**ЗЕМЛЕРОБСТВО, РОСЛИННИЦТВО, ОВОЧІВНИЦТВО ТА БАШТАННИЦТВО**

**Bazalii V.V. Boichuk І.V., Bazalii G.G., Larchenko O.V., Babenko D.V. Character of productivity formation in wheat varieties of different types of development under different growing conditions.**

The article presents the results of investigations of the nature of yield formation of "typical" winter wheat and alternative wheat varieties.

It proves that to obtain stable grain yield in conditions of the southern steppe of Ukraine it is necessary to use varieties of alternative type of the steppe ecotype (Clarissa, Solomiya) for later sowing time (October, November) and as an emergency catch crop for reseeding winter wheat crops lost during overwintering.

Alternative type varieties (Zymoyarka, Khutoryanka), which are created for the forest-steppe of Ukraine, form a significantly lower yield when sown in autumn in comparison with winter wheat varieties and alternative varieties of the steppe ecotype (Clarissa, Solomiya). However, alternative variety Khutoryanka is more suitable for spring sowing as its yields in early sowing were higher than yields of spring wheat varieties.

**Keywords**: winter wheat, alternative wheat type, productivity, plasticity, stability.

**Balashova G.S., Yuziuk S.M. Potato productivity in southern Ukraine depending on moistening and fertilization methods under trickle irrigation**

The article deals with the results of studying the technological process of potato cultivation under trickle irrigation in the southern steppe. Plant development characteristics and spring potato yield formation depending on irrigation and fertilization methods have been studied. The economic analysis of the efficiency of food potato cultivation depending on irrigation and fertilization methods is made.

Irrigated lands in the south of Ukraine are a major factor in the intensification of farming in the areas with inadequate and unstable moistening. Insufficient natural moistening in the south of the country combined with high thermal resources, solar radiation and fertile soils stimulate the development of irrigation.

The article provides the results of the potato cultivation process under trickle irrigation in the southern steppe. The crop formation processes have been studied and the economic analysis of the efficiency of spring potato cultivation depending on the irrigation and fertilization methods has been made.

The use of fertilizers ensures a significant yield increase – 8.5 t/ha, or 25.9%, on the average, compared to the fields with no fertilizers applied where the tuber weight was smaller (110.6 vs. 138.9 g). In accordance with the fertilization methods, the tuber yield amounted to 31.6-33.9 t / ha, the efficiency of fertilization being 30.0-39.6%.

The maximum potato productivity (35.8 t/ha) was ensured by applying mineral fertilizers at the time of planting, the dose being N60P60K60, and by moistening the soil layer of 0-60 cm, the output unit cost being 1345 UAH/t and the profitability – 160.3%. The water usage coefficient was minimal – 97.8 m3/t. The estimated soil layer reduction to 0-20 cm resulted in lower yields by 2.9 t/ha or 9.9%, on the average, compared to a 0-60 cm layer.

**Keywords:** technological process, trickle irrigation, productivity, net income, fertilization method, yield formation dynamics.

**Vasyuta V.V. Bioenergy efficiency of red table beet growing under drip irrigation in the southern region of Ukraine**

Analysis of energy efficiency of cultivation technologies is an important task, as all the resources involved in the technological process are reflected in energy performance based on the law of conservation and transformation of energy. It, in its turn, makes it possible to assess the effectiveness of the entire process, or some of its elements, without indicators of value, which is a topical direction of research under unstable economy. The aim of this work was to assess energy efficiency of growing beet crop under different seeding patterns, fertilization rates and methods under drip irrigation and to determine the optimal ratio of factors of the technological process. To achieve this goal, field research and analytical methods were used.

Analysis of energy intensity of technology elements studied showed that the layout of plants caused insignificant changes (0.9 – 1.8%) in total energy consumption. From the standpoint of energy, this element of technology requires no additional energy consumption, but increases the energy that accumulates in the crop, which is observed in a four- and eight-row pattern of sowing. Comparison of energy consumed and returned depending on fertilization methods revealed a trend in which a slight increase in energy input in technology (by up to 2.8%) increases the energy that accumulates in the yield by 3.8 – 9.7%. This shows that the layout of plants and methods of applying fertilizers are the least energy-intensive operations. Assessment of energy efficiency of fertilization showed that the amount of nutritive elements under study led to a decrease in energy intensity of production by 9.3-14.8% compared to the control. Comparative evaluation of energy accumulated in roots after spring and summer seeding shows that spring seeding returns on average 111.1 GJ/ha, or by 53.7% more.

Estimation of total energy consumption under beets cultivation technology under drip irrigation showed that the most significant share in an increase in energy consumption in the technological process are mineral fertilizers, the share of which in the total energy consumption increase is from 17.8 to 48.7 % under spring seeding and from 7.3 to 25.1% under summer sowing. Bioenergy analysis of the technology of growing red table beets of the BordoKharkiv variety under drip irrigation determined high energy efficiency of its cultivation in a four- and eight-row pattern of sowing on spring and summer seeding dates at fertilization rates of N90R60K135 using fertigation.

**Keywords:** energy analysis, energy consumption, energy intensity of production, energy efficiency.

**Vozhegova R.A., Dymov O.M. The application of fertilizers as a guarantee for soil fertility conservation and sustainable development of agricultural production**

The purpose of this article is to assess the status of soils and the application of mineral and organic fertilizers in the agriculture of Kherson region, identify existing problems, determine the factors that caused them, and shape proposals for solutions from a regional perspective.

The following research methods have been used: monographic, statistics, calculation-analytical, economic analysis and synthesis.

The article makes an analysis of the structure of sown areas, current state of soils and application of mineral and organic fertilizers at the agricultural enterprises of Kherson region. The reasons that led to the decrease in the volume of fertilizer application are listed. The dynamics of prices for mineral fertilizers is considered. The efficiency of the use of mineral fertilizers for the main crops on the irrigated lands of the southern region is shown. The main directions of solving the problem of reducing the amounts of organic fertilizers and improving soil fertility are outlined.

Based on research results, a conclusion is made that the cause of poor soil condition of Kherson region due to the lack of nutritive elements and deterioration of soil properties are low volumes of organic and insufficient use of mineral fertilizers. Under such conditions, it is advisable to use cover crops, straw of cereals, stalks of soybean, corn, peat, sapropel, peat humus as organic fertilizers, and increase a share of perennial legume and cereal grasses and other legumes in crop rotations. Tabl.: 5. Figs.: 6. Refs.: 15.

**Keywords:** soil fertility, structure of sown area, mineral and organic fertilizers, price, efficiency.

**Vozhegova R.A., Belyaeva I.M., Kokovikhin S.V.** **Innovative directions of development of irrigated land** **amelioration under the conditions of Southern Steppe of Ukraine**

The article provides the results of research on organization and management of innovative development of irrigated land amelioration under the conditions of Southern Steppe of Ukraine.

The task was to study scientific substantiation of expanding irrigation areas and optimization of technologies of growing crops under the conditions of arid climate.

We used analytical approaches that form the basis of knowledge bases in irrigated agriculture aimed at the optimization of decision-making in growing crops, improving strategic planning and operational management of growing technology based on natural and economic factors.

It shows that scientific grounding and optimization of the systems of irrigated agriculture allow getting a 3-5 times higher productivity of agricultural crops, compared with rainfed conditions. Resource-saving technologies of irrigation, which take into account biological features and genetic potential of modern varieties and hybrids of domestic and foreign selection, allow saving 15-40% of irrigation water, fertilizers and other resources actually without yield loss. The study proposes innovative measures for an increase in the productivity of irrigation and optimization of technologies of growing agricultural crops on irrigated lands.

Progress of modern and promising irrigated agriculture is unthinkable without energy saving and nature protection technologies, which are based on the rational use of natural resources (climate, soils) and artificial energy of agrochemistry, irrigation, machines. The effective conduct of agriculture on irrigated lands at the background of economic and ecological crisis induces a search for new approaches to the organization of crop production on irrigated lands, planning and operative management by the modes of irrigation.

For solving the problems of irrigated agriculture in Ukraine, it is necessary to concentrate our efforts on the implementation of such strategic tasks: to develop and take measures for the improvement of water supply of agricultural crops due to the application of water-saving methods of basic till soils; to optimize the structure of sown areas, crop rotations, systems of plant fertilization and protection; to develop adaptive modes of irrigation for specific fields and crop rotations on the basis of water consumption by crops and evaporation.

**Keywords**: irrigation, climate, growing technologies, water supply, weather conditions, productivity of irrigation.

**Gerayzade A.P., Gyulalyev Ch.G., Mamedov N.A. Using phytocenosis energy balance in calculating its water consumption**

The paper considers the questions of moving water and energy in the soil environment of the system of phytocenoses. It reveals the role of plant mass in the system of circulation and movement of matter and energy and proposes a technique of calculating transpiration based on the equation of photosynthesis. The paper scientifically proves the expediency of using the energy accumulated by various phytocenoses in water and heat balance calculations. The heat of combustion of organic mass of plants was determined by the method of liquid calorimetry. Time dependence of an increase in temperature of the calorimeter system in the main combustion period of individual plant specimens is reflected. The study shows the amount of energy contained in the mass of different plants, and calculates the corresponding coefficients of efficient use of phytocenosis energy. It marks the differences in calorific value of the mass of different species of plants of natural and artificial cenoses. The paper proposes an improved heat balance formula envisaging the consideration of organic matter synthesized by phytocenosis and coefficient of energy use efficiency. From the energy point of view, the study of various processes in ecosystems allows revealing regularities in the transformation of solar energy on the earth's surface for optimizing energy consumption to ensure stable functioning of agricultural production.

**Keywords:** water regime, transpiration, heat balance, combustion energy, calorimetry, water consumption.

**Gorash O.S., Kufel A.V. Dependence of productive tillering of spring barley on the effect of sowing dates and seeding rate**

The analysis of the results of our research proves dependence of tillering of spring barley on sowing dates and seeding rate.

The best parameters of data on tillering coefficient were obtained under the first date of sowing; with each successive sowing date, tillering of plants decreased; also, a slightly lower tillering coefficient was marked with a higher seeding rate. This pattern is confirmed by means of statistical analysis conducted on the basis of a test of Duncan. The results of statistical analysis show that for each subsequent seeding time the tillering coefficient of two varieties of barley was significantly lower, as all parameters without exception formed a single homogeneous group. The best values of tillering of plants, an average of the experiment was in the first period of sowing 2.76 - Syebastyan variety; 2.85 - Eksployer variety, the lowest values depending on these varieties were provided in the fifth period of sowing: 1.43; 1.33.

As for the factor of seeding rate, a significant impact of every rate was determined: under a seeding rate of 300 seeds/m2 tillering was slightly better compared to a seeding rate of 350 s/m2. Accordingly, at a seeding rate of 400 s./m2 the tillering coefficient of two varieties was naturally smaller.

To assess the connection of dependence of barley plants tillering on the effects of the evaluated factors a correlation analysis of dependence of seeding rate and duration of the light period of the day at the time of the phase of tillering was carried out. An interrelation confirmed by the coefficient of multiple correlation Rу.хz= 0.94 and equation of multiple regression of linear dependence of acceptable error is established. According to the prediction based on the regression equation at a constant value of seeding rate of 300 s./m2 an increase in the number of light hours by 30 minutes will reduce the tillering coefficient by 0.27. At a constant length of the light period of the day, an increase in the seeding rate by 25 s./m2 results in tillering coefficient decrease by 0.11.

The same pattern is observed for variety Eksployer Rу.хz= 0,94; F = 47; р = 0,00. The interrelation is described by multiple regression based on which we can predict the effect of seeding rate and duration of the light period of the day on the tillering coefficient of barley. Thus, if the duration of the light period of the day at the beginning of tillering phase is 30 minutes longer, the tillering coefficient is reduced by 0.31. If we increase the seeding rate by 25 s./m2, the tillering coefficient is reduced by 0.12, at a constant day length.

**Keywords:** spring barley, tillering rate, light period of the day, sowing dates, seeding rate.

**Demydas G., Demtsyura Y. Formation of botanical composition of a mix of alfalfa and cereal grasses depending on fertilization level and seeding method**

The paper highlights regularities in the formation of botanical composition of a mix of alfalfa and cereal grasses depending on fertilization level, seeding method and grass population age.

**Keywords:** botanical composition, fertilization level, seeding method, grass mix.

**Yeremenko O.A., Pokoptseva L.A. Influence of plant growth regulators on forming the productivity of sunflower (Helianthus annuus L.) in the Steppe of Ukraine against the background of Euro-Lightning herbicide application**

The climate of the Steppe zone of Ukraine has been recently characterized by a substantial temperature increase, decrease of rainfalls, and their irregularity. This led to the decrease of the stock of productive moisture in the arable and one meter deep layers of the soil, occurrence of prolonged hydrothermal stresses during critical phases of plant development, especially of the late spring crops including sunflower. In the conditions of the Southern Steppe of Ukraine the best indexes of growth, development and yield of sunflower plants can be obtained by pre-sowing treatment of seeds with growth regulators. The goal of our research was to determine the influence of Emistim C and AKM growth regulators on growth, development and formation of the main structural elements of yield of Armada sunflower hybrid against the background of Euro-Lightning herbicide use. The influence of growth regulators (factor A) and hydrothermal conditions of the year (factor B) on formation of sunflower yield structure was studied in the field experiment by the scheme: 1 (control) – treatment of seeds with water, 2 – treatment of seeds with Emistim C (0.20 l/t), 3 - treatment of seeds with AKM (0.33 l/t). Seed treatment was done 1-2 days before sowing with using incrustation method calculated from 10 l of working solution for 1 t of seeds.

Pre-sowing treatment of sunflower seeds with plant growth regulators causes increase in leaf surface area by 26 %; reduces the duration of phenological phases of development on average by 2 – 4 days; increases resistance of sunflower plants to abiotic stresses and increases productivity by 31.5 %. The comparative assessment of results of research is carried out and the ranged row for Armada hybrid is established. The optimal is the option of pre-sowing treatment of seeds with AKM plant growth regulator – the first rank (=1.90).

**Keywords:** sunflower, productivity, plant growth regulator, hydrothermal conditions, growth and development of plants, the ranged row.

**Kapinos M.V., Kalytka V.V. Influence of growth regulators and microbial preparations on seed germination and initial growth of peas (Pisum sativum L.)**

To enhance the symbiotic and associative nitrogen fixation, it is effective to inoculate seeds before sowing with active strains of nitrogen fixating agents. However, to improve the phytosanitary condition of crops and the quality of commercial products it is expedient to introduce a balanced application of biological products, plant growth regulators (PPP) and mineral fertilizers.

In order to establish the impact of anti-stress PPP and bacteria of the genus Rhizobium on the process of seed germination pea, the initial growth of roots and shoots, a two-factor laboratory experiment (ACN - A factor, Ryzobofit - factor B) was done.

As the results of the study show, the highest and most reliable intensity of full soaking of pea seeds was under the pre-PPP AKM treatment, and the lowest - after the inoculation with Ryzobofit. During heterotrophic nutrition the greatest effect on the process of seed germination of peas had AKM and its mixture with Ryzobofitom. During autotrophic nutrition crude mass of cotyledons was significantly reduced by AKM treatment and its mixture with Ryzobofitom, accompanied by activation of growth processes in roots and shoots, and increase in their weight and linear sizes. During the development stages studied between pea seedlings raw achene weight and mass of raw roots there was established an inverse correlation of medium strength (r = from - to 0.4611 - 0.5995), and between crude achene weight and mass of raw sprout this relationship increases to strong (r = from - to 0.8457 - 0.8705). Seeds treatment with growth regulators and microbial preparations significantly increased vigor by 6-7% compared to untreated seeds, but we have not found significant difference between the options. Significant effects on laboratory germination were not determined.

Over the period studied plant growth regulators (factor A) show the greatest impact on the length of the root (86.7%), root weight (49.3%) with a significant exposure to the interaction of these factors (35.6%). The influence of microbial preparations (factor B) on root growth is insignificant (2-6%). The interaction of the factors studied had the highest effect on the growth of shoot mass (71.9%), while the growth regulator (57.3%) mostly influences shoot growth in length. The influence of the microbial preparation on the growth of the stem is not significant (0.6 - 6.9%). Thus, the biggest impact on the growth of the root system has AKM (factor A), and the growth and development of shoots is influenced by AKM and Ryzobofit (interaction of factors A and B).

**Keywords:** peas, microbial preparation, plant growth regulator, germination energy, roots, shoots.

**Kokovikhin S.V., Nesterchuk V.V. Effect of plant density and fertilizers on the formation of productivity of sunflower hybrids grown under the conditions of Southern Ukraine**

The article presents the results of studies on the productivity of sunflower hybrids based on differentiation of stand density of plants and nutrition background due to the application of complex fertilizers.

The aim of research was to establish the effect of hybrid composition, stand density and complex fertilizers on sunflower yield.

The study used common research methods and cases in plant agriculture. To determine the least significant difference and share of influencing factors analysis of variance was used.

The productivity of plants depended on hydrothermal conditions during the research, the role of fertilizing increased with decreasing rainfall, an increase in air temperature, and decrease in relative humidity. In unfavorable 2016, this figure decreased to 14.4-16.6 c/ha. The density of plant stand also caused significant fluctuations in plant productivity. In 2014, we observed an increase in the formation of the maximum yield of seeds (20.6-21.5 c/ha) at a density of 40-50 thousand plants /ha. Under favorable conditions of 2015, the highest yield – at 22.1-22.7 kg / ha was also obtained under this density. In different years of research complex fertilizers manifested varying degrees of efficiency, but on average, the positive effect of fertilizing compared with control plots (without treatment) varied widely: in 2014 – 11.5-23.1%; in 2015 – 9.2-16.8; 2016 – 12.1-21.9%, respectively. Thus, the role of fertilizing was positive in all the years of research, even under the deterioration of environmental conditions, reducing rainfall, increase in temperature and decrease in relative humidity.

According to the results of field research, it is found that when sunflower is grown on dark chestnut soils under rainfed conditions of Southern Ukraine the highest yield at a level of 23-25 c/ha of seeds is formed by the Megasan hybrid. Plant density should be adjusted depending on the genetic potential of hybrids. Thus, for hybrids Megasan and Yason optimum stand density is 50 thousand/ha, and for hybrid Darii – 40 thousand/ha. The application of complex fertilizers provides a 10.7-20.9% yield increase and improves the quality of seeds, complex fertilizer Master having the highest efficiency.

**Keywords**: sunflower, hybrid, plant population, fertilizer, productivity, yields, share of influencing factors.

**Lavrinenko Yu.О., Vlaschuk A.M., Shapar L.V. Yield and economic efficiency of growing winter rape varieties depending on the time of sowing and seeding rate under the conditions of the South of Ukraine**

The paper presents the calculation of economic efficiency of growing winter rape varieties for seeds depending on the time of sowing and the seeding rate under irrigated conditions of the South of Ukraine. The estimation of the economic elements of the given technology of growing winter rape seeds was done according to the basic indices such as yielding capacity, production costs per 1 ha, the cost of gross output generated, UAH/ha, the obtainment of net profit from 1 ha, the cost price of 1 t of seeds, the level of profitability.

The research examines the winter rape varieties of the domestic selection –Antariia, Senator Lux, Anna and Cheremosh. The seeds were sown: the first period (1-10 September); the second period (10-20 September) and the third period (20-30 September). The seeding rate was 0.9, 1.1 and 1.3 million pieces per hectare.

On the average for 2013–2015, the best seed yield was produced by the variety Antariia – 2.58 t/ha – when sowing took place between 1-10 September and the seeding rate was 1.1 million pieces per hectare. Of all the factors examined in this experiment the most influential factor for the seed productivity was the time of sowing, its share being 73.3%, the share of the varieties under study being 16.2%, the seeding rate being 0.5%. Of all the winter rape varieties under study the most productive was the variety Antariia.

Of all the varieties under study the maximum of the gross output – 57.1 thousand UAH/ha – was generated with the variety Antariia when sowing took place between 1-10 September, the seeding rate being 1.1 million pieces per hectare, the minimum of the gross output – 29.3 thousand UAH/ha – was generated with the variety Senator Lux when the sowing took place between 20-30 September, the seeding rate being 0.9 million pieces per hectare. The highest level of profitability, on the average, was achieved when sowing took place between 1-10 September and comprised 666%.

The analysis of the experiments conducted in 2013–2015 allowed drawing the conclusion that growing new domestic winter rape varieties in combination with different times of sowing and seeding rates under irrigated conditions is one of the main factors of maintaining the crop productivity which depends on soil and climate conditions of an area, agro-technology of cultivation, morphological and biological features of winter rape varieties.

On the basis of the economic analysis it has been determined that of all the winter rape varieties under study the best one for the conditions of Kherson region as well for the Southern Steppe area of Ukraine is the variety Antariia when the sowing takes place between 1-10 September and the seeding rate is 1.1 million pieces per hectare, which allows making a net profit of 43–50 thousand UAH/ha.

**Keywords**: winter rape, varieties, time of sowing, seeding rate, economic efficiency.

**Mykolaiko V. P. Peculiarities of seed formation of large-rooted chicory depending on the complex of agriсultural and technological practices**

The article shows the results of the investigations of productivity and quality of seeds of large-rooted chicory depending on the complex of agricultural and technological practices – regulation of the growth and development processes of plants, schemes of planting root crops and drip irrigation of seed plants. Over the three years, the productivity of seeds has risen depending on the planting patterns: in the control without pinching out by 0.04 tons per hectare, with pinching out - by 0.05 tons per hectare. The highest increase in seed productivity was under the use of drip irrigation under both planting patterns. In such a way, with the scheme of planting 45×60 centimeters without pinching the seeds productivity comprised on the average 0,40 tons per hectare for 3 years. With the use of drip irrigation and support of soil humidity at the level of 60% of field moisture capacity during the vegetation of the same scheme of planting it increased to 0.26 tons per hectare.

The same increase of seed productivity was observed with the scheme of planting 45×25 centimeters. An essential increase in seed productivity was received with the use of the process of the plants growth and development. The greatest increase of seed productivity with the use of both schemes of root crops planting was observed under drip irrigation with the support of soil humidity up to the stage of blossom at the level of 60% of field moisture capacity. During the phase-to-phase period of “blossom-seed ripening” it was at the level of 80% of field moisture capacity. During the years of investigations, seed productivity increased with the scheme of planting 45×60 centimeters without pinching out on the average by 0.33 tons per hectare comparing with the control and by 0.07 tons per hectare comparing with the variant of drip irrigation, while soil humidity was maintained at the level of 60% of field moisture capacity during the period of vegetation.

The years of investigation show the same dependence. Favorable soil and climatic conditions of seed growing together with the agricultural and technological practices allowed the formation of high-quality seeds. For three years the energy of germination and growth of seeds comprised on the average 88-93 and 91-96%, respectively, depending on the agricultural technologies, which were used by their growth. The use of agricultural technology, which is directed at the adjustment of growth and development of seed plants, assured the increase of the energy of germination and growth of seeds only with the use of the scheme of root crops growth 45×60 centimeters, both in the control and dry-land conditions and with the use of drip irrigation under the support of soil humidity at the level of 60% from the field moisture capacity during the vegetation period.

With the scheme of planting 45×25 centimeters only the tendency of increase of this quality rates was observed. Under drip irrigation, when soil humidity was maintained up to the stage of blossom at the level of 60% from field moisture capacity. During the phase-to-phase period of “blossom-seed ripening” 80% from field moisture capacity of the essential difference of the seed quality depending on the scheme of planting was not revealed. The essential influence on the energy of germination and growth of seeds with the irrigation of seed trees hasn’t been revealed. These rates were almost the same as in the control without irrigation. The influence of the particle of the “irrigation” factor was the least and comprised 8,6–30,0%. Vice versa, the volume of 1000 seeds increased essentially under the influence of drip irrigation, comparing to the control – without irrigation under both schemes of planting of transplanted plants. This rate increased essentially under the use of pinching out than without it both under dryland conditions (control), and under drip irrigation. After the years of investigations the same results on the seeds quality have been received.

**Keywords:** large-rooted chicory, planting patterns, pinching out, irrigation, productivity of seeds, energy of germination, germinating power.

**Muntian L.V. Economic efficiency of growing winter wheat of different varieties depending on seeding rates and fertilization in rice crop rotations**

The main purpose is to study the economic efficiency of growing soft winter wheat varieties Odeska 267, Khersonska awnless and Rosynka depending on seeding rates and fertilization in rice crop rotations in the Southern Steppe of Ukraine.

Research subject is Rosynka, Odeska 267 and Khersonska awnless winter wheat varieties.

Field experiments included options of studying seeding rates (3 million pieces/hectare, 5 million pieces/hectare, 7 million pieces/hectare) and fertilizers (N0P60; N60P60; N90P60; N120P60).

The understanding of economic and energy essence of crop production, quantitative accounting and analysis of processes of transformation and circulation of financial resources and flows of energy in agrocoenosis gives us a chance to determine an optimum combination of elements of technologies of cultivation.

The results of experimental studies carried out on the research farm of the Institute of Rice of National academy of agrarian sciences in 2010-2014 became the information basis for a complex analysis. The economic evaluation was made based on application of the commonly accepted technique allowing us to estimate an option of technology by the level of productivity, cost value of production of a unit of production, profitability of hectare of cultivated area and profitability level.

The estimation of cost efficiency of using different varieties of winter wheat, doses of fertilizers and regulation of seeding shows that among the options studied maximum efficiency is provided by the cultivation of Khersonska awnless winter wheat at a planting rate of 5 million seeds/ha and fertilizer application rates of N90P60. The profit in this case is 10188.3 UAH/hectare, profitability level – 101.5%. In addition, the produce received in this option has the lowest cost value – 1587.9 UAH/t.

**Keywords:** winter wheat, variety, productivity, prime cost, profitability.

**Netis I.T. Correlation between winter wheat yield and moisture reserves in the soil in different phases of plant development**

The article presents the results of research on the correlation between winter wheat yield and available moisture reserves in the soil in different phases of plant development. The strongest dependence of wheat productivity on moisture reserves is observed in the period when the elements of plant productivity are formed – leaf tube formation, earing and grain forming. The strength of this connection is very changeable and depends considerably on soil humidity. On winter wheat crops after non-fallow predecessors, the connection between yield and moisture reserves in soil are strong in all periods of vegetation – r = 0.69-0.95. On bare fallow, where there is more moisture, this connection is weak and middle in the period before earing– r = 0.09-0.49; after earing, when humidity of soil is decreasing, this connection is much stronger – r = 0.73-0.90. Under irrigation, the correlation between winter wheat productivity moisture reserves in soil in all periods of vegetation is weak – r = -0.24-0.20. There is a strong relationship – r = 0.76-0.83 between wheat yield after non-fallow predecessors and moisture reserves in the soil in early spring. The study develops regression equations that make it possible to forecast wheat productivity depending on moisture availability in the soil in early spring.

**Keywords**: winter wheat, moisture, predecessors, harvest, correlation.

**Rudik A.L. Raw material potential of oil-bearing flax and prospects of its application in medicine**

The article presents a general assessment of oil-bearing flax productivity as to the yielding capacity of seeds, straw, oil content, acid and fat content, bast fiber production. It is found that an increase in yielding capacity of seeds is accompanied by an increase in bast fiber production and improvement of technological indices of straw. Irrigation and fertilizers change the content of fatty acids within 0.3-1.5 %, the content of linolenic and oleic acids being also changeable. It is suggested to cultivate the crop using a row spacing of 45 cm. At the background of N90P60 K60, sowing 6mln pcs/hа with a row spacing of 15 см the yielding capacity of seeds amounts to 1.65 t/hа, straw – 2.36 t/hа, bast fiber – 0.34 t/hа. Irrigation and a sowing rate of 7 mln pcs/ha make it possible to obtain 2.16 t/hа of seeds, 3.19 t/hа of straw with bast fiber content of 0.68 t/hа. It is proved that under the conditions of Steppe zone the technology of straw use works best under irrigation. Oil flax straw can be regarded as a renewable source of pulp and straw recycling technology has a positive effect on the ecological condition of agrophytocenosis on the whole. It is proposed to use sampling for technological indexes of straw quality in the selection process, which is necessary for the introduction of technologies of dual use of the crop.

**Keywords:** oilseed flax, seeds, fat and acid content, straw, bast fiber, ecologically clean products.

**Talankova-Sereda Т.Ye. The influence of silicon nanoparticles on Mentha piperita rhizogenesis under in vitro conditions**

The study investigates the influence of silicon nanoparticles in nutrient medium on rhizogenesis of Mentha piperita L. explants of Lidia, Mama and Chornolysta varieties under in vitro conditions and on further regenerants adaptation in vivo. Isolated tissues and bodies culture method in vitro, clonal microreproduction, graftage, biometric and statistical methods were used in the work. For rhizogenesis research, microplants were cultivated during two passages on modified MC nutrient medium for microreproduction. This nutrient medium contained 0,75 mg/l of 6-benzylaminopurine, 0,1 mg/l of adenine, 0,05 mg/l of indoleacetic acid and 0,5 mg/l gibberelic acid. Pitchers 4-5 mm in size with one internode were grafted and subcultured on nutrient mediums MЅі0 (control), МСЅі 1 (silicon concentration 5 mg/l), МСЅі2 (10 mg/l), МСЅі3 (20 mg/l) with a half concentration of macrosalts and microelements, 2 % of sucrose.

When adding silicon nanoparticles at a concentration of 5 mg / l to the nutrient medium, by the 28th day of cultivation, in Mentha piperita of Lydia variety the average length of roots had increased by 84 % (р <0.05), of Mama variety by 107 % (р <0.05), and of Chornolysta by 26 %; in Lydia, the amount of roots increased by 27%, in Mama by 20 %, in Chornolysta by 31 %. The proposed modification of the nutrient medium МС for rhizogenesis which contains IAC and IBA at 0.5 mg/l enriched with silicon nanoparticles at a concentration of 5 mg/l has increased rhizogenesis frequency in Mentha piperita of Lydia and Mama varieties up to 100 %. Plants implantation degree is 100 %. Silicon nanoperticles concentration in nutrient medium over 5 mg/l suppresses root formation in conditions in vitro, reduces rhizogenesis indices, causes the occurrence of roots with abnormal structure, with pithy callus presence; this caused complication in microplants’ carrying over on substratum and their implantation. It is necessary to note, that silicon nanoperticles at 10 and 15 mg/l concentration did not lead to negative changes in sprouting and leaves morphology.

Plants-regenerants adaptation to conditions in vivo was on the substratum: peat: universal soil: pearlite: sand at a ratio 2:1:1:1 within 4 weeks, then plants were transplanted in the open ground. The implantation of peppermint varieties cultivated on the nutrient medium with 5 mg/l silicon nanoparticles addition, was 100 %.

Thus, silicon nanoperticles optimum concentration is established – 5 mg/l. It intensifies rhizogenesis processes in peppermint plants-regenerants.

**Keywords:** Mentha piperita L., silicon nanoparticles, explant, culture in vitro, growth regulators, rhisogenesis, adaptation.

**Ushkarenko V.O., Likhovid P.V. Total sugar and dry matter content in sweet corn kernels at the beginning of milk-wax ripeness depending on agrotechnology**

Improvement of the quality of crop production is an important task of modern agrarian science. One of the important levers of influence on the crop quality is cultivation technology. An effective use of the agrotechnics for improvement of the quality indices of crop production is possible only if the scientific solution of the problem will take place. To establish the patterns of change in the quality of sweet corn variety Brusnitsa depending on the depth of primary tillage, nutritive background and plant thickening, in 2014-2016, a field experiment was made on irrigated lands of the AC “Radianska zemlia” of the Bilozerskiy district of Kherson region. The field and laboratory investigations were conducted in accordance with current requirements and standards of the methodology of the experimental work in agronomy. It was established that total sugar and dry matter content in sweet corn kernels at the beginning of its milk-wax ripeness significantly depends on the studied agrotechnical elements and their interaction. The maximum sugar content (4.65 %) was provided by the cultivation technology: primary tillage at a depth of 20-22 cm, nutritive background N120P120, plant density 35 ths/ha. The above-mentioned agrotechnical complex contributed to the maximum dry matter accumulation — at the level of 34.56 %. An increase in the depth of primary tillage to 28-30 cm, decrease in fertilizers application rate, increase in plant density had a negative impact on dry matter accumulation and total sugars content in sweet corn kernels. The minimum total sugars (3.14 %) and dry matter (28.76 %) content was under the moldboard plowing at a depth of 28-30 cm, non-fertilized agricultural background and plant density of 80 ths/ha. There should be mentioned the presence of a tight direct interrelation between the indices “Total sugars content” and “ dry matter content” in sweet corn kernels: the correlation coefficient was 0.87.

**Keywords:** sweet corn, total sugar content, dry matter, depth of primary tillage, nutrition background, crop thickening, drip irrigation.

**Chorna V.M. Energy efficiency of soybean growing technology under the conditions of the right-bank Forest-Steppe**

The increased production of basic legumes, including soybeans can be achieved only through the introduction of highly payback and competitive technologies of their growing. The development of these technologies, along with increasing productivity, will provide a significant increase of grain quality that corresponds to the standards and requirements of modern market.

Energy analysis of technologies will determine the degree of labor resources, soil and climatic conditions, solar radiation, fertilizers, pesticides, irrigation water, fuels, various types of agricultural machinery and other factors that effect soil fertility and yield formation.

On average, during the years of research (2013-2015) maximum seed yield of the variety of seeds KyVin 2.13 t / ha, Knyazha 2.14 t / ha and Monada 2.39 t / ha was received due to the seed treatment with a bacterial preparation which is called OPTIMIZE and by spraying crops with chlormekvatchloride in the budding phase, which is 47, 38, 40% more compared to those without bakterisation and cultivation of crops with retardants. In addition, different varieties reacted differently to the chlormekvatchlorid concentration. Thus, for a variety of seeds Kyvin most effective concentration was 1%, and for varieties Knyazha and Monada - 0.75%.

Analysis of energy efficiency showed that the energy of yield changed and accordingly changed the rate of energy efficiency. In all versions of the experiment the determined rate was considerably higher than 1, indicating the feasibility of inclusion to the technology of soybean growing the seed inoculation and processing of crops with growth regulator chlormekvatchlorid. It is marked that energy efficiency indicators of soybean are directly dependent on the level of its productivity.

In the variants with the maximum yield of soybean varieties KyVin (2.13 t/ha), Knyazhna (2.14 t/ha), Monada (2.39 t/ha), there was also the highest energy efficiency coefficient - 2.9, 3.1 3.4, respectively. High value of energy efficiency shows that the developed technology of soybean growing based on soybean seed inoculation and processing of crops with a morph regulator is approaching to energy saving.

**Keywords:** soybean, inoculation, morph regulator, productivity, energy efficiency coefficient.

**Shevel V.I. Evaluation of photosynthetic activity of millet under the conditions of the Southern Steppe of Ukraine**

The paper presents the results of research on photosynthetic activity of millet crops under rainfed conditions of the Steppe of Ukraine depending on agricultural practices.

Special agrotechnological research was conducted on the experimental farmlands of the SIA «Zemledelets» Zhovtnevy district, Nikolaev region in 2008-2010. The soil of the experimental site is southern chernozem. The object of research was varieties of millеt — Tavriyskoe, Konstantinovskoe, Vostochnoe (factor A). Factor B in the experiment was sowing dates of plants: 1-10 May, 10-20 May, 20-30 May. In addition, the backgrounds of mineral nutrition (factor C) were studied: unfertilized variant, N40P30, estimated rate of fertilizers for a yield of 4 tons/ha.

The study shows that the best conditions for plant photosynthesis were created after early seeding and application of mineral fertilizers at estimated rates. On average, during the growing season, most powerful [leaf](http://wooordhunt.ru/word/leaf) [apparatus](http://wooordhunt.ru/word/apparatus) was formed in Tavriyskoe plant varieties in the variant with the application of mineral fertilizers at estimated rates during sowing in the first early period - 42.7 thous.m2/ha in the flowering phase. The maximum value of photosynthetic capacity was observed during [earing](http://wooordhunt.ru/word/earing)-ripening; in the variant with the application of mineral fertilizers at estimated rates it was the highest - 1.02 mln. m2per day / ha (average for varieties and sowing dates). Net productivity of photosyntesis was high for varietes Tavriyskoe and Konstantinovskoe – 3.63-5.23 and 3.13-4.97 g/m2 per day, whereas in Vostochnoe variety it was 3-23% lower depending on sowing dates and mineral nutrition background.

**Keywords:** millet, varietes, sowing date, nutrition background, photosyntetic potential, net productivity of photosyntesis.

**Yarchuk I.I., Masliiov S.V., Bozhko V.Y., Pozniak V.V., Kravchenko K.O. The efficiency of applying Antistress and Mars ELBi preparations to winter barley crops**

The study presents the results of field study on how the products Antistress and Mars ELBi influence winter resistance and yield of winter barley variety Osnova under the Northern Steppe conditions. For deeper investigation of the products in adverse winter conditions, artificial stripes were made: without snow and with ice crust. Both products improved tillering capacity in autumn period and better survivability in winter period. The product Antistress appeared to be more efficient in the most extreme conditions (ice crust). But its use in spring favorable conditions is not viable. Treating winter barley seeds with Mars ELBi before setting seeds in fallow soil is unproductive. It happens due to growth stimulation and overgrowth of plants what leads to worse northering and decreasing of survival rate.

The best state had plants wintered in natural conditions; a little bit worse was the state of plants wintered without snow cover; the worst state had plants under ice crust. Both studied agents facilitated better stooling in autumn and better survivance in winter. Treated plants saved more tops and culms. In early winter plants treated with Antistress have the fewest nodal roots. It might mean that plants were in deeper dormant state and have begun spring vegetation later. The agent Mars ELBi has shown itself only as a growth stimulant.

Both in conditions of snowless winter and with ice crust we can see decreasing of such important indicators as density of crop and production index of tillering. Besides, damaged plants do not compensate for productive sprouting loss with spike size and its weight.

Both products have a positive impact on yield of winter barley. For three years of study Antistress, which has a cryoprotective effect, appeared to be more efficient. Its application increased the yield by 0.2 tons per hectare. The product Mars ELBi increased the productivity by 0.13 tons per hectare due to its growth-stimulating agent. The use of Antistress in spring in wet enough years did not give good results.

**Keywords:** winter barley, cryoprotection, growth regulator, incrustation, spray application, overwintering, yield.

**ТВАРИННИЦТВО, КОРМОВИРОБНИЦТВО, ЗБЕРЕЖЕННЯ ТА ПЕРЕРОБКА СІЛЬСЬКОГОСПОДАРСЬКОЇ ПРОДУКЦІЇ**

**Zavalniuk I.P.** **The main aspects of technologies of production of soft goat milk cheese**

Cultural traditions and features of a living area of different nations determine that milk of different animals: cows, goats, sheep, camels, deer, llamas, etc. is used for making cheese.

In world practice, there is a tendency to replace cow's milk with goat’s milk, especially for baby and medical nutrition. Compared to cow's, goat's milk has a higher content of protein, fat and minerals, including calcium, phosphorus, iron and 1.5-2 times more vitamins A and C. World production of goat milk is growing and is more than 15.3 million tonnes a year, that is almost two times more than the production of sheep milk. In Ukraine, there are over 650 000 goats, mainly of dairy and combined directions of productivity, of which 95% are in private households.

Cheese is one of the main and best dairy products made from goat milk. They are quite fatty, rank second by the content of trace elements, have a characteristic aftertaste of goat milk and can be both soft and hard; but these are often soft cheeses with a high whey content. Goat milk cheese is a delicacy. European countries-leaders in the production of goat cheese in 2000-2015 are France, Greece and Spain.

We should consider the following factors in the production of goat milk cheese: fractional composition of protein and low acidity is caused by a less volumetric ability to clot; it is advisable to adjust the acid-salt composition of raw materials; rennet clot from goat milk has low rheological properties, so it is recommended to cut it a little overmatured. The small size of milk fat globules and increased fragility of clots are caused by a high content of fat and protein in the whey, which is released when cutting the clot.

Usually soft milk cheese with dietary properties is produced by the acid-rennet method from pasteurized skim milk, sour pure cultures of lactic streptococci, with separation of whey in a curd separator, adding cream and fruit fillings to the resulting fat-free cheese.

Using fillers with sea-buckthorn and blackcurrant berries is expedient in the manufacture of composite milk-based products, as it is the concentrate of bioactive substances and it contains a significant amount of vitamins, proteins, carbohydrates, fiber, organic acids, pectin, minerals and substances that inhibit microbiological spoilage of the product.

**Keywords:** benefits of goat milk, goat population dynamics, processing technology, high indexes of homogenization, peculiarities of clot forming, soft goat cheeses, fruit and berry fillers.

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**Pelykh V.G., Chernyshov I.V., Levchenko M.I., Ushakova S.V. Internal parameters of pigs of different genotypes**

One of the ways to increase the productive qualities in pigs is to study their internal features. Blood has a functional connection with the main types of animal productivity. Internal research makes it possible to predict the future of swine productivity. Alanine aminotransferase (ALT) and aspartate aminotransferase (AST) in blood has a positive correlation with the meatiness, fertility and growth. It determines the level of productivity in animals.

The article provides the results of research concerning the internal parameters of pigs of different genotypes.

The studies were conducted under the conditions of the “Freedom Farm Bacon”, іn the Kherson region. The internal research of four month-old pigs was done with the use of indicators and techniques such as: total protein content - Biuret method, the activity of aminotransferases (AST and ALT) - Reitman and Frenkels method listed in the directory by V.V. Menshikov. The object of the research was the Large White breed and crosses: Large White × Landrace, Duroc × Pietrain and Pietrain × Duroc.

Our study confirms the results of studies on increased total protein in the blood serum of quick-grown pigs.

Crossbred young animals had higher values of total protein in the blood than purebred pigs of the Large White breed. This index was for pigs of ♀D×♂P and ♀P×♂D combinations 67.60 ....63.00 g/l, respectively. The analysis of blood from young pigs, produced from boars of different genotypes, suggests that a more intensive growth of ♀D×♂P and ♀P×♂D animal groups led to a higher protein content in the blood serum, which is closely related to the muscle growth process. It has been established that the results of internal tests at four months of age allow predicting the age, when pigs achieve the weight of 100 kg and predicting the daily gain of pigs in the control fattening.

**Keywords:** crossing, interior indices, growth dynamics, daily gain, AST, ALT, formation intensity, Duroc, Pietrain, Landrace.

**Piskun V.I., Osipenko T.L. Greenhouse gas emissions in manure preparation with renewable energy receiving in pork production**

The article highlights the results of greenhouse gas emissions estimation using the technology that envisages the transporting of effluent to methane tanks during manure preparation for getting renewable energy by traditional technology in pork production. The wastewater using technology for renewable energy and organic fertilizer obtaining is the all outgoing wastewater submission to the methane tanks. Removed effluents via a gravity system with a ground gate from the complex get into the receiver tank. Later from the receiving reservoir via the pump they are periodically submitted to the methane tanks, where wastewater fermentation and biogas generation takes place. The biogas from the methane tank enters the cogeration equipment where electricity is generated, which is used for technological needs. The temperature of exhaust gases of the cogeration equipment through a heat exchanger is used for the methane tanks biomass heating. The fermented mass removed from the methane tank, according to the technological cycle, goes to a press filter for a liquid and solid fraction separation. The solid fraction goes to the platform for solids preparation for organic fertilizer. Then the organic fertilizer is spread on farmland. The liquid fraction is supplied to liquid fraction storage. Later, after the exposure, the liquid fraction will be transported to farmland as fertilizer. The calculations showed that methane emissions per head amounted to the equivalent of CO2 – 118.24 kg, direct emissions of nitrogen per head in CO2 equivalent - 16.4 kg, side emissions of nitrogen were in CO2 equivalent - 1.64 kg per head.

**Keywords:** manure, preparation, methane fermentation, greenhouse gases, environment.

**Remizova Y. Using the Large White breed in today technologies**

The article highlights the advantages of the Large White breed and its inner breed types (UVB - 1, UVB - 2 UVB - 3) in modern technologies. Using the breed under different selection types was characterized; hybridization schemes were described and based on selection the Large White breed.

Consumption of high-grade animal protein from milk and meat is a necessary precondition for health.

Despite the crisis of economic situation in our country, today we face an urgent need to provide the population with products of high quality and low price, caused by low purchasing power of the population.

Nowadays it is one of the most common and old selected breeds. Large White is bred in all regions of our country. The total number of cattle is around 90 percent.

Animals of Large White breed type have strong constitution, a high reproductive capacity, a significant level of fattening and meat productivity, good adaptive nature-qualities in different areas, suitability for use both at home and in industrial technology.

The classic pattern of hybridization is 3-breed crossing, which provides the effect of two levels of heterosis. In the first stage sows of Large White and boars of Landrace breed are crossed and hybrid saws F1 are got, hybrids due to increased maternal heterosis effect have better fertility traits and increased milking up to 15-20%.

At the second stage F1 females cross with boars of specialized meat breeds, usually of Duroc or Petren. In modern pig breeding specialized synthetic line "terminals" are being used.

Pigs F1 are real example of a unique form of parental sows, adapted to the conditions of industrial technology content. Its main feature is the high level of adaptation and excellent production results. During crossing with Duroc breed increasing in growth rate; high feeding performance are got.

Thus, the Large White breed has proved itself as a great choice for future development of pig breeding. Breed has high capacity to adapt to different micro-climatic zones and high results in various productivity traits.

Thus, as a result of interbreeding and hybridization pig offspring is taken for setting for fattening, which has a number of qualities: a high level of adaptation in intensive industrial technologies, resistance to diseases and stress, strong constitution, a high feeding capacity, high-quality meat and grease products.

Thus, the Large White breed is a ductile material to selective development to further intensification of pig-breeding. Waste feature has a high capacity to adapt to different micro-climatic zones, it has high levels in various productivity traits.

**Keywords:** Large White, productivity, feeding, hybridization, industrial technology.

**Usenko S.O., Shostia A.M., Tsybenko V.H. Peculiarities of the dynamics of estradiol-17β in blood serum of pigs of different sex, age and physiological state**

The aim of this work was to study the dynamics of estradiol-17β content in pigs’ blood serum from different sex and age groups and during pregnancy.

The study was carried out on clinically healthy young boars, castrates and gilts of the Large White breed. Housing of animals was in groups: 2-3 pigs in every stall. Feeding was carried out according to the feed norms of Pig Breeding Institute and AIP NAAS. Blood for tests was taken in pigs every month from frontal cavity vein at the age of 120, 150, 180, and 210 days and at reaching a weight of 100 kg. In puberty gilts blood was tested during sex rest, estrus, on the 15th , 30th ,60th ,90th , 104th ,113th days of pregnancy and 12 hours after farrowing. The content of estradiol- 17β- in blood serum was studied by the radioimmunological method.

The obtained data testify to the fact that in pigs independently of sex there was determined the decreasing content of estradiol- b17β- in blood serum from the 120th to the 210th day of age. In blood serum of young boars, compared to castrates the increasing concentration of this hormone was observed.

The content of estradiol-17β- in blood serum of gilts was more compared to castrates. In gilts, during the periods from the age of 120 to 210 days a 5.9 times drop in the level of this hormone was observed. Then, independently of sex of pigs, the content of estradiol- 17β- in blood serum, comparatively with its level at the age of 210 days increased: in young boars -by 1.4, in castrates-by 1.3, in gilts-by 3.8 times.

In sexually mature gilts, the content of estradiol- 17β- was changing depending on their physiological state: In the period of estrus compared with sex rest, it was decreasing by 1.6 times. After fertilization, the concentration of hormone in blood serum quickly increased during pregnancy. Especially sharp increasing of the amount of the hormone was observed from day 90 to the end of the pregnancy. As to the period of sex rest, an increase in the amount of this hormone was registered: on the 90th day of the pregnancy by 10; 104-by 21; 113-by 47 times.

After farrowing, the concentration of estradiol- in 17β- blood serum of sows decreased: after 12 hours it was 6 times lower than on the 113th day of pregnancy.

**Keywords**: estradiol-17β, pregnancy, boar, castrates, sows.

**Fedoruk N.M., Bomko V.S. Impact of different levels of crude protein in combined feed on egg production of ostrich females**

The current state of development of normalized feeding rations for African ostriches gives reason to state that the problem of protein supply has not been investigated profoundly, and, therefore, it is of some scientific value and practical value.

Analysis of the experimental data reveals that an increase in crude protein share in the fodder for ostriches results in a significant change in egg mass. In particular, there was a probable increase in the average egg weight in the research groups of birds during the whole period of the experiment as compared with the control. The analysis of egg weight parameters gives grounds to argue that 17% of crude protein content in fodder for ostrich females is optimal, since feeding the feed containing 18% of crude protein had similar results. To make final conclusions one needs to take into account the economic efficiency of feed for ostrich females.

Eggs quality is determined by their morphological composition, nutritional and biological value. The absolute mass of egg protein obtained from the control group of ostriches was 830.7 g, while in the experimental groups of birds the figure varied from 862.5 to 894.0 g. However, it should be noted that the increase in the level of crude protein in the experimental group rations to 17-18 % (second and fourth groups) provided an increase in the protein absolute weight by 7.1% and 7.6%, and had the character of a tendency.

**Conclusions.** A detailed analysis and synthesis of the research results proved that the increase in crude protein in the ration of African ostriches results in the morphological parameters changes, which, in turn, increases the nutritional value of eggs and hatching capacity.

It has been proved that in the 3rd and 4th experimental groups egg production increased, and the average weight of eggs is higher by 8% compared to the control group under optimizing the levels of crude protein in the ration of African ostriches.

An increase in crude protein content in the feed of ostrich females from 15% to 17 - 18% contributes to an increase in absolute mass of egg constituents.

Using the optimal level of crude protein in feed for female ostriches stimulates the increased synthesis of edible components of ostrich eggs (white and yolk) and further on promotes the hatching of a day-old ostriches with a higher body weight.

**Keywords:** crude protein, complete feed, African ostrich, egg production, average egg weight, egg white, egg yolk, shell.

**Fydria M.V.** **A study of physical and chemical indexes of meat of pigs of different levels of stress resistance**

Technological conditions of modern pig breeding demand higher productivity of animals and economic efficiency. However, biological peculiarities of pigs are not fully taken into consideration. Numerous veterinary and zootechnical measures, production conditions become a source of nervous stress in animals. The complex of such phenomena that are accompanied by the reaction of sensitive pigs to stress, received the name stress-syndrome. The task of technologists is to find and timely remove stress sensitive animals from the herd with the aim to prevent economic losses and low- quality production. Therefore, it is important to carry out research on indirect methods for determining stress sensitivity of animals and meat properties.

Prevention and overcoming the negative effect of stress on organism is an urgent task of pig breeding. Many domestic and foreign scientists in our time study the adaptation possibilities of organism, so the science constantly develops new methods of diagnostics; more modern ways of diagnostics of stress states are worked out and put into production.

The article describes the results of research on physical and chemical indexes of pork, such as acidity, moisture-holding capacity, tenderness, loss during heat treatment. The analysis of the results of research revealed no significant differences in the active acidity of meat of piglets with different stress resistance. A tendency to a decrease in the ability to retain moisture in stress-sensitive animals of all groups was observed. According to research results, the rate of loss during heat treatment ranged between 22.62 and 28.28%. In all experimental groups of Myrhorod and Large White breeds, as well as crosses (LW \* M), animals of class M exceeded Mo and M+ by this index. The pigs of Myrhorod breed and crosses of the modal class tended to have more tender meat in classes M+ and M-.

**Keywords:** stress, meat acidity, tenderness of pork, stress resistance.

**ЕКОЛОГІЯ, ІХТІОЛОГІЯ ТА АКВАКУЛЬТУРА**

**Burgaz M. I. Assessment of fish productivity of Chernohirskyi pond with the aim of setting up a special commercial fish farm**

Modern farming on the majority of small reservoirs ignores the productive capacity of these reservoirs. The gap between the possible and the actual quantities of fish products is big enough and reaches up to one or two orders of magnitude indicating significant reserves, rational use of which will help to increase the effectiveness of fish farming. The main increase of products can be obtained by optimizing the use of natural food resources, i.e. the use of pasture aquaculture.

In the Odessa region, there are a number of specialized fish farms. These entities are full-system fish farms, fish hatcheries and breeding-reclamation plants.

Based on the analysis of specialized literature and empiric methods of research the study makes a biological analysis of fish, investigates food supply and determines basic hydrochemical parameters of water in small reservoirs in Odessa region by the example of Chernohirskyi pond. It evaluates the current state of the reservoir and identifies possibilities of its further use in setting up a specialized commercial fish farm.

The experience of commercial cultivation of fish shows the feasibility and necessity of introducing pasture fish farming in Chornogirskiy pond. In view of the composition of ichthyofauna and the number of individual fishes, in order to improve ichthyocenosis and to use feed resources more efficiently it is necessary to introduce two-year-old herbivorous fish and carp (the weight of two-year-old fish is 150-250 g) annually.

For effective fish farming management, marketable fish production and sales to the population it is expedient to set up a specialized commercial fish farm on Chornohirskyi pond for the period of at least 10 years.

**Keywords:** Chernohirskyi pond, food supply, fish farming use, ecological changes, biomass, biological productivity.

**Geina K.M. Characteristics of the morphological features and linear growth of tench (Tinca tinca, Linnaeus, 1758) of the Dnieper-Bug estuary**

Currently, the abundance of tench (Tinca tinca, Linnaeus, 1758) in the Dnieper-Bug estuary is very limited. Previous studies of the biological state of this species were carried out in 1970-1980s and included the study of some of its biological traits. Less attention was given, especially in the Dnieper-Bug estuary, to the analysis of morphological features. The limitation and even the total absence of scientific information on some issues caused a pressing need for conducting studies on these aspects of tench biology.

Morphological studies showed that meristic features of tench were currently as follows: D – III-IV 9-10 (М=9.22±0.10); A – III-IV 7-8 (М=7.22±0.10); P - I 13-20 (М=17.11±0.44); V – I 9-10 (М=9.44±0.12); l.l. 96-110 (М=103.00±1.08); Sgu1 22-32 (М=27.33±0.74); Sgu2 21-29 (М=24.39±0.57).

A comparison of the current plastic features of tench of the Dnieper-Bug estuary with previous data revealed significant changes in the morphology for the majority of features. Currently, tench body height became significantly lower (td=10.99-13.92; p<0.05), narrower (td=19.86; p<0.05) with smaller head (td =9.64; p<0.05).

All fins were found to be displaced closer to the head (td=3.10-10.86; p<0.05), distances between paired fins diminished (td=4.68-7.97), anal fin became shorter (td=6.64), while dorsal fin became lower (td=6.43). However, the lengths of caudal peduncle, dorsal and pectoral fins were not virtually changed and no significant differences for these features were detected.

The determined maximum age of tench was eight years. As in all cyprinids, the most intensive linear growth of tench was observed up to the sexual maturation and in the Dnieper-Bug estuary it continues until the age of five years. The length of 8-year-old tench was 25.5-26.7 cm (М=26.2±0.26 cm) with low variability level (Cv=2.0%). The most significant deviations from average values in age groups are observed during first years of life.

**Keywords**: morphological variability, plastic, meristic features, linear growth rate, variability.

**Dyudyaeva O., Breus D., Petukhov M. Modern realities of organic farming in Ukraine**

Ukraine, as a strong agricultural state, has considerable potential for organic production. At the end of 2015 more than 250 farms were certified and operated according to the principles of organic farming, the total area of agricultural land under organic products grew to over 400 thousand hectares (0.95% of all agricultural lands).

Fertile soils, low prices for land rental and large scale lands, the growth of volume of international organic products trade, the demand of the local population for safe food, all this creates favorable conditions for the development of Ukrainian organic farming. Society is ready to support producers of Ecoproduct, 60% of Ukrainians prefer ecofood. The internal Ukrainian market in 2015 consumed organics on 17 million €, that is in 34 times more than in 2007.

Constraining factor of the development of Ukrainian organic sector is lack of state support. There is a need to implement transparent instruments of state regulation of the industry, to accredit domestic organizations and empower them to issue certificates for organic products, to develop and adopt national standards for organic production that will maximally meet European and international standards, form an official register of national producers of organic products, to introduce accounting of organic production in statistical data on agricultural production. Sustainable development of organic production requires investment in climate improvement, integrated assessment of land resources for the possibility of their use for organic production, further popularization of healthy lifestyles through the use of environmentally friendly and safe products, including organic.

**Keywords:** agricultural production, organic products, European approach, certification, standards, regulatory framework, food market.

**Y**[**ehorova**](http://en.pons.com/translate/english-russian/Egorova)[**T.**](http://en.pons.com/translate/english-russian/T.), **Sapsai T. Characteristics of zinc imbalance formation in biogeochemical chains of agrolandscapes of Ukraine**

Characteristics of zinc biogeochemical food chains in agricultural landscapes of Steppe and Forest-steppe regions of Ukraine were studied. The objective of the research is determination of impact of landscape-geochemical conditions of agricultural lands on characteristics of processes of biogenic migration and biogeochemical zinc imbalance. Research method is based on biogeochemical zoning of Ukraine’s territory, of environmental assessment of processes of physico-chemical and biogenic migration of zinc in the components of agricultural landscapes and anaemia morbidity of child population as a result of zinc endemic hypomicroelementosis. Regional process of zinc excess formation in biogeochemical chains is physical-chemical concentration in agricultural landscapes of calcium classes with highly metamorphic waters. Deficiency prevails in agricultural landscapes of acidic classes with nonmetamorphic waters.

Increased biophility of zinc (AZn = 4.0) and its biogenic concentration (KKbZn = 1.1 ÷ 2.3) in cereals (wheat, barley, rye) characterizes agricultural landscapes of Steppe region with biogeochemical excess of microelement with low availability of its mobile forms. Reduction of biophility of zinc (AZn = 1.2 ÷ 1.6) and its biogenic scattering (KKbZn = 0.02 ÷ 0.4) in vegetable crops (potatoes, beets, cucumbers) describes agricultural landscapes of Forest-steppe region with its biogeochemical norm with sufficient availability of soil mobile forms. Determined characteristics of zinc biogeochemical chains are spatially consistent with spread of anaemia morbidity of some regions. Low morbidity of child population is typical for the Dnipropetrovsk, Kirovohrad and Mykolaiv regions of Steppe region and high morbidity is in Vinnitsa region of Forest --steppe region.

**Keywords:** zinc, agrolandscape, soil, biogenic migration, biogeochemical chain, endemic disease.

**Kukurudziak К.,** **Bryhas О.,** **Revka Т. Environmental assessment of the soil near pig farms of different capacities with the aid of biotesting**

Pig farms are a powerful source of pollution for adjacent areas. Biotesting is a relatively easy, simple and cheap method of diagnosing the condition of environment, which allows discovering problems at their initial stages. Since the soil accumulates harmful substances, this method is a reliable indicator of environmental state.

Our research was aimed at environmental impact assessment next to pig farms of different capacities using biotesting.

To carry out an environmental impact assessment of the soil close to pig farms the following pig farms were selected in Kyiv Oblast:

- individual entrepreneur "Kedr" with a population of up to 3,000 heads a year (Barahty village, Vasylkivskyi district);

- limited liability company "Agricultural company "Fastivets'ke, named Zelen'ka", with a population of 9,000 heads a year (Fastivets' village, Fastivs'kyj district);

- limited liability company "Nyva Pereiaslavschyny" with a population of 15,000 heads a year (Nova Orzhytsia village, Zghurivskyi district).

As a control plot there had been taken an area, located 3 km to South-East from Kodaky village, Vasylkivskyi district.

The environmental impact assessment of the soil close of the pig farms of different capacities was carried out based on biotesting of general soil toxicity according to the growth of cress (Lepidium sativum L.) and onion roots (Allium cepa L.) observing the corresponding methods.

Based on the research results we can state that testing according to the growth of onion roots provides more information but the results gained describe only general toxicity caused by chemicals in the soil. Testing according to the growth of cress does not help determine the nature of pollution but it is more sensitive to toxic substances than previous one.

Having analyzed the data received from both tests, the following regularities can be found. Pig farms increase general soil toxicity significantly and make the reverse influence of the toxic substances in the soil even more harmful. There is a direct dependence between the size of an enterprise and soil toxicity: the bigger the livestock population of the enterprise becomes, the higher is the toxicity on the adjacent areas. There is inverse dependence between the capacity of the enterprises and the intensity of reverse influence: with the livestock population increasing the reverse influence gets reduced. The size of the sanitary protection zone ensures significant improvement of the ecological condition of the soil but it still fails to provide for its complete purification.

It can be concluded that pig farms require improvement of their technology of waste processing and biotesting is worth paying special attention when an environmental impact assessment is needed.

**Keywords:** biotesting, general soil toxicity, environmental impact assessment, cress, pig farms of different capacities, onion.

**Makarenko N.A., Budak O.O. Sociological research of environmental problems of the municipal solid waste landfills**

The Public opinion of the population living within the influence of the municipal solid waste landfillsis studied insufficiently and, therefore, local and regional authorities does not take it into account when they are making decisions about arrangement of rural areas and environmental protection.

The study of the negative impact ofthe municipal solid waste landfills on the environment is devoted works of many scientists. However, these studies have not paid enough attention to the sociological question, although they should be an integral part of a comprehensive risk assessment of the municipal solid waste landfills and programmes for the development of rural areas.

Paper objective is studying of the public opinion of the population living within the influence of the municipal solid waste landfills, relative to its actions on human health and the environment.

The studies were conducted in Myronivka district, Kyiv region, where was studied the local impact of the municipal solid waste landfills on adjacent rural areas, the environment and human health. For this purpose the survey of the rural population of the territory Sloboda, Myronivka was carried out.

The results of the questionnaire have showed that the majority of respondents are concerned about the activities of public utilities (32%), and industrial enterprises (24%). They believe that a significant contribution to the ecological state of locality is effected by the motor transport (15%), agriculture (19%) and other objects (10%).

The majority of respondents (64%), pay attention to the high level of pollution of territory by garbage, 25% feel concern to average level of pollution and only 11% of people believe that the level of contamination is low. The impact of the municipal solid waste landfills in Myronivka have experienced 47% of the population, 35% haven’t, and 18% haven’t answer this question.

40% of respondents believe that the most negative aspects of the operation of the landfill is the spread of unpleasant smell, 30% of respondents noted the deterioration of quality drinking water, 15% believe that the main problem of combustion of the waste, 10% of the respondents choose other pollution factors.

It is established that in the locations of the municipal solid waste landfills has occurred an environmentally hazardous situation, which causes discontent among the local population

**Keywords:** the municipal solid waste landfills, ecological safety, sociological research.

**Manturova O.V., Kolesnyk N. L., Symon M. Yu. Phytoplankton of the separate areas of the Nyvka river**

The paper deals with results of investigation of composition and development peculiarities of phytoplankton of some parts of river Nyvka (Kyiv) with different level of anthropogenic load on the adjacent territory. For the river Nivkа most instructive in assessing the impact of anthropogenic factors on the development of phytoplankton are two areas - within Kyiv (part for straight channels and ponds, with a high degree of anthropogenic impact on the surrounding area) and the area outside the urban area (administrative Kiev-Sviatoshinskyi district) including the area of a non-overregulated riverbed. Forming groups of planktonic algae depends on many factors, the main one of which is the anthropogenic load on one or another particular area. According to a gradient of its intensity, there has been increasing dominance of species with wide ecological amplitude, so there is a narrowing of the floristic spectrum. Data on seasonal dynamics of species composition and quantitative indices are included. The paper contains detailed analysis of the research results on the formation of phytoplankton at selected sites of the river, which differ in their hydrological regime, nature habitats and adjacent catchment area of anthropogenic load transformation of the bed, and so on. The study clarifies specific features of the formation of phytoplankton in the river under the influence of various nature factors acting on it in its urban environment. The investigations cover the period from 1997 to 2000.

**Keywords:** river Nyvka, phytoplankton, anthropogenic pressure, diatoms, cyanophyta, euglenids, chlorococcaceae.

**Palapa N.V., Pron N.B., Ustymenko O.V. Monitoring of ecological condition of rural residential areas**

The results of longstanding researches on the main components of residential agroecosystem, mainly soil, drinking water and plant products are presented. It is established that soils of rural residential areas have very high content of exchangeable forms of phosphorus and potassium (maximum content in the soil is 5375 and 2090 mg/kg respectively), which is 5–8 times higher than the highest values of standard indicators. The content of basic nutrients – phosphorus and potassium is very high due to the application of high doses of manure on small-area land plots.

In addition there are private households, where the owners of individual households also use mineral fertilizers in unjustified doses, which results in contamination of drinking water and plant products with harmful substances. Hydrolyzed nitrogen content is usually low and very low, and in the process of agricultural crops cultivation there is a necessity of its additional application. In many cases, soils of residential zone are contaminated with heavy metals. The content of zinc and copper in certain cases exceeds the maximal permitted level by 4.2 and 5.2 times respectively, and toxic elements such as lead and cadmium by 1.8 and 1.7 times.

It is also found that drinking water does not correspond to quality standards. The pH value is in the range of 6,5–13,0 units and when pH level>11, water gets a characteristic unpleasant soapy smell and may cause irritation of eyes and skin. The total hardness in some cases reaches 44.6 mg-eq/100 g when the acceptable level is less than 7. We also recorded the excess of nitrates and chlorides content. The reason of the high content of nitrates and chlorides and insignificant exceedances of copper and zinc content in well water on the territory of private households of the population in most cases is violations of sanitary building rules, increased level and high doses of mineral and organic fertilizers application and irregularities in the procedure of manure storage and domestic animals and birds care.

Laboratory researches on plant produce grown on the rural residential area found a high content of nitrates and heavy metals that undoubtedly have a harmful impact on people’s health.

The conducted long-term researches on soil, drinking water and vegetable products of rural residential areas found a significant excess of toxic substances, which does not meet sanitary and hygiene requirements to the quality of drinking water and food products. Given all this, we think there is an urgent need for continuous monitoring of agroecological areas at the national level.

**Keywords**: residential area, ecological state of the territory, agroecological condition of soil, water quality, plant production quality, monitoring of private households.

**Plugataryov V.A. The evaluation of the effect of hormonal preparations of different origin in artificial reproduction of the Dnieper sterlet population**

In order to ensure the effective artificial sturgeon reproduction in productive conditions, 4-year-long studies were carried out with the application of the hormonal preparations of different origin - natural glycerin extract of sturgeon pituitaries and synthetic preparations (Surfahon, Nerestin H5) to stimulate the maturation of sturgeon breeders. There have been experimentally proven the benefits of natural glycerin extract of sturgeon pituitaries and synthetic preparation Nerestin H5, the stimulating effect of which found a positive response in sturgeon females with an average weight of 2.24 + 0.13 kg, ensuring the work fertility of 31.7-41.3 thousand eggs and fertilization of eggs at 86.5-91.7%. At the same time, the first preparation has been more effective in a period of low water temperature and its changes, the second is appropriate for application during the spawning temperature stabilization.

The cost indexes of preparations application are assesssed; according to them with the application of almost identical doses per 1 kg of a female, a more economical variant is the synthetic analogue of the pituitary extract - Nerestin H5, the production cost of which is twice lower.

The negative results for sturgeon females were received after the application of the synthetic preparation Surfahon, which showed a positive effect on paddlefish.

**Keywords:** sterlet, breeders, hormonal preparations, injection, artificial reproduction.

**Ridei N.M., Khitrenko T.F. Recreational potential of the agrosphere of Pryluky district, Chernihiv region**

During a complex analysis of environmental, social, economic and institutional components of the general characteristics of Pryluky district, Chernihiv region, there were determined parameters of its recreational potential.

There was determined the recreational potential of the territories of the agrosphere of Pryluky district that united natural, cultural, historical, socio-economic background of organization of recreational activities on the territory of the district and are based on: the natural, ecological and biotic potential, socio-economic development of the territory and their environmental and economic balance. The above-mentioned characteristics allow speaking about a significant background, which would promote the use of potential recreational opportunities of territories of the agrosphere with the aim of ecologically, socially and economically balanced development of the recreational branch of Pryluky district. The promising directions of development of tourism for the district were established, namely: cultural, historical, ecological, therapeutic, sports, rural, green, gastronomic, informative and scientific.

There were determined the types of recreational objects for their intended purpose (specialization) of recreational activities in the agricultural domain: religious, theological, cultural, historical, agrorecreation, landscape architecture, gardens and parks, traditional, domestic, social rehabilitation and recreation, sports and tourism, ecological and recreation, and identified existing recreational objects for them. For the development of these directions we should develop eco-tourist routes and ecological paths, promote the development and establishment of a network of agricultural farmsteads, implement strategic plans for the protection, preservation and restoration of natural, historical, cultural, architectural monuments, protect existing and create new memorials of landscape arts, recover folk crafts, renew and improve infrastructure, implement the system of advertising the kinds of tourism in the agrosphere.

**Keywords:** recreational potential, recreational facilities, recreational area agrosphere, recreation.

**Slavgorodskaya Y. Sustainable development in the context of the functioning of the agro-industrial complex of Ukraine**

The article analyzes different perspectives on the concept of “sustainable development”. Overall, researchers and analysts have suggested over 100 interpretations of the concept of “sustainable development”. They differ from one another by the focus on specific issues such as the balance between economic activity and the environment, sustainable economic growth, quality of life, social and cultural values of man, safety of biodiversity and natural resources, a fair relationship between generations, etc.

The concept of sustainable development, including agriculture complex, is defined as closely interrelated three components: economic - involves the formation of an economic system, harmonized with the ecological factor of development, social - affirms the human right to the highest standard of living in terms of environmental safety, ecological - determines the conditions limits and restores ecological systems due to their use.

The issue of sustainable development as a global development model is widely researched and developed in Ukraine. Since independence, several attempts have been made to create and approve the legislation concept of sustainable development, all of which failed.

The study considers the basic directions of sustainable development of agro-ecosystems in Ukraine up to 2025. Despite the programs of sustainable development of the agricultural sector adopted by the state, their implementation is carried out too slowly. The areas of sustainable land use as components of sustainable development of society as a whole are still not fully formed. So, in terms of land reform, we must strictly adhere to the following strategic principles: taking a system approach to rationalization of land tenure and land use; land protection; eliminate and prevent the negative consequences of land degradation; ensure socio-economic interests of land relations; harmonization of the institutional framework of the environmental component of land use.

The findings indicate that today there are many definitions of sustainable development. Most interpretations of this term are based on the Brundtland Commission definition: “Sustainable development is the development that meets the needs of the present, but without compromising the ability of future generations to meet their own needs”.

The managed process of the development of economic, social and environmental components of agriculture is aimed at sustainable use and restoration of natural resources of the agrosphere.

Today in Ukraine, there are plenty of theoretical developments and draft concepts of sustainable development for making an acceptable version of the Concept in the short term.

**Keywords:** sustainable development, agriculture, Concept of sustainable development.

**Starko M.V. Calculation of specific input of contaminants when rearing marketable fish in cages in water cooling reservoirs**

The peculiarity of a cage fish farm is waste input (fish metabolites, feed residues, etc.) directly into the water body. Consequently, one of the most important aspects of the regulation of this type of aquaculture is the determination of environmentally safe amounts of fish production.

Since cage fish farming in Ukraine is practiced mainly in warm waters, the aim of this work was to determine the specific input of pollutants when rearing fish in cages in water cooling ponds. As primary data, we used the results of our own studies on the actual input of suspended substances from cages and literature data on the excretion of metabolism products in fish. The data on the export of suspended substances from cages and results of the performed experiments on their effect on water quality allowed calculating the specific (per 1 ton of fish) input of the most important biogenic substances for cooling pond functioning and calcium (calculated as total water hardness) during the entire rearing period (180 days).

The results showed that rearing of 1 ton of marketable fish (carp) in cages produced on average 2645.0 kg of air-dry weight of suspended substances.

The aim of the work was to determine the specific input of contaminants when rearing marketable fish in cages in water-cooling reservoirs. It was found that rearing of marketable fish in cages (mainly carp) results in an input on average of 9800 kg (wet weight) of suspended matter into the water-cooling reservoir: 91.3 kg of nitrogen, 9.2 kg of phosphorus and 56.0 kg/eq. of hardness salts. The obtained results can be used in the calculations of ecological capacity of water-cooling reservoirs for cage aquaculture.

**Keywords**: сage fish farms, water-cooling reservoirs, fish feeding, biogenic elements, contaminants.

**Sushko S., Khrystych Y., Nakonechnyi I. Bioclimatic background and population dynamics of rodents in mosaic agricultural landscapes of the arid steppe belt of Tiligul-Bug interfluve**atershed

The paper presents the results of the study of bioclimatic and landscape-cenotical characteristics of the steppe zone of the northwestern part of the Black Sea region as the arena of forming mosaic agrocenotical complexes of mixed natural-agrogene genesis. It recommends differentiating as a dry-steppe subzone only the territory to the south of the Dniester-Dnieper. The climatic conditions of the Black Sea line are characterized by a remarkable variety. Proceeding with this aspect, there was highlighted the specificity of a steppe biotope where there is a new level of adaptation to the Cenozoic direction of natural processes in the temperate zones of the Earth. Retrospective analysis shows that a significant volume of anthropogenic development in the process of transformation of the steppes in agrolandscapes stimulated a radical break-up of zonal ecosystems. Such a conversion of plant dynamics took place at the background of climate aridization and under the influence of anthropogenic activity. A structured approach to analytical synthesis allowed us to update the selected perspective and became the basis for the study. The received results allowed asserting the deterioration of living conditions for the existing biotic complex as well as a significant impact on seasonal conditions for the existence of rodents in the field agrolandscape, directly and indirectly limiting the state of their populations.

**Keywords:** epizootic conditions, population, places of natural infection, migration.

**Khorunzhyi I.V., Korniienko V.O., Mukhina I.A. Dynamics of catches of aquatic living resources in natural and artificial bodies of the Kherson region**

The results of the general analysis of the production activities of the fishing enterprises of the Kherson region for the period of 2010-2015 in order to determine the effect of unstable economic conditions on their work and predict further development of production are given in the article.

The effective functioning of the fishing industry in Ukraine is primarily determined by the peculiarities of the economic conditions prevailing in the area of production and consumption. Nowadays imported products dominate the general structure of supply of fish and seafood. The share of domestic producers takes no more than 10% of the value of imports, which is a consequence of the crisis, in which there is both the state and the fishing industry. Considering this aspect, the stabilization of the economic component of the industry lies in the context of the reorientation of domestic fishing enterprises to meet first of all the requirements of the domestic market.

Reducing the number of fishing fleet and worsening economic components have caused a drop in total catches of aquatic living resources of Ukraine by more than five times.

Less significant economic relations have influenced the results of the extraction of aquatic living resources in internal water objects.

It was established that during the analyzed period the main part of the catches of the aquatic resources was within the Dnieper-Bug estuarial area. In separate years, 60.7 – 67.5% of the total catch fell to the share of this water area.

Analysis of the trend line and its equation that allowed us to calculate the volumes of aquatic living resources catches for the next 2 years confirms the general tendency.

**Keywords:** fish industry, economic efficiency, production of fish, fishing enterprises, fishing, trend.

**Chebanova Y. Current ecological condition of the land of Zaporozhe region as a result of agricultural use**

Intensive agricultural use led to a number of negative environmental changes in the Zaporozhe region lands. The structure of sown areas in the whole region has changed significantly, owing to specializing farms and farmers in the cultivation of monoculture, namely sunflower, which leads to depletion of soil, removal of all the nutrients. The main factors of human influence on land resources caused by agriculture are unsustainable use of agricultural land, pollution of the agrosphere with plant chemization agents, scientifically unjustified use of organic and mineral fertilizers. Negative impact is also made by an increase of disturbed land and the lack of reclamation. Of particular danger are unusable and banned pesticides that are improperly stored. High percentage of plowed farmland in Zaporozhe region, which amounts to 84.8%, the misuse of heavy tillage equipment, ignoring anti-erosion measures, inefficient use of funds aimed at combating erosion, all this leads to an increase in eroded land. Low precipitation with a significant thermal impact lead to the fact that the management of agriculture in the region is on the verge of permanent risk. Therefore, reducing the negative impact of air and soil drought on crop productivity can be achieved through irrigation, but it leads to the environmental problems such as soil salinization, soil compaction, groundwater area expansion. The article provides data on the results of a generalized analysis of the land of Zaporozhe region.

**ЕКОНОМІЧНІ НАУКИ**

**Baisha K., Kovalov V., Fadeieva K. Theoretical essence of investment projects evaluation**

Investment activity is a component of financial and economic activity of business entities. The effectiveness of business development of an economic entity is associated with investments. There are different methods of investment effectiveness evaluating that give different results and have their own advantages and disadvantages. As investments are investment in a project, there is a need for a gradation of investment projects by their effectiveness.

The main problem of investment activity is to find the sources of investment financing. This problem can be partially solved by analysis of investment activity of the economic entity. However, we should take into account the qualifying indicators of investments that reflect the content and functionality of analysis techniques. To achieve the expected efficiency of investment processes it is important to have scientific and methodical providing of investment appropriateness.

The article deals with the interpretation and the stages of formation of knowledge about the evolution of the "investment" concept. It examines the points that should be considered when developing investment projects and sources of their funding. Methods of investment projects profitability assessment are described.

**Keywords:** investments, investment projects, evaluation methods, profitability.

**Belous I.V. Prospects for viticulture and winemaking development of Kherson region, Ukraine**

The article is devoted to developing a mechanism of stabilization and further development of Kherson region viticulture and winemaking on the basis of modern innovative techniques for the purpose of saturation of domestic food market with competitive products and increasing its export potential.

However, a number of problems related to the reform of viticulture and winemaking, determining the strategy of further development in the integration into the world market, require a more detailed study. In particular, the problems of development and improvement of the production market of the wine-growing sector (especially high-quality table grapes), an innovative restructuring of domestic viticulture, sustainable scientific and reasonable allocation of vineyards formation and reconstruction of grape assortment and wine production to meet national and international market needs, scientific support and implementation of scientific innovation in viticultural production. The models of integrated relations between wine producers and grape growers, processing enterprises and other organizations that contribute to the promotion and marketing require further development; the same refers to marketing strategies of further development of viticulture and winemaking.

Further development of the sector requires qualitative transformation that would ensure increasing competitiveness of viticulture-wine production. Therefore, it is important to determine the strategic directions of viticulture development, according to which Ukraine will pursue a policy of regarding legal, financial, economic, environmental and social regulation through the introduction of an innovative model of viticulture and winemaking.

According to the draft Program, the development of viticulture in the Kherson region can be achieved through innovation. The article shows the main parameters of viticulture development at regional enterprises up to 2025 and projections of economic activity of viticulture in the region.

**Keywords:** viticulture, winemaking, development, performance, efficiency, innovation, market.

**Zorya P.S. Methodological approaches to assessing the efficiency of economic activities of agricultural enterprises**

The study shows that in the conditions of downward spiral deterioration of economic conditions of management of agribusiness entities there is an urgent question about searching the reserves of increasing the efficiency of their management activities. That finds the reflection in the scientists’ and practical workers’ attempts to take innovative approaches to the determination of its estimation in the calculation procedure. The study considers methodological approaches to the determination of efficiency of management activity of agricultural enterprises, the essence of which consists in the formation and filtration of totality of indexes, most valued for the estimation, and this initiates the reduction of informative space of signs. The study envisages such steps of methodology of evaluation of economic efficiency as the construction of a matrix of basic data by every group of indexes; procedure of standardization of indexes (bringing to the same measure units); calculation of matrices of distances for the initial system of indexes; choice of indexes-representatives of groups, which have the most valued information; forming of matrix of basic data according to indexes-representatives of the investigated agricultural enterprises; on the basis of matrices of forming of vectors-standards; distance finding between point-unit and point-standard. The presented methodology is approved at one of the agricultural enterprises under study in the Zhytomyr region. The paper proposes a set of indicators that allow evaluating the efficiency of economic activities and obtaining a high level of accuracy of the calculation results. It reveals a step-by-step technique for the estimation procedure and substantiates the necessity of transformation of the pricing mechanism in agriculture for the alignment of economic conditions of management of entities in the various sectors of economic activity, particularly in comparison with the industry.

**Krukovskа O.V. Theoretical basis of market formation in animal veterinary care**

One of the most important conditions for effective livestock production development and strengthening of its positions including international competitive environment is the creation and effective functioning of the agricultural food market. Market is understood as a complex, multifaceted category that includes the organization of social production, consumer behavior, a place where the exchange of goods, services is provided, a set of buyers and sellers, and a system of economic relations that have formed between them, and is a form of manifestation of supply and demand.

Veterinary services may be provided as a result of the direct contact between a veterinarian and animals. Therefore, it is impossible to use the services of intermediaries and create distribution channels. Accordingly, ways of improving the market for these services can be offered on the basis that the geographical factor is a determinant for selecting a subject that can provide the service, and often the only one in case of urgent veterinary services.

Today, the significance of services market as one of the most important sectors of economy is high and relevant. This is due to complications, including livestock production, saturation of the market with new products, with the acceleration of the growth of scientific and technical process. All this is impossible without the existence of information, financial, insurance markets and markets of other services. One of the most important principles of competitive livestock production development is the relationship of its economic growth and enhanced role of veterinary services in the process.

One of the most important features for customers, including veterinary service, is quality. The main factor in improving the quality is the growth of the level of competition in the market for these services. The overall global trend of veterinary services is increasing specialization of individual specialists and veterinary services in certain types of services. Strengthening of market reforms in the field of veterinary service does not eliminate the need for national quality control that is carried out through the licensing of private medical practice, state control of compliance with veterinary legislation.

**Keywords:** animal husbandry, veterinary care, agriculture, industry, food market, qualification and competition.

**Mironov V.V., Tkachuk A.I . Economic, legal and ecological protection of land in Ukraine: history of formation and present state**

The relationship of the ownership and use of land by different categories of population on Ukrainian lands has been formed since the ancient times. Economic, legal foundations of these relations have a long history. Nature-protection activities have quite a long tradition in Ukraine.

At each stage were specific tendencies of development in these areas, and yet we can trace some succession. Different legal regimes are typical for certain forms of land ownership: private (burghers, peasants, nobles) and peasant allotment in two forms - communal and homestead. The nobility had ownership not only of the surface land but also on water and mineral resources. In the Soviet period, despite the existence of a significant number of national environmental acts the legislation of the USSR and the USSR was not able to solve environmental challenges. At the time of the Soviet collapse, an unfavorable ecological situation was formed in Ukraine; the existing legislation and the legal system are not regulated and do not find meaningful ways out of the range of existing problems.

At present, Articles 162-165 of the Land Code of Ukraine provide regulations on land protection and restoration of soil fertility - they, first of all, ensure optimum value of land and the quality of the soil. Optimization of forage land in the structure of sown areas is the key to improving the quality of land resources for agricultural purposes.

At the same time, the imbalance of crops and livestock is not only a factor of soil depletion, but also the problem of providing the population with domestic food.

The deterioration of the ecological state of land and soil fertility is the basis for making decisions on the application of certain restrictions on land use, as well as compensation of damage to agricultural land because of exhausting their fertility and deterioration of environmental conditions.

**Keywords:** rational use of lands, land resources, land use, development of land relations, history of Ukraine.

**Nykytiuk Y.A., Boiko A.L. Economic analysis of the market of hops (Humulus Lupulus L) in Ukraine under modern conditions of its cultivation**

The paper deals with analysis and evaluation of hop production market in Ukraine and its comparison with world indices. The author investigates and analyzes the development of hop growing in Ukraine, and explores the environmental and economic causes of its decline. The paper reveals a clear correlation between biological factors influencing the productivity of hops, namely the dependence of yield and quality of raw materials on the number of healthy plants of hops. Based on research and analysis of hop growing condition, the authors propose measures for the regulation and development of this industry in Ukraine. It is necessary to develop national and regional programs of the development of the industry, the measures for the implementation of which should be supported by state funding at the expense of taxes for the development of viticulture, horticulture and hop growing. For sustainable development of the hop growing industry we propose the following: based on modern technologies, to introduce into agrocenoses varieties, lines, hybrids of hops resistant to viruses; to conduct disease prevention based on modern domestic biologics; to cultivate planting material from virus-free, healthy plant donors based on cost-effective technologies. It is necessary to develop a modern system of potential use of raw hops in Ukraine for progressive sectors: pharmacy, food industry, the system of formation of modern organic bio-agents based on components of hops for the agro-industrial complex, etc.; with the help of the media, to raise the market value of local varieties, clones and hybrids that by their biochemical indexes exceed the gene pool of this crop.

**Keywords:** hops, market, gross yield, bitter substance, α-acid, Carlavirus, Ilarvirus, viroids.

**Novakovska I.A.** **Methodological aspects of land use formation in cities according to economic activity**

The functions of land in cities are determined by functions of the city itself, which is a complex socio-economic formation and should ensure effective settlement of people (living, work, recreation), location of industrial and economic and transport and communication facilities, adherence to a qualitative favorable status of environment that surrounds people. Urban macro functions are divided into three types: primary (dwelling); secondary (manufacturing); tertiary (service and rest). On this basis, basic and general city functions are formed, which are the backbone of the organization and functioning of urban settlements.

The main features of the classification of city land division is their purpose and character of use. Both urban development and land management classifications are based on the division of urban areas according to their functional organization and purpose types (land category); nature-protecting ones are based on environment-protective and environment-forming properties of land. Ensuring sustainable development of urban areas requires the application of economic incentives for certain activities. This requires the creation of a "special budget" and territorial development funds, ensuring preferential lending policies and compensation, improvement of paid system of natural resources use, differentiated taxation of real estate and economic activity.

Functional distribution of land of cities according to economic activity in foreign countries, particularly in the North American, which is standard, includes six groups of land use: residential; transportation; institutional; open space land use; industrial and commercial. These groups are highly generalized, but not meaningless, especially when forming zoning types of territorial zones.

Based on the research results, we propose a classifying division of urban land use functions into nine types: residential, industrial economic, transport communication, recreation, nature-protective and environment-creating, aquatorium, waste saving, defense-law enforcement, emergency reserve. These types are to be introduced together with land use and economic organization of cities, shaping and changing the purpose of land, development of urban planning and land use documentation.

**Palyanychko N.I. Financial and economic support of state land resources management**

The paper deals with the relevance of public land resource management at present and the need for financial and economic support given that public land resource management can occur through the use of various kinds of mechanisms. The author analyzes versions of their applications, which are usually limited by resource potential, size and financial and economic stability of business entities and areas of agricultural policy. However, implementation of mechanisms and means of land resource management depends not only on properly selected priorities, but also financial and economic support. The author formulates basic challenges in providing public land resource management and suggests directions for their solution. The author allocates financial and economic tools to ensure the formation of a system of sustainable use and restoration of land resources. The paper deals with application of financial and economic security of public land resource management to promote the rational use and reproduction of land resource areas of the country by improving the functioning of the land relations system.

**Keywords**: state regulation, land resources, financial and economic tools, provision.

**Petrenko V.S., Arсhipova T.A. The efficiency of working capital management**

Effective financial management has significant value, especially in the economic instability of market relations. Working capital is part of the total capital employed by a company and is often defined as the difference between short-term liabilities and short-term assets. Practically speaking, it is the cash required to run the daily, weekly and monthly operations of a business. Working capital management is, therefore, the process of managing short-term assets and liabilities so that a firm has sufficient liquidity to run its operations smoothly. There are three strategies or approaches or methods of working capital financing – Maturity Matching (Hedging), Conservative and Aggressive. These three strategies are plotted on a number line with one side as ‘risk’ and the other side as ‘profitability’. Conservative strategy is on the side of lower profitability and lower risk. On the contrary, an aggressive strategy is on the side of higher profitability and higher risk. The management attitude towards risk and other factors would decide their place on this number line.

**Keywords:** management, working capital, financial position, management strategy.

**Podakov Ye.S. Current problems of taxation of agricultural producers**

In 2015, our country chose a strong European integration course of the economy according to which the Cabinet of Ministers pledged to reform the economy according to the requirements of time and the IMF. Thus, one of the reforms is the tax which results in reducing the number of taxes from 22 to 11, introduction of electronic VAT administration, reducing tax burden on small businesses and on the contrary, its increase for highly profitable business, the introduction of a moratorium on inspections of small businesses until 2017.

The main objectives of this study is to analyze the main problems of taxation of agricultural enterprises, development trends of improvement of taxation of the agri-food sector in terms of European integration of Ukraine.

Since 1998, according to the Order of the President of Ukraine "On supporting agricultural producers" in our country there has been offered a special tax regime for agricultural producers, which provides for the calculation and payment of the fixed agricultural tax and certain benefits regarding calculation and payment of VAT. However, analysis of scientific papers on the issues of taxation shows that fixed agricultural tax since its introduction until the present time does not fulfill the inherent function, is not conducive to the stimulation of producers. Given the state of the industry in the late 90s such a move justified itself. However, due to frequent changes in legislation a number of shortcomings have accumulated.

Ukraine loses in exports of chemical products; machinery, equipment, vehicles and appliances. This tendency will increase with regard to military geopolitical circumstances in relations with the Russian Federation. Therefore, state support of the agricultural sector through tax incentives is of particular relevance and significance.

In 2017, the Ministry of Economic Development considers four types of preferential VAT for farmers. From the conducted analysis and research, we can conclude that every scenario has certain risks and disadvantages for both agricultural producers and to the state budget of Ukraine. If the situation does not change quickly, it will lead not only to significant losses in the sector and reduce the competitiveness of its products on the world market by artificially increased costs but to direct damages to the State budget due to falling profitability of the sector and increase the share of the shadow market of agricultural products.

**Keywords:** farm tax, value added tax, fixed agricultural tax, simplified tax system, tax burden.

**Radvanska N. V. Risks and problems of the transformation of national savings into investments**

The role of savings of the national institutional units in ensuring the investment process is investigated. It is stated that strength and power of this source of development is determined by the risks and problems that may arise at different stages of transformation of savings into investments. These risks and problems are generalized in such groups: 1) the general volume of savings in the economic system and their structure by participants (risks of insufficient volume, risks of the savings deficit); 2) the completeness of their transformation into investment demand and what part of savings remains unused and lost for development (risks of divergent interests of the subject of savings and subject of investment, risks of spreading of non-organized forms of savings); 3) the way of distribution of the investment demand into real (capital investment) and financial investments (risks of real sector underinvestment because of spreading of financial speculative operations); 4) the amount and proportions in which investments are turned into the modern types of capital: physical, human, natural (risks of unbalanced development of the national wealth elements); 5) the types of branches and technologies which are invested by additional capital (risks of ineffective reproduction of common production structure).

It is stated that the top priority issue for development is long-term savings as a financial base for real investment; simultaneously short-term investments have the speculative character. The indicated risks and threats have to be managed for the purpose of growth and development of the national economy. Management means purposeful actions for the harmonization of the conflicting interests of the subjects of savings and investments.

**Keywords:** savings, investments, capital accumulation, economic development, sector of economy.

**Saienko V.G.** **The entry of Oriental martial arts into the business market: marketing problems, management and innovation promotion**

Substantiation of methodological guidelines and methodological aspects of martial arts promotion in the Ukraine market on the principle of dialectics as a form specifying services product, its features and attractive sides.

The article reflected the occurrence of the situation in the market of business systems of martial arts, which are spreading as a method of physical and spiritual development. The acceleration of the processes of perception is related to the solution of problems of marketing, management and innovation movement, because we need to pay attention to the essence and characteristics of innovation. To achieve this goal, the appropriate means of scientific and methodological support are involved, where marketing is a science, and management is a function or a mechanism of business organization management; on this basis, an attempt is made to present one item to the population – a product of oriental martial arts and promote it on the market, affecting the image of their perception. It was found that the combination of scientific positions of management and marketing, which are organic, identifies evidence base of benefits of martial arts as a service, the condition of the organizational embodiment and its materialization.

Moments of utility are recorded in a spiral of human development that allows for the interaction according to the scheme of the technique of motion criterion filling exercise training process; safe extensive services with methodological content and their own consumer who creates business by sectors according to the criteria of health, crafts, sports, traditional, religious and esoterics. Attention is drawn to the conditions that hamper the promotion of martial arts products to the market, which is opposed to the state, communal and religious and national institutional environment of the society, which is due to the canons of economic and religious structure of the state and mentality of the people. In its organizational unity of this society among developing its own relations personificators – educators, teachers, mentors, coaches and managers with the knowledge, skills and abilities to communicate the implementation of the pedagogical process. The elements of the formation of physical culture systems that allow effective business promotion of martial arts on the market, is the mentality of the people, the educational system, organizational, teaching and management of essential system of martial arts, subordinate to the fractal theory.

The methodological basis of the anvance of martial arts to the Ukraine market is a systemic approach based on the management and development of advertising and marketing of the outreach program. The starting points of such a program are:

a)  outward signs of manifestation of martial arts, the most important of which are associated with the improvement and development of common features of physical health, such as endurance, flexibility, body, beauty, agility and strength, with meeting standard requirements and athletic achievements, recognition and success, spectator’s pleasure and pastime;

b) hidden moments are associated with improving such characteristics as courage, perseverance, ability to stand up for themselves.

It is planned to search for ways of modeling the system of martial arts. The benchmark is similarities between the two models, which allow us to describe the essence of the study. The first model is an organizational and functional model built on the principles of management and modeling, and the second is a phenomenological model based on conventions of probability, uncertainties and assumptions about the fractality of martial arts.

**Keywords:** marketing, management, organization, service, innovation, martial arts, service activities.

**Skrypnyk S.V., Repilevska O.Y. – State levers of influence on the development of agricultural service cooperatives**

Ensuring the efficiency and competitiveness of agricultural production and social stability in rural areas is possible through state regulation in agriculture. Particular attention is paid to the functioning of agricultural service cooperatives, which today is virtually the only prospect for improving the profitability of small forms of agricultural business. Attention must be paid to the need to harmonize the interests of agricultural producers through the mechanism of agricultural service cooperatives.

Agricultural service cooperatives need special treatment from the government, resulting in the creation of an appropriate system of financial measures to support their activities, and addressing conflicts in the legal framework. Therefore, the creation by the state of stable economic conditions for agricultural service cooperatives is a condition for their effective functioning. Therefore, the spread of effective agricultural service cooperatives is necessary for both agricultural producers and the state as a whole.

The specific features of the functioning of agricultural service cooperatives are: financial participation of the members of a cooperative, democratic governance, control and focus not on profit but on providing services to co-founders. Agricultural service cooperatives are involved in solving many very important problems of society: employment, creating new jobs, solving educational issues and more. Therefore, the development of cooperation with the purpose of agricultural production and the provision of services to the rural population is now the main task of government and local authorities.

In Ukraine, for quite some time attention has been paid to the development of agricultural service cooperatives, as evidenced by a number of regulatory legal acts adopted by the government. There are three main groups of legislation governing cooperative relations in agriculture: general legislation that applies to all entities, sectoral legislation, and special legislation.

There are also various international and local programs on the development of agricultural service cooperatives and activities for their support. An important aspect of this trend is that such programs should not only be declared, but also fulfilled.

**Keywords:** agricultural service cooperatives, agricultural production, development, state financial support, regulation, public influence, agricultural services.

**Sobchenko A.M. Features of consolidated financial statements: international experience and practice of Ukraine**

In an ever-rising competition, information about business is increasingly more important as it allows influencing the movement of capital within the group of companies and attracting additional financial resources from other entities. Therefore, the increasing importance of information as a factor of economic development should have a regulated (legal) character. International Financial Reporting Standards (IFRS) contribute to a high level of accounting, preparation and comparison of financial statements of entities worldwide.

In connection with Ukraine's taking a course of integration into the European economic space, there rises a question of conformity of accounting and reporting to national and international standards. The question of the introduction of international accounting standards and financial reporting is a prerequisite for the entry into the European space. Therefore, there is a need to study the characteristics of consolidated financial statements based on international experience and its implementation in the practice of Ukraine.

The preparation of consolidated financial statements according to international standards is governed by: International Accounting Standard (IAS) 1 "Presentation of Financial Statements" and International Financial Reporting Standards (IFRS) 10 "Consolidated Financial Statements". At the same time, the specifics of consolidated financial statements according to national standards are regulated by: national provisions (Standard) (NP (S)) 1 "General Requirements for Financial Reporting" and 2 "Consolidated Financial Statements".

Consolidated Financial Statements (IFRS 10) - this is a group of financial statements in which assets, liabilities, equity, income, expenses and cash flows of the parent and its subsidiaries are presented as assets, liabilities, equity, income, expenses and cash flows of a single economic operator. Consolidated Financial Statements (NP (S) 1) - Statements that the financial position, results of operations and cash flows of a legal entity and its subsidiaries are a single economic unit.

The introduction of IFRS in Ukraine follows the Law of Ukraine "On Accounting and Financial Reporting in Ukraine". International standards are used for the preparation of financial statements and consolidated financial statements and are mandatory for public joint stock companies, banks, insurers and companies that conduct business activities by kinds listed by the Cabinet of Ministers of Ukraine.

IAS is used by Ukrainian companies whose investors are interested in it, and by companies wishing to obtain credit from banks that require reporting under IAS or enter international stock markets. Thus, the benefits of financial reporting under international standards really exist, and they are undeniable for most users of financial statements. IAS can be regarded as a tool of economic globalization and world economic ties. The principles laid down in the procedure of reporting under IAS, make it adequate and can display a real property and business status of the organization. Therefore, the value of IAS is important not only for international but also for domestic investors.

**Keywords:** consolidated financial statements, international standards, parent enterprise, subsidiary, intergroup operations, investment object, control.

**Tanklevska N.S. Financial instruments of influencing the regulation of the development of agriculture**

The impact on the development of agriculture is performed through financial instruments, based on the structural elements of the financial mechanism. The combination of elements of the financial mechanism is its "design", which is driven by the establishment of quantitative parameters of each element, that is determination of rates and standards of withdrawal of funds, the volume of funds, levels of expenditures and others. The purpose of the financial mechanism is ultimately financial provision and regulation of economic and social processes in the country.

Based on the systematization of different approaches to determining the structure of the financial mechanism, taking into account the specificity of functioning of agricultural enterprises, we can distinguish seven main elements in the financial mechanism of sustainable development of agricultural enterprises: subsystems of financial policy, financial methods, financial leverage, legal, regulatory and information services, financial policy, which is evident from our proposed structure of the financial mechanism. This financial mechanism is effective when all of its components are operating. However, the government can give them action through its financial policy.

The study considers the classification of financial control based on subjects that exercise control; according to this, there are the following forms of control: national, departmental (intra), internal, public and auditor (independent). The main feature of national control is that it is non-departmental; it is performed toward any entity, regardless of its subordination and affiliation. State legislative and executive bodies and special state control bodies exercise this control.

Methods of financial control, as specific ways and techniques of its exercising, include audit, subject inspections, examinations, continuous tracking of financial activities. A prerequisite to ensure the effectiveness of financial control is optimal and systematic actions of regulatory authorities. In other words, financial control can not be effective if it does not cover all areas of outstanding funds. In Ukraine, the funds at the disposal of businesses after granting them tax incentives, compliance with social security and others are in fact beyond financial control. Considering this, we improved the structure of tools of financial management of agricultural economics and identified its main elements: the organizational structure of financial management in the country; the existing legislative and regulatory framework governing financial management of public finances, finance companies and finance sectors; plans for the development of public finance and tax; incentives and constraints of financial and economic activity in the country; instruments to control the operation of finances at all levels of management in order to further improve the implementation of financial policies. Only comprehensive application of financial instruments can provide quality agricultural development.

**Keywords:** agriculture, development, monitoring, financial policy, financial tools, resources, efficiency.

**Tarasiuk A.V., Sharap A.O. Marketing of innovation as a basis for innovative development of Ukrainian enterprises**

The approaches to the definition of innovation marketing are considered in the research. In general terms, innovation marketing is an activity aimed at the search of new sectors and methods of using the enterprise’s potential, development of new products, technologies and their market promotion in order to meet the needs and stocks of consumers using more attractive products than competitors have.

There was determined a proportion of enterprises involved in innovation in the total number of enterprises in Ukraine. The amount of innovatively active enterprises is 16.1%, the amount of enterprises that implement innovations in Ukraine – 13.6%. The amount of performed research and scientific and technical work in GDP has declined, and in 2014, it was 0.81%.

Costs for innovation activities in Ukraine and some European countries were analyzed. Data analysis allows us to determine that Germany spends the biggest amount of funds on innovation activities. Poland spends the least amount of funds on innovation activities among European countries.

The causes that retard the innovative development of Ukraine were determined. The most retarding causes include: lack of own funds; need to implement innovations using own funds; high economic risk; long payback period of innovations; lack of information.

A comparative analysis of innovation activity in Ukraine and Poland was carried out. Interrelationships between scientific research and experimental design work and the marketing in the innovation process were identified. Strategy and structure of innovation marketing opportunities were described. The relationship between marketing and innovation, as well as their impact on the operation and development of an enterprise were characterized. Important principles of marketing while engaging in innovation activity were determined.

**Keywords:** marketing, innovation, innovative development, enterprise.

**Shepel I.V. Payments to the budget on farms - subjects of special tax regime: organizational accounting principles and methods**

The choice of the tax is based on tax legislation, which allows a taxpayer to elect an alternative tax that best takes into account all aspects of its operations. The basis of the tax laws in the selection of Farm tax charged sales of agricultural products. Properly organized and methodically sound payments of value added tax (VAT) on farms considering branch features of taxation are the key to preventing errors in practice, which results in the accrual of penalties.

Currently, tax legislation of Ukraine for the agrarian sphere has two tax systems one of which an agricultural company chooses at its discretion, meeting the requirements prescribed by the Tax Code of Ukraine: total taxation (payment of all taxes fixed by law - the most typical for farms is a tax income, generic VAT) and special tax treatment as the fourth group of the EP (replaces a set of tax) and a special VAT regime.

Agricultural company uses a special tax regime for agricultural producers (unified tax (EP) fourth group, the special VAT regime activities in agriculture). In general, the object of accounting calculations for taxes under the tax laws should serve a basis and / or object of taxation and tax liability of the taxpayer.

Thus, the special tax regime in the form of the fourth group of the EP, which is regulated by the Tax Code of Ukraine, can benefit agricultural producers, taking into account the limitations of the Tax Code of Ukraine, in which the share of agricultural commodity production for the previous tax (reporting) year equals or exceeds 75%.

According to the Tax Code of Ukraine, the tax object for EP payers of the fourth group is the area of agricultural land (arable land, hayfields, pastures and perennial crops), owned by the company or leased. Relations associated with the lease of land are governed by the Land Code of Ukraine, the Law of Ukraine "On Land Lease" and other legal acts, and leases of land. The specific feature of the object of taxation for EP payers of the fourth group is a need to ensure the accounting of land, owned or leased.

The total amount of tax liability includes VAT amounts specified in tax invoices for the tax period. Amounts of tax liabilities are recorded in the Register of received and issued tax invoices. The primary instruments for calculating taxes are accounting calculations, and calculations of VAT - VAT invoices. Accounting for tax liabilities is in the account 64 «Settlements on taxes and charges». This bill is intended to summarize the reflection of all types of payments of the company with the budget. Accounting for the purposes of taxation of agricultural enterprises provides synthesis and accumulation of information to determine the tax base and operations that form the object of VAT taxation. Therefore, VAT is levied on the basis of collection- reimbursement: in the case of tax liability, the principle of collection is applied to VAT, and in the case of tax credit - the principle of reimbursement.

**Keywords:** agricultural enterprise, budget, value added tax, special treatment, a single tax.