Summary

Babich O.A. Dependence of the index of acidity on the level of irrigation water evaporation of the main pumping station of the southern Bug irrigation system

Purpose: To investigate the changes in the acidity index depending on the level of evaporation of the irrigation water of the MPS SBIS (Main pumping station of South-Bug's irrigate system). **Methods:** Sampling of irrigate water according to state standard, pH-metric of irrigation water, evaporation of samples of the investigated irrigation water in the incubator Biosan Incubator ES 20/60 at a temperature of 50^0C, statistical processing of the obtained results (Student's t-test, correlation and regression analysis). **Results:** The obtained results demonstrated a significant increase in the pH level of the irrigation water of the STB SES by increasing the evaporation level. At the maximum level of evaporation (70%) pH value of irrigation water increased by 14.8% (from 7.69 to 8.82) at a temperature of 22°C. The dynamics of pH growth doesn't depend on the initial mass of water. At initial evaporation levels the pH of the water increases sharply and gradually and the growth slows down after a logarithmic dependence on the evaporation level. A mathematical equation is derived from the logarithmic regression of the dynamics of pH growth from the level of volatility, which makes it possible to find the pH value of irrigate water:

$pH = 0.2716 * lg (\%) + pH_0 + 0.69$

or the level of evaporation (%) at any point of the SBIS relative to the initial pH_0 value of the irrigation water of the MPS:

$lg\% = 3.68 (pH-pH_0-0.69)$ or $\% = 10^{3.68(pH-pH0-0.69)}$

Conclusions:

1. The pH of the irrigation water of the MPS SBIS increases with the level of evaporation.

7. The dynamics of the pH investigated irrigation water is described by the logarithmic regression, which has a high statistical significance.

8. Dynamics of pH growth of the water under investigation does not depend on its initial mass.

9. Mathematical equations are derived from the equation of logarithmic regression for calculating the pH level or the level of volatility at any point of the SBIS.

Key words: dynamics of acid index, evaporation, Southern-Bug's irrigation system, transformation, quality of irrigation water, thermodynamic parameters.

Vlasov V.V., Muljukina N.A., Levitskij A.P., Melnik E.B., Suzdalova V.I., Geretskij R.V. The influence of meteorological factors on grapevine esca symptoms

Purpose. Study of the influence of moisture factors (precipitation during the vegetation period (June - August) and in the previous period (October - November) and temperatures during the growing season (June - August) on the development and strength of the symptoms of the escus of grapes. **Methods.** Visual assessment of symptoms, meteorological observations, high-performance liquid chromatography, correlation analysis. **Results.** The influence of meteorological factors on symptoms of grapevine trunk diseases — esca - on Dobrynya rootstock and Cabernet Sauvignon has been studied. The fact that the increase in the amount of precipitation in the period from October to November causes a decrease of esca symptoms for both studied varieties (r = 0.79 for the Dobrynya and r = - 0.45 for the Cabernet Sauvignon, respectively) has been shown. The closest connection is observed between the indexes of the average monthly temperature during the vegetation period (June-August) and the development of esca symptoms on the Dobrynya rootstock (r = 0.77); the correlation coefficient between the average monthly temperature of the vegetation period and the level of visual damage of the Cabernet Sauvignon is smaller (r = 0.595). The relationship between the rainfall inexes during the growing season (June-August) and the number of days with rains and the development of esca symptoms is weak for both studied varieties. An assumption about the influence of the humidity factor on the polyphenolic compounds metabolism and the esca symptoms has been made. **Conclusions.** Weather conditions of the year (mostly the average monthly temperature, and less - the amount of precipitation) significantly affect the manifestation of the disease of perennial grapes – esca.

Key words: varieties, rootstocks, grapevine trunk diseases, temperature, rainfall, polyphenolic compounds.

Vozhehova R.A., Pisarenko P.V., Andrienko I.O. Dynamics of soil moisture reserves and efficiency of moisture use by maize crops depending on irrigation regimes and basic tillage

Purpose. Investigate the dynamics of soil moisture reserves and the efficiency of the use of moisture in maize crops, depending on irrigation regimes and basic soil cultivation. **Methods.** Field experiments were conducted during 2012-2015. in accordance with the methodology of field experience at the Institute of Irrigated Agriculture of the National Academy of Sciences. **Results.** Observations of indicators of moisture reserves in the soil have shown that the highest level of total and productive water reserves is recorded at the level of 2633 and 1294 m^3/ha. The smallest number of irrigation (4 irrigation) and the minimum irrigation norm in the experiment (2175 m^3/ha) was obtained with a water-saving irrigation regime of 60-70-60% NV in the 0.5 m layer soil, which allowed saving 1163 m^3/ha, or 34.8% of irrigation water. In the variants using the conventional irrigation regime, water discharge fluctuated within 390-461 m^3/t, and under soil protection regime this index decreased by 7.1%. With a turnaround to a depth of 28-30 cm, water costs amounted to 387 m^3/t, replacing plowing with a no-tillage treatment to a depth of 20-22 cm resulted in an insignificant increase in water costs to 391 m^3/t, and when using surface treatment at 12-14 cm the indicator increased by 16.1%. **Conclusions.** The lowest values of total and productive moisture reserves in the soil were observed during disking to a depth of 12-14 cm. Using the irrigation regime of 70% NV in a 0.5 m layer of soil required 7 vegetative irrigations at the highest irrigated rate of 3338 m^3/ha, with soil-protection irrigation regime The irrigation rate with an identical number of irrigation is reduced by 15.6%. It is established that irrigation regimes and methods of basic soil cultivation significantly influence the water consumption coefficient of maize.

Key words: maize, irrigation regime, soil cultivation, moisture reserves, irrigation norm, water consumption coefficient.

Vozhehova R.A., Malyarchuk M.P., Bilyaeva I.M., Piliarska O.O. Formation of organic farming systems on irrigated lands

Introduction. Social and economic development processes agroforestry potential in southern Ukraine led to the construction of irrigation systems for irrigation as one of the main factors of intensive farming in areas with insufficient and unstable moisture.

Condition of irrigated lands. Use the entire area of irrigated land in the southern region of production provided 29% of grain, fruits and vegetables - 87, technical - 26, forage crops - 63, rice - 100% to gross their production and productivity of irrigated hectare was 2.0-2.5 times higher compared to non-irrigated land. In Ukraine and foreign countries with the development of irrigation set, 40-50% of cash flow from the sale of crop products producers prepared for the set to increase production from irrigation, despite the fact that irrigated land covers 2.0 to 16.5% of the arable land .

Results. In general, the use of irrigated land in the future needs to be linked to the dynamics of reconstruction of irrigation systems This will enable grow enough raw materials for processing plants and feed for livestock shook off.

In general, the introduction of the five experimentally proved farming systems in irrigated areas, depending on the specialization of farms, which was formed and has the prospect of further development.

Conclusions. The strategic plan requires the use of the modern concept of irrigated land on a market basis, which provides specialization aimed at the production of food and feed grains, soybeans, fruit and vegetables to improve the food security of the Ukrainian population and access to foreign markets. On its basis, should Bat reconstruction and improvement of existing water systems.

Key words: agriculture, irrigation systems, production, agricultural crops.

Vozhehova R. A., Rudik O. L. Economics ground of technologies of growing of flax of oil-bearing on unwatering and irrigated earths in the conditions of South Ukraine

Purpose. To define economic efficiency of technologies of growing of flax of oil-bearing on unwatering and irrigated earths in the conditions of south of Ukraine. **Methods.** Researchers conducted during 2009–2013 in the field and irrigated crop rotations in the Askaniyska GS OS of Institute of the irrigated agriculture NAAN, which is located in the Kahovskom District of the Kherson Region. The book-mark of experiments, conducting of supervisions and economic analysis carried out in accordance with the classic and special methods of researches. **Results.** The use of straw for the technical processing promotes general efficiency of growing. Growing of flax oil-bearing provides a maximal income at the application $N_{60}P_{45}K_{45}$ and sowing with spaces between rows 15 sm. On a background the natural moistening and norm of sowing 6 million/ha he arrives at a 7.58 thousand UAH/ha. At irrigation and norm of sowing 7 million/ha an income increases to 7.78 thousand UAH/ha. Sowing with space between rows multiplies 45 cm charges, diminishes profitability and is expedient only in the complex of growing of organic products. **Conclusions.** It is set on results researches, that flax oil-bearing is a plastic culture which at construction of technological process of growing on principles of the system and adaptive provides high economic recoupment of factors intensification. In the conditions of the natural moistening the greatest income, at level a 6.78-6.88 thousand of grn/ha, provides growing of the varieties Aceberg, VNIIMK 620 and Orphey. At irrigation more profitable there is growing of sorts Orpheus, Iceberg, VNIIMK 620 and Lirina. The use of sort of the Glinum long-stalk flax for processing on a butter is economic inadvisable, and on a background irrigation – unprofitable. In the structure of expenses make most part in the conditions of the natural moistening agrochemicals, combustible-lubricating materials and seeds, and in the conditions of irrigation also melioration charges.

Key words: flax is oily, sort, irrigation, natural moistening, fertilizers, term of sowing, width of space between rows, economic efficiency.

Vozhegova R.A., Sergeev L.A. Forming of elements of the seminal productivity of winter wheat depending on a fertilizer and plants protection of in the conditions of South Ukraine

Purpose. The purpose of researches was to set influence of the systems of fertilizer and plants protection on the dynamics of forming of elements of the seminal productivity of the winter wheat at growing in the unwatering terms of South Ukraine. **Methods:** the field, laboratory. **Results.** Researches showed that bringing of N_{60} in the additional fertilizing early in spring to 363 things/m^2. Provided the height of number of productive stems. Application of the same dose of nitrogen on a background autumn P_{40} and $N_{30}P_{40}$ did not result in the increase of productive стеблестоя. On a variant with plants protection the most of ears was on a background the maximal dose of fertilizers of $N_{120}P_{40}$ and made 421 things/m^2. Without application of the system of computer-integrated protect sowing was damaged by illnesses and wreckers, overgrew weeds, and the amount of seed from an ear was made by 26 things/m^2. **Conclusions.** To the substantial increase of number of grains in an ear on 4–7 things, autumn application of nitric fertilizers promoted in a dose 30 to 90 kg of д.р. Introduction of the system of computer-integrated plants protection of the winter wheat from harmful organisms substantially improved forming of elements of the removable productivity of sowing. Application of mineral fertilizers increased the number of seed without securing of plants for 1.349–1.591 thousand things/m^2, and plants protection assisted the increase of amount of seed on 1 $м^2$ almost in all variants of fertilizer. However an exception was only diminishing of this index on the variant of $N_{90}P_{40}$ before sowing, on 2.9%. On other backgrounds of fertilizers, due to introduction of the system of computer-integrated plants protection of the winter wheat the amount of seed increased on 2.4–18.6%.

Key words: wheat winter-annual, seed, fertilizer, computer-integrated plants protection, seminal productivity, mass 1000 grains, mass of seed from an ear, amount of grains in an ear.

Hranovska L.M., Zhuzha P.V. Ecological and ameliorative state of lands and factors of its formation on the territory of the Nyzhnii Dnipro delta plain

The results of the study on ecological and ameliorative state of lands and factors of its formation at the territory of the Nyzhnii Dnipro delta plain are represented in the article. **Purpose.** The purpose of the study is the scientific substantiation of the influence and harmful impact of waters on the hydrological, geological and meliorative state of the territory of the Nyzhnii Dnipro delta plain. **Methods.** The methodology of the study based on the use of modern scientific methods: analysis, synthesis, induction and deduction, statistical and graphical methods. To determine

the intensity of the filtration feed from the channel of the North-Crimean canal we analysed the conditions of the canal work in project regime (2013) and modern working conditions (2017). The analysis based on the comparison of the technological indices in the first decade of April after filling up the canal and in the second decade of July in the rush-load. **Results.** We established, that flooding of the lands on the territories of the Nyzhnii Dnipro delta plain is characterized as dynamic and depends on a number of natural, anthropogenic and techno genic factors. The main among them are: geological and hydrological conditions, natural and climatic factors, building and functioning of the engineer objects of water economy and irrigation systems, water filtration intensity from irrigation canals. In natural conditions before the Kahovskyi reservoir, canals and irrigation systems were built, on the territory of the Nyzhnii Dnipro delta plain the main source of feeding soil and sub-soil inter-layer waters used to be the water of the atmosphere (precipitations, condenser moisture in rocks of the aeration zone in the zone of sandy arenas). Unloading of the ground waters was performed at the expense of their flow to the Black Sea. Building and use of the irrigation systems had led to the change of the natural hydrological and geological conditions, and due to the filtration the layer of the irrigation and ground waters created. It became the hindrance for unloading the ground waters to the sea, besides, filtration losses from the canals and irrigation network increased the volume of soil waters in comparison to the feeding volume in natural conditions. As a result, the rise of the ground water levels and lower Pliocene pressure aquifer horizon occurred. At present there are 21 settlements, which are situated in the Nyzhnii Dnipro delta plain in the flooding zone, however, work of the vertical drainage even in discrete mode grants slight improvement of the hydrological, geological and ameliorative conditions. **Conclusions.** To solve the problems of the harmful waters influence on the territory of the Nyzhnii Dnipro delta plain we substantiated possible ways of the engineering measures: diversion of the surface flood beyond the territory, building and use of the vertical and combined drainage with absorbing columns. The most efficient measures are: building of the combined drainage on the base of the existing drainage drills by connecting the horizontal drains to the drills for diversion of the ground waters, and building the horizontal drainage with absorbing columns, which should be situated on the lowest plots of relief.

Key words: ecological and ameliorative state of lands, Nyzhnii Dnipro delta plain, irrigation, flooding, vertical and horizontal drainage, filtration feed, balance of the water diversion, engineer measures.

Dymov O.M. Innovations as a factor of improving the efficiency of irrigated agriculture

Purpose. The aim of the research was elucidating of the existing problems in irrigated lands' use, the reasons which were conditioned of its, the substantiation for the necessity of innovations application in the branch and definition of the directions of innovative development of irrigated agriculture.

Methods. System approach, monographic, abstract-logical, factor analysis, comparative analysis and scientific generalizations.

Results. The reasons of reduction of the areas of actually watered lands and processes, which it accompanied, are investigated. The state of irrigation systems management is characterized. The analysis of air temperature changes during the vegetation period of crops in the Southern Steppe zone of Ukraine is realized. The negative impact of the expansion of arable land on the increase of water balance deficit is noted. The analysis of the current state in application of mineral and organic fertilizers in agricultural enterprises of the Kherson region is carried out. Domestic and foreign experience of introduction in production of innovative ways of watering is considered. The factors that strengthen the role of innovations in the development of irrigated agriculture, as well as the components of organizational and economic innovations are determined.

Conclusions. Further development of irrigated agriculture demands the conversion of this branch to innovation model, that provides for introduction the organize and managing, technological, technical, economic, legal, ecologic and social innovations, which will promote to rise the profitability and competition ability of agribusiness, to conservation of environment and social development of rural territories.

Key words: climate changes, plowing, fertilizers, soil fertility, drip irrigation, harvest, efficiency.

Klipakova Yu.A., Belousova Z.V. The influence of presowing seed treatment and weather conditions on the yield and quality of wheat grain in winter

The aim of the study was to determine the effect of fungicidal and fungicidal-insecticidal mixtures for presowing seed treatment both separately and in combination with the plant growth regulator AKM and the weather conditions of the year on the productivity and quality of wheat grain winter. **Methods.** The research was conducted during 2014-2017. in the stationary experience of the department of plant growing in the scientific and production center of the Taurian State Agrotechnological University, which is located in the village of. Azure of Melitopol district of Zaporozhye region. The experimental design and experimental studies were carried out according to generally accepted methods. **Results.** The use of different-quality disinfectants for presowing seed treatment promoted an increase in yields throughout all the years of the study by 13-85%, depending on the treatment option. The greatest influence on the increase in this indicator was the use of a mixture of Lamardor + Gaucho etchants. The joint use of a growth regulator with preservatives increased the efficiency of pre-sowing treatment of winter wheat seeds, which was manifested in an increase in yield by 0.45-0.82 t / ha in comparison with the corresponding variants without a growth regulator. Presowing seed treatment with a tank mixture of preservatives and growth regulator of AKM promotes an improvement in the quality of the products obtained, which provides an increase in the quality grade of the grown grain up to II-III against the V class in the control variant. **Conclusions.** As a result of the conducted studies, it was found that the greatest impact on the productivity of the winter wheat of the Antonovka variety had the weather conditions of the year with a significant contribution to the value of this indicator of the use of different-ingredient disinfectants and the growth regulator of AKM. The maximum level of yield in the weather conditions of the growing region ensures the use for the presowing seed treatment of a fungicidal-insecticide mixture of Lamardor + Gaucho etchants together with the growth regulator AKM. The level of grain productivity at the same time amounted to 8.48 t / ha of valuable wheat of the II class of quality of food group A.

Key words: disinfectants, plant growth regulator, genetic potential, hydrothermal conditions, quality class.

Kryvenko A.I., Burykina S.I. Productivity and quality of winter wheat for long-term use of fertilizers

The article presents the results of studies of the effects of prolonged use of fertilizers on southern black soil in field crop rotation in conditions of the black sea steppes of Ukraine on yield, biochemical and physical indicators of grain quality of soft winter wheat, predecessors of which the first four rotations were fallow, peas, corn MVD, in five and the sixth – fallow, green manure couples, winter rape, winter wheat.

Fertilizers and predecessors are the most important elements of technology of cultivation of winter wheat, the effectiveness of which is affected by weather conditions specific soil and climatic zones. The results obtained in long-term stationary experiments, provide the most comprehensive information on these issues.

Purpose - establish the influence of continuous application of different fertilization systems on yield and grain quality of winter wheat.

Methods. Field experience founded in 1972, on the southern humus in accordance with the techniques of experimental work. Studied 17 systems of fertilizers during the four rotations included a zero option, organic, mineral and organic-mineral with different ratio of nutrients. The manure was applied twice in the rotation under fallow and maize of the Ministry of interior; with the 5th turnover in the rotation introduced syderal steam.

Studied sequentially increasing doses of mineral nitrogen in complete fertilizers: the first to the third rotation N60, N90, N120 in the background P40K40 and P60K60, in the fourth rotation – N30, N45, N60 amid P20K20 and P30K30 and in the last two - N60, N120, N180, which was made both in pure form and in the composition of complete fertilizer on the background P30K30 and P60K60.

Agrotechnics in the experiment, except factors studied, common for the conditions of South of Ukraine.

Results. It is established that the gain of a crop when growing winter wheat on the black pair for the first 34 years were at the level of 12.7%, following the eleven – 32,9%, with the deterioration of the predecessor absolute value of yield decrease in relation to the black pair, but a growth regarding zero increase in the number of pairs siderale → peas → corn MIA → stubble predecessor from 34,2% to 71,9%.

Mineral fertilizers improve the weight of 1000 grains, nature of grain and hardness of 7.2% to 8.8% and 7.9% at SCC of>1 and regardless of weather conditions, increase the content of protein in grain and gluten, but there is a definite impact on the quality of gluten the grain of winter wheat.

The correlation analysis of an array of long-term data revealed a dependence on the level of high between yield and mass of 1000 grains (r=0,81) between the yield and content of protein and gluten (r=0, 66–0,68), and protein and gluten among themselves: pair correlation coefficient of 0.88; determination – of 0.79.

Conclusions.

1. At a high level of fertility of southern humus the content of available forms of phosphorus and potassium are economically advantageous rates of application and N60 and N60P30K30 that only at the expense of yield gains provide additional 1350-1800 UAH/ha;
2. Return 1 kg of nitrogen to the growth of grain at the application dose of N60 is 14.3 kg/kg, N120 – 14,0 kg/kg and N180 – 10,7 kg/kg; agronomic efficiency is almost the same for introducing one nitrogen in pure form and in the background P30K30, and in the background P60K60 – above 71.4%–14,3 8,8%.
3. Mineral and organic-mineral fertilizer system with long-term use to provide the protein and gluten contents in grain that meets the requirements of class 2;
4. The average for 2007–2017 years of research of mineral fertilizer increased the grain protein by 1.11 to 3.25% absolute at SNR=0,67, and the content of gluten – 3.0 to 10.5% at SNR=2,2; observed a significant improvement in the rate of glassiness at the maximum dose of nitrogen N180; N180P30K30 and N180P60K60 11.3% to 14.1% and 11.1% at SNR =10,0.

Key words: predecessor, weather, yield, quality, profitability.

Mialkovskyi R. Formation of the surface area of the potato leaf surface, depending on the varietal features and the direction of the herbs in the agrophytocenosis.

Goal. The study of the influence of varietal features and the direction of herbs in agrophytocenosis on the formation of the leaf area of potato in the conditions of the Right-bank Forest-Steppe of Ukraine. **Methods.** Analysis, synthesis, generalization, field experiment. **Results.** It has been established that on average in three years the highest growth rates of the leaf surface area are observed when herbs from the North to the South are placed in the medium-early varieties (Malinskaya white – 31.4 thousand m^2/ha), the medium-ripe (Nadiyna – 30.7 thousand m^2/ha) and medium-late (Dar – 31,4 thousand m^2/ha). From the direction of the lines from West to East, this indicator that corresponded to the same grades was: 28,1; 27,4 and 29,7 thousand m^2/ha. **Conclusions.** Placing herbs in the agrophytocenosis from North to South contributed to the formation of a larger area of the leaf surface per unit area due to an increase in the intake of solar energy to plants than on the West-to-East variant. Placing herbs from the West to the East leads to shading of each other's plants, the area of the leaf surface decreases, the photosynthetic activity of plants decreases, and the yield decreases. The maximum area of the leaf device is formed during the flowering period in all investigated varieties of different ripening groups.

Key words: potato, variety, direction of herbs, phase, area of leaves.

Palamarchuk V.D., Kovalenko O.A. Influence of foliar feeding on the level of introductive grain humidity of hybrids of grain corn

Purpose. The main purpose of our research was to study the effect of foliar feeding on the pre-harvest moisture content of corn hybrids of different groups of maturation and its moisture output in the conditions of the Central Right Bank Forest-Steppe.

Methods. In the course of our scientific work and the writing of the article, we used field, laboratory, statistical and computational and comparative research methods.

Results. We have found that the level of pre-harvest humidity with the lengthening of the length of the growing season is increasing. So, for example, in the group of early maturation maize hybrids, on average for three years of research, pre-harvest moisture content in grain was 22.97%, in the early-ripening – 25.57%, and in the medium-ripening – 25.85%. Humidity of the grain also depended on the genetic features of a particular hybrid. Thus, the moisture content of early-ripening corn hybrids, on average over three years, was 22.1–23.8%, medium-ripening hybrids – 23.7–27.5%, and the average-ripening of the hybrids – 24.8–27.8%. Conducting of foliar feeding provided a rise of the level of grain moisture at 0.47–3.27% in the early-ripening, by 0.8–4.2% in the middle-ripening and by 1.5–5.45% in the average-ripening hybrids com-

pared to control (without foliar feeding). Also the amount of grain moisture was influenced by the amount of foliar feeding. Thus in the course of one foliar feeding in the phase of 5–7 leaves of maize, the moisture content of the grain, on average over three years, was 22.2–27.6%, and in the case of two foliar feedings was from 22.5 to 28.7%.

Conclusions. Humidity of the grain significantly depended on the hybrid's group of ripening, with the extension of the growing duration season, the level of pre-harvest humidity also increased, and the highest value was obtained in the group of mid-late-ripening hybrids. Conducting of foliar feeding promotes to increase the pre-harvest moisture content of the grain.

Key words: corn, grain, foliar feeding, hybrid, grain moisture, micro fertilizer, plant growth regulator, bacterial preparation.

Pisarenko P.V., Kozyrev V.V., Bidnyna I.A., Shkoda E.A., Morozov A.V. Parameters of changes in the physical and chemical properties of dark chestnut irrigated soil under various meliorative loads.

The goal is to determine the changes in the physical and chemical properties of irrigated soil under various meliorative loads. **Methods:** field, analytical, computational-comparative, mathematical statistics. **Results.** The content of toxic salts in the composition of aqueous extract increased in all variants of the experiment by 0,38-0,87 times. However, in the system of long-term application of deep-dump soil tillage in crop rotation and differentiated treatment with application of fertilizers, a decrease in the solonetizing action of irrigation water was observed, where the smallest content was found – 0,065% in the 0-40 cm layer. **Conclusions.** The highest productivity was formed under a differentiated system with one splitting for rotation of crop rotation and with application of increased doses of fertilizers: maize – 14,51, sorghum – 8,58, wheat winter – 7,11, soybean – 4,49 t/ha.

Key words: chemical composition of water, doses of mineral fertilizers, systems of basic soil cultivation.

Timofeev M.M., Bondareva O.B., Vinyukov A.A., Uvarov N.L., Eleizarov I.Yu. The formation of biogenic means of production is the basis of the soil protection system of agriculture

Purpose. Determine the biogenic means of production in the conditions of the formation of the biogenic system of farming at the formation of sustainable agrobiocenoses. **Methods.** Research has been conducted since 2015 on the fields of the SE "EF "Zaboyshchik" DSASS of the NAAS of Ukraine" using certified and standardized in Ukraine methodologies and methodical recommendations. Mathematical processing of the research results was carried out in accordance with the methods of Dospehov B.A. The soil is chernozem, an ordinary weakly washed with a humus content of 3,44%, lunisol hydrolyzed nitrogen of 80 mg/kg, mobile phosphorus 124 mg/kg, exchangeable potassium 163 mg/kg. **Results.** In biogenic agriculture, prevention of soil degradation is achieved due to the mulcheplast, vertical drains and shrubby strips that will form across the slopes. When examining large fields of 300 ± 30 ha and EAS (ecological-agrochemical score) 41–60 with slopes in the range of 0 – 3°, it is determined that the most suitable areas under the mulcheplast are 9–16 hectares. They can have 3,2–2,4 t/ha of shrub mulch annually. Shrub strips should be formed as an anti-erosion scaffold in the form of parcels. A stable agrobiocenoses, where the erosion processes are completely eliminated, is the sowing of perennial grasses, where it is obligatory to chisel the soil between rows, with the embedding of plant mulch into drains to a depth of 10–40 cm. Among the crops, winter wheat is the best against erosion processes. After harvesting the crops of the continuous seeding method, it is important to create a temporary mulcheplast that prevents loss of moisture from the soil. It is predicted that under the biogenic system of agriculture there will be a new type of soil cultivation using plant residues. The crushed plant residues will be packed in vertical drains with a diameter of 5 cm to a depth of 10–40 cm, and will been strewed by crumbly soil from above. Plant residues as energy and trophic material will first be used by fungi and unicellular microorganisms, and then by various kinds of saprophagous. The entire biota, together with saprophagous, must be considered in the formation of sustainable agrobiocenoses as biogenic means of production. Based on the study of the agrochemical state of the lands of the SE "EF "Zaboyshchik", the formation of 4 types of agrobiocenosis is identified: the most productive lands with the EAS 55–60 will be occupied by perennial legumes (10–20%); for grain crops of a continuous method of sowing and temporary mulcheplast, will be employed 45–50% with EAS 50–60; for row crops with a constant mulcheplast, lands with slopes 1 – 3° and EAS 40 –50 will be allocated 30–35%; all land with the EAS less than 40 should go under the shrub plantations. **Conclusions.** Elimination of physical, chemical and biological degradation of chernozem soils is associated with such biogenic means of production as permanent and temporary mulcheplast, shrubby strips, vertical drains, saprophages, with an increasing the area under perennial bean grasses. Depending on the ecological-agrochemical score of the soil, 4 perspective constructions of stable agrobiocenoses have been identified.

Key words: soil degradation, biogenic system of agriculture, parcelling of large fields, mulcheplast, shrubby stripes, vertical drains, saprophagous, stable agrobiocenoses.

Vishnevsky S.P. Selection on the heterosis of the winter rape on the basis of cytoplasmic male sterility

Purpose. Creation of initial material for selection of winter rapeseed hybrids on the basis of cytoplasmic male sterility. **Methods.** Researches were conducted in selection crop rotation the Institute of forages and agriculture Podillia of the National Academy of Sciences of Ukraine. The soil behind the agronomic characteristic refers to gray podzolic, arable layer 0–30 cm, humus 2.0%. Selection materials were sort, hybrids, individual selection lines, collection samples of domestic and foreign selection. Were used 52 genotypes of winter rapeseed that were used in 2014–2016 as form pollinators from cytoplasmic male sterility. **Results.** Research from heterosis selection were carried out using winter rapeseed from cytoplasmic male sterility. The hybrids rapeseed winter, receipt on the basis of (CMS) are promising, they considerably surpass grades rapeseed productivity, stability and quality indicators of the production. So in 2016, with 25 hybrids, 17 hybrids exceeded the standard yield by 2 – 89%, and 13 exceeded the yield of the parental form by 2 – 104%. In 2016, the hybridization of 19 combinations with a sterile form was additionally performed. Also, the hybridization for the combinations of 2015 was repeated for the production of hybrid grains. Following the results of the tests of 2016, the best 7 combinations were sown in a hybrid nursery F1. Productivity ratings for the year 2017, in comparison with the yield of the parental form and the standard, have shown that rapeseed hybrids significantly exceed for the crop both the parent and the grade standard. In 2017 from 26 hybrids 22 surpass standard by 0,8-63% and 25 – surpass parental form by 0,8 – 59%. For results of bi-annual research we have such indicators in 2016 the total average yield

was 7.41 t / ha, that by 2,59 т / га higher than the standard. In 2017 year, these combinations had a common average yield of 6.58 t / ha, which is 1.80 t / ha higher than the standard. Ratings heterosis in winter rapeseed hybrids in the two years of observation is in the range of 65 – 71%, while for winter rapeseed hybrids the average indices parental heterosis is equal 50%. **Conclusion.** The advantage of hybrids F1 over varieties has been established, today the creation of heterotic winter rape hybrids is a priority in selection.

Key words: winter rape, hydrides, cytoplasmic male sterility (CMS), heterosis, seminal productivity, qualitative indices of oil.

Vozhegov S.G., Tsilinko N.I., Zorina A.G. Mathematical analysis of seed indicators of rice varieties of domestic breeding depending on the background of potassium fertilizer in the conditions of the South Ukraine.

Goal. Determine the effect of potassium fertilizers on the quality of seeds of rice varieties of domestic breeding and establish mathematical relationships between the studied indicators of productivity and quality. **Methods.** The research was conducted during 2016-2017 on the experimental fields of the DPDG Institute of Rice NAAS. The results of field studies and observations were processed using Excel and Statistica. For analysis of various characteristics of rice seeds, depending on the application of potassium fertilizers, a graphic method of visualization was used. **Results.** Using a graphical method for visualizing the variability diagrams of the Statistica program, a study was conducted to study the effect of potassium fertilizers, depending on the timing and doses of their introduction in different phases of the development of the rice varieties studied, on the quantitative and qualitative characteristics of the seeds. For each of the studied varieties Viscount, Premium, Ontario, variability diagrams are generated that allow to simulate and compare indicators of the structure of the crop of seeds, establish the dynamics of dependencies and the tightness of the correlation between different factors and the yield of varieties. **Conclusions.** The received results of researches testify to high sensitivity of all grades of rice to entering potash fertilizers. The highest yields, the number of grains from panicle, PGV, plant height, germination energy, similarity at the lowest characteristics of hollowness and fissuring had seeds of all varieties with background application of K_2SO_4 and double feeding in the tillering and tubing phases in doses of 30 kg/ha. The highest closeness of correlation at the level of 0.97 was established when modelling the productivity and quality parameters of seeds in the medium-ripened Ontario variety, in which, with the optimal fertilizer application scheme, the yield increased to 9.54 t/ha, and the length of the main panicle reached 15.5 cm. The worst quality was plant seeds on the control version without the introduction of potash fertilizers.

Key words: rice, variety, seeds, quality indicators, productivity, variability, correlation, modelling.

Vozhehova R. A., Bilyi V. M. Seeds productivity of varieties of the winter wheat of depending on the terms of sowing and fertilizer in the conditions of South Steppe of Ukraine

Purpose. To set influence of terms of sowing and system of fertilizer on seeds productivity of varieties of the winter wheat of domestic selection – Antonovka, Blago, Maria at growing on areas requiring irrigation in the conditions of South Steppe of Ukraine. **Methods.** Field, laboratory, dispersion. **Results.** It is proved, that under act of features of meteorological terms, in particular the amounts of precipitations, explored terms of sowing and background of feed, are marked substantial vibrations of seminal productivity of wheat of winter in a range from 3.67-4.15 t/ha in 2017 favourable at substantial (in 1.7-4.9 times) by the decline to 2.12-2.15 t/ha – at the deficit of precipitations and high temperatures of air in 2018. In addition, oscillation of force of influencing of the explored terms of sowing is marked on forming of seminal productivity with growth of their specific gravity at the high amount of atmospheric precipitates and, opposite, by the decline – in droughty weather terms. **Conclusions.** Most seminal productivity at the level of 4.3 t/ha was marked at sowing of the variety Antonovka in the third ten-day period October at complex application of mineral fertilizers in the dose $N_{30}R_{60}$ under basic treatment of soil, to treatment of seeds before sowing by preparation a «5 Element», and also additional fertilizing of sowing in the early spring period by the nitric fertilizer (N_{30}) is joint with explored microfertilizer. The analysis of variance allowed to set that maximal force of influence on seminal productivity of wheat of winter in experience at the level of 32.8% have the fertilizers. Influencing of terms of sowing and of high quality composition also has the ponderable value – according to 28.6 and 19.2 %. In addition, the high level of co-operation of the high quality composition and fertilizers is set – 5.9%.

Key words: variety, a winter wheat, seminal productivity, term of sowing, fertilizers, force of influencing of factor.

Kormosh S.M. levisticum officinalis l. in the conditions of Transcarpathia and assessment of adaptive ability of the source material for selection

Purpose. To assess the source material of lovage according to the complex of features, depending on changeable meteorological conditions, to establish the dependence between the characteristics, to select the best samples and involve them into the selection process.

Methods of investigations. The results are obtained on the bases of using the generally accepted methods and methodological designations in selection.

Results of investigations. The correlation connections between the amount of the formed stems, size of the leaf and output of the productive raw material had been established (r= -0,916; r= -0,869; r= -0,674); between the productive raw material output and the size of the leaf (r= 0,807; r= 0,674) and the plant's height, length of the leaf and raw material output (r= 0,582; r= 0,511), between the plant's mass and its height (r= 0,352).

The best samples: Redei (duration of vegetation -113 days, plant's mass and yield capacity -682,5 g and 27,3t/ha, content of dry matter -16,4%); MLL (duration of vegetation period – 116 days, plant's mass and crops – 707,5 g and 28,3 t/ha), Mriya (ascorbic acid content -22,0 mg/100g and essential oil – 0,93%) had been singled out.

Conclusions. Lovage growing in Transcarpathia is a perspective thing. The results of the investigations are implemented when creating the highly productive, resistant to the basic diseases and pests sort Coral.

Key words: samples, selection, vegetation period, characteristics, productivity, correlative connections, biologically active sources, essential oils.

Ushkarenko V.O., Chaban V.O., Kokovikhin S.V., Shepel A.V. Yields of the *Salvia sclarea* L. inflorescences, rationality of fertilizer application and the role of sowing dates for growing crops under drip irrigation

Purpose. The aim is to establish the yield levels of the *Salvia sclarea* L. inflorescences, the rationality of fertilizer application and the role of sowing dates for

growing crops under drip irrigation in the Southern Steppe of Ukraine.

Methods. Field research to improve the technolo-gy of growing the Salvia sclarea L. by using a drip irrigation system was conducted on the lands of PE "Diola" Beryslav district of Kherson region from 2011 to 2018 according to the methodology of the research case.

Results. The level of yield of the Salvia sclarea L. inflores-cences during harvest was stable for three years of use, on aver-age, for the first year it was 9.51, for the second - 9.38, the third - 9.69 t/ha. In general, we can conclude that in the second year of determina-tion conditions were created that formed the yield of the Salvia sclarea L. inflorescences with high rates in the first and second sowing dates and formed the content of essential oil 25-35% in plants in the variant with mineral fertilizers in the first year of life at a dose of N60P90. The efficiency of fertilizer application fluctu-ated significantly depending on the years of use, plowing depth and row spacing. In the first year of use, the maximum efficiency was ensured by: plowing to a depth of 20-22 cm, sowing in the first term and row spacing of 70 cm, with an increase in inflo-rescence yield at the level of 8.9 t/ha. In the sec-ond and third years, the advantage of plowing to a depth of 28-30 cm and row spacing of 45 cm was manifest ed. In the fourth year of use there was a significant decrease in the increase in yield of inflorescences from the application of fertilizers.

Conclusions. Reducing the doses of mineral ferti-lizers in the first year of life reduced the increase in yield with different depths of plowing and sowing dates of the Salvia sclarea L. The timing of sowing in cooperation with other studied factors significantly affected the yield of the Salvia sclarea L. inflores-cences. In the second and third years, the advantage of the first sowing period was preserved, as well as the advantage of deep plowing (by 28-30 cm) and expansion of row spacing to 70 cm, which provided an increase in yield by 4.8 t/ha. In the fourth year of use, the difference in yield increases of the Salvia sclarea L. inflorescences decreased significantly, but a posi-tive effect was recorded only during the first sowing period.

Key words: Salvia sclarea L., drip irrigation, nutri-tion background, tillage, sowing period, years of use, yield, share of impact, efficiency of fertilizer use.

Balashova H.S., Boiarkina L.V. Formation of econom-ic-value signs of superelite potato of spring perijd of plant-ing with drip irrigation in the South of Ukraine

The purpose of the article is to present the results of research on the impact of the use of a complex of macro- and microelements in different soil moisture conditions on the for-mation of economically valuable traits of potatoes under early harvesting. **Research objectives and methods**. To establish the effectiveness of using various irrigation rates and feeding potato plants when growing seed potatoes in spring planting and early harvesting. Two-factor field experience, carried out in 2014-2015. At the Institute of Irrigated Agriculture of the NAAS. **Research results**. In the early period of harvesting without irri-gation, 207.8 thousand units/ha of conditioned seed tubers were formed. Replenishment of 100 and 200 m³/ha of water consump-tion deficit ensured an increase in their quantity by 41.8 and 62.5 thousand units/ha, respectively, and also contributed to an increase in the productivity of one plant by 1 and 1.5 units/bush, respectively, and an increase in the weight of the conditioned plant seed tuber at 29.5 and 25.3 g. **Conclusions**. The study of the influence of moisture and nutrition conditions when growing seed potatoes on drip irrigation showed that the largest num-ber of conditioned seed tubers (284.7 thousand pieces/ha) was obtained as a result of treatment of potato tubers with Plantafol $N_{10}P_{54}K_{10}$ at a rate of 1 kg/t with a worker consumption solution of 20 l/t and when the deficit of water consumption is replenished by 200 m³/ha. The maximum number of conditioned seed tubers (6.8 pcs/bush) was recorded when the water consumption deficit was replenished by 200 m³/ha in two variants – without using a complex of macro- and microelements and when applying foliar feeding with Plantafol $N_{30}P_{10}K_{10}$ with a rate of 3 kg/ha and the consumption of the working solution is 250 l/ha for seedlings. Seed tubers with the largest mass (98.7 g) were obtained as a result of replenishing the water consumption deficit by 100 m³/ha, treating tubers with Plantafol $N_{10}P_{54}K_{10}$ at a rate of 1 kg/t with a working solution consumption of 20 l/t and feeding plants with Plantafol $N_{30}P_{10}K_{10}$ at a rate of 3 kg/ha with a working solution consumption of 250 l/ha for seedlings and in the budding phase with Plantafol $N_5P_{15}K_{45}$ at a rate of 3 kg/ha and a working solution consumption of 250 l/ha.

Key words: conditioned seed tubers, drip irrigation, Plantafol preparation, seed productivity of one plant, early harvesting.

Vozhegova R.A., Maliarchuk A.S., Kotelnikov D.I. Biologi-cal activity on winter wheat crops under different systems of basic cultivation and fertilization in the conditions of irri-gation of the south of Ukraine

The aim of the research was to establish the influence of dif-ferent systems of basic cultivation and fertilization on the activity indicators of soil microorganisms and its further influence on the yield of winter wheat.

Methods. During the experiment, field, quantitative-weight, visual, laboratory, calculation-comparative, mathematical-statis-tical methods and generally accepted in Ukraine methods and methodical recommendations were used. The research was conducted during 2009-2016 in the research fields of the Askani DSDS IZZ NAAS of Ukraine. **Results.** Studies have shown that the number of nitrifying and cellulose-destroying microorganisms at the beginning of the growing season at different depths without shelf treatment was the maximum in the experiment at the level of 10.56 and 1.96 thousand pieces. in 1 g of absolutely dry soil, which was practically at the level of the control variant. The decrease in depth in the system of permanent shallow tillage led to a decrease in average by 13%, and the smallest number of microorganisms was observed when sowing in directly uncultivated soil 8.96 and 1.68 thousand pieces. in 1 g of absolutely dry soil

Conclusion. The same level of yield was obtained for disk cultivation of 12-14 cm in the system of differentiated and shallow single-depth cultivation and chisel for 23-25 cm in the system of different-depth tillage 4.46 and 4.55 t / ha, with minimum values for shallow single-depth system and maximum for shelfless loos-ening at different depths and was practically at the control level of 4.54 t / ha. The lowest level of yield in the experiment was noted at zero tillage 3.88 t / ha, which is less by 0.66 t / ha or 16.9% compared to the control

Key words: irrigation, biological activity, tillage, yield, winter wheat.

Tishchenko A.V., Tishchenko O.D., Piliarska O.O. Seed productivity of alfalfa varieties depending on moisture con-ditions and growth regulators in the Southern Steppe of Ukraine

Goal. Identify the influence of moisture conditions and growth regulators on seed productivity of Unitro and Zoryana alfalfa vari-eties. **Methods.** The research was conducted at the Institute of Irrigated Agriculture (2012-2015) in a three-factor experiment with alfalfa varieties Unitro and Zoryana under drip irrigation and conditions of natural moisture and the use of growth regulators (Agrostimulin, Garth, Lucis and Emistim C). **Results.** Seed yield increases from the first year of life with grass to the second and it remains high in the third, regardless of moisture conditions. Under conditions of natural moisture, the yield was 154, 471, 235 kg / ha, and under drip irrigation - 207, 640, 538 kg / ha in the variety Zoryana. The use of growth regulators helped to increase seed yield 161-171, 479-492, 245-256 kg / ha without irrigation and 217-230, 653-668, 559-583 kg / ha under irrigation. The highest yields of 175, 497, 261 kg / ha and 236, 674, 594 kg / ha were obtained using the growth regulator Hart. The stud-ied factors had a significant impact on the accumulation of root mass. Drip irrigation contributed to its increase from 1.61 t / ha to and 2.03 t / ha in the variety Zoryana. Drugs Agrostimulin, Lucis, Emistim C and Garth showed a stimulating effect on the mass of the root system, most with drip irrigation, by age: Agrostimulin - 2.46; 5.36; 6.78 t / ha, Lucis - 2.50; 5.61; 7.05, Emistim C - 2.42; 5.28; 6.72 and Garth with maximum values - 2.53; 5.73; and 7.25 t / ha. Atmospheric nitrogen fixation rate also varies depending on growing conditions and years of grass life. Its increase occurred from the first to the second year of life. However, in the third year, in the variants without irrigation, nitrogen fixation in the control decreased from 131.94 kg / ha to 123.45 kg / ha, in the conditions of irrigation a small increase - from 193.86 to 200.84 kg / ha. A similar pattern was observed with the use of growth stimulants. **Conclusions.** The yield of conditioned alfalfa seeds of the first, second and third years of life depended on moisture conditions, variety and growth regulators. The use of plant growth regulators Agrostimulin, Lucis, Emistim C and Gart is an effective techno-logical measure that can increase the production of alfalfa seeds, the accumulation of root mass and biological nitrogen in the soil.

Key words: alfalfa, variety, seed productivity, root mass, fixation of atmospheric nitrogen, natural moisture, drip irrigation, growth regulators.