2007).

Nowadays remote sensing techniques are widely used in updating land cover information, environmental protection and ecological monitoring. The use of RS data proves to be useful for observation anthropogenic effects, natural and ecological processes on a large scale (Gyuris 2015). RS allows observation of processes over long timescales and at the same time helps us solve many difficulties and necessities, existing in traditional ecological analyzing method (Giniyatullina, Potapov, and Schactlivtcev 2015).

The high temporal resolution of the MODIS datasets can provide an efficient and consistent way for monitoring of biomass, vegetation and above-mentioned factors (Dalezios et al., 2001). Consequently, such high temporal and medium spatial resolution sensor like MODIS could be a very useful tool for such investigations on the regional scale.

Methods and materials. Study area. Syrdarya is one of twelve provinces of Uzbekistan, which borders on Kazakhstan Republic in the north, on Tashkent province in the east, on Tajikistan Republic on the south and on Jizzakh province in the west. Gulistan city is the center of this province. The province is located on the left riverside of Syrdarya, the main source of irrigation water in the province. (Figure 1).

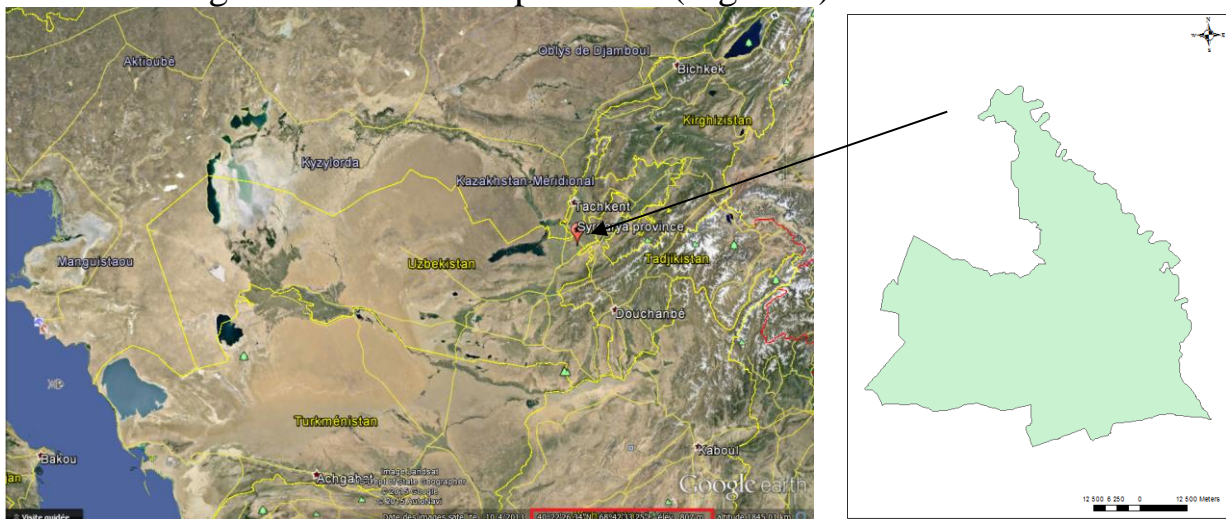


Figure 1. Study area

(Source: Google earth image and GIS shape file of Syrdarya province)

The climate of the region is continental with hot and long summers, and short winters with little snow. The long-term annual average temperature in the region is + 14.75°C. Ground in daylight time warms up to 38-40 °C, in winter temperature decreases up to -10°C (UzGidroMet data 2000-2012). Precipitations mainly occur during the winter-spring

months showing and averages at 340 mm per year. Relative moisture of the air at wintertime forms 74-78%, but in a year, it is about 29-31%, at average annual rate of 56%. Annual evaporability is 1500 mms (World Bank Project 2010) (Figure 2).

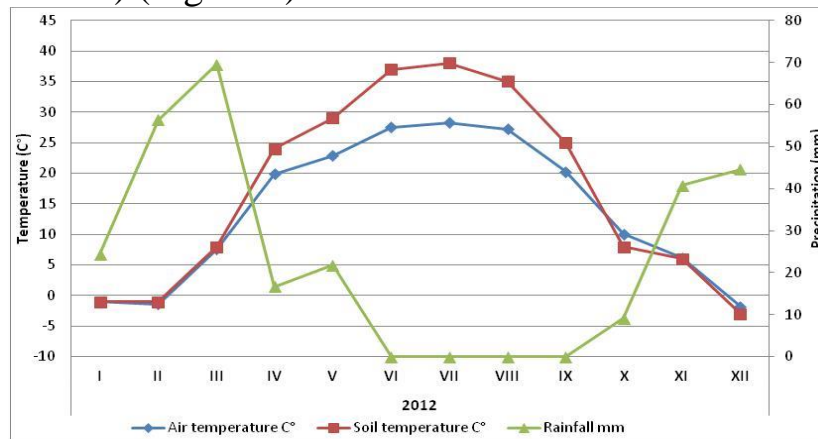


Figure 2 Average annual meteorological data of Syrdarya province (Source: UzGidroMet data).

Data used. Some meteorological data was selected for correlation analysis of MODIS NDVI value to natural factors. This data (2000-2012) has been provided by UZGIDROMET center and includes the following: air temperature, runoff value of Syrdarya River, participations.

MODIS NDVI data. Analysis required Terra (MOD13Q1) MODIS vegetation index products which are provided every 16 days at a spatial resolution of 250 meters as gridded level-3 products in the Sinusoidal projection. The Terra 16-day period starts from the day 001. In the study 154 images from the period between 2000 and 2012 were taken in sequence of one image per month. Georeferenced MODIS NDVI images were provided free of charge.

Tools and software used. OBIA method was used during the analysis, which was performed by eCognition program. With this software, MODIS NDVI images have been segmented up to the homogenous object of the surface for the whole Syrdarya province. Segmentation parameters were chosen as following (Table 1):

Name	Number of images	Image layer weight	Scale Parameter	Shape	Compactness	Number of object
MODIS NDVI	154	1	80	0,1	0,9	1 Province

Table 1 Segmentation parameter of MODIS NDVI images

After the segmentation, monthly average values of NDVI have been copied from the window of "image object information" and pasted to Excel file. Then, the water volume of river, average values of temperature and monthly total sum of precipitation were added to the data base in

accordance with months in a year.

Results and discussion

By statistical analysis, the correlation coefficients (R) of monthly NDVI changes have been found. Table 2 shows the correlation of vegetation with natural factors within the last 12 years.

	Amount of water (entrance to Syrdarya reg.) m ³ /s	Rainfall mm	Air temperature C°
Mean NDVI of province	-0.73	-0.47	0.87

Table 2. Correlation results.

In accordance to the results, the precipitation almost do not have an impact on vegetation period, since the correlation coefficient between them is equal to $R=-0.47$, which means the absence of any relation. It could be explained by the fact that precipitation in province mostly falls in the non-vegetation period and the greatest part of agriculture is based on irrigation.

At the same time, NDVI has strong negative correlation with the change of water volume of the Syrdarya river. In spite of the fact that this river is among ice-fed rivers R is equal to -0.73 .

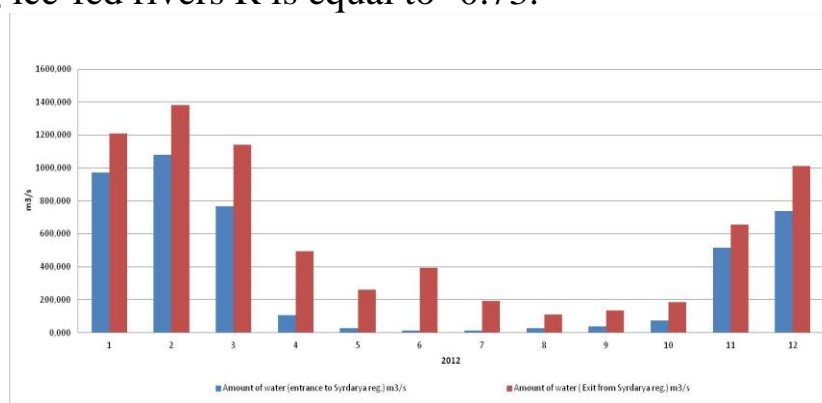


Figure 3. Annual average volume of water of the Syrdarya river (Source: UzGidroMet data).

We imply that this fact appears because two water reservoirs in the up-flow part of the river (Tohtagul reservoir in Kyrgyzstan and Kayrakkum reservoir in Tajikistan) collect water intensively during vegetation period and in non-vegetation period a huge amount of water is dropped to Syrdarya in order to produce electrical energy (Figure 3). Water do not almost influence the vegetation period in province, because it is dropped in down-stream and drain water reaches the river which flows straight away to the neighboring Kazakhstan.

However, correlation index of vegetation period with temperature is very high (0.87), which means that the vegetation period occurs in hot seasons of the year.

Conclusion and recommendations. Satellite information (in particular

MODIS data) is very important if we are going to solve an influence of natural and anthropogenic factors on vegetation development. For such issues remote sensing provides a wealth of time-consuming information at a global scale.

Nowdays, MODIS images are in open access, and the analysis program of eCognition Developer is not very expensive, which means their accessibility for the researches. Besides, MODIS images have NDVI band, which saves us from the difficulties of calculation.

Considering results of the analysis, vegetation development has high levels of concordance with temperature, but at the same time negative relations with water volume and precepitations revialed. Influences of hot summer, artificial irrigation and water shortage in agricultural areas were chosen as a main factors for that.

Trans boundary water problems are international issues requiring global interferences. It could be recommended to continue current investigations by gathering field experiments with results and conducting future analysis of factors influencing the natural changes.

List of literature:

1. Brigante, Raffaella, and Fabio RADICIONI¹. 2014. "Use of Multispectral Sensors with High Spatial Resolution for Territorial and Environmental Analysis." *Geographia Technica* 9 (2).
2. Dao, Phuong D., and Yuei-An Liou. 2015. "Object-Based Flood Mapping and Affected Rice Field Estimation with Landsat 8 OLI and MODIS Data." *Remote Sensing* 7 (5): 5077–97.
3. Giniyatullina, O. L., V. P. Potapov, and E. L. Schactlivtcev. 2015. "Integral Methods of Environmental Assessment at Mining Provinces Based on Remote Sensing Data." Accessed June 8.
4. Gyuris, Mr Peter. 2015. "WP4-SATELLITE REMOTE SENSING DELIVERABLE D4. 1 REPORT ON THE LIMITATIONS AND POTENTIALS OF SATELLITE EO DATA." Accessed June 9.
5. Law, Beverly E., Tim Arkebauer, John L. Campbell, Jing Chen, Osbert Sun, Mark Schwartz, Catharine van Ingen, and Shashi Verma. 2008. "Terrestrial Carbon Observations: Protocols for Vegetation Sampling and Data Submission." FAO, Rome.
6. Tukhliev N., Kremensova A. Republic of Uzbekistan: encyclopedic reference. [country and the administrative division of the people, history, government structure, economy, education, science, health, life, cultural life]. "National encyclopedia of Uzbekistan" State Scientific Publishing, Tashkent. 2007.
7. World Bank Project 2010. «Water supply of Syrdarya province». Agency «Uzkommunservice». Uzbekistan, Tashkent.

УДК: 658.382.3

**Akhmedov I.,
Khojiev A.**

**Tashkent Institute of Irrigation and Melioration, Assistan of the
Department of «Safety of Vital Activity», Tashkent, Uzbekistan**

THE IMPACT OF AMELIORATIVE CONDITION OF LANDS ON FOOD SAFETY

Abstract. Agricultural and animal products provide a man essential vitamins and minerals that body needs to work properly and, thereby; it is directly connected with the land. Vitamin deficiencies can lead to a variety of health problems.

Keywords: water resources, the land resources, food safety, agricultural products, the little salinity lands, the average salinity lands, the strong salinity lands, ground potential.

Irrational usage of water and land resources leads to negative consequences. Agricultural and animal products provide a man essential vitamins and minerals that body needs to work properly and, thereby; it is directly connected with the land. Vitamin deficiencies can lead to a variety of health problems.

For instance, the vitamin B1 (Thiamine) deficiency results fatigue, fall in worker productivity, having problems with skin; the vitamin B5 (the nicotine acid) deficiency - to quick fatigue, development of such disease as pellagra, also disorder of the central nervous system, gastrointestinal tract, kidneys, skin (integumentary system). A deficiency of vitamin B9 (the folic acid) leads to cardiovascular disease, liver disease, metabolic disorder. Also deficiency of vitamins R, A, D, E, K leads to development of the different types of the diseases[1].

Vital activity of the number of people who are suffering from the vitamin deficiency is not adequate. Therefore, from this it is possible to deduce that damage caused by vitamin deficiency is not less harmful than different types of emergency situations. At present, the population of the Republic Uzbekistan amounted to more than 30 million people (as of 01.03.2014.) The area of irrigated lands used for sowing of the agricultural products is 4212,2 thousand ha (on condition on the end 2012), of them 3714 thousand ha used in agriculture.

Land precipitate has been decreasing each year. This brings about reduction of the product animal and agricultural products. In order to maintain activeness of a man, supply of energy to the body plays important role.

From the medical sources, it is known that person, who does light physical labour spends in 1 minute 2 kkal, moderate physical labour - 5 kkal, heavy physical labour - more than 5 kkal. If organism is provided with energy, that person can work productively. Products we get from the land serve us as a source of energy.

According to the data of United Nations Organization, if the daily energy supply is less than 2500 kkal, then such phenomenon is considered as energy deficiency. For adequate supply of vitally necessary energy needs of the body, it is necessary to consume the products in amount specified in the table, regrettably not each family can afford itself. At the moment internal resources of Uzbekistan is insufficient for its population, and there are some issues with importing some products. The main irrigated area of the republic occupied basically wheat-cotton rotation, which are a raw materials for food products comparison of cotton production of the Republic Uzbekistan and some developed countries were provided in table 2 [4].

№	Name of the products	Scientifically motivated rates	
		V. Siderenko. and others[2]	V.A.Dosenko and others [6]
1	Meat and meat products	89	75
2	Milk and milk products	392..	320-340
3	Egg, sht/year	292....	260.....
4	Fish and seafoods	25	1822
5	Grain and grain products	110	
6	Potatoes	118	
7	Gourds and vegetables	139	
8	Sugar	30...	24...28
9	Vegetable butter	10-12
10	Salt	2.53.5
11	Bread and bakery products	105*	

Table 1. Need of the person in product of the feeding (kgs/year)

Apparently from the table, productivity of cotton in Uzbekistan is much less, than in the developed countries, in particular in comparison, with Australia than-285%, Israel of 273%, and also it is less, than in China, Brazil, Mexico, Syria and even the next Kyrgyzstan. On the irrigated lands of Uzbekistan there are all prerequisites for creation of potential in development of agriculture and animal husbandry.

Country	Australia	Israel	Brazil	China	Mexico	Syria	Kyrgyzstan	Turkmenistan	Uzbekistan
Productivity, kg/hectare	1844	1762	1489	1277	1313	1206	824	412	645
Relative indicators of Uzbekistan, as a percentage	-285*	-273	-231	-198	-203	-187	-127	+64	0

Table 2. Relative indicators of the Republic of Uzbekistan in comparison with some developed countries of the world on production of cotton

Note: "-" means "less", "+" means "more".

For this purpose it is necessary to hold melioration, agrotechnical events and actions for improvement of quality of seeds. In the Republic events for achievement of the specified purpose are held. To it the Decree of the President of the Republic of Uzbekistan "About actions and rational use of water resources during the period since 2013-2017" for № PK-1958 of April 19, 2013 can form improvement of the melioration condition of the irrigated lands the basis.

According to the Ministry of a rural and water management Republic of Uzbekistan Square the little salinity of lands makes 134,7 thousand hectares, the average salinity - 125,9 thousand hectares, the strong salinity of lands - 125,9 thousand hectares. Fertility of these lands can be increased. For this purpose it is necessary to carry out a complex of drying melioration and to improve irrigational systems.

In Uzbekistan the system of drying melioration takes an important place in development of agriculture. In the Republic there are 1.3 million hectares of the irrigated lands, more than on a half of them are constructed and systems of drainage function.

For drainage more than 110 thousand km of systems of a horizontal drainage, over 4200 wells of a vertical drainage are put into operation. According to SANIIRI, one of the reasons of decrease in productivity of crops on the irrigated lands is them засоление [6]. On the strong salinity lands productivity of cotton can decrease by 100%. (fig. 1).

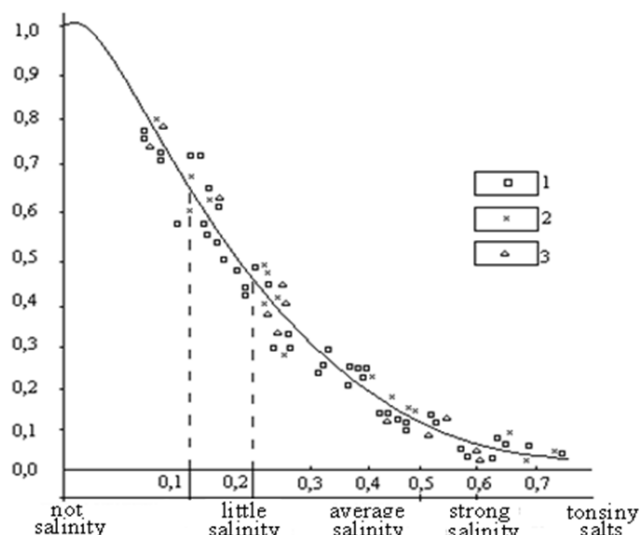


Fig. 1. Influence of salinity of lands on productivity of cotton [6].

Based on the above data on cotton crops, it is possible to calculate average value of capacity of the earth:

$$P = P_{\max} - P_f \quad (1)$$

Here: P – ground potential;

P_{\max} – the highest indicator;

P_f – actual indicator.

From fig. 1. it is visible that productivity of cotton on the little salinity lands is equal 0,65-0,45, on the average salinity lands 0,45-0,18, on the strong salinity lands makes less than 0,18. In that case productivity of cotton (P_{cot}) can be calculated on the following formula:

$$P_{cot} = \frac{\omega_1 \cdot M_1 + \omega_2 \cdot M_2 + \omega_3 \cdot M_3 \dots}{\Sigma \omega_i \dots} \quad (2)$$

Here: $\omega_1, \omega_2, \omega_3$ – areas weak, average and strong salinity of lands;

M_1, M_2, M_3 – the parts considering decrease in productivity depending on salinity of lands.

On the basis of it:

$$P_{cot} = \frac{1354,7 \cdot 0,55 + 632,8 \cdot 0,31 + 125,9 \cdot 0,10}{1354,7 + 632 + 125,9} = 0,45$$

From calculations it is visible that productivity of cotton for this territory makes 0,45 or 45%. These formulas can be applied to calculation of average productivity of other crops.

Based on the above-stated calculations, it is possible to draw the following conclusions:

1. There is an internal potential for improvement of safety of production and supply of the population with necessary energy.
2. For densely populated territories of Uzbekiston introduction of vnutrenny potential is the basic from an economic and social position.
3. It is necessary to consider that there are 50% potential for

development of actions for the solution of this problem.

Literature:

1. T. Hudoyshukurov, M. Karimov, V. Otayev, B. Saidov, The journal "Health". T.: 1990 й.
2. V. Sidorenko, P. Mikhaylushkin. Food security in the modern world. «The international agricultural journal» 2012 pp.40-45.
3. I. Korovkin. A condition of production of meat-and-milk production and its quality in Russia, «The international agricultural journal» 2012 pp.45-49
4. P. Ibragimov, M. Iksanov. Production of cotton fiber in the leading countries of the world. T., The journal «Agroilm», № 2 (8), 2011. pp 3-4.
5. V. A. Dotsenko, I. A. Kononenko. Problems of safety of food of the population. The journal «Health and safety» Moscow.№11/2011.
6. R. Ikramov, H.Yakubov. «Modern problems of land reclamation». T.: 2003.

УДК 332.624:131

**Капрanchikova D.A.,
Kolbneva E.U.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

**NORMATIVE-LEGAL BASE OF TECHNICAL PLAN
FORMATION**

Аннотация: В данной статье рассмотрено понятие и содержание технического плана и технического паспорта на современном этапе. Приведен перечень документов, необходимых для формирования технического паспорта, а также перечень разделов, которые входят в состав технического плана и технического паспорта.

Ключевые слова: технический план, технический паспорт, бюро технической инвентаризации, реестр земельных участков, межевой план, кадастровая палата.

At present one of the main duties of specialists of Bureau of Technical Inventories (further – BTI) is formation of three registers (the register of the property rights, register of the land plots and register of inhabited capital construction projects) [1].

There was a need to unite these three registers to create one information base. In this case technical building plan will reflect all three components of the above-mentioned registers.

Technical data sheet is one of the main documents on the apartment, the building, room. Technical data sheet is made out in BTI in the location of the building or apartment. Each house, room or building has a technical data sheet. It is possible to name technical data sheet of the apartment is an extract from technical data sheet of the building. Without technical data sheet it is impossible to carry out the transactions at the apartment or room – purchase and sale, an exchange and even re-planning. Departure of the representative of BTI to the object is necessary to register technical data sheet of a room, an apartment or a country house. It is possible to make urgent registration of technical data sheet on a country house or a city apartment. It will allow saving time and relieving of the need to stand in queues. Technical data sheet of a house or an apartment consists of three sections: "Data of the state account", "Data on consumer properties, technical characteristics and service conditions", "Reference information" [2].

The employee of BTI fixes the following data on a room, building or the apartment in a technical data sheet:

- inventory and cadastral numbers;
- address of a house or an apartment;
- year of construction of the building;
- physical wear;
- floor-by-floor plan of a house;
- explication;
- inventory cost of a house, room, apartment;
- general information on a design and systems of a house (material of walls, overlapping's, ventilation, heating, electricity, sewerage, water supply system);
- sanitary and hygienic standards of premises of a house.

Technical data sheet of a country house, apartment has no validity period that distinguishes it from many other references of BTI. However if during five years there are changes (extensions to a country house or changes of in a apartment planning), it is necessary to change technical data sheet of room or a country house.

For registration of technical data sheet of apartment or a country house the following documents are required:

- written statement on registration of technical data sheet;
- passport of the applicant;
- the documents confirming the property right of the applicant to a room or apartments;

- other documents depending on a situation for which technical data sheet is made out.

The technical plan of a real estate object represents the document in which the certain data brought in the State Immovable Property Cadastre are reproduced and the data on a building, room or an object of incomplete construction are necessary for registration of such real estate object, or data on a part or parts of such real estate object or new data necessary to be introduced into the State Immovable Property Cadastre of data on such real estate object to which cadastral number is assigned.

Data on a real estate object are specified in the technical plan on the basis of the cadastral works of permission to input such real estate object presented by the customer in operation, project documentation of such real estate object or technical data sheet on such real estate object.

In the absence of the specified documents such data, except for data on location of a building, construction or an object of incomplete construction on the land plot and about location of the room within a floor of the building or a construction, or within the building or a construction, or within the corresponding part of the building or a room, are specified in the technical plan on the basis of the declaration made and certified by the owner of a real estate object. This declaration is attached to the technical plan and is its integral part.

Difference of the technical building plan from technical data sheet is that now coordinates of rotary points of a residential building on the district will be attached to the location of an apartment in room floor borders. The new statutory act provides that the technical plan will contain not only the description of object on a site, but also its satellite photo. The technical plan will allocate a capital construction project on the designated space including technical data sheet of an apartment.

It is easily possible to define finding an inhabited object location by the new technical plan.

The document includes:

- graphic part in the form of a drawing with the numbered rotary points, an object arrangement on a site;
- data on the performer and customer of works;
- short characteristics of an object (address and its location);
- appointment;
- list of walls materials;
- total area [3].

Cadaster data on the plot extract are specified a site, documents establishing the property right, permission to explore a residential building are presented in the document.

Technical data sheet in this case is an important annex to the technical plan. If the owner wants to receive the documents, it is enough to

order the registration certificate where the information to fill in the plan will be given in BTI.

Printing version of the plan is developed electronic one so as the object could be put on the cadastral account. It should be noted that today documents are to be ordered in BTI and then to register in Cadastral Chamber. But by the end the of so-called "transition period" necessary documents between these two organizations will be able to be transferred by e-mail.

To exclude possibility of confusion between the boundary and technical plan, it is necessary to remember the following explanation. The boundary plan concerns only the land and specifies coordinates of borders of a plot on which the room is located. The technical plan coordinates rotary points of a residential building concerning this plot.

It should be also noted that the technical plan is made out only on the inhabited objects which are again put into operation that is necessary for their registration. In that case when a person lives in one apartment some years, there is no need to bring it in the inventory as it is already registered as a part of one apartment house. These apartments are already considered as a registered object and if any reconstruction or re-planning, the cadastral passport is issued for it. To sell or change such an it will be necessary apartment to apply to the Cadastral Chamber to obtain the corresponding permission.

Список литературы:

1. Земельный кодекс Российской Федерации от 25.10.2001 №136-ФЗ (действующая редакция от 08.03.2015) // Справочно-правовая система «Консультант Плюс» [Электронный ресурс] / <http://www.consultant.ru>.

2. Об утверждении формы технического паспорта объекта индивидуального жилищного строительства и порядка его оформления органом (организацией) по учету объектов недвижимого имущества: Приказ Минэкономразвития РФ от 17.08.2006 № 244. Справочно-правовая система «Консультант Плюс» [Электронный ресурс] / <http://www.consultant.ru>.

3. Об утверждении формы технического плана здания и требований к его подготовке: Приказ Минэкономразвития РФ от 01.09.2010 № 403. Справочно-правовая система «Консультант Плюс» [Электронный ресурс] / <http://www.consultant.ru>.

УДК 332.264:349.41/.42

**Kotlyarova E.U.,
Vikin S.S.**

**Voronezh State Agricultural University after Emperor Peter the
Great, Voronezh, Russia**

UNAUTHORIZED SEIZURE OF LAND IN THE KALACH DISTRICT OF VORONEZH REGION

Аннотация: Рассмотрена проблема самовольного захвата земельных участков на территории Калачеевского района Воронежской области. Наглядно показана динамика изменения правонарушений. На основании проведенного анализа статистических данных сформулированы предложения по повышению эффективности проведения земельного надзора

Ключевые слова: земельный надзор, устранение правонарушений.

Art. 9 of the Constitution of the Russian Federation attached the importance to the role of natural resources. According to this article, land and other natural resources are used and protected as the basis of life and activity of the population living in the area [1]. Compared to other natural resources of the earth carries the most extensive and important functions in the system of social relations, violation the land regulations. Any failure to perform the legal requirements negatively impact on the use and protection of land. That is why the state supervision over the protection and use of land is an important problem.

One of the most common violations in the area of land legislation is unauthorized seizure. People want to get the land plots without permission documents. Currently the problem of unauthorized seizure of land is relevant.

We can also consider the dual nature of the unauthorized occupation of land. On the one hand, this is a deliberate capture of land, and on the other is the use of land without duly executed permission documents. Unauthorized occupation of land can include illegal land development, temporary or permanent storage, and other illegal actions. In accordance with Article 131 of the Civil Code, transactions and restrictions on real estate must be registered. [2]

Thus, having the resolution on the granting of land ownership, lease or other document it is necessary to apply to the local authorities for the registration of their right to the land plot.

Federal Law № 447 "On Amendments to the Federal Law" On State

Real Estate Cadastre "and some legislative acts of the Russian Federation" came into force on December 22, 2014. In accordance with the law number 447 from December 31, 2014 the total period of the state registration of the rights to real estate has been reduced from 18 to 10 calendar days.

The total (limit) period of the state cadastral registration was also reduced. Setting and removal from the register of the realestate is carried out within 10 working days (previously the term was 18 days) [4].

Federal Law № 46 "On Amendments to the Code of Administrative Offences" came into force on March 8, 2015. According to the law unauthorized occupation of land plot or it is part will be sanctioned by an administrative fine if cadastral value of the land plot is determined citizens have to pay from 1 to 1.5% of the cadastral value of the land plot, but not less than five thousand rubles; officials - from 1.5 to 2% of the cadastral value of the land plot, but not less than twenty thousand rubles; on legal entities - from 2 to 3% of the cadastral value of the land, but not less than one hundred thousand. The cadastral value of the land is not defined the citizens have to pay with an administrative fine from five thousand to ten thousand rubles; the officials - from twenty thousand to fifty thousand rubles; legal entities - from one hundred thousand to two hundred thousand. [5]

Consider the dynamics of different types of offenses in Kalach district of Voronezh region for the period 2010-2015.

Kind of violations of land legislation	Violators of the law	Number of violations					
		years					
		2010	2011	2012	2013	2014	2015
Unauthorized occupation of land, the use of them without title documents	entities	13	3	0	4	0	2
	citizens	7	2	0	0	1	1
	officials	23	12	5	7	3	2
Intended purpose land use	entities	2		2			
	citizens				2	4	2
	officials				1	4	
Failure to comply with regulations	entities	5	5		2	3	9
	citizens	43	38	23	2	12	14
	officials	14	3	8	2	2	1
Failure to pay an administrative fine in time	entities				6		
	citizens						
	officials				2		
Other violations of land legislation	entities	3	23	12		3	5
	citizens	66	19	12		25	26
	officials	2		21			
Total	entities	21	31	14	12	6	16
	citizens	18	59	35	4	42	43
	officials	44	11	34	12	9	
All in all		178	101	83	28	57	62

Table 1 - Offences of land Legislation Identified in the District

Consider the ratio of violations of land legislation in 2015 in Kalach district (Fig. 1).

Analysis of the statistical reports revealed that the predominant species in the area of violations of land legislation are as follows: failure to comply with the state inspector regulations for the elimination of violations of land legislation and the unauthorized occupation of land plots, their usage without permission documents allowing economic activities.

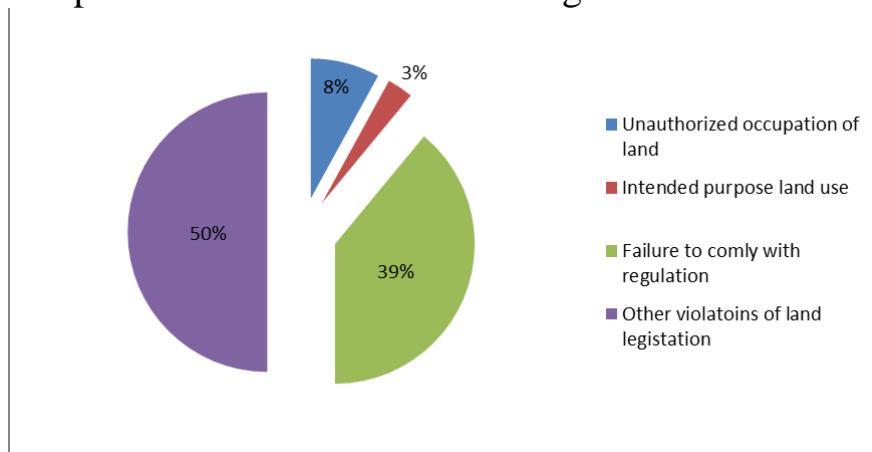


Figure 1 - Violations of land legislation

We analysed the situation conserning the violations of land plots in the district for the period of 2010-2015., and reveled the following:

- unauthorized seizure is one of the most common offenses;
- officials are the greatest number of violations;
- the percentage of offenses removals are not always 100%.

Analyzing the data of the state land supervision we recommend the following:

- to increase the number of the state inspectors;
- to increase the funding and state supervision organizations on the use and protection of land;
- to increase the fines for violation of land legislation;
- to increase the number of the planned inspections.

Список литературы

1. Конституция Российской Федерации от 12.12.1993 (ред. от 21.07.2014) // Справочная правовая система «Консультант Плюс ВерсияПроф» [Электронный ресурс]: [сайт]. – Режим доступа: <http://www.consultant.ru/>

2. Гражданский кодекс Российской Федерации часть первая: федеральный закон от 30.11.1994 № 51 – ФЗ (ред. от 02.11.2013) // СПС «Консультант Плюс ВерсияПроф» [Электронный ресурс]: [сайт]. – Режим доступа: <http://www.consultant.ru/>

3. Кодекс об административных правонарушениях:

федеральный закон от 30.12.2001 №195–ФЗ (ред. От 1.04.2014) // Справочная правовая система «Консультант Плюс» ВерсияПроф» [Электронный ресурс]: [сайт]. – Режим доступа: <http://www.consultant.ru/>

4. О внесении изменений в Федеральный закон «О государственном кадастре недвижимости» и отдельные законодательные акты Российской Федерации: федеральный закон от 22.12.2014 № 447 // Справочная правовая система «Консультант Плюс» ВерсияПроф» [Электронный ресурс]: [сайт]. – Режим доступа: <http://www.consultant.ru/>

5. О внесении изменений в Кодекс Российской Федерации об административных правонарушениях: федеральный закон от 8.03.2015 № 46 // Справочная правовая система «Консультант Плюс» ВерсияПроф» [Электронный ресурс]: [сайт]. – Режим доступа: <http://www.consultant.ru/>

6. Официальный сайт Управления Федеральной службы государственной регистрации, кадастра и картографии по Воронежской области / <http://to36.rosreestr.ru>

УДК 631.164.25(470)=20

**Laktionova Y.A.,
Gladnev V.V.**

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

STATE REGULATION OF RATIONAL USE OF LAND IN RUSSIAN FEDERATION

Аннотация: Земельные ресурсы являются одними из наиболее значимых для каждого государства. В последнее время вопрос рационализации природопользования становится актуальным. Организация рационального использования земли возможна только с помощью механизмов государственного регулирования.

Ключевые слова: рациональное использование земель, категории земель Российской Федерации; функции государственного регулирования рационального использования земель; совершенствование рационального использования земель.

Today, the question of the rational land use sharply arises. It has

been known that land is the main space basis and the means of production. For a long time land resources were considered inexhaustible, and the question of their conservation was not studied deeply. But in the XXI century – the question of rational use and protection of land appears to be significant. Soil erosion, land degradation, soil contamination, improper use is reduces the annual agricultural land area in the world. The magnitude of the issue demands its decision at the state level.

Rational land use is economically efficient operation of enterprises, organizations and citizens in land use under land conservation environmental requirements in a way to secure maintenance of land as a key production means.

Rational land use planning and arrangement is conducted to improve land distribution that means the development of new land uses by grants to various enterprises, organizations and farms, streamlining and rational arrangement of available land uses, removal of land location disadvantages, establishment of proper quantitative and qualitative ratio among certain land types [2].

The land fund of the Russian Federation amounts 1710 million hectares. The territory of the Russian Federation is characterized by specific features. The land fund of Russia presents the following categories of land:

1. lands of agricultural enterprises, organizations, citizens, i.e. the territories that are directly used for agricultural purposes.

2. lands under the jurisdiction of cities', settlements' and villages' administrations - the territories that are situated within the limits of inhabited localities.

3. territories given to industrial enterprises, associations and organizations for realization of special tasks (industrial production, transport, communication, etc.)

4. nature protection territories. Specially protected conservation areas with natural objects and complexes that have nature protection, scientific, aesthetic, recreational and sanitary value.

5. wood fund lands - the territories with wood vegetation or assigned for its restoration.

6. water fund territories: lakes, rivers, glaciers, swamp areas (except for tundra and forest-tundra zones), hydroengineering and other water reservoirs.

7. reserve territories - territories are not the subject of property or rent of legal or natural persons [1].

Land management in Russia has always been one of state activity priorities.

State regulation of land relations is an objective necessity. State

regulation of land relations are aimed at organizing the rational use of land and its protection. This is done by establishing certain rules and norms of ownership, use and disposal of land resources of the country.

State regulation of land relations has the following objectives:

- ensuring state and public needs and development priorities;
- environmental protection and use of natural resources;
- control over the use of land for its intended purpose.

The functions of state regulation of land relations are determined by the Constitution of the Russian Federation Land Code and other regulations in accordance with the economic, social requirements for the organization of land use and protection:

1) accounting function It implies a environmental monitoring, land cadastre, taking into account all land regardless of ownership.

2) distribution function. It implies land survey work; seizure of land used with violations of the law; compulsory acquisition of land for public purposes; the provision of land ownership, lease, use.

3) function of land use management. It implies economic and tax incentives; responsibility for the violation of the land legislation; introduction of standards of activity on the land; measures for land reclamation; the allocation of territories with special regime of use

4) control over land use and protection. Check examination of land use projects; land use monitoring; respect for the nature of the target land use; prevention and suppression of violations of land legislation [3].

State management of land management should be constantly improved. In the manual of V.D. Postolov «Modern problems of land management» the following organizational and legal aspects of rational land use and protection are identified:

1. improving the system of assessment of agricultural land. Estimation of land needed for the involvement of land in the civil legal turn and turning it into a real working financial asset. The current practice in the country of land plots assessment and their improvement has not yet developed unified methodological approaches. Existing methods of evaluation and their improvement is almost unrelated and are purely sectoral in nature.

2. improving of the existing rules of the land legislation. The current legal provisions do not ensure effective use and preservation of agricultural land. Due to land degradation expanding the scope of legal regulation in the field of rational use and protection is required.

3. improving of land management and state control over their use and protection[2].

In the current legislation there is no clear definition in the field of land management and control of land use and protection. Established penalties for violations of law in the field of land are ineffective because

they are of no economic value for those guilty.

Because land resources are unique and most important of all resources, the state must constantly improve legislative framework in the field of land relations regulation. Land management must have a scientific basis for the efficient use of land resources

Список литературы:

1. «Земельный кодекс Российской Федерации» от 25.10.2001 N 136-ФЗ (ред. от 05.10.2015) (с изм. и доп., вступ. в силу с 19.10.2015)/ Справочно-правовая система «Консультант-Плюс» URL : [http:// www.consultant.ru /document /cons _doc_ LAW_33773/](http://www.consultant.ru/document/cons_doc_LAW_33773/).

2. Постолов В.Д. «Современные проблемы землеустройства»/ В.Д. Постолов, Е.В. Недикова, А.А. Харитонов.– Воронеж: ВГАУ, 2014–139

3. G. V. Dobrovolskiy GENERAL APPROACH TO PLANNING AND MANAGEMENT OF LAND RESOURCES (WITH PARTICULAR REFERENCE TO RUSSIA) © Encyclopedia of Life Support Systems (EOLSS) : URL: <http://www.eolss.net/Sample-Chapters/C16/E1-56-06.pdf>

УДК: 33:001.895

**Khamidov S.S.,
Khadjimuhamedova Sh.I.**

**Tashkent Institute of Irrigation and Melioration, Tashkent,
Uzbekistan**

GOVERNMENTAL ROADMAPS FOR GREEN INNOVATION

Abstract: Under such circumstances that are becoming more global, such as climate change, global heat, energy efficiency the innovation called “green innovation” is becoming more significant and must be solved urgently all over the world and more and more countries are facing such problems. In this paper two countries, USA and Germany, were selected and their problems, capabilities and ways (innovations such as wind energy, solar energy, biotechnology) to solve the challenges related to climate change were compared and results from those activities were given.

Definition of green innovation and its significance.

Climate change is one area that new technologies and systems for production and consumption of goods and services can help mitigation and

adaption strategies, but technologies to improve the efficient use of water and other natural resources are also urgently needed. Developments that can contribute to improved environmental performance include nanotechnologies for clean water, biotechnology applications for detection, prevention, remediation and improved resource use, and ICTs as cornerstones of “smart” applications such as for energy efficiency in buildings, transport systems or new electricity grids. [2]

2. Environmental Policies of both Governments

2.1 A short brief about U.S. Environmental Policy

U.S. government spending on green technology includes a range of measures, from direct spending on R&D to tax breaks and loan guarantees. Following the 2008 financial crisis and the passage of the American Recovery and Reinvestment Act (ARRA) in 2009, U.S. government spending on developing clean energy more than doubled from \$17.895 billion in 2007 to \$37.160 billion in 2010. [3]

On 25 June 2013, President Obama announced a package of new policies and measures to address climate change. The package, the President’s Climate Action Plan, contained a series of measures and policies to reduce the country’s GHG (greenhouse gas) emissions, prepare the country for the impacts of climate change, and lead international efforts to combat climate change (IEA, 2013). In the lack of congressional agreement on climate policy, the plan relies exclusively on executive powers already granted to the Administration through existing legislation. The plan directs the EPA (the EPA is an agency of the United States federal government whose mission is to protect human and environmental health) to develop regulations to control CO₂ emissions from power plants, using existing statutory authority.

The Climate Action Plan is built upon three key pillars:

- Cut carbon pollution in the United States.
- Prepare the United States for the impacts of climate change
- Lead international efforts to combat global climate change and prepare for its impacts. [4]

2.2 A short brief about German Environmental Policy

In recent years, there has been a change in focus in Germany from traditional regulatory policies to new environmental policies such as eco-taxes, tradable permits and environmental agreements. German environmental policy is embedded in and influenced by the European framework; however, Germany has established itself as a pioneer and market driver in the fields of renewable energy, offshore-wind farms, cogeneration, and the energy-efficient redevelopment of buildings and other infrastructure. In the latest Environmental Performance Index, Germany is considered to be a “strong performer,” achieving a score of 66.91. With a rank of 11th place worldwide in the survey, Germany trailed

the lowest “strongest performer” by a margin of just 1.91 points, but fell almost 10 points behind Switzerland, the leading country (cf. Environmental Performance Index 2012).

In May 2011, Chancellor Angela Merkel announced that nuclear power would be phased out by the end of 2022, completely reversing her previous policy. Although the decision was welcomed by the public, certain questions remain unanswered. Long-term radioactive waste storage remains a challenge to public authorities, and the costs from the consequent changeover in the energy mix, the financing of the much-needed grid expansion and additional renewable-energy subsidies will result in ballooning energy costs for consumers in the medium run. In addition, it is highly plausible that the phase-out will result in a higher share of fossil fuels in the country’s energy mix, making it more difficult for the country to achieve its CO₂ emissions goals. This policy change will over time add new difficulties to an already mixed environmental-policy picture. While environmental concerns have been among the top issues of Germany’s policy agenda in recent years, policymakers have in some cases failed to align measures implemented with market incentives. The extremely expensive subsidies provided to renewable-energy producers represent one such example. In this case, the Renewable Energy Act (Erneuerbare Energien Gesetz, EEG) has guaranteed fixed prices for renewable-energy suppliers over a long-term investment horizon. The EEG, in addition to its distorting effects on prices, is highly discriminatory between different types of renewables. In particular, the EEG heavily promotes and subsidizes photovoltaic electricity production, which is extremely expensive in comparison to other renewable energy sources. [5]

The Government is also paying attention to rise the number of green cars on the roads of Germany. For example, according to Dr. Liendel Chang of the Volkswagen Group complemented this with a view from the business perspective. He gave an overview of how Volkswagen is preparing for supplying future mobility needs, citing Germany’s goal to have 6 million electric cars on the road by 2030. [6]

And also, Angela Merkel hopes offering incentives like the tax breaks and cash rebates available in other countries will rapidly grow the number of plug-in cars on German roads beyond the current total of around 24.000. [7]

5. Results of Green Innovations

5.1 Some Results in the USA

About 82% of the nation’s energy comes from fossil fuels, 8% from nuclear, and 10% from renewable sources. U.S. onshore wind resources have the potential to generate almost 10,500 GW of electricity, 172 times more than the current installed capacity of 61 GW. In 2013, the U.S. installed 1.1 GW of wind capacity, a 92% decrease from 2012. This

significant drop resulted from the expiration of the federal production tax credit for wind energy. Future estimates range from 80 GW to almost 400 GW by 2050. [8]

5.2 Some Results in Germany

In 2011, for the first time, the generation of electricity from renewable energy sources (RES) accounted for a larger share than nuclear energy. Data of 2011 indicate that 20 per cent of the electricity produced in Germany came from renewable sources (compared to 17 per cent in 2010). Likewise the overall share of energy (electricity, heat and fuel) from RES rose from 11.3 per cent in 2010 to 12.5 per cent in 2011. More importantly, the markets in Germany remain geared towards further growth by 2020 the German government plans to increase the share of electricity generated by RES to 35 per cent to 40 per cent. [9]

If we observe to a few years earlier, Germany was the leader on wind and solar energies. For example, According to the information at the end of 2009, for the first place on the capacity of the wind energy installations were in the USA, after Germany, China and Spain. At the end of 2008, Germany was leader on installations of solar panels and the followings were Spain, Japan and the fourth place for the USA. [1]

6. Future Challenges and solutions

Economy: The world has not yet got his previous condition because of the International Financial Crisis and it is becoming much more difficult under strong globalization. Since that time more and more countries are facing economic problems and they are trying to make it a little bit easier by lowering the budget expenses. And by this way they are going to improve their financial situation. Without hesitation I can say that it also gives much more impact to future innovations to adapt in reality.

Population: The population is getting the most crucial issue all over the world. The increasing population, its demand to food, water, energy require from the government to more active and sensitive for the future challenges. To satisfy the demand of the energy of population the governments try to increase their opportunities to the innovators, companies by giving them tax reductions or by subsidizing their innovations or by finding out other solutions.

Conclusion: I can conclude that each country, whether it is developed or developing no matter, should give attention to current environmental problems. To make a solution for them they should separate necessary number of endowment for grants, programs, innovations, and others. If they do not do it on time then it will be late. Because afterwards the condition of quality of the climate much more decrease and it will be more and more costly than now. The companies also should work together. Of course, may be in this case share of small companies or firms is not large, thus, it depends on Multinational Corporations that have high impact

to innovations. It would be more profitable for the climate if they spent more investment for R&D developments related to green the innovations always depend on the amount of R&D developments. Governments should give incentives such as tax cuts, subsidies for large firms, plants in case they use harmless new technologies addressed to contribute for climate reforming. If this process is not seen as governmental level inside a country nobody and nothing is able to solve these global problems such as global heat, energy efficiency, sustainable land management and other factors.

List of Literature:

1. Шкрадйук Игорь Эдуардович (Moscow, 2010). Тенденции развития возобновляемых источников энергии в России и мире, р8.
2. Anon. 2009. Green Growth: Overcoming the Crisis and Beyond. p. 10. [Online] Available at: http://www.oecd-ilibrary.org/environment/green-growth_9789264083639-en Accessed: 30.06.2009
3. Joshua Meltzer, 2014. [Online] A carbon tax as a driver of green technology innovation and the implications for international trade. p. 53. Available at: http://www.felj.org/sites/default/files/docs/elj351/14-45-Meltzer_Final%205.13.14.pdf Accessed: 13.05.2014
4. Anon. Energy Policies of IEA Countries: The United States 2014, p. 143-144 [Online] Available at: http://www.oecd-ilibrary.org/energy/energy-policies-of-iea-countries-the-united-states-2014_9789264211469-en Accessed: 18.12.2014
5. Anon. Environmental Policies. [Online] Available at: http://www.sgi-network.org/2014/Germany/Environmental_Policies Sustainable Governance Indicators (SGI)
6. Ursula Heinen-Esser, 2011. Energy Goals for Germany: Perspectives from Policy and Industry. [Online] Available at: <http://www.ecologic.eu/3942> Accessed: 22 February 2011
7. Stephen Edelstein, 2014. Germany to boost incentive towards 1 million electric-car by 2020. [Online] Available at: http://www.greencarreports.com/news/1095775_germany-to-boost-incentives-toward-1-million-electric-car-goal-by-2020 Accessed: 05.12.2014
8. Anon. Center for sustainable system, 2014. U.S. renewable energy. p. 1. [Online] Available at: www.css.snre.umich.edu/css_doc/CSS03-12.pdf Accessed: October 2014

Chernysheva S.V.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

FACTORS AFFECTING GULLY FORMATION

Abstract: Now the most part territory of Russia in different degree is subject to gully erosion. A gully is a landform created by running water, eroding sharply into soil, typically on a hillside. Gullies resemble large ditches or small valleys, but are meters to tens of meters in depth and width. Gullying or gully erosion is the process by which gullies are formed. Hillsides are more prone to gullying when they are cleared of vegetation, through deforestation, over-grazing or other means. So the most important aspect in preventing gully erosion is to maintain good ground cover.

Generally gullies are formed by an increase in surface run-off. Therefore, minimizing surface run-off is essential in gully control. Watersheds deteriorate because of man's misuse of the land, short intensive rainstorms, prolonged rains of moderate intensity, and rapid snow melts. These precipitation factors also turn into high run-off which causes flooding and forms gullies.

The factors affecting gully formation can be categorized into two groups, man-made factors, and physical factors.

Man-made factors

1. Improper land use

Most people cut trees, burn litter and grass, and cultivate hillsides without using conservation measures. After a few years, the productivity of the soil is lost because of sheet, rill and gully erosion, and the land is abandoned. This kind of cultivation (slash and burn or shifting cultivation) is repeated by farmers on other hillsides until the land loses its productivity there as well. Thus the whole of the area may be completely destroyed by gullying as the gully heads advance to the upper ends of the watershed.

2. Forest and grass fires

Many forest fires are caused by the uncontrolled burning used in shifting cultivation. These fires can easily spread into the forest and

destroy the undergrowth and litter. Grass fires are usually ignited by farmers near the end of the dry season in order to obtain young shoots for their livestock or new land for cultivation. On slopes, the soil that is exposed after forest and grass fires is usually gullied during the first rainy season.

3. Overgrazing

Overgrazing removes too much of the soil's protective vegetal cover and trampling compacts the soil; thus the infiltration capacity of the land is reduced. The increased run-off, caused by the insufficient water holding capacity of the soil, produces new gullies or enlarges old ones.

4. Mining

Underground (block cave) mining is another factor that can cause gullying. Initially, cracks in the ground and soil creep (a kind of gravity erosion) are observed in the mining areas. Then, during rainy seasons, gullies are formed. Gullying in open-pit mining areas is also a big problem in many countries.

5. Road construction

If road cuts and fill slopes are not revegetated during or immediately following road construction, gullies may form on both sides of the road. Inadequate drainage systems for roads (small number of culverts, insufficient capacity of road ditches, etc.) are a major cause of gullying. Widening operations along roadsides do not often follow road construction but, where widening is practiced, the operation usually causes landslide erosion and then gullying during the first rainy season.

6. Livestock and vehicle trails

Gullies are also formed on livestock and vehicle trails that run along hillsides. This is because the traffic on them compacts the soil and reduces the water holding capacity.

7. Destructive logging

In forest regions, logging with tractors down slopes can lead to gully erosion, because the run-off becomes concentrated along the skid trails. Highland logging with slack cables also causes gullying on forest land.

Physical factors

As mentioned before, gullies are formed by increased surface run-off which acts as a cutting agent. The main physical factors effecting the rate and amount of surface run-off are precipitation, topography, soil properties and vegetative cover.

1. Precipitation

(a) Monthly distribution of rainfall

The duration of wet and dry seasons cannot be deduced from total annual rainfall. The monthly distribution of rainfall is more significant than total annual rainfall because of its effects on the growth of vegetation, as well as the fact that it gives some indications about rainfall intensity.

In humid regions with uniform distribution of rainfall, surface erosion, including gully formation, may not be a serious problem because vegetation grows throughout the year.

However in areas that do not have uniform rainfall, the vegetation (especially grass) dries up during the prolonged dry season (3 to 5 months or more). If the land is not properly used, or if forest or grass fires occur during the dry period, it cannot sufficiently hold rainwater and so the increased surface run-off in the rainy season produces large scale landslides and gullies.

(b) Rainfall intensity and run-off

There is a relationship between rainfall intensity, rate of run-off, density of vegetative cover, and the size of a catchment area.

If the amount of rainfall is more than the holding capacity of the soil, there will be an increase in surface run-off, followed by surface erosion and gulying. In some tropical and subtropical countries, after the soil is completely saturated, almost all of the rainfall turns into run-off during the wettest months, which include the monsoon season, tropical cyclones and especially typhoons. It rains intensively for two or three days without stopping during each typhoon period and the increased run-off causes landslides, huge gullies and devastating floods.

In continental and temperate-climate countries prolonged rains of moderate intensity (duration of several days) or short, intensive rain storms lasting from 15 to 90 minutes (maximum rainfall intensity about 3mm/minute), cause landslides, gullies and floods because of the increased run-off in the watersheds. Torrential floods, which generally occur after the short, intensive rain storms, destroy agricultural lands, residential areas, roads, irrigation ditches and canals at the base of the valley below a deteriorated watershed.

Rainfall intensity and run-off rates (peak flows) are expressed in

milliliters per hour or minute and cubic meters per second, respectively. In designing engineering measures such as check dams or diversions in gully and torrent control, the rate of run-off is more important than the amount of run-off.

(c) Rapid snowmelts

Rapid snowmelts turn into high run-off. This increased surface run-off acts as a cutting agent and produces gullies. Like prolonged rains of moderate intensity and short intensive rain storms, rapid snowmelts cause destructive floods.

2. Topography

The size and shape of a drainage area, as well as the length have an effect on the run-off rate and amount of surface water. Therefore, all topographic characteristics should be studied in detail before gully control work begins.

Length and gradient of the slope

On long slopes, there is generally an accumulation of water towards the base. To prevent the gully formation, this water (run-off) should be conducted safely downhill over a long distance to stable, natural water courses or vegetated outlets. Otherwise, the water should be infiltrated into the ground by land treatment measures such as contour ditches (infiltration trenches), level terraces (gradoni), wattling, staking, etc.

The steeper the slope, the higher is the velocity and erosive power of the run-off. Watershed land treatment measures not only reduce the amount of surface water, but they also decrease its velocity, and so its erosive power.

3. Soil properties

The following seven soil classes are based on soil texture: sand, loamy sand, sandy loam, loam, silt, loam, clay loam and clay. The infiltration rate increases from clay to sand (for loamy sand 2.5-5 cm/hour), but resistance against erosion decreases.

4. Vegetative cover

The role of vegetative cover is to intercept rainfall, to keep the soil covered with litter, to maintain soil structure and pore space, and to create openings and cavities by root penetration. This is best achieved by an undisturbed multistory forest cover. Under special

conditions, however, a well-protected, dense grass cover may also provide the necessary protection.

In general it is management and protection rather than the type of the vegetative cover which determines its efficiency in gully control. Any vegetation which is well-adapted to local conditions and which shows vigorous growth may be used. In some cases, these may be broadleaf species, in others conifers, tall grasses, etc. In critical areas, it may be necessary to exclude any use of the protecting vegetation. Whenever possible, however, it is desirable to establish a vegetative cover which serves a dual purpose, for example, provision of fodder, fuelwood, fruit, etc.

The identifying factors of gully erosion will help to take the most efficient measures of erosion control

Список литературы:

1. Заславский, М. Н. Эрозиоведение. Основы противоэрозионного земледелия: учеб. для географ. и почв. спец. вузов / М. Н. Заславский. – М.: Высшая школа, 1987. – 376 с.
2. Заславский, М. Н. Эрозия почв / М. Н. Заславский. – М.: Мысль, 1962. – 245 с.
3. Зорина Е.Ф. География овражной эрозии / Е.Ф.Зорина. - М.: МГУ, 2006. - 324 с.
4. Зорина Е.Ф. Овражная эрозия: закономерности и потенциал развития. – М.: Геос, 2003. – 168 с.
5. Маккавеев Н.И., Чалов Р.С. Эрозионные процессы / Н.И. Маккавеев, Р.С. Чалова. – М.: Мысль, 1984. - 255 с.
6. Рожков А.Г., Адерикина Л.А., Адерикин В.В. Выявление и анализ роли факторов овражной эрозии в Белгородской области // Геоморфология, 1985. №1.
7. Сильвестров С.И. Сравнительная оценка влияния на эрозию основных факторов // Районирование территории СССР по основным факторам эрозии. М.: Наука, 1965.
8. Чалов Р. С. Эрозия почв и русловые процессы. Вып. 12. / Р.С. Чалов. М.; Изд-во Моск. ун-та., 2000. - 297 с.

***Секция VII. Актуальные вопросы гуманитарных и
юридических наук.
Section VII. Topical issues of law and humanities.***

УДК 387.147.88

**Alimova N.B.,
Faizullaev B.P.**

Tashkent State Agrarian University

**ROLE OF RELATIONSHIP TEACHERS AND STUDENTS AT
TRAINING USING INFORMATION TECHNOLOGY**

Abstract: The problems of the relationship of teacher and student in teaching the use of information technology by the example of the department "Electric power in agriculture and electro technology".

Key words: virtual laboratories, a real laboratory stands information technology.

The rapidly increasing flow of information is recently ahead of the speed of its interpretation. This problem is particularly acute in circumstances where the use of information technology is not simply desirable, but is a matter of the survival of humanity. Modern scientific information, particularly in the educational sphere, without the use of electronic means, presents considerable difficulty. In this regard, there has been a serious turn in the integration of teaching and information technology, a new direction - e-learning, allowing to establish a two-way contact with many learners are introduced Virtual Labs. Quality e-learning process is directly dependent on the quality of e-learning illustrative material.

The development of new technologies of the information and pedagogical processes made a highly significant correlation with the psychology of pedagogy and cybernetics. The teacher and the student are active parties to the educational process and the subjects of each of its activities. It would be inappropriate to consider the educational process as the only train and educate the impact on the student's teacher. The student also has an impact on the cognitive resources of the teacher, so the educational process is quite correct to characterize the interaction.

The joint activity of a teacher and a student in the use of information technology increases the cognitive activity and creative independence; increasing the amount of digestible material and the depth of its

understanding. The student gets more satisfaction from the knowledge and feels comfortable among fellow students; increasing the ability to adequately assess their capabilities and others, eventually it achieved equal partnership. With all of this, you should always keep in mind that the lack of respect for the student nullifies the whole system of learning how to meaningfully and methodically correct it may be organized.

In a market economy, competition, competition for customers requires constant updating of the industrial enterprises of products; improve its quality, the maximum meet customer requirements. The solution to these problems can only provide a fundamentally new information technology computerization of engineering.

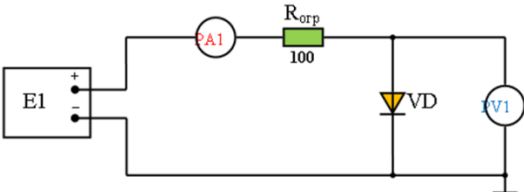
The collection of data and knowledge forms the information resources, the volume and quality of which will determine the competitiveness of enterprises and individuals.

In this regard, the department "Electric power industry in agriculture and electro technology" developed a virtual laboratory work on the course "Electronics and microprocessor technology", available electronically summaries of lectures, allowing students to engage in self-education, virtual labs delivered. Of course, it is especially important highly qualified teachers and their methodical and psychological approach to the trainees.

Virtual labs for this course are aimed at on the basis of theoretical knowledge; examine in more detail the principle of operation of various types of semiconductor devices, their structure and basic parameters. Based on this, the student is guided, where some cases it is more expedient to use each of them. In carrying out such studies the student has the ability to change elements of the scheme, to vary its dimensions and electrical parameters. Available software allows calculating and plotting the current-voltage characteristics of various semiconductor devices. A student from the existing database selects the appropriate element for the study.

In the real world such research presents considerable difficulties.

However, it is impossible to issue a competent specialist for successful work in the field of power industry and agriculture Electro technology, if he has not studied the real hardware does not have the skills of its measurement parameters. Therefore, the department delivered a number of not only virtual, but real laboratory work, allowing each student to learn how to work with the control - measuring instruments and technically competent to assess the results of the measurements.



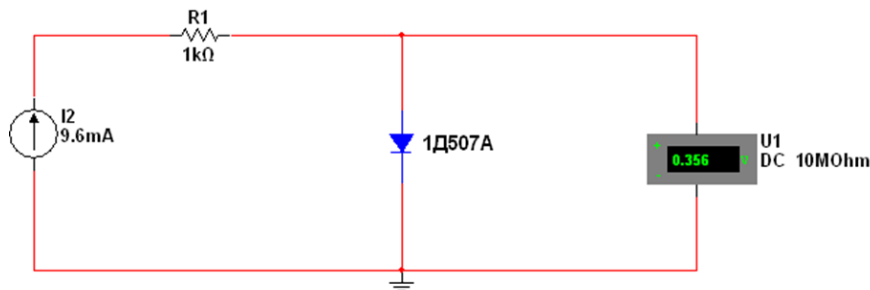


Fig.1. Plans investigations semiconductor diode on universal laboratory stands and in the environment of visual modeling of electronic circuits and components MultiSim10.

In laboratory work teachers conduct an interview with students, clarifying understanding of their task and performance stages. Defending the completed studies, the student corrects his understanding of those or other issues in an interview with the teacher. Thus obtained practical skills the student with specific equipment and control - measuring devices, will serve as a great help to him in his future work

Only the combination of virtual and real performances of laboratory work, can give the desired result.

The task of educators is - to instill interest in this specialty. All this together, of course, is the key to success in teaching activities and will allow graduates to work productively in the field of science and industry.

УДК 387.147.88

Alimova N.B.,

Tashkent State Agrarian University

INNOVATIVE PEDAGOGICAL TECHNOLOGIES IN THE STUDY OF THE SUBJECTS "ELECTRONICS AND MICROPROCESSOR TECHNOLOGY"

Abstract: This paper examines the role and importance of the introduction of innovative technologies in the study of technical disciplines in technical colleges. It is proposed the use of a virtual circuit simulation MultiSim.

Keywords: modernization of the educational process, the system of the virtual circuit simulation MultiSim 10.

The crisis of the system of vocational and general education indicates

the gap between the rapidly changing conditions of life and the educational system, its objectives, types, content and technology education. The most important causes of the crisis include: the growing demand for quality education; new requirements for teaching; conservatism of education and the lack of its adaptation to the changing needs of society; the need for formation of professional thinking, activity and initiative of the future experts, etc. Among these factors is not developed of technology training. Traditional technology training (from knowledge to skills), based on the logic of science, should be complemented by new technologies, based on the laws of cognitive activity. The principal figure in the learning process itself becomes a student, acting not as an object but as a subject of study.

In the new paradigm focus on the formation of the educational process, especially the individual expert and then professional leading technologies become personality-oriented learning strategies, which are aimed at forming a new type of thinking of teachers and therefore the mastery of complex skills of the educational process technology type. New technologies are aimed at the practical implementation of psychopedagogical conditions, optimally adapted to the interaction of teachers and students.

Educational technology is not the same as teaching methodic. Technological learning process (educational technology) has the following features:

- Developed of the conceptual foundations, the validity of the goals and objectives of training in the philosophical, didactic, psychological and socio-pedagogical aspects;
- Consistency and regularity;
- Handling, i.e. the ability to plan, organizes, controlling, make adjustments to achieve the goals;
- A guarantee of high performance and effectiveness;
- The ability to achieve high performance cost-effectively;
- Replicability, i.e. the possibility of using the experience of other teachers and schools.

In today's education systems are used (or embedded) different types of technologies. Innovative educational technology is being introduced in the educational process of the new (methods or methodological techniques, content, etc.). Innovation is always progressive, and in compliance with all conditions and requirements is positive because of changes. It productively than the current educational system, ultimately, is sure to provide a higher level of knowledge and skills of students.

At the department "Electric power industry in agriculture and electro technology" Tashkent State Agrarian University established a laboratory complex on the basis of the virtual circuit simulation - MultiSim laboratory

workshops, distance learning, scientific research and experiments in the field of analog and digital electronics. The purpose of the laboratory complex is the modernization of the educational process, and as a consequence of the development of material and technical bases of training (introduction of new technical training).

MultiSim - a system of virtual circuit simulation. Working in a real lab requires a lot of time spent on the preparation of the experiment. MultiSim - electronic laboratory - allows you to make the study of electrical circuits more affordable. Errors experimenter in a real lab can lead to large financial losses, while working in MultiSim, the student is safe from accidental shock, and devices do not come out of the system due to improperly assembled circuit. In addition, to quickly identify the error and the student has more opportunities for developing creativity.

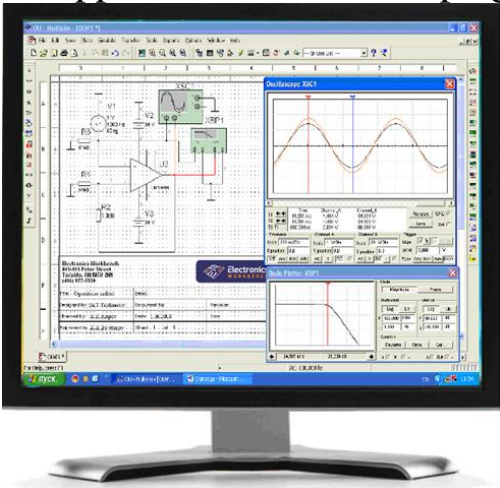


Fig.1. Program of visual modeling of electronic circuits and components MultiSim 10.

In MultiSim it is possible to analyze circuits at a constant (the definition of the operating point) and alternating currents. Analysis AC uses results of the analysis at constant current for linearized models of nonlinear components. The behavior of electronic circuits with alternating current can study both the time and frequency domains.

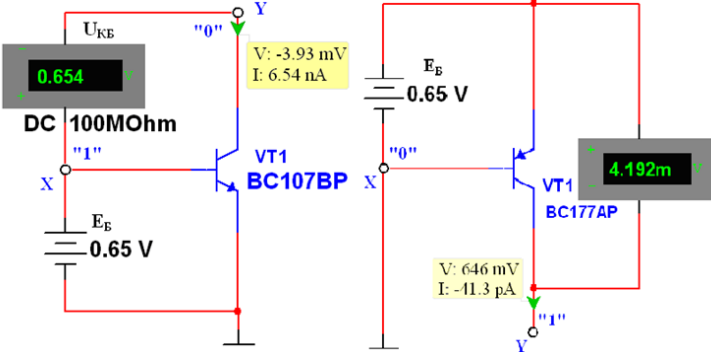


Fig. 2. Fragments of the work in the environment of visual modeling of electronic circuits and components MultiSim10.

To create electronic circuits there is a set of libraries with popular electronic components. But there is also the possibility to add new libraries.

There is a wide range of devices (in a form as close to real) to monitor the electrical state of the electronic circuits, the ability to set an input to build schedules.

The program is compatible with MultiSim known, actually sets the standard description of the electronic circuits, the program P-SPICE (for medium UNIX), i.e. It provides the ability to export and import schemes and measurement results in its various versions.

The library program components include passive components, transistors, controlled sources operated keys, hybrid elements, indicators, logical elements, trigger devices, digital and analog components, special combinational and sequential circuitry. Active elements can be represented by models as ideal and real elements. You can also create their own models of elements and add them to the library elements.

The program uses a range of instruments for the measurement: ammeter, voltmeter, an oscilloscope, multimeter, Bode-plotter (plotter frequency characteristics of the circuit), function generator, words, logic analyzer and a logic inverter.

MultiSim allows you to use the results obtained in programs P-SPICE, PCB, and send the results to MultiSim in these programs. You can insert a chart or a fragment thereof in a text editor and type in the explanations or comments on the scheme. For operations with components on a common field MultiSim highlighted two areas: the panel components and field components. Panel component consists of pictograms fields of components, field components - from the conventional image components.

Students design numerous analog and digital circuits simulate prototypes of systems and devices in the environment of visual simulation of electronic circuits and components MultiSim10, then collected on a real prototype platform and tested by means of measuring devices, included in the virtual environment. Thus, they have a unique opportunity to pass the entire cycle of product development on a single platform - from modeling to test the real prototype of the device.

The effectiveness of the implementation of the proposed method is expressed in an increase in the Learning with the use of new information technologies in the educational process and the quality of training.

УДК 808.2:378.147

Bouvier-Vashchenko A.

ATER à l'université Lyon 3 Jean Moulin

**LES DIFFICULTÉS DE TRADUCTION COMMERCIALE
FRANÇAIS-RUSSE: LE PRÉAMBULE DU CONTRAT DE VENTE
À L'INTERNATIONAL**

Аннотация: В настоящей статье представлены основные сложности практического перевода текста преамбулы внешнеторгового договора купли-продажи товара с французского на русский язык. Автором предложены варианты межъязыкового соответствия отдельных терминов и выражений, а также приведены правила перевода на русский язык юридических терминов и имён собственных.

Материалы статьи являются частью учебного курса «Русский деловой язык», разработанного автором для студентов бакалавриата по специальности «Международная торговля. Английский и русский языки» факультета прикладных иностранных языков университета Лион 3 (Франция). Материалы курса опубликованы в форме практического учебного пособия по переводу для студентов французских ВУЗов, изучающих русский язык.

Ключевые слова: преподавание русского языка как иностранного, коммерческий перевод с французского языка, внешнеторговый договор купли-продажи товаров, преамбула контракта

Dans le contrat de vente à l'international de marchandises, les cocontractants sont identifiés soit dans le Préambule, soit dans le premier article du contrat – «Parties du contrat». Afin d'éviter toute éventuelle confusion et d'assurer la bonne communication ultérieure entre les parties contractantes, leur désignation doit être très précise et complète et contenir obligatoirement l'information suivante : les raisons sociales, les formes juridiques et les coordonnées des entreprises (siège social, téléphone, courriel, etc.), ainsi que les noms des personnes physiques – des signataires – pouvant engager la société commerciale.

Ci-dessous, l'exemple de traduction suivi de commentaires :

Entre les soussignés :
L'ACADÉMIE SCIENTIFIQUE DE BEAUTÉ, SAS au capital de **435 000 euros**, enregistrée au **RCS** de Versailles sous le numéro de 592 023 345 et dont le **siège social** est situé au 163, rue **Léon Jouhaux** – 78500 **Sartrouville** (France), représentée par Madame **Emma CUEFF** en sa qualité de **président**, ci-après **dénommée** : « le **Vendeur** », d'une part, et **OAO NEVA**, dont le siège social est situé au 26/1 rue **Tverskaïa**, 129278 **Moscou**, Fédération de **Russie**, représentée par Monsieur **Igor Maximovitch SAVVOUCHKINE**, ci-après **dénommée** « l'**Acheteur** », d'autre part, il a été convenu et arrêté ce qui suit :

SAS (Упрощённое акционерное общество)⁽¹⁾ «Академия Научной Красоты» (Академи Съянтифик де боте)⁽²⁾ с капиталом 435 000 евро⁽³⁾, зарегистрированное в Реестре торговых компаний и акционерных обществ⁽⁴⁾ г. Версаль под номером 592 023 345 и располагающееся по адресу⁽⁵⁾: 78500 г. Сартрувиль (SARTROUVILLE), улица Леон Жуо (Léon Jouhaux)⁽⁶⁾, 163, Франция, в лице Президента⁽⁷⁾ Госпожи Эммы КЮЭФФ⁽⁸⁾, именуемое в дальнейшем «Продавец»⁽⁹⁾, с одной стороны, и **OAO «НЕВА»⁽¹⁰⁾, местонахождение которого: 129278 г. Москва, улица Тверская, 26/1, Российская Федерация, в лице Господина **Игоря Максимовича САВВУШКИНА⁽¹¹⁾**, именуемое в дальнейшем «Покупатель», с другой стороны, заключили настоящий договор о нижеследующем:**

(1) Il faut faire attention à la traduction en russe des abréviations des formes de propriété de sociétés étrangères. Afin d'éviter toute confusion, il est d'usage de les garder en langue source¹. Pour la traduction en russe de l'abréviation **SAS** (société par actions simplifiée), vous pouvez laisser cette forme de propriété juridique telle quelle, en lettres latines, accompagnée de sa traduction entre parenthèses : **SAS = SAS (Упрощённое акционерное общество** ou **Акционерное общество упрощённого типа)**.

Notez également que dans le texte russe, l'abréviation désignant le statut juridique de la personne morale est habituellement placée devant la dénomination de l'entreprise : **SAS «Академия Научной Красоты»**. Retenez la traduction en russe des principales formes de propriété des

¹ « Malgré le fait que les principales abréviations de formes juridiques de sociétés figurent dans les dictionnaires bilingues, en règle générale, leur utilisation ne peut pas être recommandée dans le texte juridique. [...], les formes de propriété sont différentes dans les systèmes juridiques nationaux et sont régies par les lois nationales ». Dans : Kira PECHKOV. *Le discours juridique en russe et en français : une approche typologique*. Thèse de doctorat, Aix-Marseille Université, 2012, p. 249.

entreprises françaises :

SA : société anonyme	Акционерное общество
SAS : société par actions simplifiée	Упрощённое акционерное общество
SARL : société à responsabilité limitée	Общество с ограниченной ответственностью
EURL : entreprise unipersonnelle à responsabilité limitée	Предприятие одного участника с ограниченной ответственностью
SCS : société en commandite simple	Простое коммандитное товарищество
SCA : société en commandite par actions	Акционерное коммандитное товарищество
SNC : société en nom collectif	Полное товарищество

(2) Sachez qu'en Russie, le nom de l'entreprise est mis habituellement entre guillemets : *ОАО «Холсим. Строительные материалы»*, *ООО «ТЭК Транс-Агент»*, *ЗАО «Корона»*.

Le problème de la traduction en russe des noms des entreprises peut être résolu de différentes façons :

♦ Les noms des compagnies étrangères peuvent être laissés, dans le texte russe, en langue source : *compagnie REDBUS = компания REDBUS*.

♦ Vous pouvez vérifier également si la compagnie, dont la traduction du nom vous intéresse, est déjà connue sur le marché russe. Dans le cas de notre exemple, la société *Académie Scientifique de Beauté* opère sur le marché russe sous le nom «*Академия Научной Красоты*».

♦ Il est possible également de faire une transcription basée sur la prononciation du nom propre étranger dans sa langue d'origine² : *Académie Scientifique de Beauté = Академи Сьянтифик де Боте*.

(3) Il s'agit du **capital social** de l'entreprise, communément traduit en russe par le terme **уставный капитал**. Variante de traduction : « *с уставным капиталом 435 000 евро* ».

(4) Le **RCS**, abréviation de **registre du commerce et des sociétés**, doit être rendu en russe soit par **Реестр торговых компаний и акционерных обществ**, soit par **Торговый реестр** (et non pas par le calque russe **регистр** dont l'utilisation serait, dans le contexte de cette phrase, erronée).

(5) Il s'agit du lieu de l'établissement principal de l'entreprise – son adresse officielle qui permet de déterminer la nationalité de l'entreprise. Le

² Pour les **règles de transcription des noms propres du français vers le russe**, voir l'ouvrage suivant : SAKHNO S., HÉNAULT Ch. *VOT ! Votre thème russe : ce qu'il faut savoir pour le réussir*. Paris : Éditions Ellipses, 2007, p. 53.

terme français *siège social* (adresse juridique de l'entreprise) peut avoir plusieurs traductions en russe. Dans le texte du contrat, par exemple, on privilégie les termes **юридический адрес** ou **местонахождение** (*фирмы, предприятия*). Les termes **главный (центральный, головной) офис** et **штаб-квартира**, quant à eux, sont utilisés surtout à l'oral.

(6) La méthode appliquée communément pour la traduction en russe des noms des villes françaises est la transcription usuelle :

Vénissieux	Венисьё
Neuilly-sur-Seine	Нёйи-сюр-Сен
Saint-Cézaire-sur-Siagne	Сен-Сезер-сюр-Сиань

Selon les règles de transcription du français vers le russe, les consonnes doubles sont rendues en russe par une seule consonne lorsqu'ils se trouvent à la fin du mot ou devant une autre consonne : Sartrouville = *Сартрувиль*.

Francheville	Франшвиль
Belleville	Бельвиль
Contrexéville	Контрексвиль

Le nom de la rue *Léon Jouhaux* a été également transcrit. Lors de la transcription, le **H** « aspiré », muet en français, n'est pas rendu en russe : rue *Léon Jouhaux* = *улица Леон Жуо*.

Les noms géographiques français (noms des rues et des places), ainsi que les noms des ponts et des monuments, sont généralement traduits (et non pas transcrits) en russe³. La transcription usuelle reste toutefois, dans certains cas, une méthode acceptée pour rendre en russe les noms français des rues:

Avenue de l'Opéra	Проспект Оперы
Champs-Élysées	Елисейские поля
Place des Victoires	Площадь Побед
Boulevard Joliot-Curie	бульвар Жолио-Кюри
Rue Division Leclerc	улица Дивизьон Леклер
Route de Grasse	Рут де Грасс

(7) Les signataires – les personnes physiques habilitées à signer le contrat au nom de leurs sociétés – sont obligatoirement indiqués dans le contrat. Les documents tels que le statut de la société (*Устав предприятия*) ou le mandat social (*Доверенность компании*), prouvant leurs pleins pouvoirs contractuels, sont mentionnés à l'appui:

«Monsieur S. G. Lavrinenko, | « *Господин С. Г. Лавриненко в*

³ SAKHNO S., HÉNAULT Ch. *op.cit.*, p. 52.

<p>agissant en tant que représentant légal de la société X, habilité par les statuts de la société (par le mandat),... »</p>	<p>лице законного представителя компании X, действующий на основании Устава предприятия (доверенности),... »</p>
---	---

(8) Les noms de famille et les prénoms français sont traduits en russe selon les règles de transcription usuelle⁴. Le son *E* du nom de famille *Cueff* est rendu ici en russe par la voyelle de premier type – Э, vu sa position après une voyelle. Notez également l’absence de déclinaison pour le nom de famille *Cueff* de notre exemple : « в лице (+ G) Госпожи Эммы Кюэфф ». D’une manière générale, les noms de famille d’origine étrangère se terminant par une consonne se déclinent, sauf s’ils désignent une femme.

(9) Par souci de clarté et pour alléger le texte du contrat, on indique la dénomination usuelle des parties dans le texte ultérieur : le **vendeur** et l’**acheteur** (Продавец и Покупатель), le **fournisseur** et le **client** (Поставщик и Заказчик).

(10) Les abréviations des formes juridiques des entreprises russes doivent être **translittérées** (lors de la translittération, on se base sur la forme écrite du nom propre) ; on ne les traduit pas par un équivalent étranger au risque de créer une confusion quant à la nationalité de l’entreprise : ООО = ООО ; ОАО = ОАО ; ЗАО = ЗАО⁵. Les noms de compagnies russes, quant à eux, sont également **translittérés** : ЗАО «Рассвет» = ЗАО Rassvet (la traduction du nom, par exemple par ЗАО l’Aube, ne serait donc pas admissible).

(11) Prénom : Игорь = Igor (le signe mou n’est pas rendu en français). Patronyme : Максимович = Maximovitch (l’élément *кс* est rendu en français par la lettre *х*). Nom de famille : Саввушкин = Savvouchkine (les noms de famille se terminant par l’élément *ин* [masculin] sont écrits en français avec un *e* à la fin).

Le présent article est extrait d’un manuel de travaux pratiques de traduction commerciale⁶ destiné en premier lieu aux étudiants de facultés en formation de LEA de niveaux C1 et C2 (Cadre européen commun de référence pour les langues), mais également à tous ceux qui désirent

⁴ Pour les règles de transcription des noms propres du français vers le russe voir l’article de Sergueï SAKHNO « Nom propre en russe : problèmes de traduction » [réf. du 23.11.2014] Disponible sur Internet : <https://halshs.archives-ouvertes.fr/file/index/docid/131413/filename/sakhno_nompropre_version_meta_2_.pdf>

⁵ Комментарии к Письму Банка России от 20.04.2005 № 64-Т: SWIFT BIC (международный стандарт ISO 9362) [réf. du 15.03.2015] Disponible sur Internet : <<http://www.englishhelp.ru/translator/articles-for-translator/17-patterns-of-ownership-abbreviations.html>>

⁶ ALLA BOUVIER-VASHCHENKO. *Manuel de russe commercial. Vocabulaire. Expressions. Modalités des contrats à l’international*. Paris : Éditions Ellipses, 2015, 208 p.

améliorer leurs connaissances du russe commercial dans le cadre de leurs activités professionnelles.

УДК 359:947.08

Volskiy M. V.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE PRISON SYSTEM OF RUSSIAN EMPIRE IN THE SECOND HALF OF THE XIX - EARLY XX CENTURIES AND ITS STAFF

Аннотация: *Статья рассматривает вопросы совершенствования кадрового обеспечения тюремной системы в Российской Империи во второй половине XIX – начале XX века, исследуя вопросы деятельности российской пенитенциарной системы в указанный период.*

Ключевые слова: *тюремная система, преступление, наказание, кадровое обеспечение, Главное тюремное управление.*

The analysis of the national prison system history development, its staff and management features are of great importance for the history of the national prison system.

The study of the Russian Empire system at the end of XIX – beginning of XX centuries, the sources note an important condition for carrying out a punitive policy in the sphere of execution of punishment, the tsarist government saw in continuous improvement of the detention centers management. It is important to note that the complexity of the tasks and functions of the prison resulted in increasing the prison staff number requirements for candidates.

An important step towards the transformation of the prison system and its staff started in 1879 with the penal reform and established the main prison management – GTU, which became the Central governing body of the entire prison system of the Russian Empire. In addition the next important step towards prison reform was the transfer of the gas turbine in 1895 from the Ministry of internal Affairs to the Ministry of justice of the Russian Empire. The Supreme Supervisory and regulatory authority became the main prison management. It undertook direct management of the subordinates of the local authorities of the prison service through a Prison Inspectorate and the Council on prison Affairs.

The main prison management act, including the system of published circulars that were sent and the governors. In particular, they addressed issues of treatment and protection of detainees and prisoners, questions of their life and life of prison staff service, etc.

Special requirements to the training of prison personnel to the greatest extent applied to the places of detention supervision composition. In a note by the chief of the Main prison administration, M. N. Galkina-Wreckage relating to 1879, it is provided that : "... to date between the local prison and probation administration and the Central authority was not permanent and indissoluble connection, which would give the authority the opportunity to monitor the correctness of the actions of subordinate agencies"[1].

Based on the above assessment of the situation the Government and the State Council of the Russian Empire came to the conclusion that "correctional and punitive establishments designed by the law for the detention of perpetrators of significant crimes should be arranged uniformly throughout the Empire and consequently be under the direct supervision of government authorities" [2].

Thus in organizational terms the most significant result of the prison reform was the formation of the so-called three-tier system of management of prison facilities.

Analyzing the history of activities of the Government of the Russian Empire to reform the prison system and its staff, it should be noted the establishment by the Chief of the prison Department - Prison inspection, which was responsible for the implementation of audits of local prisons, the management of their activities, as well as the development of legislative proposals.

Another important body for the implementation of personnel policy in the prison system of the state was the strengthening of control functions, improvement of detention centers management. It was created by a collective body such as the Council on prison Affairs. By the Imperial decree representatives of the top authorities from various departments entered it.

The founders of the Council on prison Affairs could introduce the draft estimates of income and expenditure; the issues of prison devices, transfer of prisoners, corrections and inmates, management and reporting and other important for the system of places of detention.

At the level of provinces, the office of detention facilities civil Department of the Supreme power belonged to the governors of the regions and mayors. They were charged with the responsibility of monitoring the improvement of places of detention, as well as control over the implementation of all government resolutions on the order of detention.

Russian governors were given the right of appointment, transfer and dismissal from the post of wardens and their assistants, consisting of posts from XIV to VII grade during the given period. In accordance with the law passed on the 31st of March in 1890, local institutions as prison parts were established in some districts of the provincial prison inspection.

Thus during the period from 1890 to 1896, such inspections have been established in twenty-four provinces [3].

Provincial prison inspector was actually the head of the local prison administration. Prison inspectors were made responsible to conduct the prison reforms in the locations, where they were subordinated to all places of detention both "criminal and political".

Thus, at the grassroots level and the direct management of places of detention was carried out by the prison administration. The act of June 15, 1887 separate places of detention were referred to the management institutions: prison Directors and their assistants; the assistant prison Directors or the supervisor of the women's wards the priests, deacons and Psalm readers held in in the custody, doctors, paramedics and field service. Supervision of prisoners and their tending was placed on prison guards, consisting of senior and Junior wardens and wardens.[4]

Separately we describe such a category of employees as caretakers of the prison locks.

Rangers of prison locks, equal in grade and discharge to the retired assistant police chief and County district were appointed by the provincial authorities, and their maintenance was attributed to urban incomes (articles 21 and 22 of the Charter of detainees and the expansion of article 21). The law did not specify a direct reference to the chain of command of the prison caretakers. In different articles of the Charter of detention determining the directions of their professional activities .It was recommended that the Rangers were made conditional not only on the peer composition of the prison Committees and prison chiefs in particular, but also from different individuals administrative and judicial agencies, and even from the Bureau of prisons (arts. 23, 24, 82, 647, 648, 658, 659, 660 the regulations on detention).

Russian prison system at the turn of XIX - XX centuries was the basis of a sufficiently serious legal basis, the development of which was carried out mainly in the 30-90-ies of the XIX century. So, among the basic legal documents governing the activity of the system of execution of criminal penalties were contained on Charter under guard (1890, amended in 1906, 1908 and 1909) and the Charter of the exiles (1909)[5].

In the early twentieth century the Main prison administration expressed the idea of creating an educational institution for prison staff. So, the inspector of the Main prison administration N. F. Lucinschy,

initiated the establishment of St. Petersburg Lyceum two-year term of closed type with exemplary single prison (on the Vyborg side), where young people who graduated from secondary educational institutions were taken, primarily the military, as well as in the service of the officers. The purpose of the Lyceum was to set solid training for future prison officials to the prison service. The key idea was to put forward their acquaintance with the scientific notions of crimes and punishment from historical and present day systems of criminal punishment, as well as teaching students the art of managing a prison. The estimated number of the graduates annually was 50 people, "what was sufficient for the needs of prison affairs" [6].

Prison courses were designed to help in the short term (1.5 months), to implement additional training for the employees of the prison service.

The first classes on prison higher courses in St. Petersburg began on March 1, 1912 and lasted until July 10, 1912.

Among the teachers dominated the staff of the Main prison administration. The lectures were devoted to the questions of history and modern status of the penitentiary institutions of Russia and abroad, consideration of the draft General prison regulations, the rights and duties of prison staff, prison management and construction, correctional institutions for minors, prison hygiene [7].

This initiative was continued after the February revolution of 1917. According to the decree of the Provisional Government on April 11, 1917 the Prison courses have been opened since May 1, 1917 under the Main prison administration of the Ministry of justice.

"...Courses will teach: the common law, penal law, prison management, criminal policy and sociology, prison hygiene and sanitation, General principles of accounting, merchandising.

The General management was provided by. the head of the Department Professor Zhizhilenko. The faculty courses included Professor S. N. Gogel, I. P. Lublin, P. A. Ostanin, Privat-docents: M. M. Isaev, D. P. Nikolsky, E. E. Pantovich.

The classes will be held at the office of Criminal law at the University of Petrograd" [8]. However this initiative was interrupted by the October revolution of 1917.

Thus an important condition of the personnel policy in the prison system of the Russian Empire in late XIX – early XX century was a radical reform, in particular the creation of a new organizational-staff structure of management of prisons and other places of detention.

Список литературы:

- 1) ГАРФ. – Ф. 122. – Оп. 1. – Ч. 1. – Делопроизводство. – Д. 138. – Л. 11.
- 2) ГАРФ. – Ф. 122. – Оп. 1. – Ч. 1. – Делопроизводство. – Д. 138. – Л. 27.
- 3) ГАРФ. – Ф. 122. – Оп. 1. – Ч. 1. – Делопроизводство 1. – Д. 182. – Л. 1.
- 4) Выс. утв. мн. Гос. Совета. Об устройстве управлений отдельными местами заключения гражданского ведомства и тюремной стражи. 15 июня 1887 // ПСЗ. – Собр. 2-е. – № 4593. – СПб., 1889. – Т. VII.
- 5) Полный свод законов Российской Империи. СПб, 1911. С. 3427—3548.
- 6) Лучинский Н.Ф. Основы тюремного дела // Тюремный вестник, СПб, 1904. № 7. С. 18.
- 7) Опыт систематических чтений по тюрьмоведению при Главном тюремном управлении // Тюремный вестник. СПб, 1912. №№ 6-7. С. 1207-1208
- 8) ГАРФ. – Ф. 122. – Оп. 13. – Д. 1. – Л. 1.

УДК 568.244.4

Gevorgyan A. G.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

AGRARIAN REFORM OF P. A. STOLYPIN IN FOREIGN HISTORIOGRAPHY

Abstract. Stolypins agrarian reform is supposed to be a topical subject, it is popular with scholars and public figures. We can divide it into three periods in our resourches. The first from 1906 to 1917, the second soviet from 1917 to 1991, the thired modern period from 1991 to the present day. Many important law los and act were published. In the first period articles on the agrarian reform.

Keywords: Stolypins agrarian reform, modern period, agriculture history, law, act.

The object of Stolypin reforms attracts the attention of foreign specialists. Typically, the focus of historians emphasizes on the implementation of Stolypin reforms of the early 20th century.

Most foreign researchers have not created individual works on the history of Stolypin reform but included this of course the most important period for Russia in their general works on the history of the 20th century.

Historians are divided into two categories. The representatives of the first one supported the agrarian reform and saw it as the future of Russia. The second ones talked about the collapse of Stolypin's course. Conventionally the views of Western historians on agrarian transformation of the Prime Minister can be divided into "optimistic" and "pessimistic".

The researcher who considers the reform of P. A. Stolypin with "optimistic" positions is G. Vernadsky. He wrote a history of Russia from the establishment of the state until the 60-s of the 20th century [2]. In the context of economic development of Russia at the turn of 19-20 centuries, the author refers to Stolypin reform in the most general terms. He notes that agriculture was in this period the foundation of the Russian economy. The cultivated land occupied a huge area, but the yield able to be obtained per hectare in Russia was less than in other countries. Thus the development of agriculture occurred in an extensive way. After 1861, Russia's agriculture has undergone great changes, but the land has essentially remained at the same level. The peasants could not obtain land ownership. Even in the conditions of transition to capitalism agriculture continued to grow by expanding the area of cultivated land. In these circumstances highlighted was the need for reform. As a result of Stolypin agrarian reform independent were the householders of 5 thousands of peasant communes. Russia for the first time in its history began to move in the direction of individual agricultural holdings. The author appreciates the personality of Stolypin, noting that he was "a patriot and a man of ideas."

From the same standpoint A.Gerschenkron considers agrarian reform. He calls the Stolypin reform as "brilliant, bold, and resolute."

British researcher Dr. Hosking is also generally appreciated the beginning of the XX century. "The rulers tried, half consciously and deliberately, half the force of circumstances, to convert the multinational Empire to nation state and the autocracy into a constitutional monarchy. Russia took the first steps to the creation of diverse and scattered material of the old Empire of ethnic and civic nation. The attempt was unsuccessful, and this is not surprising. It was not amazing that it was taken."

In their study, D. Hosking concludes that in some respect Stolypin agrarian reform was very productive during that relatively short time, until it acted. By 1916 about 2.5 million peasant farms (from 12.3 million by 1916 the number had increased as a result of separation of families and the population growth to 15.3 million) received the documents of title in respect to the lands which had been in community ownership. Of these, 1.3 million completed the process by allocating their land from the

community. On the other hand, the bulk of privatization occurred in the first years of the reform, and then began to decline. It was performed in many cases, former peasants who have already left the land and only achieving the final part of their business. In addition, in most areas the peasants were too poor to lead self-management on the farms. "Thus, - Hosking concludes, Stolypin agrarian reform does not indicate a decisive move in favor of private peasant landownership. As for other aspects of the creation of civil society in the period of Stolypin agrarian reform peasants discovered the path to becoming full-fledged citizens and play an active role on the national market, but this has come at the increasing polarization, conflicts within the village that previously did not have such significance as the conflict between the community and outsiders".

In parallel with the historians who defend the point of view on the reform, as the beginning of agricultural modernization in Russia, there appeared a number of works that critically assess the transformation of P. A. Stolypin.

Western historians ("pessimists") believe that the center failed to overcome resistance to reform on the part of governors and their offices. Attention is drawn to the relatively small size of farms envisaged by the reform that, in the opinion of this group of historians, erected a barrier to modernization. Thus the conclusion is the following: "the political system of polysomography" put insurmountable obstacles of their own reform efforts. According to these researchers, the ones from the very beginning went the wrong way to reform in the country.

One of the first historians who examined the errors of the agrarian reform of the early twentieth century, was J. Any.

In his work "the Impetus for mobilization. Agrarian reform in Russia" G. Ani writes: "Nowhere in the world there has achieved a similar practical experience, which would show that the united in one of the fields brought with them agricultural progress. And some modern scholars of peasant agriculture actually deny such a causal relationship. The 40s of the XX century in Western Europe were accompanied by a powerful effort towards the unification of holdings. But the system of open fields is still prevalent among some of the most productive farms" (3). From this wording it can be concluded that Ani considers the reform of Stolypin somewhat far-fetched and unsupported by practical knowledge. The only useful thing about Stolypin reformers, in his view, was a "group planning" (delimitation of the neighbouring villages, apportionments, etc).

Thus foreign researchers following the Russian historians draw the conclusion about the incompleteness of the reforms, although they recognize their beneficial effect on the Russian economy and their exceptional role in the history of the twentieth century. It is worth noting

that historians "pessimists" in the Stolypin historiography are less numerous than their opponents. The vast number of Western historians sees Stolypin "on track", believing that his transformation accelerated the process of change in the peasantry towards the achievement of a highly individualized lifestyle. Several have improved the financial situation of the majority of the rural population. The legal consequence of economic development was to reduce the peasant's readiness to act against the landlords.

УДК 528.88: 332.3

Gorjuschkina J.N.,
VVS PVO RF
Otarowa J.N.
VUNZ VVS

ANWENDUNG DER FERNBETÄTIGTEN SONDIERUNG DER ERDE BEI DER ERRICHTUNG VON VERKEHRSTRABEN

Im Artikel werden Programme der fernbetätigten Sondierung der Erde sowie die Methodik ihrer Anwendung bei der Errichtung von Verkehrsstraßen behandelt. Schlüsselwörter: fernbetätigte Sondierung der Erde, Programmmodule, Verkehrsstraßen, hochdetaillierte Aufnahme.

An allen Projektierungs-, Errichtungs-, Betriebs- und Verwaltungsetappen von Objekten und Territorien ist aktuelle kartographische Geländeinformation nötig. Das optimalste Verfahren der Erhaltung von dreidimensionalen Koordinaten und Parametern der Situationsbestandteile ist heutzutage die Anwendung von verschiedenartigen Daten der fernbetätigten Sondierung der Territorien. Zur fernbetätigten Sondierung der Erde gehören kontaktlose Erforschungsverfahren. Im Fall der Gewinnung von Informationen über Territorien und Objekte handelt es sich streng genommen um Luft- und Weltraumaufnahmen, bei denen Photo-, Wärme-, Funkmess- und andere Angaben gewonnen werden. Von Zeit zu Zeit versteht man unter fernbetätigter Sondierung der Erde nur die Weltraumaufnahme. Um konkrete Angaben über den geographischen oder dreidimensionalen Standort von Objekten der Erdoberfläche sowie ihre qualitative Kenndaten zu gewinnen, soll man Bildmessbearbeitung von Werkstoffen vorausgehend machen, die in der geometrischen Modellbildung vom Gelände, im geodätischen Anhängen von Angaben und in der

Bildinterpretation besteht.

Praktisch alle Luft- und manche Weltaufnahmen werden mit Überdeckungen erfüllt, wobei dieselben Geländeteile auf mehreren Aufnahmen dargestellt werden. In diesem Zusammenhang kann die Bearbeitung im Stereo-Betrieb mit dem Aufbau von 3D-Modellen und dem Informationsgewinn nicht nur über zwei-dimensionalem Standpunkt, sondern auch über Höhenstellung durchgeführt werden. Ergebnisse der Bearbeitung von fernbetätigter Sondierung der Erde sind verschiedene Arten der Geoinformation, die für die Lösung von konkreten Aufgaben verwendet werden können. Mit Hilfe von Photos werden erzeugt:

Bildskizzen (photographische Aufnahmen des Geländes in vorgegebenen Rahmen ohne präzises geodätisches Anhängen, die für die Visualisierung und approximative Berechnungen bestimmt sind);

Orthophotokarten (photographische Aufnahmen von Geländeteilen, die topographische Vollständigkeit haben und für die Messungen und Berechnungen mit Genauigkeit des gegebenen Maßstabes bestimmt sind);

Karten und Geländepläne (Erzeugung von neuen oder Auffrischung von vorhandenen);

für Projektierung oder Visualisierung verwendbare 3D-Modelle der Geländeform;

Geländeprofile in aufgegebenen Richtungen.

Anhand der Aufnahmen werden auch erfüllt:

die Analyse der Territorien zu Zwecken der Verwaltung, der geologischen Untersuchung, der Vorprojektforschungen usw.

das thematische Monitoring der Territorien (die Ökologie, der Bau, die Tagebaue von Bodenschätzen usw.)

die Kontrolle über die Verwendung von Land-, Wald- und Wasserressourcen u.a.

Dabei sei es berücksichtigt, dass im Kosmos schon neben 50 Sensoren der weltweiten Produzenten funktionieren, die die vielfältigsten Daten der fernbetätigten Sondierung der Erde darunter in der superhohen Auflösung (von 50 cm im Gelände) liefern. Die Radarraumschiffe der fernbetätigten Sondierung der Erde erfüllen die Allwetteraufnahme mit hoher Auflösung. Das lässt das Extraktieren beim Entstehen der Notstandssituationen verwenden.

Außerdem kann nach Radarangaben das Monitoring der senkrechten Absetzungen der Elemente der städtischen Bebauung und der Objekte der industriellen Infrastruktur mit der Genauigkeit bis zu einigen Millimeter durchgeführt werden.

Unter den effektivsten Programmen der fernbetätigten Sondierung der Erde kann man für die Aufgaben der Einschätzung des Zustandes der Straßenobjekte nach Kennziffern die Systeme IRS, EROS (Abb. 1),

SPOT, IKONOS und QuickBird wählen [1, 2].

Für die Erweiterung der Datenanwendung der fernbetätigten Sondierung der Erde im Straßenverkehrswesen ist es wichtig, eine Reihe der spezifischen Besonderheiten Russlands zu berücksichtigen:

die Abwesenheit von erneuerten digitalen und rastertopographischen Karten von Bezirken der Bauarbeiten der Straßenobjekte des Föderalen Amtes für Straßenagentur in den fernen Regionen der Russischen Föderation;

die Abwesenheit in der offenen Verwendung der genauen Koordinatenanpassung der Straßenobjekte des Föderalen Amtes für Straßenagentur.



Abb. 1. Beispiele der kosmischen Darstellungen der Straßenobjekte.

Links oben – die Kreuzung von Asphaltstraßen und Erdwegen; auf den übrigen Aufnahmen sind die Brückenkonstruktionen deutlich sichtbar. Die Aufnahmen EROS B, räumliche Auflösung 0.7 m (© ImageSat, SCANEX, 2013).

Infolge der Ausführung der wissenschaftlichen Forschungsarbeit für das Föderale Amt für Straßenagentur hat das Zentrum "SkanEks" entwickelt und des weiteres die Methodik der Einschätzung des Zustandes der Straßenobjekte in den schwer zugänglichen Regionen Russlands nach den Materialien der kosmischen Aufnahme vervollkommnet. Die Methodik besteht in kombinierten Verwendungen von zwei oder mehreren gegebenen Programmen der fernbetätigten Sondierung der Erde mit der stufenweisen Präzisierung des Bezirkes und der Aufgaben von Aufnahme. Das lässt die russische Spezifik berücksichtigen. Als Ergebnis ist in der

Praxis die integrale Technologie der Anforderung, der Sammlung, der thematischen Bearbeitung und der vergleichenden Analyse der kosmischen Darstellungen in den Interessen der informativen Sicherstellung der Aufgaben des Föderalen Amtes für Straßenagentur demonstriert.

Die Etappen der Realisierung der Methodik:

Die Verwendung der breitschneidenden Systeme der hohen oder mittleren Auflösung IRS, SPOT, Landsat mit der Hochfrequenzaufnahme des gegebenen Bezirkes für das Erhalten einer vorübergehenden Serie der Darstellungen der Bauobjekte des Föderalen Amtes für Straßenagentur der großen Ausdehnung, der Aufdeckung der Veränderungen und der Aufgabenstellung auf die nachfolgende hochdetaillierte Aufnahme durch die optischen Sensoren der metrischen Auflösung;

Die Bestellung der hochdetaillierten Aufnahme von herausgefundenen Baubereichen.

Die Notwendigkeit der ersten Etappe der breitschneidenden Aufnahme ist von den Aufgaben bedingt, die mit der Erneuerung der Karte des Straßennetzes in der Region, der Bestimmung der Koordinaten der im Bau befindlichen Objekte und der Einschätzung der Baudynamik verbunden sind. Aufgrund der Angaben der Satellitenaufnahme der ersten Etappe entsteht die thematische Schicht des Straßennetzes des geographischen Informationssystems, sowie werden die Objekte für nachmalige hochdetaillierte Aufnahme (die im Bau befindlichen Brücken, die Bahnüberführungen, die Aufschüttung u.a.)

Außerdem ermöglichen die Daten der fernbetätigten Sondierung der Erde der hohen Auflösung die geographisch befestigte kartographische Grundlage auf dem Territorium einer beliebigen Fläche operativ zu schaffen und zu erneuern. Die Aufwände sinken mehrmals im Vergleich zur Durchführung der vollständigen Landaufnahmen oder mit der Kombination von Luft- und Landaufnahmen. Aufgrund der Methodik der Einschätzung des Straßenobjektzustandes in den schwer zugänglichen russischen Regionen im Laufe der Forschung wurden die Straßenrandbauten und Objekte aktiver gebaut, wurden die Zufahrtsstrecken der lokalen Wege repariert. Auf dem Beispiel der tschetschenischen Trassenstrecke "Kaukasus" war die Möglichkeit der Überwachung der Veränderungen nach gegebenen hochdetaillierten Aufnahmen demonstriert (Abb. 2).

SCHLUSSFOLGERUNGEN

1. Es ist der Begriff der fernbetätigten Sondierung der Erde behandelt.
2. Es sind die Programmmodule der fernbetätigten Sondierung der Erde, ihre Klassifikation und die Anwendung beim Bau der Autostraßen

studiert.



Abb. 2. Der Bau der Straßenrandobjekte (Zeiger) auf der Trasse "Kaukasus": oben – das Fragment der Aufnahme EROS A, unten – das Fragment der Aufnahme EROS A (© ImageSat Int., SCANEX, 2013)

Quellenverzeichnis

1. Kutscheiko A.A., Sputnikovy monitoring federalnykh avtotrass / A.A. Kutscheiko, V.A. Rogova. – M.: 2013.
2. Pudovkin O.L. Distanzionnoje sondirovanije Semli is kosmosa: priklanye sadatschi lesnogo chosjaistva / O.L.Pudovkin. – M.: 2013.

УДК 94 (470): 070

S.S. Ivantsova

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

THE NEWSPAPER “VORONEZH TELEGRAF” AS A HISTORICAL SOURCE FOR THE RESERCH OF THE EVERYDAY LIFE OF THE RUSSIAN PROVINCE OF THE SECOND HALF OF THE 19th – EARLY 20th CENTURIES.

Аннотация: В статье рассматривается источниковедческое значение газеты «Воронежский Телеграф» в качестве источника для исследования повседневной жизни населения русской провинции во второй половине 19 – начале 20 вв.

Ключевые слова: «Воронежский Телеграф», повседневная жизнь, Воронежская губерния, исторический источник.

One of the actual problems of modern historical science is a need to expand the source base by entering into a scientific circulation of historical

research for new sources and widening of the descriptiveness of the already known sources. The task of improving methods of extracting information ones is facing the researcher. It imposes new requirements on analysis of main types of historical sources.

Periodical Press is one of the most important historical sources. Before the radio, television and other modern media invention, printed media has long been a major source of relevant and useful information for urban residents. A feature of the periodical press is its synthetic nature that allows extracting a variety of historical information from it

In addition an increased interest by the researchers to local history in recent years is observed, as well as to the history of everyday life. Local periodic media are particularly valuable to work in these areas, since on their pages we can learn a lot of valuable empirical data. However it should be remembered that the newspaper as a means of mass media was designed for certain social groups. The main criteria for consumers of information from the newspapers were literacy, but even among the urban population in the late XIX - early XX centuries this criterion does not correspond to 100%. Therefore the information for publication was compiled in accordance with the needs and interests of a certain group of the population. The newspaper cannot be the source displaying the picture of social life in its entirety.

"Voronezh Telegraph" is the newspaper published in Voronezh for almost half a century continuously since 1869 twice a week, since October, 1878 - three times, and since 1900 - on a daily basis. Editors pointed out in the announcement that the newspaper will print government regulations, reprinted from the government newspaper, local news, a review of the internal life of Russia. Throughout its existence, "Voronezh Telegraph" informed its readers about the main events in Russia and abroad, local news, and placed advertising and private ads on their pages. In the summer of 1918, the newspaper "Voronezh Telegraph" was closed.

Newspaper format was not constant; it could be published with a different number of pages. We have an opportunity to find the issues of the newspaper of four, eight, or six pages. The newspaper contained the local news, small notes about international developments, news Russia, a short literary works - poems, short stories and satires.

Private advertisements of everyday life of population are the most interesting and informative part of the "Voronezh Telegraph". They are placed in the newspaper for a certain fee, and published before the main information blocks of the newspaper. If published on the front pages it cost twice as much as those placed on the back pages.

Ads in most cases have an advertising nature. On the first pages of the "Voronezh Telegraph" a large number of declarations with the proposals of services of medical clinics and physicians in private practice prevailed there dominated the advertisements of dental clinics and treatment of sexually transmitted diseases, as well as proposals of experts on children's and women's diseases. Often these ads included not only information about the location and schedule of reception of doctors, but also a description of methods of treatment, as well as information on the cost of medical services. These ads can be considered as an additional historical source for research on the history of public health in Voronezh.

There are numerous offers of educational services. On the newspaper pages ads about a variety of paid and free training courses, colleges, schools, gymnasiums and private tutoring are posted, information on the state of education in the city and province can be also obtained from the news notes, usually located on the second or third pages of the issues.

In addition the "Voronezh Telegraph" pages contain information about the work of charity institutions and Voronezh province - orphanages, almshouses and organizations of trustees.

For the researcher of everyday life announcements of renting apartments and rooms can present a lot of interest, because such ads often describe the everyday conveniences in rented apartments, such as electric lighting, water supply, sewerage, bath, heating. A number of rooms in a rented apartment, availability of kitchen and anteroom, additional household services such as heating rooms, or feeding inclusion in the cost of rental housing is also mentioned. Advertisements of this type, as a rule, are published after the basic information block on the last pages.

From the ads of the "Voronezh Telegraph" we can get information about the ways of leisure activities of urban dwellers. The newspaper published announcements of theatrical performances and films, horse racing, concerts, festivals and masquerades, notes about the opening and functioning of museums as well as reviews about performances and concerts. These announcements and notes can be a source of information for research of cultural life of the inhabitants of the province of Voronezh.

From short local notes and City Council reports we can be found information about the status of urban beautification, municipal services, street lighting and urban roadways.

Great interest for the researchers represent the advertisements of the stores, which indicate the prices of the products - food, textiles, wallpaper and even cars. From the newspaper ads, we can conclude that in the early twentieth century, cars have pretty firmly established in the life of the

province, as there are ads not only about the car sales, but also about their rent, and repair. But cars did not become the only mode of transport. In the newspapers there were ads for sale of a variety of horse carriages, horses and notes about the horse railway. In the newspaper there are advertisements of restaurants, containing information on the composition and price of standard orders.

In every issue there are ads on the employment or job search. These ads can be an additional historical source for research works about labor market in Voronezh at the relevant period.

As a whole, we can conclude that due to the diversity of factual material each researcher of everyday life of Voronezh and the province can use the publications of the "Voronezh Telegraph" as an additional historical source. However despite the fact that many local historians and historians specializing in the study of the historical realities of the province of Voronezh used the pages the "Voronezh Telegraph" in their works as a source of historical information. Comprehensive source study analysis was not written. This article is not aimed at complete and thorough primary source analysis. The volume of work and its overall directionality do not permit to do this. The purpose of the article is to attract attention to the actuality and necessity of such rese

Список литературы

1. Воронежский Телеграф. – 1913. – № 49 – 293.; – 1917. – № 1 – 69.
2. Голиков А.Г. Источниковедение отечественной истории: учеб. пособие для студ. высш. учеб. заведений / А.Г. Голиков, Т.А. Круглова, – 2-е изд., стер. – М.: Издательский центр: «Академия», 2008. – 464 с.
3. Данилевский И.Н. Источниковедение: Теория. История. Метод. Источники российской истории: Учеб. пособие / И.Н. Данилевский, В.В. Кабанов, О.М. Медушевская, М.Ф. Румянцева, – М.: Российск. гос. гуманитар. у-нт., 1998. – 702 с.
4. Махонина С.Я. История русской журналистики начала XX века. Учебно-методический комплект (Учебное пособие, хрестоматия) / С.Я. Махонина, – М.: Флинта: Наука, 2004. – 368 с.

**Pankov O.S.,
Shcheglova S.A.**

**Voronezh State Agricultural University after Emperor Peter the
Great, Voronezh, Russia**

THE PROBLEMS OF CRIMINAL PROSECUTION OF CIVIL SERVANTS

Abstract. The main results of the study of the problems of legal regulation and law enforcement in the field of criminal prosecution of public officials are stated in the article. The authors present substantiation of the relevance of the problems and formulate the main directions of legislation improvement in this sphere.

Keywords: corruption, civil servants, criminal responsibility, receiving a bribe, criminal penalties.

Art. 19 of the Russian Constitution states: «All are equal before the law and the courts». If you think about these words, it can be assumed that these are strong words of the powerful and fair state, where everybody despite of rank and position are equal before the law. Unfortunately, in Russia this idea remains a utopia of the state.

This article will focus on the criminal liability of public servants. Materials of mass media form citizens' impression of full impunity of public servants and their families. We can see a myriad of movies on the Internet how this or that MP driving in a state of alcohol or drugs intoxication commits an accident that causes damage to health and property of citizens. As the result the police officers escorted him home with an honorary escort.

It is said that there are two troubles in Russia such as fools and roads, but, in our opinion, there is another one - corruption. Now corruption penetrated all strata of the society, organizations and structures. Hundreds of officials stealing from the state billions of rubles go unpunished. The money mysteriously disappears, while the officials purchase villas abroad and huge yachts. What does the state do? Common ordinary people think that it does nothing. Since the Department for Combating Corruption is rotten inside itself and soaked with the sense of greed. After all, everyone loves money.

After reviewing a lot of news on the Internet you often come across

the following reports: the Chief of Police is caught for a bribe; an official is arrested for taking a bribe of one million rubles. According to the newspaper «Trud», in 2015 4000 officials were held to disciplinary responsibility; while 3/4 of them who are dismissed for corruption worked in the federal government. Also, according to the Prosecutor General's Office, the growth of crime in Russia in the first half of 2015 increased by 5.2% compared to the same period in 2014. In the first half of 2015 1,148,352 crimes were registered in Russia. That is 56,893 (5.2%) more than in the same period last year. According to published data, the growth of crime is observed in 61 regions of the country. The leaders of this anti ranking are Moscow, Chelyabinsk region, Rostov region.

Obligatory sign of most malfeasances are mercenary or other personal interest of the official (abuse of power, illegal participation in business activity, forgery) or selfish motive (bribery).

The law includes the following subjects of the considered crimes in the first category:

- A) persons exercising the functions of representative government;
- B) persons who perform organizational and administrative or administrative functions in state bodies, local authorities and other agencies mentioned in the law, permanently or temporarily;
- C) persons who perform the same functions on special authority.

The second category of subjects consists of the persons holding public office of the Russian Federation.

The third category of subjects is the persons holding public officials positions of the subjects of the Russian Federation established by the Constitution or the statutes of the subjects of the Russian Federation.

The fourth category of subjects of the crimes provided for in Chapter 30 makes up the civil servants and employees of local governments who are not related to the number of officials.

In accordance with the Federal Law of July 27, 2004 № 79-FL «On the state civil service in the Russian Federation» public offices are divided into:

- the position of the federal civil service;
- positions of state civil service of the Russian Federation;
- military posts;
- the position of law enforcement service.

The conclusion can be drawn that criminal responsibility for certain misconduct of public servants does not meet the social danger of the acts committed. We have to admit also that so far the measures taken to combat corruption remain inadequate severity and prevalence of this phenomenon.

The absence of specific legislation or at least separate rules in the Criminal Code, which would be formulated the concept of corruption, forces the police to use the methods developed for the detection and investigation of bribery, abuse of power, abuse of power, while the criminal law nature of corruption is quite different: it has the large scale and at the same time latent character which requires special means of struggle.

These factors are the reasons why Russia has a critically high level of corruption in the system of public authorities. And although the official criminality is objectively common to all models of social organization in which the natural right of management is originally delegated to individuals or social institutions or usurped by the latter by means of fraud or violence, and the phenomenon of corruption is diverse, the state should seek to introduce measures aimed at maximum reduction of official crime level using various systems of economic, political (including legal) and psychological (including educational and training) measures.

Currently the fight against corruption looks like a series of campaigns to time to political seasons. We believe that this struggle must be a continuous process and is actively used, first of all, legal remedies. New legislation on the civil service follows precisely this path. The recognition of the fact that corruption is ineradicable should not create the feeling of hopelessness.

To improve the effectiveness of the fight against corruption displays the list of requirements to persons holding positions of public service should be determined. We believe that all the candidates for the post of civil servant must have a university degree, have no criminal record, do not have any business and only exercise their powers. Legislation on public service establishes certain restrictions and prohibitions, but they are not enough. We believe that it is necessary to set limits for family members of government officials to eliminate illicit influence, illegal entrepreneurship and other criminogenic factors.

In our opinion, the punishment of corrupt officials should be tightened, the length of imprisonment must be increased, and the confiscation of property should be introduced. Perhaps, the experience of China on the use of the death penalty for crimes against the state and the current management regime is worth considering. In any case, the legislation on the use of criminal penalties to civil servants requires thorough revision.

拉多琴斯卡娅·瓦·阿·
Радочинская В.А.
沃罗涅日彼得一世国立农业大学
ВГАУ

汉语初级教学方法在无语言本科大学。

Аннотация: В настоящее время, в ситуации все более возрастающей роли и усиления значимости китайского языка, все большее количество неязыковых ВУЗов включают его в программу обучения. Этим и объясняется отсутствие специализированных учебных пособий, методических рекомендаций. В данной статье рассматриваются основные задачи, особенности и трудности преподавания китайского языка на начальном этапе в неязыковом ВУЗе, а также возможные пути их решения.

Ключевые слова Основные задачи обучения китайскому языку на начальном этапе. Особенности и методы преподавания китайской фонетики, грамматики и письменности.

随着汉语作为人们交际工具的作用提高，并汉语作为学科的重要性加强，在俄罗斯大学有汉语科大学的数量也增加了。

最近汉语科列入无语言本科大学的外语教学大纲。因此没有专业性的教材，规范教学准则。

任何学府的学生学汉语的主要问题是汉语的发音和文字比欧洲语言的有更大的差别。词对学欧洲语言的学生是有自己发音的字母组合，而对学汉语的学生是有音节发音的汉字或汉字的组合。每个字由部首加画组成，每个词一般由两个字组成，每个部首有自己的意义和发音，每个字有自己的意义和发音，而每个字音是音节。教汉语的时不能不考虑这个复杂性差别。所以首要的任务是使学生对汉语感到兴趣，感到有利。

在第一课介绍学生汉语系统时，要对学生显示语言不仅是语法，发音等规则的综合，既首先是交际工具，文明遗产。每个字是有意义上的文字，汉语文字体现而保留下今代中国人对世界的看法，怎样他们古时接受世界，怎样每个后辈现时通过语言接受世界。学汉语时学生可能从与习惯的有区别的角度看来世界，生活的现象。

因为无语言本科大学的外语教学大纲有有限的时间，汉语初级

教学的主要任务是语言发音基础，语法体系，文字的习得，并是在常用词汇和专业词汇基础上的交际能力。这些都促进对学生在具体的专业，商务，科学的领域上用外语交际能力的发展。鉴于上述，选择的基础教材是使用汉语课本。

介绍学生汉语的语音体系，首先要介绍拼音，就是汉语的拉丁音标（学汉语的辅助工具），并且介绍四声，就是属于每个音节的语源音训。学生要了解普通话声调的性质和功能，因为音节中具有区别意义的音高变化。把四声的转调可以描写得图表，详细地说明每个声调的语调。念各种声调的时候，劝告学生用手的动作图画声调。为记住每个字的声调，还可以劝告学生下一个必择其一的方法，就是字的意义与声调的连接，比如：“妈”字的声调是一声，因为妈妈一般是安静的，“爸”字的声调是四声，因为爸爸一般在家庭承担教养作用，有时骂孩子。这种方法只是推荐性的。

最初几个课的练习大部分是发音练习，这些练习足够重视音节，声调的发音，语调和语速。代替练习（每次念语句的时候只要改变一个词）帮助学生不仅记住词汇，还牢牢记住这个词语的发音，声调。每个练习和课文有录音，就帮助学生改善听力和发音的技能：听并发音汉语词，词语的节律语调特性。发音听写帮助学生听懂声调。

在这个阶段上，为了遵守各句式的正确语调，还要掌握把句子分解意义上组的技能。

对学生汉语的语法体系比文字和发音体系好学。虽然某些的复杂性是汉语没有一些欧洲语言所特有的语法工具，比如：性，数，格的变格或时的配合。

在汉语语法体系的初级教学上，重要是教学生用汉语工具（如定语链，固定次序等）造单句和复句。学生最常见的错误是用母语言的工具造句子，所以首先对学生提出句子的示范图，按照它学生要想出几个句子。教学时把句子的示范图复杂化，而变化。翻译练习也很重要，即从汉语翻译成俄语，又从俄语翻译成汉语。这样的练习对学生引起用外语的工具传递信息的必要性。每个课含有翻译练习，学生首先要自己书面做，以后口头检查。最难句子在黑板上研究。

学汉语时，对学生最难的是象形文字。汉字初级教学时，向学生介绍汉字的结构，书法基本规则，即是写画的次序（遵守写画的次序使记住汉字好学）。学生最常见的错误是记住汉字作为“符号+意义”。最初很重要使学生注重汉字是成分的组合，即是“符号+意义+

发音+声调”，教学生接受汉字与它的发音和声调连接。所以劝告学生每次写汉字的时候反复念叨它的发音，而且念或写课文的时候，在汉字上写它的声调。所以把每个新汉字首先在黑板上分析画。

在初级上学生说话能力的实现是用汉语的工具表示自己的意见，思想，用汉语的工具提问题提得对。每上课的时候，念课文以后对学生提出想出几个问题，按照课题进行对话，吸引学生参加课题的共同讨论。很重要鼓励学生用汉语表示自己意见的发起，有礼貌得改正错误，因而保持学生想用汉语交际的动机。

其中掌握说话能力的技能也重要是了解书面并口头课文的技能。在学汉语初级上学生不要了解全部课文，但要会了解课文的内容，总意义。

听力练习越来越学生学好更多词汇越复杂化，逐步实行发音听写改语句的听音，以后改课文的听音。对学生不仅要告诉课文的内容，还要译解地复述。

在教学过程中吸引现代信息通信技术也是很重。现代信息通信技术也可能作为交际能力的实现。劝告学生用各种程序（如社会化媒体，讯佳普等）与母语者交往。由于需要教材的缺乏，鼓励用电子字典，汉语教学程序，中国搜索网站等。

汉语初级教学首要的任务是使学生不接受汉语作为课程，但接受汉语作为实现人们的主要要求，就是交往的要求。吸引学生用汉语交往，教学生汉语的基础，为了后来学生能在自己专业领域上使用这个交际的工具。

Список литературы

1. Демина Н.А. Методика преподавания практического китайского языка. – 2 изд. – М.: Восточная литература, 2006. – 88 с.
2. Задоевко Т.П., Хуан Шуин, Начальный курс китайского языка. Часть I. – 5-е изд., испр. и доп. – М.: Восточная книга, 2010. – 304 с.
3. Кочергин И.В. Очерки методики обучения китайскому языку. – М.: ИД Муравей, 2000.-160 с.
4. Кондрашевский А.Ф., Румянцева М.В., Фролова М.Г. Практический курс китайского языка: в 2 т. Т.1./отв. ред. А.Ф. Кондрашевский. – 11-е изд., испр. – М.: Восточная книга, 2010.-768 с.

УДК 94(34)

A.A. Semenenko

Gymnasium No 2, Voronezh, Russia

ARABLE FARMING OF VEDIC INDO-ARYANS ACCORDING TO ATHARVAVEDA SHAUNAKIYA AND SAMHITAS' DATING.

*Аннотация: В статье рассматриваются все упоминания земледелия в Атхарваведе Шаунаки. Индоарии выращивали ячмень, рис, сезам и бобы и практиковали глубокую вспашку поля упряжками из 6 или 8 животных и плугами с лемехами из твёрдого дерева *Acacia Catechu* и металла. Упоминание пахоты на Сарасвати и наличие заимствований из Ригvedы датирует Атхарваведу Шаунаки минимум до 2000 г. до н.э., Ригvedу — минимум на несколько столетий ранее этого.*

Ключевые слова: Атхарваведа, Ригvedа, индоарии, пахота, ячмень, рис, Сарасвати, земледельческая идеология, датировка Ригvedы и Атхарваведы.

Atharvaveda Samhita Shaunakiya (further AVSh) [1] comprises four parts, more or less sequentially included in the collection: books I–VII, VIII–XII, XIII–XVIII and book XIX. [2]

Book II mentions brown barley with white joints and sesame in connection with ploughs and draft poles-yokes (*bab^hrór árjunakāṇḍasya yāvasya te palālyā tilasya tilapiñjyā / vīrūt // nāmas te lāṅgaleb^hyo nāma iṣāyugéb^hyaḥ / vīrūt*) (II.8.3–4). Book III describes granary-hut with high roofing and sifted grain (*d^haruṇy asi śāle bṛhác^handāḥ pūtid^hānyā*) (III.12.3) together with ploughing (*imām śālām / bhāgo no rājā ní kṛṣim tanotu*) (III.12.4). Deva-gatherer, creator of plentiful corn (*cakāra dhānyam bahú / samb^hṛtvā nāma yó devás*) (III.24.2) is asked to make it inexhaustible like hundredfold and thousandfold source (*úd útsam śatád^hāram sahasrad^hāram ákṣitam / evāsmākedām dhānyam sahasrad^hāram ákṣitam*) (III.24.4). The plough, easily-lying down and with sharp ploughshare of metal (*pavīrávat*) and convenient handle, is begged to plow out a cow, a sheep, a high-speed framework for the chariot and a fat maiden (*lāṅgalam pavīrávat suśimam somasátsaru / úd id vapatu gām áviṃ prast^hāvad rat^havāhanam pībarim ca prap^harvyam*) (III.17.3). This hymn contains verses, repeated with variant readings in Rigveda Samhita (further RV) [3] hymns IV.57 и X.101. Poets, putting on yokes and harnessing ploughs—“furrowers” severally, are mentioned first (*sīrā yuñjanti kavāyo yugā ví tanvate pṛ^hak*) (III.17.1). Then goes the call to harness ploughs—“furrowers”, to put on yokes, to sow

seed into the prepared womb of obedient Viraj (Earth) so as she may bear a burden; and sickles are urged to move closer to the ripened barley (yunákta sīrā ví yugā tanota kṛté yónau vapatehá bījam / virājaḥ śnúṣṭiḥ sábhārā asan no nédīya ít sṛṇyāḥ pakvám ā yavan) (III.17.2). Indra is asked to press in the furrow and Pushan — to guard her so as she, full of milk, may give milk for the poets each next year (índraḥ sītām ní gṛhṇātu tām pūṣābhī rakṣatu / sá naḥ páyasvatī duhām úttarāmuttarām sámām) (III.17.4). Good ploughshares are invoked to cut up soil happily, ploughmen — to follow happily the draft animals, two happy ploughs — to make plants covered with beautiful berries (śunām suphālā ví tudantu bhūmiḥ śunām kīnāsā ánu yantu vāhān / śunāsīrā havīṣā tósamānā supippalā oṣadhī kartam asmaí) (III.17.5). Good luck is sought for the draft animals and the men, for the ploughing plough, for the straps which are being tied and for the goad which is being swung (śunām vāhāḥ śunām náraḥ śunām kṛṣatu lāṅgalam / śunām varatrā badhyantām śunām aṣṭrām úd iṅgaya) (III.17.6). Two happy ploughs are called to give joy to the author of the hymn and to sprinkle with milk created in heaven (śunāsīrehā sma me juṣethām / yád diví cakráhuḥ páyas ténémām úpa siñcatam) (III.17.7). Furrow, carrying lucky share, is praised and incited to turn to the poets, to become favourable to them and to be beautifully-fruited for them (sīte vándāmahe tvārvácī subhage bhava / yátbhā naḥ sumánā áso yátbhā naḥ suphālā bhūvaḥ) (III.17.8). In the next verse the furrow is begged to turn back to the composers of the hymn with milk, full with refreshments and swelling with fat (sītā sá naḥ sīte páyasābhāvāvṛtsvórijasvatī gṛtāvāt pīnvamānā) (III.17.9). Book IV mentions laboring draft ox and ploughman (srāmeṇānaḍvān kīlālam kīnāsāś cābhī gacataḥ) (IV.11.10). In Book VI Ashvins are impelled to kill a driller, a caterpillar and a mole or to tie them mouths up to prevent them from eating barley; these two Devas are asked to create safety for grain; then a driller, a locust, a rodent and some creature are called to go away without eating barley and making harm (hatām tardām samañkām ākḥum aśvinā chintām síro ápi pṛṣṭiḥ sṛṇītam / yāvān néd ádān ápi nahyatam múkham áthābhayaḥ kṛṇutam dhānyāya) // tárda haí pátaṅga haí jábhya há úpakvasa / brahmévāsamsthitam havír ánadanta imān yāvān áhimsanto apódita) (VI.50.1–2). Next the deep ploughing of barley with teams of six and eight draft animals is described (imām yavam aṣṭāyogaiḥ śadyogébhīr acarkṛṣuḥ) (VI.91.1). Reference to the first ploughmen digging without proper knowledge evidences the hoary antiquity of Indo-Aryan agriculture (yád yāmām cakrúr nikhānanto ágre kārṣivaṇā annavido ná vidyāyā) (VI.116.1). Rice, barley, beans and sesame are enumerated (vrīhīm attam yavam attam átho máṣam átho tīlam) (VI.140.2). Barley is urged to rise, to become plentiful in power, to break all vessels; lightning is begged not to hit it; then divinized barley is asked to ascend like heaven and to be

inexhaustible like ocean, to have inexhaustible retinue, inexhaustible accumulations and the same givers and eaters (úc c^hrayasva bahúr b^hava svéna máhasā yava / mṛṇīhī vísvā pátrāṇi mā tvā divyāśánir vad^hīt // āśṛṇvántam yávam devám yátra tvāc^hāvádāmasi / tād úc c^hrayasva dyaúr iva samudrá ivaíd^hy ákṣitāḥ // ákṣitās ta upasádó 'kṣitāḥ santu rāśáyāḥ / pṛṇánto ákṣitāḥ santv attāraḥ santv ákṣitāḥ) (VI.142.1–3). The last, seventh book of the first block of AVSh expresses the wish to overcome hunger by means of barley with the phrase almost identical with the text of RV (ṭarema yávena vā kṣúd^ham puruhūta víśve) (VII.52.7=RV X.42.10).

Of great significance is the statement that Devas ploughed deeply the barley along Sarasvati for the first man Manu or for men with Indra acting as the lord of the plough and Maruts — as ploughmen (devā imám yávam sárasvatyām ád^hi maṇāv acarkṛṣuḥ / índra āsīt śírapatiḥ śatákratuḥ kīnāśā āsan marútaḥ) (VI.30.1). This AVSh hymn was composed at least before 2000 BC, that is before the drying up of the Sarsuti–Ghaggar–Hakra–Nara River [4]. At that time already Indo-Aryans inhabited the Sarasvati Valley. They knew that their ancestors had been practicing arable farming as AVSh poets make their gods the first ploughers of barley along the Sarasvati River. The similarity of “agricultural” verses of RV and of AVSh (vide ante) evidences that the latest X cycle of RV, I–VII Books of AVSh and Indo-Aryans’ barley growing should be dated at least before 2000 BC.

In Book VIII rice and barley (vrīhiyavāv) (VIII.2.18) are characterized as cures and immortal sons of heaven (vrīhír yávaś ca b^heśajaú divási putráv ámartyau) (VIII.7.20). The team of six harnessed to a plough is described further (ṣaṭyogám śíram) (VIII.9.16). Also ploughing and sowing are mentioned and it is stated that they support men’s life (kṛṣím ca sasyám ca / té kṛṣím ca sasyám ca manuṣyā úpa jīvanti kṛṣṭárād^hir upajīvanīyo b^havati yá evám véda) (VIII.10.4.25). In Book IX rice and barley (vrīhís ca yávaś) (IX.1.22) are named Soma’s offshoots (yé vrīháyo yávā nirupyánte 'mśáva evá té) (IX.6.1.14). In Book X the poet depicts himself as striding after the ploughing and as excommunicating his haters from it (kṛṣím ánu ví krame 'hám kṛṣyās tám nír b^hajāmo yò 'smán dvéṣṭi yám vayám dviṣmáḥ) (X.5.34). In the other hymn the protecting amulet which is made by the skillful carpenter with a knife (yát tvā śikváḥ parāvadhīt tákṣā hástena vāsya) (X.6.3) from ploughshare (várma máhyam ayám maṇíḥ p^hálāj jātáḥ kariṣyati) (X.6.2) or in the form of ploughshare of very hard wood Acacia Catechu [5] (maṇím p^hálam k^hadirám) (X.6.6=7=8=9=10) is described. Ashvins guard the ploughing with this amulet (maṇím / ténemám maṇínā kṛṣím aśvínāv ab^hí rakṣataḥ) (AVSh X.6.12). It is said to have come to the poet with rice and barley (sá māyám maṇír āgamat sahá vrīhiyaváb^hyām) (X.6.24). It is stated next that seed grows on the plough land in the furrow from the plough (yát^hā bíjam

urvārāyām kṛṣṭé p^hālena róhati) (X.6.33). Book XI mentions ploughing (kṛṣyā) (XI.3.2.41); rice and barley are being compared to inhalation and exhalation, a draft ox — to breathing (prāṇāpānau vrīhiyavāv anaḍvān prāṇā ucyate / yāve ha prāṇā āhito 'pānó vrīhír ucyate) (XI.4.13). Book XII begins with the description of the Earth with plough land and food (yāsyām ānam kṛṣṭāyaḥ saṃbab^hūvúḥ) (XII.1.3), pṛ^hivya yāsyām ānam kṛṣṭāyaḥ saṃbab^hūvúḥ) (XII.1.4) of rice and barley for the five peoples–ploughers (yāsyām ānam vrīhiyavaú yāsyā imāḥ páñca kṛṣṭāyaḥ / bhūmyai) (XII.1.42). Then again we have the mention of ploughing (yát kṛṣáte) (XII.2.36) and of excommunicating from it (c^hinátti kṛṣyā) (XII.2.37).

Book XIV compares a woman being fertilized to a soulful plough land (ātmanváty urvárā nārīyām āgan tāsyaṃ nara vapata bījam asyām / śá vaḥ prajāṃ janayad vakṣāṇāb^hyo bíb^hratī dugd^hám ṛṣab^hasya rétaḥ) (XIV.2.14) thus demonstrating a typical agricultural ideology. According to Books I and XIX of AVSh the waters of the Himalayas, of sources, flowing and raining, of deserts and swamps, dug out and brought in jars were used (āpo haimavatīḥ u utsyāḥ / saniṣyadā āpaḥ u varṣyāḥ // āpo d^hanvanyāḥ anūpyāḥ / k^hanitrímā āpaḥ yāḥ kumb^héb^hir āb^hṛtāḥ) (XIX.2.1–2; comp. I.6.4). One more verse of crucial chronological importance asks Sarasvati to bring wealth and milk fat and grain (ā me d^hanam sárasvatī páyasp^hātim ca d^hānyam / úpā vahād) (XIX.31.10). This means that even during the latest period of AVSh composition the Sarasvati Valley abounded in dairy and grain-producing products. AVSh and not only its most ancient part must be dated not later than at least 2000 BC. RV with its more archaic language and the material of which AVSh plentifully borrows dates to at least approximately 2500 BC.

Список литературы

1. Атхарваведа (Шаунака): В 3-х тт. Пер., вступ. ст., комм. и прил. Т.Я. Елизаренковой. — М.: Вост. лит., 2005–2010; Atharva-Veda Saṃhitā. Śaunaka Recension. On the basis of the editions Gli inni dell' Atharvaveda (Saunaka), translit. a cura di Ch. Orlandi, Pisa 1991, and Atharva Veda Sanhita, herausgegeben von R. Roth und W.D. Whitney, Berlin 1856 // [Электронный ресурс:] <http://titus.uni-frankfurt.de/texte/etcs/ind/aind/ved/av/avs/avs.htm>.

2. Елизаренкова Т.Я. Атхарваведа — структура и содержание // Атхарваведа (Шаунака): в 3 т. Т. 1. Книги I–VII. — М.: Вост. лит., 2005. — С. 39–43.

3. Ригведа. Изд. подг. Т.Я. Елизаренкова. В 3 тт. М.: Наука, 1989–1999; Rigveda. Metrically Restored Text. Eds. K. Thomson & J. Slocum // [Электронный ресурс:] <http://www.utexas.edu/cola/centers/lrc/RV/>.

4. Klostermaier K.K. A survey of Hinduism. — 2nd edition. —

Albany: State University of New York Press, 1994. — P. 36; Allchin F.R. The end of Harappan urbanism and its legacy // Allchin F.R., Erdosy G. et al. The archaeology of early historic South Asia: the emergence of cities and states. — Cambridge: Cambridge University Press, 1995. — P. 28–29; Kenoyer J.M. & Heuston K. The ancient South Asian world. — NY: Oxford University Press, 2005. — P. 72 & 75–76; Shaffer J.G. & Lichtenstein D.A. South Asian archaeology and the myth of Indo-Aryan invasions // The Indo-Aryan controversy: evidence and inference in Indian history. — L.: Routledge, 2005. — P. 84; Klostermaier K.K. A Survey of Hinduism. — 3rd Edition. — Albany: State University of New York Press, 2007. — P. 23.

5. Елизаренкова Т.Я. Комментарий // Атхарваведа (Шаунака): В 3-х тт. Пер., вступ. ст., комм. и прил. Т. Я. Елизаренковой. Т. 2. Книги VIII–XII. — М.: Вост. лит., 2007. — С. 216 и 247–248.

УДК: 372.016.811

Solomatina A.G.

Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia

Kildichyova L.A.

Secondary School №95, Voronezh, Russia

THE MAIN DIFFICULTIES OF USING LISTENING IN FOREIGN LANGUAGE LEARNING

Аннотация: Данная статья посвящена вопросу использования аудирования в обучении студентов иностранному языку. В статье дается определение аудирования, рассмотрены основные характеристики аудирования как вида речевой деятельности. В статье сформулированы и описаны основные трудности, с которыми могут столкнуться студенты при использовании аудирования на занятиях по иностранному языку.

Ключевые слова: аудирование, языковые трудности, психологические трудности, речевая деятельность, уровни аудирования.

Listening is the process of semantic perception of audio information, a process mediated reflection of the reality, connections and relationships, including interpretation. Listening is ability to distinguish and understand other people speaking, and in studying a foreign language, it is an understanding of the foreign-language speech. It means understanding of

accent of speaking, grammatical structures and vocabulary of a foreign language.

There are several characteristics of the listening as a form of speech activity:

- People can do listening genetically;
- Listening is implemented in oral communication;
- Despite internal activity, listening is not proactive and reactive

process;

- Listening is receptive kind of speech activity;
- Formation and formulation of ideas is carried out an internal

process;

- Listening is externally unexpressed internal activity of the process.

Students show the following abilities while listening:

- Prediction of that people will speak.
- Guess of unknown words and phrases without panic.
- To use the previous knowledge as base for understanding.
- To understand the relation of the conversation speaking to a subject.
- To be able to make entries on listening time.
- To understand intonation and accents.

I.A. Zimmaya presented the psychological structure of listening as an activity in three levels: motivated, formed and implemented.

Motivated level combines situational-contextual, the signal information and motivational sphere. The main motive, as a rule, are the cognitive and communicative. Motives determined target, which, in turn, is implemented in the subject. Listening objectives may be different, but they are achieved through the disclosure of semantic relationships and understanding of the incoming message. The object of listening is a statement of the other person, subject is the idea, the meaning of the utterance.

Formed level contains four interrelated and mutually exclusive phases:

1. semantic prediction;
2. verbal comparisons;
3. semantic relationships between words and between semantic units;
4. senseforming phase.

Implemented level creates a response speech acts through the establishment of a common sense of purpose.

Thus, the main activity of the person is to obtain, understand information. It is human natural ability to listen to and understand larger amount of information at a higher level than express thoughts by speaking or writing. In this context, false opinions may be that (a) listening is a

passive kind of speech activity, (b) listening skills, formed in the process of mastering the mother tongue, are easily transferred into a foreign language, and (c) to train listening comprehension is not necessary.

Students face many difficulties when learning listening the foreign language speech. There are difficulties connected with language aspects and the difficulties connected with features of the speech.

The main difficulties that may be in the development of students auditive skills:

- The difficulties associated with the peculiarities of listening as a kind of verbal activity and the conditions in which this activity is carried out. The difficulties of this group are: the one-time presentation of information and the irreversibility of sounding speech that requires listening to the rapid determination of sound signals; the rate of speech of the speaker, which causes the listener to perceive speech in fast mode; the need to adapt to the different characteristics of the voice and manner of pronunciation of individual speaker; bad connection, external noise.

- Language difficulties. They can occur when there are new grammar structures in the speech of the speaker (grammar, abbreviated conversational forms), new vocabulary (words, idioms, non-equivalent vocabulary), with the features in the pronunciation (intonation, emphasis, rhythm, speed statements).

- Contextual knowledge or difficulties caused by the socio-cultural features of the country of studied language. Listening in their native language does not occur out of context. We always listen to the specific purpose of having some background knowledge and / or expectations of the audited text. Ignorance of the context and background (socio-cultural) of information can reduce the level of understanding of the material and complicate the process of perception.

- Psychological difficulties. Students try to understand all words of the text and as a result they lose their concentration of the meaning of the speech. This greatly reduces the effectiveness of listening. It is necessary to teach students to understand the material, which contains the unfamiliar vocabulary.

- Difficulties caused by the stylistic features of the text. The difficulties of this group are the difficulties associated with the style and genre of the audiotext. The characteristic style of spoken word features are: a large number of phonetic compression, assimilation and reductions; the presence of incomplete sentences, elliptical structures and reduced forms;

It is very important to choose the exercises for teaching listening. Effective listening exercises lead to the consolidation of the material that help students to develop speaking based on listening material.

The materials for listening practice should be authentic. Authentic

materials are the materials taken from original sources, which are characterized by naturalness of lexical filling and grammatical forms, by situational adequacy of the used language material. They illustrate cases of authentic word usage that can be used when training in a foreign language.

Список литературы.

1. Зимняя И.А. Смысловое восприятие речевого сообщения. – М.: Наука, 1976.
2. Сысоев П.В. Спорные вопросы коммуникативного контроля умений учащихся воспринимать на слух речь // Иностр. языки в школе. – 2008. – № 2. - С. 16-21.
3. Соломатина А.Г. Развитие умений говорения и аудирования учащихся посредством учебных подкастов // Язык и культура. 2011. № 2. С. 94-99.

УДК 372.881.111.1

Tokmakova Y.V.
Voronezh State Agricultural University after Emperor Peter the Great, Voronezh, Russia
Kildichyova L.A.
Secondary School №95, Voronezh, Russia

THE FORMATION OF THE COMMUNICATIVE COMPETENCE AS THE MAIN PURPOSE OF STUDYING FOREIGN LANGUAGES.

Аннотация. В данной статье рассматривается сущность и назначение коммуникативной компетенции, и приводятся ее основные составляющие компоненты. Подчеркивается важность использования коммуникативного подхода в практике обучения иностранным языкам как неотъемлемой части подготовки специалистов, способных комфортно чувствовать себя в иноязычной среде.

Ключевые слова Коммуникативная компетенция, межкультурное и межличностное взаимодействие, учебно-познавательная деятельность, языковая среда, языковое общение, коммуникативный подход

The main purpose of learning a foreign language is the formation and the development of professional foreign-language competence for students

to communicate freely and use the gained knowledge in their professional activities. During the studying of foreign languages students should gain not only theoretical knowledge and practical skills in the field of their specialization but also to become a purposeful person who is ready for self-education and increasing a professional level and culture. So the formation of professional foreign competence is a very important component for teaching students.

Communicative competence can't be defined as the general ability to use language accurately, appropriately and flexibly. However the degree of such competencies can be measured in three different components. It consists of the grammatical competence, sociolinguistic competence and the strategic competence.

Grammatical competence is the ability to recognize and produce the distinctive grammatical structures of a language and to use them effectively in communication. One good example of this component is learners need to learn and understand the different time references of sets of words such as 'he breaks', 'he broke' and 'he has broken', and to be able to make appropriate time reference when speaking or writing the words.

Concentration on grammatical competence only, however will not provide the learner with the ability to interpret or produce second language expressions appropriately, so sociolinguistic competence is the ability to interpret the social meaning of the choice of linguistic varieties and to use language with the appropriate social meaning for the communication situation [2].

The third component is called strategic competence. This is the ability to organize a message effectively and to compensate, via strategies, for any difficulties. Strategic competence refers to a speaker's ability to adapt their use of verbal and nonverbal language to compensate for communication problems caused by the speaker's lack of understanding of proper grammar use or insufficient knowledge of social behavioral and communication norms. Strategic competence, along with grammatical competence and sociolinguistic competence constitute a framework for determining a language learner's proficiency in communication [1].

But it should be noted that ability to cross-cultural interaction directly depends on formation of communicative competence. In the course of training in a foreign language at students knowledge in the sphere of the specialization, professional personal qualities and communicative abilities for free communication in a foreign language has to be created. Forming this type of competence it is necessary to use both traditional and interactive methods in the process of teaching a foreign language.

Generally communicative language teaching makes use of authentic material, because it is important to give them an opportunity to understand how language is actually used outside the classroom. Students are involved in real life situations tasks that require communication. In this approach, the teacher sets up a situation, in which students are likely to be involved in a real life. Furthermore, in a communicative language teaching class use the language through communicative activities. Most of these exercises are completed through pair and group work. Those activities give students the opportunity to be involved in real or realistic communication [2].

As for interactive methods of studying the international telecommunication project should be noted in practice of training of foreign languages because they create the natural language environment and the need for language communication is formed with their help. Besides, real conditions for cross-cultural communication are created. The educational telecommunication project is "the joint educational, research, creative or game activity of students organized on the basis of computer telecommunication, having a common problem, the purpose, the coordinated methods, and the ways of activity and aimed at achieving of a joint result of activity".

The basic aim of a foreign language consists of the formation of communicative competence, i.e. the ability to carry out interpersonal and cross-cultural communication with native speakers. Communicative approach teaches to be guided freely in the foreign-language environment, and also to be able to react adequately in various speech situations.

According to the numerous researches on this problem, the communicative method is the most appropriate way of teaching foreign-language culture as it develops "a sense of language" and corresponds to the aims of teaching foreign languages in a modern society - to teach languages for communication.

Список литературы:

1. Пассов Е.И. Коммуникативный метод обучения иностранным языкам. / Е.И. Пассов –М.: Просвещение, 2004.
2. Richards, J.C. & Rodgers, T.S. Approaches and Methods in Language Teaching, United Kingdom: Cambridge University Press, 2001.

УДК 30.303.01

**Tyurina T.S.,
Zavgorodnyaya E.L.**

**Voronezh State Agricultural University after Emperor Peter
the Great, Voronezh, Russia**

PROJECT ACTIVITIES AS A WAY OF DEVELOPMENT OF CREATIVE SKILLS

Аннотация. Проектная деятельность является эффективным методом формирования креативных умений, поскольку в ходе выполнения проектов студенты получают мотивацию выдвигать гипотезы, обобщать, задумываться о предварительных выводах. Выполняя проекты, учащиеся осваивают алгоритм творческой деятельности, учатся получать и применять знания по различным отраслям, приобретать опыт решения творческих задач.

Ключевые слова: проектная деятельность, метод проектов, иностранный язык, творческая деятельность, креативные умения.

Project-based learning is a complex of techniques and activities which helps to master a specific area of practical or theoretical knowledge in a particular subject. It is a way of learning, the way to organize the process of cognition. That's why a project method is a means to achieve a didactic purpose through elaboration of the problem, which should culminate in a very concrete, factual and practical result.

As for a teacher, an educational project is an integrative didactic tool of development, training and education, which allows to produce and improve the specific skills of projection: problematization, goal-setting, planning activities, reflection and self-analysis, presentation and self-presentation, as well as searching for information, practical application of academic knowledge, self-learning, research and creative activity.

As for students, it is an opportunity to do something interesting

on their own, in a group or alone, making maximum use of their potential; it is an activity that allows them to express themselves, to try their hand, to apply their knowledge to benefit and to show the achieved results in public; the activity aimed at solving interesting problems, formulated by the students as a target and having the practical result, which is important and significant for the discoverers.

Project-based pedagogy specifically solves the problem of student-centered learning, because it allows students to choose activities based on their interests, abilities, and aims at developing their knowledge and skills. Moreover, by carrying out projects, students can master the algorithm of innovative creativity, learn how to find and analyze information, receive and apply general knowledge, acquire experience in solving creative problems. It is worth noting that the work on the project involves and develops the skills and abilities of reflective activity. In addition, the development and implementation of projects develop students' thinking skills, information retrieval, analysis, experimentation, decision-making, self-study and group work.

The main objective of the project activities in teaching foreign languages is to shift the focus from all sorts of exercises on the active mental activity of students which requires some specific linguistic means. Only the project method can help to solve this didactic problem and to transform the lessons of foreign language to the discussion, which solves some really interesting, practically relevant and accessible problems taking into account some specific cultural characteristics of the country in terms of cross-cultural interaction.

Nowadays, the project activity is an effective technology of learning a foreign language, as the organization of learning allows students to acquire knowledge in the creative process of planning and independent performance of practical tasks. Project-based pedagogy is considered as a kind of alternative to class-lesson system. The activities are aimed at self-learning and self-improvement of students through active ways of action. The project method can be used in almost any topic, which is connected with the foreign language, since the subjects are selected according to the practical significance for the student. Each project is related to the specific topic of speech. The project is based on a problem. So students need not only language means, but also some subject knowledge to solve it. Students should

have certain intellectual, creative and communicative abilities. The project activities also make them active participants of the process. Moreover, the project method demonstrates the level of knowledge of foreign language of the students, which allows the teacher to understand what new information they have learned in the study of the topic. The main point of the project activity in the study of a foreign language - is particularly a communicative activity, as a part of other types of activities. So, the effectiveness of the project method in the practice of teaching a foreign language is high for all types of activity: it improves the reading skills, the quality of the translation of different texts, the skills of speaking and writing. Students also broaden their minds, develop their communication skills and wish to produce and use new knowledge independently.

If we talk about the use of the project method in teaching foreign languages, it is worth noting the international telecommunication projects, because they can help to create a natural language environment and real conditions for cross-cultural communication.

So, the project activity is an effective method of the development of the creative abilities of students, because the students are motivated to hypothesize, to generalize and to think about their tentative conclusions, while working on the project. The project method also motivates them to use the ability to analyze, compare, evaluate, emphasize the main points and make suggestions. By making projects, students master the algorithm of the creative activity, learn to receive and apply their knowledge on various branches and gain the experience in solving creative problems.

Content

Секция I. Инновационные технологии в агрономии, агрохимии и экологии.....	3
Alpatova E.A., Stekolnikova N.V. INFLUENCE OF COMBINED SOWING OF HAIRY WETCH AND BUCKWHEAT ON STRUCTURE AND PRODUCTIVITY OF AGROPHYTOCENOSIS.....	3
Bezruchko O., Goncharov S. CEREALS SEED LIFE CYCLE	5
Berdnikova T.N., Stekolnikova N.V. AGROECOSYSTEMS MONITORING OF LTD "BUTURLINOVSKY AGROCOMPLEX" IN BUTURLINOVSKY DISTRICT OF VORONEZH REGION	9
Borovkova A. N., Khromykh Y. V., Kryukova T. I. THE EFFECT OF PLANT GROWTH REGULATOR ON GERMINATION ENERGY AND LABORATORY GERMINATION OF SUDAN GRASS AND SORGHUM SEEDS	12
Bragina N.A. THE INFLUENCE OF FERTILIZERS ON SOIL FERTILITY	15
Glushkov S. A., Voronin V. I., Dedov A. V., Nesmeyanova M.A. THE CHOICE OF EXPERIMENTAL PLOT AND METHODOLOGICAL TECHNIQUES TO IMPROVE THE ACCURACY OF INITIAL VALUES OF GROSS HUMUS IN THE SOIL.....	17
Ilyina L.S., Voloshina E.V. INFLUENCE OF PRECIPITATION ON AGROPHYTOCENOSES PRODUCTIVITY.....	20
Komova A. V., Polunina E. Y., Stekolnikov K. E. THE EFFECT OF FERTILIZERS APPLICATION AND MELIORANT ON THE FRACTIONAL COMPOSITION OF PHOSPHATES OF LEACHED CHERNOZEM.....	24
Koryakin V.V., Karavaeva A.G., Abrosimova A.V. HETEROGENEITY OF SEEDS IN EARS OF THE FAVORITE AND KWS AQUILON WHEAT VARIETIES.....	26
Kostina M.A. THE INFLUENCE OF BIO-ORGANIC-FERTILIZERS ON CROP YIELDS AND SOIL FERTILITY	29

Lovyagina M.V. ECOLOGICAL ASPECTS OF ORGANOMINERAL FERTILIZER	32
Manaenkova I.A., Bondarchuk O.V. THE FURNITURE FACTORIES WASTEWATER UTILIZATION FOR WINTER WHEAT SEED TREATMENT	36
Mitin Ye.V. THE INFLUENCE OF MINERAL FERTILIZERS ON FODDER PRODUCTIVITY OF AMARANTH IN THE CONDITIONS OF CENTRAL CHERNOZEM REGION	39
Nerovnaya I. J., Oleinikova E. M. ECOLOGICAL FEATURES HERBACEOUS BIOLOGICHESKIE KULSEITOV OF THE VORONEZH REGION	42
Pelagin D.S., Kozhokina A.N., Myazin N.G. INFLUENCE OF LONG APPLICATION OF FERTILIZERS AND AMELIORANT IN ACID-BASE STATUS OF LEACHED CHERNOZEM AT THE SUGAR BEET	46
Podlesnykh N. V., Starodubtseva A. M. NET PHOTOSYNTHESIS RATE AND BIOMASS BUILDUP IN WINTER WHEAT SPECIES IN THE CONDITIONS OF CENTRAL CHERNOZEM ZONE	49
Pospelowa M.W. VERWENDUNG VON TONMINERALIEN ALS SORBENSMITTEL FÜR DIE BODENENTGIFTUNG	52
Raspopova, L. A., Nesmeyanova, M. A. THE BIOLOGIZATION METHODS IN THE CULTIVATION SUNFLOWER IN THE CONDITIONS OF CCZ	55
Semchenko I.N., Stolyarov O.V. STATUS, PROBLEMS AND PROSPECTS OF SOYBEAN PRODUCTION IN THE CENTRAL BLACK SOIL REGION	59
Skubakowa A.N. DIE EINWIRKUNG DES FLUGHAFENS AUF DIE UMLIEGENDEN AGRAROEKOSYSTEME	63
Stepanova E.A., Melkumova E.A. MALADIES ET PARASITES DES ROSES DE JARDIN	70
Stognienko E.S., Vorontsova A.I. RESISTANCE OF SUGAR BEET HETEROSIS HYBRIDS TO ROOT ROTS	72
Khorin A., Goncharov S. DEVELOPMENT OF SPRING BARLEY BREEDING PROGRAMS IN EUROPEAN UNION	74

Tsitsilina T.M. THE INTERACTION OF CULTIVATED AND SEGETAL PLANTS IN AGROCENOSIS OF HIEMS TRITICUM.....	79
Shakurova S.H., Pychkareva V.I., Goleva G.G. THE INFLUENCE OF PARTICLE SIZE AND UNIT WEIGHT ON SOWING QUALITIES OF SEEDS OF WINTER WHEAT CULTIVAR ALAYA ZARYA	84
Секция II. Актуальные проблемы механизации сельского хозяйства и переработки сельскохозйственной продукции.....	88
Annenkov M.S. POST-HARVEST TECHNOLOGY OF GRAIN HEAP TREAT MENT.....	88
Boev O.V., Pukhov E.V., Belozertsev A.Yu. THE USE OF GIS TECHNOLOGY IN THE TRANSPORTATION OF AGRICULTURAL PRODUCTS BY MOTOR TRANSPORT	91
Borodin S. A. IMPROVING STRUCTURES OF MILKING MACHINES	94
Vahidov A., Turdibayev A., Haliknazarov O. THE EFFICIENCY OF ELECTRO HYDRO IMPULSE IN PRIMARY PROCESSING OF COTTON SEED IN OIL PRODUCION.....	98
Gorbunov E.A., Puhov E.V. THE IMPORTANCE TO CONTROL THE OVER FUEL CONSUMPTION	101
Irgashev A.A., Turkmenov H.I., Jumaev Z., Shermuhamedov H.P. FEATURES OF FORMATION OF ACTUAL CONTACT AREA INTERACTION OF POLYMER MATERIAL WITH FIBROUS MASS.....	103
Kuznetsov M. THE APPLICATION OF SWIVEL MOUNT TO HINGING TAPE BUCKET ELEVATORS	107
Leshcheva O. V., Vorokhobin A. V. THE EFFICIENCY OF TRACTION-COUPLING PROPERTIES OF WHEELED TRACTORS REGULATION IN THE UNIT	110
Lee A., Gorlova I.G., Usmonov K.E. RESEARCH OF PROCESS OF A WIPE OF BEANS OF SEEDS LUCERNES IN GRATING DEVICE	117
Lee A., Sharipov Z.SH. DETERMINATION OF PARAMETERS DISPENSER SORTERS.....	120
Ovsyannikov D.V., Titova I.V. APPLICATION OF COMPOSITE MATERIALS IN THE AUTOMOTIVE INDUSTRY	124

Parfenov A.G. THE REDUCTION OF SUNFLOWER SEEDS INJURY IN A BUCKET ELEVATOR.	129
Sannikov E. M. AUTOMATED SYSTEMS OF CONTROL AND MANAGEMENT OF ELECTRICAL EQUIPMENT AT AGRO-INDUSTRIAL COMPLEX ENTERPRISES	132
Timoshinov M.T., Kondrashova E.V. JUSTIFICATION OF CHANGES IN MAINTENANCE SERVICE.....	135
Haritonov M.K., Chernyshov A.V., Gievsky A.M., Baskakov I.W. ANORDNUNG UND BAUPLAN VON ÄHRENSIEBEN IN SIEBGERÄTEN VON MÄHDRESCHERN	139
Eshpulatov N.M., Salomov M.N., Fayzullaev B.P. ENERGY CHARACTERISTICS IN ARTIFICIAL ENERGY SYSTEMS	142
Секция III. Научно-исследовательский потенциал современной молодежи в аграрной экономической науке и управлении АПК	145
Altukhova Y. L'ETUDE DES COMPTABILITES ENVIRONNEMENTALES AGRICOLES.....	145
Baydikova Y. THE ROLE OF MARKETING FOR THE ENTERPRISE AND ITS FEATURES IN AGRICULTURE	148
Bobko A.S. THE PRODUCTION POTENTIAL OF THE COMPANY AND WAYS TO IMPROVE ITS USE.....	155
Borisova E. THE FACTORS INFLUENCING INCREASE OF GRAIN PRODUCTION.....	156
Volodin V.A. THE KEY FUNCTIONS OF BUDGET PLANNING IN A COMPANY.....	160
Yoshida. H. EFFECTS OF THE CRISIS OF 2007 ON FINANCIAL RISK MANAGEMENT	163
Zakshevskiy G.V. GOVERNMENT REGULATION OF AGRI-FOOD MARKET	166
Zakharova S. E., Zakshevskaya E. V. ECONOMIC EVALUATION OF PRODUCTION AND SALES OF GRAIN IN AGRICULTURAL ENTERPRISES.....	169
Kuksin S.V., Zakshevskaya E. V. FORECAST OF AGRICULTURAL PRODUCTION DEVELOPMENT AND ALLOCATION IN VORONEZH REGION FOR THE LONG TERM PERSPECTIVE	173

Lebedev A.V., Fedulova I.Yu. THE STRUCTURE OF THE COMPETITION AND COMPETITIVENESS IN AGRICULTURE	178
Marunich N.A. ECOLOGICAL AND ECONOMIC EVALUATION IN ENERGY RUBLES IN ORDER TO FIND WAYS OF MANAGEMENT	182
Maslova V. A. STATE AND TENDENCIES OF DAIRY CATTLE BREEDING DEVELOPMENT IN THE CENTRAL BLACK SOIL REGION	185
Meshkova I.N. THE QUESTION OF CHOICE DEVELOPMENT STRATEGY OF AGRICULTURAL ENTERPRISES	190
Milovidov A.A. IMPROVING BUSINESS PLANNING IN ENTERPRISES	193
Miroshnikov A. S. FEATURES OF FEEDING CALVES IN THE FIRST DAYS OF LIFE.....	196
Panin A.I. ASSESSMENT OF FACTORS OF MACRO-ENVIRONMENT OF THE ENTERPRISE WITH APPLICATION OF THE TECHNIQUE OF PEST ANALYSIS.....	199
Saprykin V.R., Zakshevskaya T.V. REASONS FOR THE MARKETING DECISION CONCERNING IN-SITU MILK PROCESSING.....	203
Semenova Y.S. PROBLEMS OF CAPITAL STRUCTURE.....	207
Stashevskiy V.V. THE STATE AND NECESSITY OF GOVERNMENTAL SUPPORT OF RUSSIAN AGRICULTURE	210
Tkacheva Y.V., Marysheva Y.V., Ryabykh M.E. STRATEGIC ASPECTS OF CRISIS FUNCTIONING OF COMMERCIAL ORGANIZATIONS	213
Tyrnova E.S. INCREASING OF LABOR PRODUCTIVITY IS THE BASIS FOR ECONOMIC GROWTH OF COMPANIES.	217
Ugraitskaya O.A. INDICATORS AND FACTORS OF EFFECTIVENESS OF INTERSECTORAL INTERACTIONS IN DAIRY-GROCERY SUBCOMPLEX OF AGRARIAN AND INDUSTRIAL COMPLEX.	220

Ugraitskaya L.A. THE MAIN ELEMENTS OF THE DEFINITION OF "AUDIT OF EFFICIENCY OF BUDGETARY FUNDS USE "	222
Секция IV. Вклад молодых ученых в инновационное развитие ветеринарной медицины и технологий животноводства.	225
Andreytchik E.A., Mikhaluk A.N., Sviridova A.P., Poplavskaya S.L. INDICATORS OF NATURAL RESISTANCE AND IMMUNOLOGICAL REACTIVITY OF THE ORGANISM OF PIGLETS WITH USING OF THE FEED ADDITIVE CARDIORENAL	225
Artyomov Ye.S., Vostroilov A.V. ROYAL FAMILY OF RED-MOTLEY BREED OF CATTLE OF THE VORONEZH TYPE	229
Artyomov Ye. S., Vostroilov A. V. ECONOMIC USE OF COWS OF RED-MOTLEY DAIRY BREED IN PEDIGREE FACTORIES OF VORONEZH REGION	232
Artyomov Ye. S., Krupicin V. V. REPRODUCTIVE QUALITY of RED-SPOTTED DAIRY BREED CATTLE IN LISKINSKY DISTRICT OF VORONEZH REGION.....	236
Atanov I.N., Lopatin V.T. EXPERIENCE OF BIRDS CANNIBALISM TREATMENT IN JSC "CHICKEN KINGDOM" OF CMR "NOVOZHIVOTINNOE"	239
Breslavtsev S.A. MAIN HELMINTHOSES IN WILD HOOFED ANIMALS OF VORONEZH REGION: RETROSPECTIVE ANALYSIS.....	241
Zelina Yu. M. THE EFFICIENCY OF THE USE OF DIFFERENT COMPOSITIONS OF MIXED FODDERS IN THE DIETS OF QUAILS	243
Kartashov S.S., Lopatin V.T. TREATMENT OF UROLITHIASIS IN CATS IN A VETERINARY CLINIC "ANIMAL HEALTH"	246
Komanov V.V., Troyanovskaya L.P. USE OF THE DRUG "VITAFOL" FOR WATER AND GENERAL ANESTHESIA, IN SMALL PETS AT OUTPATIENT CARE AT EDUCATIONAL VETERINARY CLINIC OF VSAU.....	249
Kuznecova D.A. DIE ENDOMETRITIS BEIM RIND – PROBLEME RECHTZEITIG PROPHYLAKTIEREN!	252

Mitina A.O., Skorikov V.N., Malanych E.V. OVARIAN FUNCTIONAL DISORDERS IN COWS OF VARIOUS CLASSES OF ETHOLOGICAL ACTIVITY.....	256
Popova O.V. L'ÉTUDE DE L'INFLUENCE DES SOUCHES H ET VG/GA «AVINEW» DU VIRUS DE LA MALADIE DE NEWCASTLE SUR LE DÉVELOPPEMENT D'EMBRYONS DE POULET.....	260
Shmykova V.S., Pelevina G.A. ANALYSIS OF DAIRY EFFICIENCY OF SIMMENTAL BRED COWS IN THE CENTRAL BLACK-SOIL AREA.....	264
Секция V. Научно-техническое обеспечение технологии производства и товароведения сельскохозяйственной продукции.....	267
Gornaleva S.V., Kurchaeva E.E., Manzhesov V.I. THE DEVELOPMENT OF COMPOSITE MIXTURES FOR ENRICHMENT OF FOOD PRODUCTS.....	267
Pronina A.V. CHEESE PRODUCTION WITH VEGETABLE INGREDIENTS.....	270
Rysantceva A.O., Kurchaeva E.E., Glotova I.A., Uhina E.Y. NEW FOOD PROTEIN NANOCOMPOSITES FOR EMULSIFIED MEAT PRODUCTS.....	273
Fedorova V.A., Butova S. V., Shakhova M. N., Vorontsov V. V., Fomina N. A. USE OF FUNCTIONAL INGREDIENTS IN PRODUCTION MAYONNAISE SAUCES ON THE EXAMPLE OF APPLE POWDER.....	276
Chegerjeva K.L. DIAGNOSTICS OF LUNG CANCER USING OF THE DEVICE «ELECTRONIC NOSE» TYPE.....	279
Eshpulatov N.M. INTENSIFICATION OF WITHDRAWING PROCESS OF JUICE USING OF ELECTROTECHNOLOGICAL METHODS.....	283
Секция VI. Землеустройство, кадастр и управление водными ресурсами в современных условиях.....	288
Abdullayeva D.A., Erzakova R.K. OVERVIEW OF AUTOMATION TECHNOLOGY REQUIREMENTS WHEN CREATING MONITORING SYSTEMS AND OPERATIONAL MANAGEMENT OF THE DOWNHOLE PUMPING UNITS.....	288

Abutaeva A.G., Aznagulov D.R. THE RECYCLING IN UFA	290
Aznagulov D.R., Abutaeva A.G. DOMESTIC WASTE MANAGEMENT IN BIG CITIES.....	293
Aznagulov D.R., Abutaeva A.G. THE STOCK OF WATER IN THE SNOW, AS THE MAIN FACTOR, OF THE FORMATION OF THE SPRING RUNOFF PONDS AND RESERVOIRS IN BASHKORTOSTAN.....	296
Akmalov Sh.B., Gerts J.V., Omonov D.B. MONITORING THE NATURAL FACTORS INFLUENCES TO VEGETATION DEVELOPMENT BY USING MODERATE-RESOLUTION IMAGING SPECTRORADIOMETER (MODIS) IMAGES WITH OBIA METHOD IN UZBEKISTAN.....	301
Akhmedov I., Khojiev A. THE IMPACT OF AMELIORATIVE CONDITION OF LANDS ON FOOD SAFETY	306
Kapranchikova D.A., Kolbneva E.U. NORMATIVE-LEGAL BASE OF TECHNICAL PLAN FORMATION	310
Kotlyarova E.U., Vikin S.S. UNAUTHORIZED SEIZURE OF LAND IN THE KALACH DISTRICT OF VORONEZH REGION	314
Laktionova Y.A., Gladnev V.V. STATE REGULATION OF RATIONAL USE OF LAND IN RUSSIAN FEDERATION.....	317
Khamidov S.S., Khadjimuhamedova Sh.I. Kapranchikova D.A., Kolbneva E.U. GOVERNMENTAL ROADMAPS FOR GREEN INNOVATION	320
Chernysheva S.V. FACTORS AFFECTING GULLY FORMATION.....	325
Секция VII. Актуальные вопросы гуманитарных и юридических наук.....	330
Alimova N.B., Faizullaev B.P. ROLE OF RELATIONSHIP TEACHERS AND STUDENTS AT TRAINING USING INFORMATION TECHNOLOGY.....	330
Alimova N.B. INNOVATIVE PEDAGOGICAL TECHNOLOGIES IN THE STUDY OF THE SUBJECTS "ELECTRONICS AND MICROPROCESSOR TECHNOLOGY"	332

Bouvier-Vashchenko A. LES DIFFICULTÉS DE TRADUCTION COMMERCIALE FRANÇAIS-RUSSE: LE PRÉAMBULE DU CONTRAT DE VENTE À L'INTERNATIONAL	336
Volskiy M. V. THE PRISON SYSTEM OF RUSSIAN EMPIRE IN THE SECOND HALF OF THE XIX - EARLY XX CENTURIES AND ITS STAFF.....	341
Gevorgyan A. G. AGRARIAN REFORM OF P. A. STOLYPIN IN FOREIGN HISTORIOGRAPHY.....	346
Gorjuschkina J.N., Otarowa J.N. ANWENDUNG DER FERNBETÄTIGTEN SONDIERUNG DER ERDE BEI DER ERRICHTUNG VON VERKEHRSTRABEN.....	348
Ivantsova S.S. THE NEWSPAPER “VORONEZH TELEGRAF” AS A HISTORICAL SOURCE FOR THE RESERCH OF THE EVERYDAY LIFE OF THE RUSSIAN PROVINCE OF THE SECOND HALF OF THE 19 th – EARLY 20 th CENTURIES.....	352
Pankov O.S., Shcheglova S.A. THE PROBLEMS OF CRIMINAL PROSECUTION OF CIVIL SERVANTS.....	356
Радочинская В.А. 汉语初级教学方法在无语言本科大学。	359
Semenenko A.A. ARABLE FARMING OF VEDIC INDO-ARYANS ACCORDING TO ATHARVAVEDA SHAUNAKIYA AND SAMHITAS’ DATING.	362
Solomatina A.G., Kildichyova L.A. THE MAIN DIFFICULTIES OF USING LISTENING IN FOREIGN LANGUAGE LEARNING	366
Tokmakova Y.V., Kildichyova L.A. THE FORMATION OF THE COMMUNICATIVE COMPETENCE AS THE MAIN PURPOSE OF STUDYING FOREIGN LANGUAGES.	369
Tyurina T.S., Zavgorodnyaya E.L. PROJECT ACTIVITIES AS A WAY OF DEVELOPMENT OF CREATIVE SKILLS	372