ABSTRACTS AND KEY WORDS
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AGRONOMY

V.V. Okorkov **USE OF AGRO-RESOURCE POTENTIAL OF GRAY FOREST SOILS OF THE UPPER VOLGA REGION**

The results of long-term research on the influence of main indicators on their agro-resource potential are summarized on gray forest soils of the upper Volga region. For the conditions of the Vladimir Opolie, the probable yield of biomass and the main products of field crops were calculated at different coefficients of photosynthetic active radiation (FAR) use. Calculations of the main product yields are made taking into account the distribution of biomass to by-products and crop-root residues. For field crops of the studied crop rotations, the coefficients of precipitation utilization are estimated. They varied from 44 to 71%, depending on the crop rotation culture. On the slope of the southern exposure when cultivating winter cereals and perennial grasses, the main moisture losses were observed in the spring during snowmelt, when growing spring crops and potatoes, they were close in the autumn and spring periods. The sizes of moisture use by crops depending on the fertilizer systems for the creation of 1 C of grain units (g.u.) and from sub-arable layers are determined. In comparison with the liming background, the use of organic fertilizers reduced the water consumption coefficient from 9.6 to 8.5 mm/C g.u., their combination with a single dose of NPK – up to 7.3, and with a double dose - up to 6.8 mm / C g.u. Based on the amount of moisture used by crops, their possible yields are calculated. In spring crops, the amount of precipitation consumed (326-356 mm) corresponds to the use of 2.7-3% of the FAR and provides 54-60 C/ha of grain, in winter rye and wheat – about 4% of the FAR (yield 71-80 C/ha). In perennial grasses for 2 mowing, the moisture consumed is enough to use about 3% of the FAR, in potatoes -1.5%.

Keywords: *gray forest soils of the upper Volga region, photosynthetic active radiation, use of precipitation, field crops, fertilizers, probable yields of field crops.*

E. M. Tiutiunnikova, T.V. Plotnikova **INCREASING THE PRODUCTIVITY OF YUBILEINY NOVY 142 TOBACCO BY USING THE RAIKAT START GROWTH REGULATOR IN THE CENTRAL ZONE OF THE KRASNODAR REGION**

Efficiency of new natural growth stimulator Raykat Start for seedling plant growing (tobacco) has been studied on the base of All-Russian research institute of tobacco makhorka and tobacco products. We used west-subcaucasian leached black soil on the experimental field. Laboratorial, greenhouse and field experiments have discovered that soaking seeds in solution with concentration of growth stimulator 0.0001 % during 6 hours leads to germs mass increasing by 70 %. Seeds treatment before sowing with efficient concentration of stimulator (0.0001 %) in combination with further double spraying (in basic stages of plant development: "cotyledon" and "ready for transplanting" before pulling plants from seedbed) on plants until their total moistening of above earth plant parts leads to increasing plant length from collar to growing point by 32 %, to leaf tips – by 23 %, above earth plant mass – by 78 %, root mass – by 60 %, stalk diameter in collar part – by 25 %. It was also noticed significant decreasing of stalk and root decays (up to 52 %) in areas with plants treated by stimulator. Surviving of transplanted plants treated with Raykat Start was 95 %, they had increased growing and developing rates both in the beginning of field stage and in the end of vegetation. These led to increasing plant length, leaf area, which increased by 31 % and plant productivity which increased by 17.6 %.

Keywords: *tobacco, seeds, seedling, plant growth stimulator, Raykat Start, quality, productivity.*

N.V. Shulgin, O.A. Shulgina **FUNGICIDES USING AGAINST LATE BLIGHT OF TOMATOES IN THE CONDITIONS OF TOPKINSKY**

DISTRICT OF KEMEROVO REGION

The article presents the results of field experiments in 2018-2019 on the influence of fungicides on the spread of late blight on tomatoes in the soil and climatic conditions of Topkinsky district of Kemerovo region. A comparative assessment of a broad-spectrum copper-containing fungicide Abiga-Peak and a contact-systemic fungicide Profit gold effect on five varieties of salad tomato and a universal one included in the state register for growing in the open ground, such as Volgogradets, Novichok, Novichok pink, Demidov and Denezhny meshok. The calculation of biological effectiveness of drugs is given under favorable conditions for growing tomatoes and forming high-quality fruits during the growing season 2018-2019. During 2018, the average monthly air temperatures 1.1-1.2 times exceeded average annual ones, in 2019, the average monthly air temperatures did not differ from average annual ones, and the amount of precipitation was uniform in both years of research. The comparative assessment showed that the lowest rates of late blight spread were found in the Moneybag (8.9%) and Novichok (10.7%) varieties using the Abiga-peak fungicide, and in the Moneybag (7.1%) and Demidov (9.8%) varieties using the Profit gold fungicide. The used fungicides were able to stop the intensity of late blight spread by 10-20% compared to the control variant. The calculation of biological effectiveness of the preparations showed that the best results were for the Profit gold fungicide on the Moneybag variety (64.3%) at the time of liquid harvest, and for the Abiga-Peak fungicide on the Novichok variety, showing a biological efficiency of 60.7%.
***Keywords**: tomato, late blight, fungicide, susceptibility, biological effectiveness, lesion intensity.*

A.N. Voronin, A.M. Trufanov, S.V. Shchukin **INFLUENCE OF BIOLOGICAL PRODUCTS ON WEEDING AND YIELD OF FORAGE CROPS IN CONDITIONS OF TILLAGE MINIMIZATION**

Intensive development of livestock industry requires improving its feed base. Unconventional fodder crops can help agricultural producers get high yields of good quality. The aim of the research was to study the elements of cultivating soy, amaranth and buckwheat in conditions of minimizing tillage when using biological products Baikal Em-1 and Humate potassium. The work was carried out on sod-podzolic medium loamy gleyous soil in the experimental field of the Federal State Budget Educational Institution of Higher Education Yaroslavl State Agricultural Academy in 2019. The studied indicators were determined by generally accepted methods. When cultivating spring cereals, a significant decrease in the dry weight of weeds was noted by 3.15-7.67 g / m2. On average, according to some factors, the use of a surface tillage system caused a statistically significant increase in the number of young weeds by 1.3 pcs / m2. In the same treatment variant, an increase in the dry mass of young weeds by 3.34 g / m2 and perennials by 4.07 g / m2 was observed. A significant decrease in the length of vegetative organs in the layer of 0-10 cm by 15.44 cm and dry mass in the lower part of the arable horizon by 1.37 g / m2 was noted in row crops. On average, for primary tillage systems and biological products, buckwheat cultivation contributes to a significant increase in green mass productivity by 31.7 kg / ha. A significant increase in the yield of feed units was observed when cultivating amaranth and buckwheat by 9.9 and 14.9 kg / ha. On average, according to some factors, the use of the surface treatment system led to a statistically significant decrease in yield of both green mass and feed units by 9.1 and 2.5 kg / ha, respectively. The greatest efficiency was shown by growing buckwheat for fodder purposes in the case of a heap processing system using Baikal Em-1 biological product.

***Keywords:** Soybean, amaranth, buckwheat, weeding, forage crops, productivity.*

Proletova N. V. **BIOTECHNOLOGICAL METHODS – A TOOL FOR CREATING NEW FLAX GENOTYPES RESISTANT TO ANTHRACNOSE**

The purpose of this research was to create new flax genotypes resistant to anthracnose using biotechnological techniques and methods. As a result of studies

*with using a culture of immature embryos and a selective medium, flax regenerant plants resistant to the culture filtrate (CF) of the fungus - anthracnose pathogen Colletotrichum lini Manns et Bolley and line 21 resistant to this pathogen were obtained. A scheme for differentiating flax genotypes in vitro by resistance to anthracnose has been developed. It was established that upon cultivation of immature embryos on Sh-2 medium containing CF of the fungus, the causative agent of anthracnose, of a mixture of strains 680, 677 *, 674, 674 * at a concentration of 36.0 ml / l, the amount of morphogenic callus formed in the first and second passages, expressed in percent, and the indicator of the field resistance of this genotype to anthracnosis on an artificial infectious-provocative background was close in value, and the number of morphogenic callus formed in the first and second passages can be used to judge the resistance of the studied genotypes to ant cancer and differentiate them by resistance to this pathogen. The influence of the flax genotype on the potency of cells to morphogenesis under selective conditions was revealed. Cells of genotypes L 957-8-7, Alexim, Punjab, Zaryanka had high morphogenetic activity. The morphogenetic potential of genotypes L 1506-8-4, Rosinka has already been exhausted by 2 ... 3 passages. It was found that biotechnological methods: cell selection in vitro, embryo culture are effective in creating genotypes of flax, more resistant to anthracnose than original forms.*

Keywords: *flax; anthracnose; sustainability; selective agent; culture filtrate; immature embryo; callus.*

I. G. Meltsaev, A. E. Loshchinina, S. V. Shishkina **INFLUENCE OF SOIL TILLAGE TECHNOLOGIES ON FERTILITY, PRODUCTIVITY AND FEED QUALITY**

The article presents the results of long term field research on the influence of various processing systems on the fertility of sod-podzolic soil, productivity and quality of products.

Studies have shown that the water-physical properties of the soil differ depending on different technologies of soil treatment, the method of plowing manure and plant residues. Thus, subsurface and combined soil treatment provided the formation of water supply units at the level of 41.4%, soil density-1.35 g/cm3, and total porosity-63.7%. Reserved productive moisture in the first case was 30.6 mm, in the second-28.6 mm.

It was found that different technologies for applying organic matter had different effects on the content of earthworms in the soil, the decomposition of flax tissue, the production of carbon dioxide, and, ultimately, on the formation of humus compounds. The largest number of humus substances was formed by plowing technology. Here their growth was 0.16% of the original value or 6.2 t/ha, according to surface treatment of soil-0.15% (5.9 t/ha). The maximum CO2 production was observed at the subsurface cultivator loosening plot of 54.9 mg/h m^2, and the minimum value for surface treatment of soil was 52.5 mg/h m^2. In other variants, it was within the range of 53.6 mg/h m2. Decomposition of linen fabric for all processing technologies was in the range of 20.6-21.2%.

The productivity of agrophytocenoses in processing systems does not differ significantly, except for fine processing. For plowing, subsurface cultivator and combined processing, taking into account by-products, it varied within 43.2-43.8 C/ha, and surface soil treatment provided only 41.4 C/ha. The provision of feed units with digestible protein for plowing, taking into account by-products, was 81.5 g, for the rest at the level of 80.4 g.

Keywords: *processing, fertility, fodder, yield, quality.*

A. A.Yanyshina, V. P. Ponazhev **CHANGE IN VARIETAL PURITY OF FLAXSEEDS WHEN THEY ARE CLOGGED WITH SEEDS OF INTERMEDIATE FORM OF FLAX IN THE PROCESS OF THEIR REPRODUCTION IN PRIMARY SEED FARMING NURSERIES**

The most common reason for the appearance of varietal impurities in flax crops is the non-compliance with the main provisions of on-farm control when working with two or more varieties of flax on the farm or during variety changer. Field testing does not always give a correct assessment of the condition of

crops by varietal purity. Due to the unevenness of the crops in the field, the morphological assessment of individual plants with a handful analysis does not allow to reliably determine the percentage of biological impurities of the baggage type. The purpose of the research was to study the dynamics of propagation of varietal pollutant-type admixture, which has a yellow color of seeds, in the seeds of flax littered by it at a 3-year reseeding. Clarify the index of varietal purity of flax seed OS category in GOST R 52325-2005. Studies were conducted in 2015-2017 in the field of the Experimental Field of the Institute of Flax (Torzhoksky District, Tver Region). The object of the study was plants and seeds of flax Antey variety (control). The use of varietal mixtures with marker traits made it possible to accurately determine its content in the crop during the successive propagation of seeds in primary seed farming nurseries. It has been established that over three years of reproduction, the amount of varietal impurity in the crop according to the experimental variants with the impurity content from 0.2 to 0.7% increased by 0.2 ... 0.3%; with a clogging of 1.0%, there was a more significant increase in its yield by 0.4% in 2015 and by 1.6% in 2017. Under conditions of excessive moisture in 2016, the content of varietal admixture seeds decreased by 0.1% compared to the previous year.
Keywords: *variety, category of seed, varietal purity of seed, varietal admixture, marker, intermediate form of flax*

G.V. Efremova**,** E.Yu.Zotova **INFLUENCE OF GREEN MANURE AND BIOLOGICAL PRODUCTS ON FERTILITY OF SOD-PODZOLIC SOILS AND PRODUCTIVITY OF FLAX**

The paper presents the results of research conducted in 2018-2019 in the Ivanovo state agricultural Academy (Ivanovo region, Ivanovo) on the study of methods for increasing the productivity of flax based on the use of sideral precursors and biological preparations. In scientific experience Trichosan with a consumption rate of 3 l/ha was introduced in autumn, after harvesting the predecessor and in spring, for pre-sowing cultivation at a dose of 2 l/ha. Trichozan - 1 l/t and Vitariz - 1 l/t were used for sequential seed treatment before sowing. Vitariz – 1 l/ha was used for two-time treatment of plants during the growing season, Bioinsecticide - 3 l/ha - for a single treatment in the "herringbone" phase. To increase the biological activity of the drugs, the working fluid was added to humate Fertility Universal at a dose of 300 ml/ha.

The purpose of scientific research was to study the effectiveness of new precursors-white mustard and peas with oats, biofungicides and bioinsecticide in the formation of yield of flax-Longhorn variety Tomsky-17. The research objectives were to determine the influence of sideral precursors and biological preparations on the agrochemical and agrophysical properties of the soil, littering, disease resistance,the formation of elements of the crop structure, yield of straw and flax seeds.

Sideral crops had a complex effect on the soil: they contributed to the accumulation of humus and food elements, significantly improved its physical properties, and reduced clogging. Biological preparations were characterized by a growth stimulating effect, increased plant resistance to diseases and pests.

The use of biological preparations against the background of sideral precursors allowed to increase the yield of straw and flax seeds and realize the potential of the Tomsky-17 variety in the conditions of the Ivanovo region at the level of 104.0-92.3 C/ha of straw and 15.5-14.1 C/ha of seeds. The greatest productive and economic effect was obtained when using peas with oats and complex application of biologics.

Keywords: *sideral precursors, biological preparations, flax, fertility, yield.*

VETERINARY MEDICINE AND ZOOTECHNY

M.S. Mannova, L.V. Kletikova, N.N. Yakimenko **EFFECT OF COMBINATED APPLICATION OF PROBIOTIC AND ENTEROSORBENT ON THE DYNAMICS OF CORTISOL IN CHICKENS IN THE EARLY POSTEMBRIONIC PERIOD**

The research is devoted to the study of chickens' cortisol dynamics at an early stage of post-embryonic development with the use of probiotics such as zoonorm, enterosorbent based on polymethylsilxane polyhydrate and their complex. To achieve the goal, 4 groups of analogue chickens were formed, 1 was a control group, 2 - received a probiotic in a mixture with feed at a dose of 0.2 g per head in morning feeding; 3 - 0.3% weight enterosorbent 2 hours after evening feeding; 4 - a combination of two preparations at the appropriate time. The introduction of drugs was carried out from 5- to 25-day age. All the indicators were analyzed in 5-, 15-, 25- and 35-day chicks. As a result of the research, chicks in all groups showed an increase in cortisol concentrations. In the control group a stable growth of the indicator was observed, which reached a maximum in 35 days, an increase in the concentration of the hormone by 41.6% was accompanied by an increase in glucose to 14.6 to 0.5 mmol/L, a decrease in cholesterol and triglycerides. In chicks 2 and 3 groups the highest value of cortisol is noted in 25 days, 4 - in 15 days. In 2 and 3 groups, with maximum cortisol levels, glucose concentrations were 14.64 and 14.91 mmol/L, with a marked decrease in triglycerides and cholesterol. In the 4th group of 15-day-old chicks, an 8.4% increase in cholesterol and triglycerides resulted in a 37.3 and 68.9% decrease in cholesterol and triglycerides. At the end of the experiment, the 4th group was found to reduce cortisol to 5.07 nmol/L, glucose to 12.32 to 0.13 mmol/L, and a relative increase in triglycerides. In conclusion, the relationship between synthesis of cortisol, cholesterol, triglycerides, glucose and their metabolism was confirmed. There has been a marked reduction in the influence of stress factors and increased resistance of chickens with the complex use of probiotic and enterosorbent.

Keywords: *chickens, postembryonic development, blood serum, probiotic, enterosorbent, complex application, cortisol, dynamics*

E.A. Isaenkov, M.S. Dyumin, T.G. Kicheeva, M.S. Panuev, M.B. Lebedeva

AGE AND GENDER DIFFERENCES IN GROWTH OF MASS, LENGTH AND WIDTH OF CALVARIA IN ONTOGENESIS OF ROMANOV BREED SHEEP

This article presents the results of scientific studies of morphometric indicators of calvary in the pre- and postnatal ontogenesis of Romanov breed sheep. Changes related to the sex of experimental animals were also studied. In order to detect general patterns of growth of calvari morphological parameters, the age stages of selecting material for research were determined: from a 2-month-old fetus to 12 months of postnatal life and from adult sheep 5-6 years old. We measured the mass, length and width of the studied material. The data obtained were subjected to statistical processing. The calvary maturity at each age in percentage, was determined. As a result of our studies, we were able to establish that the growth of linear indicators of calvary subjected to general biological laws of a decrease in its intensity with age, i.e. more rapidly, it proceeds in uterine development compared with postnatal. As for the changes in sex-related animals, it was found that growth of mass, length and width of calvary occurs in both sexes simultaneously and with almost the same intensity. In their growth, two decreases are observed: the first - before birth and the second - from 3 to 6 months. Throughout the entire periods of research, the calvary mass in females approaches its final value faster, and its length, on the contrary, in males. As for its width, in uterine development it grows somewhat faster than in females, and after birth in males. By one-year-old age of sheep, none of the calvari indicators in either males or females reaches its definitive state.

Keywords: *calvaria, Romanov breed sheep, skull, morphofunctional maturity, ontogenesis.*

Gornich E.A., Melnikova L. E., Soldatkina N. T., Kosterin D.Yu.

DEVELOPMENT OF DIET SAUSAGE PRODUCTS TECHNOLOGY USING BREWING WASTE

The article presents the results of the development of a technological scheme and recipes for sausages made from turkey and veal meat with addition of brewing waste, and organoleptic and physicochemical parameters of the product are evaluated. Based on the data of scientific literature, it is established

that today there is no technology for the production of meat products using turkey poultry, veal, beer pellets and other brewing waste. A technological scheme for the production of sausage with addition of raw grains has been developed, which includes six stages: preparation of meat and vegetable raw materials, preparation of sausage meat, heat treatment, quality control, presentation of a product. Recipes of sausages have been developed with the aim of maximizing rational use of a variety of brewing waste. According to organoleptic, physico-chemical parameters, the developed samples of dietary sausages meet the requirements of regulatory documentation. According to the results of organoleptic evaluation of the obtained products, preference was given to a sample of sausage products developed according to recipe No. 2, since it had a more pronounced taste, which is associated with the addition of table salt and beer wort. To bring the developed sausage products to the most attractive appearance and more delicate taste, it is recommended to use sodium nitrite and finer grinding of beer grains as a color stabilizer in production of this sausage.

Keywords: *sausage product, diet product, turkey meat, veal, brewing waste, beer pellet, protein sludge.*

O.A. Strygina, L.V. Kletikova **COMPARATIVE ANATOMY OF LIVER OF WILD FUR ANIMALS: EUROPEAN BADGER (MELES MELES, L), RIVER OTTER (LUTRA LUTRA, L) AND ORDINARY FOX (VULPES VULPES, L)**

Fur production is the most valuable field of animal husbandry in the Russian Federation. Domestication, containment, changes in behavior and diet of fur animals have contributed to both exterior and interior changes in their biology. The biggest interior changes have occurred in the volume and functionality of the digestive system, especially liver. European badger's (Meles meles) liver mass was determined to be 324-389 g making up 3,20-3,44% of the total body mass. River otter (Lutra lutra) has 489,0-500,0 g and 5,1-5,8%, and ordinary fox (Vulpes vulpes) has 183-195g and 3,4-3,9% accordingly. The sharp end of the badger liver peeks out of the lower end of the ribcage, while the otter liver is perpendicular to the ribcage. Badger liver is yellowish-brown, otter liver is cherry-brown, fox liver is brown. All of them are separated by deep grooves to differently sized parts; badger and otter livers have 7 parts, and fox liver lacks the nipple-like protrusion. The gallbladder is located between the square and left medial parts of the liver; the badger's is pear-shaped and is easily visible from the diaphragmatic and visceral surfaces of the liver; otter's is elongated and rounded and has a wrinkle, fox's is pear-shaped. The contents of the gallbladders of badgers and otters is greenish brown, with badger's contents having pH of 7,2-7,6 pts., otter's – 6,5-6,8 pts., while fox's is brown with pH of 6,0-6,2 pts. That way, different diets and habitats form the visual changes in topography and macro morphology of livers not only in members of different biological families, but different species as well.

Keywords: *badger, otter, fox, liver, gall bladder, comparative anatomy, topography.*

Buyarov V.S. **INFLUENCE OF STOCK BUILDING LIGHT ON DAIRY PRODUCTIVITY OF COWS**

The article is devoted to the solution of an urgent problem- influence of different lighting modes on the dairy productivity of cows. 2 groups of cows with 20 heads each were formed. In control group, light in the cowshed was 50-75 Lux for a light period of 7.5 h in January to 16.5 h in June, and in experimental group - 150-200 Lux and 16 h, respectively. It was found that the intensity and duration of illumination affects physiological state, reproductive ability and milk productivity of cows. In the experimental group of cows, compared with the control group, hemoglobin content in blood increased by 4.6% ($P < 0.01$), red blood cells – by 20.6% ($P < 0.05$), total protein – by 11.2% ($P < 0.001$), glucose - by 39.1% ($P < 0.05$). There was a tendency to increase the total calcium and inorganic phosphorus in blood serum of cows of the experimental group. The level of alkaline phosphatase in blood serum of cows in the control group was 71.5% ($P < 0.01$) higher than that of cows in the experimental group. Milk yield per 1 cow in the experimental cowshed was 433 kg more than in the control. The cost of 1 kg of milk in the experimental group was 0.94 rubles lower, and the profitability of milk production and sales is 9.42%

higher than in the control group. To increase the milk productivity of cows, it is recommended to increase light level in barns for tethered keeping to 150-200 Lux, with the duration of lighting in the winter and transition periods of year up to 16 hours per day.

Keywords: *microclimate, light, cows, milk productivity, reproductive qualities, hematological indicators, efficiency of milk production.*

ENGINEERING AGROINDUSTRIAL SCIENCE

Dorokhov A.S., Sibirev A.V., Aksenov A.G. **LABORATORY RESEARCH RESULTS OF ONION SEPARATION ON A BAR ELEVATOR WITH AN ADJUSTABLE TILT ANGLE**

Existing machines for harvesting root crops and onions do not provide qualitative indicators of root crops pile separation, which leads to a violation of agrotechnical requirements when harvesting them [1, 2]. It is necessary to search for new solutions to increase the quality indicators of root crop separation, namely to increase the completeness of separation and reduce damage.

The article presents the design of the onion set harvesting machine, equipped with a bar elevator with an asymmetric arrangement of shakers.

We described the methodology and results of laboratory studies to determine the quality indicators of heap onion sets separation on an experimental bar elevator.

The results of laboratory tests of the onion set harvesting machine equipped with a bar elevator with an adjustable blade angle showed a high-quality performance of separation process at optimal values of parameters: translational speed of the bar elevator blade v_{EL} *= 1.55 ... 1.68 m / s, the supply of onions heap* Q_{Bp} *= 19.7 ... 27.1 kg / s and inclination angle of the blade bar elevator is in the range* α_1 *= 15.1 ... 21.9 degrees.*

The use of a bar elevator with an adjustable angle of inclination of the blade allows to increase the completeness of onion sets separation by 20%, and reduce damage to the bulbs by 11%.

Keywords: *onion harvesting machine, bar elevator, tilt angle, technological parameters, bulbs, onion sets, soil, cleaning.*

Trofimov M. A., Lobachev A. A., Razin S. N. **THEORETICAL SUBSTANTIATION OF INTERACTION OF A STALK WITH A CASING AND A CURVILINEAR FORM FINGER OF PICKING UP DEVICE OF FLAX HARVESTING MACHINE**

Selection of flax ribbons is one of the main operations when harvesting it. The pick-up device must cleanly pick up stem mass, do not damage, do not skew and do not mix it. Due to peculiarities of the technological process, existing devices for selection do not always perform this operation satisfactorily, especially when selecting tapes nailed by rain to the soil surface or strongly sprouted weeds, as well as in fields with uneven microrelief. To eliminate these disadvantages, a new pick-up device is proposed. Its distinctive feature is that each finger is individually spring-loaded and has a working part of a curved shape, deviated from radius of casing in the direction of its rotation. Improvement of the technological process in comparison with the serial drum is due to the fact that each finger copies the microrelief of the field independently, without sinking into the soil. The working part of the fingers of the new pick-up drums is deflected from the radius of the casing in the direction of rotation, so during contact with stems, the finger acts more on their separation from the soil. This form of fingers, which contributes to a more complete selection of flax, under certain conditions at the time of removing the fingers inside the casing can lead to pinching the stems between its curved part and the casing, so interaction of stems with the casing and the finger is considered. The forces acting on the stem are considered, the conditions of non-clamping stem are determined without taking into account tension force of the tape and taking into account this force. The influence of the angle between tangent to the circumference of the casing, is drawn through the point of contact of the stem with casing and normal to the tangent drawn through the point of tangency of the stem and curved part of the finger. The optimal value of this angle is 23°.

Keywords: *flax, stalk, harvesting, selection, picking machine, flax harvester.*

SOCIO-ECONOMIC SCIENCES AND HUMANITIES

A.I. Kolesnikova **PROFESSIONALLY-ORIENTED TEACHING AS A FACTOR OF MOTIVATION TO LEARNING ENGLISH IN NON-LINGUISTIC HIGH SCHOOLS (FROM THE EXPERIENCE OF DIFFERENT DIDACTIVE METHODS USING ON ENGINEERING FACULTY)**

This article is devoted to the features and benefits of a professionally-oriented approach to teaching a foreign language in non-linguistic high schools on the example of engineering education. According to the latest standards of higher education (FSES 3++), students must have sufficient knowledge of a foreign language for business communication in oral and written forms. However, teachers of high schools face a number of difficulties in the formation of a foreign language communicative competence of future engineers, namely: a constant decrease of a number of foreign language practical classes in a curriculum of a high school and a weak motivation of students. In our opinion, a professionally-oriented approach to teaching helps to solve these problems and make the process of learning a foreign language more intensive, focused and effective. That is, now, the development of strategies, methodological models and tools for teaching English, with a focus on professional communication, is an actual task for an English teacher at the University. This article presents some methods and techniques that stimulate students of engineering faculty to professionally oriented communication in English. Much attention is paid to both active teaching methods used during practical English classes, and individual work, which allows students to get more useful information and skills within the practical classes given, and also allows students to develop the need for individual knowledge acquisition and comprehension, thereby providing the increased interest of communication in a foreign language and increasing motivation to learn a foreign language.

Keywords: *professionally-oriented teaching, engineering education, foreign language communicative competence, motivation, FSES 3++*

Gagina M. P., Nikolaeva O. A., Stepanova N. Yu. **OPTIMIZATION OF THE PROJECT ACTIVITY IN THE EDUCATIONAL PROCESS OF IVANOVO EDUCATIONAL SEGMENT UNIVERSITY STUDENTS**

The article presents an innovative method of the volunteer project «Memorial Effort» development and its introduction into the educational process of Ivanovo region higher educational institutions students. The task of the study is to consider the results of project testing, which has been successfully implemented since the beginning of 2018 by a group of students, including foreign students from Ivanovo State Agricultural Academy named after D. K. Belyaev, Ivanovo State University of Chemistry and Technology, Ivanovo Medical Academy, Ivanovo branch of the Russian Plekhanov Economic University. Referring to the publications of foreign and Russian teachers, the authors of the article consider the history of the issue i.e. emergence of the design method and its application in educational institutions.

This project can be called unique with confidence, as 1) the handler of the project is the Ivanovo Regional Public Organization of War Disabled Persons in Afghanistan and Military Trauma «Sworn Brothers», and students perform different types of works together with veterans; 2) the first and only agitation brigade in the region was created, which gave several concerts in rural clubs of the Ivanovo region; 3) the vast majority of agitation brigade participants are foreign students of Ivanovo universities. Thus, optimization of project activity in the educational process consists in real social efficiency and availability as it is evident from the experience of Ivanovo universities students.

Keywords: *educational process, project method, volunteerism, tolerance, social efficiency*

S. Z. Itkulov **TRANSFORMATION OF SCIENTIFIC TEXTS IN TEACHING RUSSIAN AS A FOREIGN LANGUAGE AT AN AGRICULTURAL UNIVERSITY**

The article describes the forms and features of working with scientific texts when teaching Russian as a foreign language. A major role in this training is transforming syntactic structures: definition, classification of objects and phenomena, description of the subject composition, characteristics of the subject

properties, characteristics, and changes substances. This work helps to remember case endings, as well as the development of new speech models. It is emphasized that texts containing scientific information play a special role in teaching scientific style. In these texts, special attention is given to post-text tasks where the student needs to complete sentences related to the test. The specificity of these sentences is that they have the same meaning, but a different structure than those contained in the text. It can be the tasks for choosing the case, replacing the noun with a verb, replacing the subordinate determinative, building a new phrase, which encourages students to show a certain creative approach to the task. It is suggested that an interesting type of work on the transformation of the text in the course of the development of written speech can be a task that requires changing the actual scientific or scientific-educational text in such a way that it becomes similar to popular science. It is concluded that the transformation of a scientific text when working with foreign students is of great importance in the formation of competence-based speech skills, since by transforming scientific texts, students improve their lexical and grammatical potential, which contributes to the solution of communicative tasks in the professional sphere.

Keywords: *scientific text, transformation, syntactic construction, characteristic, case.*

Konovalova L. K. **EFFICIENT COST MANAGEMENT AS AN IMPORTANT FACTOR OF INCREASING THE COMPETITIVENESS OF THE ECONOMIC SUBJECT**

The research is actual, has a theoretical and applied nature. Theoretical developments at cost management branch of economic organization were illustrated by practical examples. In the work the follow methods are used: abstract-logical, methods of induction and deduction, system and situate approaches, methods of comparative analysis, analysis of breakeven, monographic analysis. The follow sources of information were used: literature, the results of the experimental investigations, carried out in Verkhnevolzhsky Federal Agrarian Research Centre, observations, carried out at an agricultural organization. Theoretical structural model of cost management was created in a functional way, relationship between elements were designated in it, as well as driving forces of its realization were determined. Such terms as "cost management" and «management accounting» were specified. The paradigm of a relation to cost process was described. Approaches to realization of cost management system of organization on the basis of flexibility principle were developed. The most important of them are: application of applied programs packages and special program means for computer, organization of feedback, account of functional relationship of cost with production results, cost accounting on elements, places of origin, carriers and centers of responsibility, as well as interactive approach. Some examples which show possibilities of using some instruments of cost management and management accounting for generation of management solutions were described. These instruments are: analysis and planning on the basis of standards of constant and variable costs and flexible cost management in interrelations to other subsystems in management system of organization (in this case it is with technology management. The work is of theoretical and practical significance.

Keywords: *cost management, management accounting, constant and variable costs, flexibility principle, carrier of costs, place of origin, center of responsibility.*

A.N. Panova, D.A.Sharov **ANALYSIS OF AGRICULTURAL LAND RESOURCES USING ON THE EXAMPLE OF CENTRAL FEDERAL DISTRICT REGIONS**

Over the past 30 years, our country has undergone many changes in the field of land legislation. Many of them were aimed at regulating land relations in the field of rural land use and were expressed in the adoption of various types of amendments and changes to laws and tightening fiscal measures for the resuscitation of unused land. However, such regulation has not led to an improvement in the use of agricultural land, and their quantitative and qualitative potential has deteriorated, which has led to inefficiency of budget funds allocated for the implementation of targeted programs in the field of agriculture.

Rational use of land resources in agriculture is one of the most important tasks of land management. This article analyzes the use of land resources in the agro-industrial complex on the example of Central Federal district regions. The main indicators of production and economic activities of the regions of Central Federal district in agriculture, such as investments in agriculture, value of gross output of agriculture, yields of major agricultural crops, productivity of the main types of livestock, profitability of production agriculture, as well as indicators of the intensity of agricultural land using: the proportion of acreage in the total area of land, use of fertilizers, volume of agrochemical operations, availability of improved lands, involvement in economic turnover of previously unused land.. Weight coefficients were calculated for all indicators, groups of regions were formed for production and economic activity in the agro-industrial complex and the intensity of agricultural land use, cartograms were drawn up and proposals were made for planning land use.

Keywords: *agricultural land resources, agro-industrial complex, land resources using intensity, land resources use planning.*