Summary

Vozhehova R.A., Biliy V.M. Dynamics of growth processes, yield and seed quality of winter wheat varieties depending on agronomic cultivation measures

The aim is to determine the influence of varietal composition, sowing dates and fertilizers on the dynamics of growth processes, yield levels and seed quality in the conditions of the Southern Steppe of Ukraine. **Methods.** Field, laboratory. **Results.** The field experiment proved the positive effect on germination and formation of the primary root system of the studied wheat varieties of winter pre-sowing seed treatment with microfertilizer "5 element". The studied indicator reached the maximum level in the third variant of fertilization with background application of mineral fertilizers and fertilization with the drug "5 Element" on varieties Antonovka - 86-87%. The height of plants in the phase of full ripeness of grain in fertilizers fertilized with microfertilizers was higher by 1.3-10.1 cm, compared with the control variant without basic fertilizer, seed treatment and fertilization. The highest plant height was with the application of microfertilizer "5 element", regardless of the time of sowing and variety of winter wheat. **Conclusions.** According to the results of the analysis of experimental data it was established that the highest seed productivity at the level of 4.3 t / ha was when sowing Antonovka variety in the third decade of October with complex application of mineral fertilizers at a dose of N30P60 for basic tillage, seed treatment before sowing "5 Element" , as well as fertilizing crops in the early spring with nitrogen fertilizer (N30) in combination with the studied microfertilizer. It was determined that a maximum of 1000 seeds of winter wheat - 46.7 g, was in the variety Maria for the third sowing period, background application of mineral fertilizers in combination with seed treatment and fertilization with microfertilizer "5 element". On the average for years of researches at the first term of sowing the investigated indicator for introduction of microfertilizers made in a grade Antonovka 32,2 g, Blago - 34,1, Maria - 39,3 g, and for the third term increased by 31,0, 24,6 and 15.7%, respectively. Laboratory germination of winter wheat seeds, depending on the variety, reached the highest level in the variant with the Maria variety - 93%. Sowing dates affected seed germination in such a way that early sowing in the second decade of September was less productive. The fifth variant of fertilizer application was the best, which provided for the treatment and fertilization of plants with the drug "5 element" - 95%, which compared to the control (C-1) - 87% increased germination by 8%.

Key words: winter wheat, seeds, variety, sowing period, fertilizers, germination, plant height, yield, seed quality.

Bazaliy V.V., Domyaratsky Ye.O., Kozlova O.P. Influence of biofungicides and growth stimulants on sunflower productivity and quality of oilseeds

The article presents the results of three years of field research in the conditions of the experimental field of the Kherson State Agrarian University School of Dentistry on determining the productivity of sunflower and the quality of the oilseed matter depending on the biological fungicides and plant growth stimulators.

Studies have shown that biofungicides increased the seed yield of sunflower hybrids by 8.7–10.2%, and in combination with growth promoters by 22.4–27.9%.

The use of biopreparations caused an increase in the content of fat in the achenes. In a combination of the addition of phytosporin with growth stimulants, the conditional yield of oil was 1.49–1.65 t / ha, which exceeded the control variant by 35–50%.

Key words: sunflower, growth stimulators, biofungicide, yield, oilseed.

Balashova G.S, Kotova E.I, Kotov B.S., Yuzyuk O.O. Influence of the nourishing environment on intensitivity of potato tuber formation of cultivars of different ripening groups in *in vitro* conditions

Purpose. Determine the optimal mode of potato cultivation *in vitro*, depending on the composition of nourishing environment and the cultivars of different ripening groups to increase the yield of the improved seed material. **Methods**: comprehensive use of laboratory, mathematical-statistical, computational-comparative methods and system analysis. **Results**. The experimental data on the effect of the composition of nourishing environment on the growth, development, and productivity of potato *in vitro* cultivars of different ripening groups are presented. **Conclusions**: Research has established optimal data on the productivity of cultivation in the context of each variety. So, for an early ripe variety, Tiras is growing it in a nourishing environment of the Institute of Potato Science NAAS. When growing the medium early potato variety Levada, the best results were obtained by cultivating on a nourishing environment a modification of the Institute of Irrigated Agriculture NAAS, and the intensity of tuberization of the middle ripe variety Yavir was high in all of the studied nourishing environment.

Key words: *in vitro* culture, seed material, microtuber, productivity, cultivation mode.

Balashova G.S, Yuzyuk O.O., Kotov B.S., Yuzyuk S.M. Economic efficiency of cultivation of seed potato varieties of different groups of ripeness

Purpose. Determination of yield and economic efficiency of growing seed potatoes of biological ripeness of different varieties under the action of growth regulators at different levels of mineral nutrition. **Methods**: field, laboratory, mathematical and statistical, computational and comparative methods and systems analysis. **Results**. Experimental data on the effect of mineral fertilizers, growth regulators on the economic efficiency of growing potato varieties are presented. **Conclusions.** The introduction of $N_{45}P_{45}K_{45}$ for growing three varieties of potatoes increases the conditional net profit by 64.9%, profitability – 42.0%, $N_{90}P_{90}K_{90}$ by 79.1 and 43.3%. Emistim C, Stimpo and Regoplant increase profitability by 10.1, 15.8% and 24.7% against the background of $N_{45}P_{45}K_{45}$.

The largest profits and the highest profitability for the Skarbnytsya variety were obtained in the variant with the introduction of $N_{45}P_{45}K_{45}$ and the processing by Regoplant (UAH 90 968 ha and 146.8%), for the Levada variety the same (UAH 92 713 and 149.2%), when making $N_{90}P_{90}K_{90}$ without treatment (95 545 and 145.0), with processing by Emistim (92 981 and 141,1); for Yavir variety – only when making $N_{90}P_{90}K_{90}$ without treatment (92 896 and 141.5) and with processing by Emistim (UAH 91 818 and 139.5%).

Key words: yield, seed productivity, mineral fertilizers, growth regulator, quality, conditionally net profit, profitability.

Bunchak O.M. Agri-ecological substantiation of oat growing depending on application of organic fertilizers, made according to the latest technologies.

Abstract. The purpose is to study the effects of organic fertilizers Biohrom, Bioactive, made by the method of accelerated biological fermentation and liquid organic fertilizer Biohrom - the cavitation method with a balanced content of trivalent chromium on the growth and development of plants and yield of oats of the Arkan variety in the conditions of the Western Forest-Steppe. **Methods.** Field and laboratory investigations were carried out in the conditions of the western forest-steppe during 2013–2017 at the experimental field of the Podilsky State Agrarian-Technical University. The soil of the experimental site - black earth is a typical heavy-granular granulometric composition. Farming machinery for oats is generally accepted for the conditions of the western forest-steppe of Ukraine. Concomitant studies and observations are performed according to generally accepted techniques. **Results.** It was established that in the version where 10 t / ha of organic fertilizer was introduced by «Bioproproms» and during vegetation, oats were sprayed with liquid organic fertilizer «Biohrom» at 5l / ha for the time of full seedlings, the amount of plants was 4.98 million / ha or 0.44 million hectares more than control, with field germination 90.5% or 7.9% more control. In this variant, for the period of harvest, the number of plants was the largest and was 4.62 million / ha or 0.63 million hectares more control. The average yield of grain during the years of the study was 3.84 t / ha, which is 1.31 t / ha more, the control and 0.18 t / ha more than in the variant where bioactive was injected at a dose of 10 t / ha and sprayed with a regulator of growth «Biochrom» 5 l / ha. **Conclusions**. Application of organic fertilizer «Bioprofrome» and liquid organic fertilizer «Biochrom» positively affects the growth and development of oats during the entire period of their vegetation, provides an increase in grain yield by 0,97-1,31 t / ha compared with the control and level of profitability growing 80.1%. Grain of high quality, environmentally friendly, with the content of the required amount of trivalent chromium.

Key words: «Bioproferm», «Biochrome», «Bioactive», photosynthesis, yield, efficiency.

Vlaschuk A.N., Shapar L.V., Misevich A.V., Konashchuk E.P., Drobit A.S. The effect of the terms of sowing and sowing rates on the structural indices of white melilot in the conditions of Southern Steppe of Ukraine.

The aim of the study. To determine the peculiarities of productivity and seed yield formation of white melilot in dependence on the terms of sowing and sowing rates in the conditions of Southern Steppe of Ukraine.

The methodology of the researches. The investigations were conducted on the dark-chestnut soil of the experimental field of the Institute of Irrigated Agriculture of NAAS in 2015–2017 with accordance to the common requirements to conduction of field experiments by the PSI 22 «Scientific bases of production, storage and use of forage for obtaining competitive products of animal husbandry («Forages and forage protein»).

Results. By the results of the study, it was established that the maximum index of plant density of the crop at the time of harvesting was 184,7 plants per m^2 under the sowing in the 1st decade of April.

In average for the period of 2015–2017, high yielding index – 876,6 kg per ha was obtained at the sowing in the 1st decade of April with the rate of 2,5 million per ha.

It was fixed that high seed yield and best structural indices of white melilot variety Pivdennyi were obtained at the sowing in the 1st decade of April with the rate of 2,5 million per ha. In 2015, the maximum seed yield of white melilot variety Pivdennyi was 1130 kg per ha at the sowing in the 1st decade of April with the rate of 2,5 million per ha.

Conclusions. In the conditions of Southern Steppe of Ukraine seed yield of white melilot mainly relied on the weather conditions, terms of sowing and sowing rates. The maximum seed yield and best structural parameters of the plants were obtained at the sowing in the 1st decade of April with the rate of 2,5 million per ha. An increased sowing rate up to 3,5 million per ha did not provide the formation of structural elements and raise of the seed yield. The determined correlation dependence between the structural indices and seed yield of white melilot points on the effect of the factor on the formation of plants productivity and further change of the seed yield.

In average for the investigations of the period of 2015–2017 it was established that, from the biological point of view, the best term of sowing for white melilot in the conditions of Southern Steppe of Ukraine is the 1st decade of April with the rate of 2,5 million per ha.

Key words: term of sowing, sowing rate, seeds, white melilot, yield, factor.

Vozhegov S.G., Tsilinko N.I., Kazanok A.A., Shepel A.V., Zorina A.G. Economic and energy estimation of growing of seeds of modern rice varieties

Goal. To conduct an economic and energy assessment of the production of rice varieties of domestic selection in the context of the categories of seeds, depending on the use of different doses of potassium fertilizers. **Methods.** Field, economic, energy. **Results.** Using IS tools in accordance with the relevant methods, we have calculated, compared and visualized the indicators of economic and bioenergy efficiency of domestic rice production in terms of seed categories, as well as depending on the doses of potassium fertilizers at different stages of the plant growth cycle during 2016–2017 years of research.

Conclusions The results of our research in 2016 showed the highest net income, the level of profitability and cost recovery in the breeding nursery category (BN) for all studied varieties, the most profitable among the varieties was the Viscount. The economic evaluation of K_2SO_4 application in 2017 on crop rice showed the most effective result in variants where the potassium fertilizers were used prior to sowing, and additionally in the planting phase at the dose of 30 kg/ha for all varieties, the most cost–effective was the Ontario variety. The highest incomes, increases in the energy of harvest of 2016 rice varieties were obtained in the category of BN seeded varieties, in 2017 there was a decrease in all energy efficiency indicators compared with 2016, the increase in energy was the highest for Viscont and Premium in the BN category, and for the Ukraine–96 – in the category Super-elite. The costs of energy and energy consumption of the products in 2017 increased compared to 2016 in all categories of seeds of all varieties, especially in the category of certified seed.

Key words: rice, category of varieties, seeds, profitability, energy growth, energy consumption.

Vozhegova R.A., Borovik V.O., Marchenko T.Y., Bidnina I.O., Rubtsov D.K. Analysis of the level of agrophytocenosis perturbation of seed soybean crops under the influence of different densities and doeses of nitrogen fertilizer

The purpose: to analyze the level of agrophytocenoses' prevalence of medium-grade varieties of soybean Sviatogor under the influence of plant density on the background of various doses of nitrogen nutrition.

Methods: the laboratorial, field, statistical. **Results.** Increase in the density of sowing of soybean meal of Svyatogor to 600 thousand. pcs./ha contributed to a decrease in the number of weeds in an unapproved background by 20,00%, with the introduction of N30 at 16,20% and at N_{60} - by 25,95%; Crude mass, respectively, at 37,20, 30,43 and 29,49% respectively. Further densification of agrophytocenoses

from 600 to 900 thousand plants / ha affected the reduction of weeds in the range of 2,02, 5,93, 6,03%, and their crude mass - by 60,54, 51,61, 50,86%, respectively. The maximum seed seeding rate is 900 thousand. pp./ha increased the competitiveness of soybean plants and decreased the quantitative contamination by 60.59%, and the weed weight decreased by 50,86%. Seeds of the variety Svyatogor on an option with a density of plant standing 300 thousand pcs / ha without fertilizers were less clogged than on the background of the N_{30} and N_{60}, both in terms of the ratio and the raw mass of weed plants. Against the background of fertilizers, with the increase in plant density per unit area, a decrease was also observed in the quantitative and weight ratio of sown contamination. So, against the background of the N_{30}, with an increase in plant density from 600 to 900 thousand. /ha the number of weeds decreased from 1,97 to 6,37 pcs./m^2, and their crude mass - from 30,43 to 51,61%, compared with a density of 300 thousand. plants / ha. The introduction of the N60 also shows a decrease in the level of contamination with an increase in the plant density per hectare (from 3,97 to 9,27 pcs./m^2). The general study in this study was that the maximum plant density of 900 thousand pounds per hectare greatly increased the competitiveness of soybeans Varieties of Svyatogor: the number of weeds on the background of N_{30} and N_{60} was less by 42,59–60,59%, and the crude weight - in the range of 25,10–25,70%, compared with the lowest density of 300 thousand plants /ha. The effect on the clogging of soybean crops had a plant density of 55,2%, much less nitrogen rhenium – 4,2% and the mutual effect of the density of sowing and fertilization – 8,2%. **Conclusions**. With a maximum density of soybean herbs of Svyatogor - 900 thousand p./ha there was a significant oppression of weeds, compared with a density of 300 thousand plants / ha in both quantitative and weight proportions. The effect of this factor on the clogging of sowing was 55.2%.

With the application of nitrogen fertilizers, the number of weed plants and their mass were large (when using N_{30} - 10.3-5.93 and N_{60}-11.33-6.03 units/m^2) than in the cases where no fertilizer was introduced (4.12-2.02 pc/m^2), regardless of the soybean density.

Key words: soybean, irrigation, density of plants standing, doses of nitrogen fertilizers.

Vozhegova R.A., Vlaschuk A.N., Drobit A.S., Vlaschuk O.A. Economic and energetic efficiency of growing white one-year clover, depending on agrotechnical measures in the conditions of southern Ukraine

Purpose. To establish the influence of the width between the rows and the dose of applying nitrogen fertilizers on the economic and energetic efficiency of growing different varieties of white one-year clover in the conditions of southern Ukraine.

Methods. The studies were conducted during 2016–2018 on dark chestnut soils in the conditions of the experimental field of the Institute of irrigated agriculture NAAS, located in southern Ukraine. Planning and research was carried out according to generally accepted methods of conducting field experience, methodical recommendations and manuals.

Results. The highest value of gross output from 1 hectare – 55600 UAH/ha with the lowest cost – 21174 UAH was obtained on crops of white one-year variety Pivdenny when sowing with a width of 45 cm between rows and a dose of nitrogen fertilizer N_{60}. The level of profitability was high and amounted to 372,0%. The highest energy costs per hectare in the experiment were established on the variant using the Pivdenny variety, which were sown with a width of 45 cm between rows and applied nitrogen fertilizer in the amount of 90 kg to 12,84 GJ/ha. At the same time, in this variant, when nitrogen fertilizer is applied in the amount of 60 kg, the highest energy input is set with a yield of 15,10 GJ/ha, which is more compared to the figures for the Donetsk variety by 14,0%.

Conclusions. The analysis of the economic and energetic efficiency of the experimental options makes it possible to say that the cultivation of white one-year white variety Pivdenny is most appropriate when sown with a row spacing of 45 cm and a dose of applying nitrogen fertilizer N_{60}. In this variant, we received the maximum conditionally net profit – 43827 UAH/ha, the lowest cost price of seeds – 21174 UAH/t, a high level of profitability – 37,2% and the maximum energy input with the crop – 15,10 GJ/ha.

Key words: cultivar, row spacing, nitrogen fertilizer dose, seeds, one-year white clover, profitability.

Vozhehova R.A., Zaiets S.O., Kysil L.B. Economic evaluation of cultivation efficiency of modern winter barley varieties at different terms of sowing and application of growth regulators

Aim. To determine the maximum economic effect of cultivation of modern varieties of winter barley at the irrigated lands in dependence on terms of sowing and treatment of the seeds and plants with growth regulators Humifild Forte bricks, MIR and PROLIS. **Methods.** The study was carried out in the Institute of Irrigated Agriculture NAAS using the methods of field and laboratory investigations at the irrigated lands (IZZ NAAS, 2014). **Results**. It was determined that application of growth regulators causes the increase in yields of the both studied varieties of winter barley comparatively to the control variants. The highest yield of variety Deviatyi val, which averaged to 7.19 t/ha, was obtained at sowing on the 1st of October under the treatment of seeds with biological preparation MIR, and of variety Akademichnyi of 7.05 t/ha under the treatment with Humifild preparation. At sowing on the 20th of October the both varieties provided the highest yield under the treatmnet of the seeds with Humifild preparation – 6.32 t/ha (Deviatyi val) and 5.62 t/ha (Akademichnyi). An average increase of the yield of Akademichnyi variety due to the application of the growth regulators was – 0.29 t/ha at sowing on the 1st of October, and 0.35 t/ha – at sowing on the 20th of October. However, higher increases of the grain yield due to the application of the growth regulators were obtained for variety Deviatyi val that averaged to 0.37 t/ha and 0.43 t/ha. This in turn significantly covers additional expenditures and positively affects on all economic indexes. The biggest conditionally pure profit (19678 UAH/ha) was provided by variety Deviatyi val at sowing on the 1st of October under the treatment of the seeds with MIR preparation, and variety Akademichnyi provided getting of 18822 UAH/ha under the treatment of its seeds with Humifild Forte bricks preparation. This is by 2804 and 2237 UAH/ha higher than on the variants without them. **Conclusions.** The highest economic efficiency of winter barley cultivation in the conditions of the South Steppe of Ukraine is provided by sowing on the 1st of October under the treatment of the seeds of Deviatyi val variety with MIR preparation, and with Humifild Forte bricks preparation of the seeds of Akademichnyi variety. This provides formation of the grain yield of Deviatyi val variety at the level of 7.19 t/ha, obtaining of 19678 UAH/ha of conditionally pure profit under the profitability level of 99% and production cost of 2750 UAH/t, and for Akademichnyi variety the above-mentioned indexes are – 7.05 t/ha, 18822 UAH/ha, 94% and 2826 UAH/t, respectively.

Key words: economic efficiency, winter barley, varieties, sowing terms, growth regulators, yield, profitability.

Vozhegova R.A., Kokovikhin S.V., Zaiets S.O., Netis V.I., Onufran L.I. Efficiency of using solar energy on soybean crops in irrigation conditions in the south of Ukraine

Purpose. To study the effect of varieties, nutrition background and norms of seeding on the uptake and use by soybean crops solar energy and to determine measures of the formation crops with a high level of energy use of PAR in conditions of irrigation. **Methods:** field, laboratory, analytical. **Results.** The uptake and utilization of photosynthetic active radiation (PAR) by the soybean crop significantly depends on the variety, nutrition background and norms, which gives the possibility to adjust their sizes. Absorption of PAR is closely dependent on the seeding rate and leaf area r=0,86–0,94. The maximum absorption of PAR by a crop of soybeans is 83–86% of the leaf area 42–46 thousand m^2/ha, and the increase ceases to improve the absorption coefficient. A significant part of the PAR is reflected from crops (9,6–13,0%), passes to the ground (3,2–18,7%) and used by plants. The best conditions for the absorption of solar energy by crops soybean varieties Aratta and Sophia was at the seeding rate of 600 thousand/ha and seed inoculation. The formation of the soybean crop was used to 2.44 was 3.42% PAR from the one that was supplied to the crops. Between the value of CPD_{PAR} and soybean yields there is a strong correlation – r=0,81. More efficient solar energy used crop varieties Sofia – 2,71–3,42%, and grade Aratta – 2,44–3,38%. **Conclusions.** The best conditions for absorption and efficient use of solar energy by crops soybean varieties Sofia was at the seeding rate of 600 thousand seeds per 1 ha and background power $N_{30}P_{40}$+inoculation of seed, and varieties Aratta for seed inoculation and seeding rate of 600 thousand/ha.

Key words: soybean, solar energy, absorption of PAR, variety, seeding rate, nutrition background.

Vozhegova R.A., Krivenko A.I. Productivity and energy efficiency of the cultivation of winter crops

Purpose. To investigate the parameters of energy efficiency of the biologized technology of growing winter crops in the conditions of the Southern Steppe of Ukraine. **Methods:** field, analytical, computational and comparative. **Results.** According to the results of summarizing the long-term field research data, it has been proved that the energy efficiency of the biologized technology of growing winter grain crops significantly depends on the influence of the main agricultural methods: the formation of crop rotation with various predecessors, basic tillage, mineral nutrition background, sowing dates, fertilizing with nitrogen fertilizers, biological preparations and microelements in different phases of plant development. **Findings.** It has been established that with the use of shallow basic tillage, the energy increase increased to 26.1 GJ / ha, and the energy ratio was 2.20. In the experiment on setting the optimal background of mineral nutrition, it was found that energy consumption was directly dependent on the costs of nitrogen, phosphorus and potash with a tendency to increase to 37.1–39.4 GJ / ha in the variants with the largest doses of fertilizers. The maximum indicators of energy growth of 60.6 GJ / ha and an energy ratio of 3.31 were obtained in the variant with winter wheat sowing on October 5, and the worst energy indicators and the growth of energy intensity of products at 7.25 GJ / t was in the fourth planting period on October 25. When growing winter barley, annual sowing dates showed a tendency to decrease in the energy input with the crop when going from sowing from September 25 to October 25. From the energy point of view, the option with the application of mineral fertilizers a dose of $N_{64}P_{64}K_{64}$ and the maximum scheme for fertilizing bio fertilizers turned out to be optimal. The highest energy ratio of 2.00–2.05 is obtained on the variants with the application of mineral fertilizers a dose of $N_{32}P_{32}K_{32}$, as well as foliar feeding with Humatal nano and Azotofit biologics.

Key words: winter wheat, winter barley, predecessor, tillage, fertilizers, sowing time, energy indicators.

Gamayunova V.V., Panfilova A.V. Water regime of the soil on spring barley (Hordeum vulgare L.) crops in the conditions of the Southern Steppe of Ukraine

The **purpose** of the study was to determine the influence of agrometeorological conditions of the year at the cultivation, accumulation and consumption of productive moisture of the soil and the formation of yield of barley grain in the conditions of the Southern Steppe of Ukraine. **Material and methods**. The results of researches carried out during 2013–2017 in the conditions of the educational-scientific-practical center of the Mykolaiv NAU in the sothern black soils. **Results.** It was found that somewhat more intensely moisture from the soil used barley plants of the Aenei variety. At the same time, on average, over the years of research and on the factor of nutrition, the grain of this variety was 3.36 t / ha, which exceeded the yield of Stalker and Adat varieties by 6.7–10.5%. **Conclusions.** The main amount of moisture in the meter layer of soil under barley is accumulated in the autumn-winter period and the largest value of its reserves, on average, over the years of research 68.1 mm, was reached in the early spring before sowing culture. At the same time, the nutrition options for the accumulation and use of moisture from the ground have had almost no effect.

Key words: spring barley, variety, plant nutrition, rhegulatory preparations, air temperature, precipitation, productive moisture reserves.

Grabovskyi M.B., Grabovska T.O., Gorodetskyi O.S., Kyrilo V.L. Formation of corn production on silage depending on the background of mineral nutrition

The results of corn research on silage at different levels of fertilization are given. **Purpose.** The aim of the research to study the formation of elements of the structure of yield corn depending on the mineral nutrition. Field experiments were carried out in 2011-2014 under conditions of the experimental field of the Bila Tserkva National Agrarian University. **Results.** The yield of green and dry maize depends on the level of mineral nutrition, as well as the weather conditions of the growing season. Mineral fertilizers influence the improvement of the structural parameters of the maize due to the growth of the proportion of stems and cobs in the total mass of plants. Application of fertilizers provided growth of green mass of corn plants at 9,8–22,1%, and dry on 7,7–19,2%, as compared to the non-fertilized variant. **Conclusions.** Use of mineral fertilizers in a dose of $N_{100}P_{80}K_{80}$ allows the yield of the green and dry mass corn – 50.1 and 14.6 t / ha, which is higher by 18.8 and 5.1 t / ha compared with the control.

Key words: mineral fertilizers, corn, hybrid, crop structure, green mass, dry matter.

Hranovska L.M., Zhuzha P.V. Scientific substantiation of the renewal of forest belts along the Kakhovka main canal

Aim. Analysis of current state of the forest belts along the Kakhovka main canal, scientific substantiation of necessity of their renewal and schemes of reconstruction and planting. **Methodology.** Analysis of current state of the forest belts was conducted by the method of visual investigation. Land survey was conducted at the chosen typical plots. Within each plot morphological features of soil profile were studied, boarders of spreading of typical by the

soil characteristics plots were defined; soil samples for analysis of physical and chemical properties were taken. **Results.** Soils along the highway of the canal are classified as technogenic, which were artificially created at the expense of covering the surface with gley horizon of humus layer at the time of the canal building. Total content of humus in the one metre layer of the soil changes from 0.77 to 1.77%. Efficiency and longevity of the forest belts along the canal depends on the right choice of trees and bushes' breeds, which have to be long-lived, grow fast and they have to be characterized with an upper-intermediate feature of closing tree crowns, provide shading of soil and water surface of the canal. We propose following construction of the canal forest belts: along the edge berms of left and right banks of the canal four-row forest belts are placed. The forest belts consist of two rows of trees of forest breeds of the first size mixed with nut and fruit trees, two rows of berry shrubs are placed along the edges. Distances between the trees in the rows are 1.0−1.5 m, distance between the shrubs − 0.75 m. Intervals between the rows −2 m. Along the inner berms of the canal two-three-row forest belts, which are penetrable for wind, without or with shrubs in dependence on the dimensions of the berm are placed. **Conclusions**. In general state of the forest belts along the highway of the Kakhovka main canal is unsatisfactory. The results of the investigation determined that nearly 10% of the forest belts should be repaired, 30% are in unsatisfactory condition and should be rooted out and replaced by new trees, 60% of the canal length has almost no forest belts. At the current state the forest belts do not provide protective functions. Renovated forest belts should be cultivated in the irrigated conditions during 4–5 years with the irrigation norm of 500 m3 / ha (5−7 water applications) in the year of planting, and 600 m³ / ha (4−5 water applications) in the next years.

Key words: the Kakhovka irrigation canal, forest belts, land survey, technogenic soils, berms of the canal, irrigation.

Dymov O.M., Boyarkina L.V. The method of correlation and regression analysis as a tool for assessing the effectiveness of technologies for growing crops on irrigated lands

Purpose. To consider the developed set of correlation and regression models as one of the tools for assessing the effectiveness of technologies for growing crops on irrigated lands. **Methods.** System analysis, factor analysis, comparative analysis, statistical analysis, computational, graphical, abstract-logical. **Results.** The method of calculation and optimization of resource costs in the cultivation of crops on irrigated lands, presented in the conceptual model, which consists of interrelated elements – blocks and flows of incoming and outgoing information and a set of graphic and mathematical models. To optimize the cost of resources for the use of innovative technologies and methods of irrigation is proposed to use a multi-criteria approach, which as a criterion of optimality to take economic; economical and environmentally friendly. Quantitative characteristics of these dependences can be obtained by the method of multiple regression analysis. Correlation and regression models are developed by the expression of these relations. Given the dependence of the yield of winter wheat against complex of factors of cultivation under irrigation by overhead irrigation. There calculated the cost of resources per unit area and production in the cultivation of winter wheat at optimal values of irrigation rates and doses of mineral fertilizers. **Conclusions.** The complex of correlation and regression models developed as a result of the research makes it possible to calculate the density of the relationship between the factors of production and the efficiency of crop production technologies in irrigation, to identify the impact of these factors on the result of the activities of agricultural enterprises and to calculate the quantitative characteristics of the dependence at different levels of management.

Key words: resources, expenses, optimality criteria, yield, profit, graphic and mathematical models.

Dudchenko K.V., Petrenko T.N., Datsyuk M.M., Flinta O.I. Soybean growing impact on salt balance of rice crop rotation soil

Porpoise. Determination of soybean growing impact on salt balance of rice irrigation systems soil. **Methods.** Field experiment, laboratory experiment, comparative method, analytical method. **Results.** Soybean growing in rice irrigation systems causes to soil demineralization – 1,37 t / ha on meadow-chestnut saline soil, 6,02 t / ha on meadow alkaline soil. **Conclusions.** Soybean growing in rice irrigation systems causes to soil desalinization to 4,75–16,01%. Soil demineralization process intensity depends of groundwater regime. Soybean growing in rice irrigation systems causes to changing sodium chloride to magnesium sulfate in soil layer 0–100 cm. Toxic salts, in particular soda, sodium carbonate and magnesium chloride appear in soil layer 100–200 cm.

Key words: meadow-chestnut saline soil, meadow alkaline soil, salt balance, groundwater, rice irrigation system, soybean.

Zaiets' S.O., Dymov O.M., Fundyrat C.S. Seed yield and economic efficiency of growing the winter triticale depending on macro- and micro fertilizers in irrigated conditions of the Southern Steppe

Purpose. The aim was to study the peculiarities formation of seed productivity of the winter triticale, depending on macro- and micro fertilizers, and their economic expediency in growing under irrigated conditions in the Southern Steppe. **Methods.** The research was conducted in 2013/14–2015/16 at the Institute of Irrigated Agriculture of the National Academy of Agrarian Sciences in the Ingulets Irrigated Array, in accordance with existing field and laboratory methods. **Results.** In the application of the early spring-feed N_{30}–N_{60} (ammonium nitrate or urea ammonia mixture (UAM)) on the background of $N_{60}P_{60}$, the winter triticale formed seed yield of 5,04–5,24 t / ha, conditionally net profit at the same time was within 18 396–19 957 UAH / ha and the profitability level 80–97%, which corresponds to 1,18–1,38 t / ha of grain, 6 152–7 713 UAH / ha and 14–31% more than in the control. It should be noted that the highest yield is formed in variants with the norm of fertilizers N_{60}, and the best economic indicators observed at N_{30}. Comparing types of fertilizers, the more economically efficient indicators and yield were when using UAM. Application of micro fertilizers on the background of the N_{60} allowed to obtain 4,46–4,88 t / ha of seeds, conditionally net profit within 20 018–22 603 UAH / ha and the profitability rate of 126–138%, which is more than on the control on 0,53–0,95 t / ha, 4 084–6 669 UAH / ha and 23–35%. **Conclusions.** It is economically expedient to use macro- and micro fertilizers on seminal sowing of the winter triticale Bogodarske in irrigated conditions of the Southern Steppe. When $N_{60}P_{60}$ is introduced under the basic tillage and early spring fertilization of crops with a urea ammonia mixture of 30 kg / ha a.m. got 5,09 t / ha of seeds with the best rates of economic efficiency – net profit was 19 957 UAH / ha, profitability level 97% and the prime cost of 4 374 UAH / t seed. When N_{60} nitrogen fertilizers were applied for pre-sowing cultivation and replenishment at the end of the planting phase with micronutrient fertilizing Nanovit micro (2l / ha), 4,88 t / ha of seed yield were formed, while the share-net profit amounted 22 603 UAH / ha per the level of profitability of 138% and the prime cost of production 3 442 UAH/t.

Key words: seed productive, economic expedient, fertilizers, profit, level of profitability, prime cost.

Zubov A.O. Evaluation of erosional soil degradation factors on the example of the Donbass region

Purpose. To analyze the impact of share of plowed up agricultural lands of Ukraine and other factors on the share of its eroded lands. **Methods.** The studies were performed on the example of the Luhansk region, which is the most eroded in Ukraine. Mathematical-statistical and correlation-regression analyzes of data on the share of plowed up agricultural lands, of erodibility of arable land and their distribution along the steepness of the slopes in the context of administrative regions were performed. **Results.** The sequence of obligatory stages of checking the initial data is demonstrated, which confirmed their reliability and adequacy of the mathematical models which were obtained from them. It has been established that more than 50% of the effect on soil erosion is exerted by the share of arable land on slopes with a steepness of more than 1°. With the increase of part of plowed up lands, this share decreases, as well as the share of eroded arable land decreases too. **Conclusions.** The erosion of arable land is influenced not by the degree of tillage of farmland, but by plowing up of sloping lands. The resulting dependence of the erosion of arable land on the share of land with a steepness of more than 1° will be supplemented by an analysis of the role of other factors.

Key words: slope lands, slope steepness, arable lands, eroded soil.

Kapinos M.V. Productivity and quality of pea varieties depending on seed inoculation in the conditions of the Southern Steppe of Ukraine

Currently, an important area of sustainable development of crop production in Ukraine is the creation of highly productive agrophytocenoses of crops, including peas, which are fully capable of using natural and climatic resources and solve economic and ecological and reclamation problems of modern agriculture. **Purpose.** The goal is to establish the yield and quality of the grain of peas in non-irrigated conditions of the Southern Steppe of Ukraine, depending on the variety composition and use of plant growth regulators. **Methods.** The studies were conducted on the experimental field of the Research Institute of Agricultural Technologies and Ecology of the Tauride State Agrotechnological University during 2015-2017 two-factor experience. The experiments laid and processed the obtained results using special techniques and experimental techniques. **Results.** It was proved that the maximum yield of peas was formed on the Variety of Deviz during seed treatment before sowing biological products AKM and Rizobofit with grain yields of up to 3.01 t/ha. Also, the Deviz variety was the best on average for Factor A, since it ensured a yield of 2.83 t/ha, while in the Glyans and Otaman varieties it decreased in accordance with 2.50-2.77 t/ha or 2.2-13.2%. **Findings.** According to the variants of seed inoculation, the maximum yield - 2.88 t / ha, was formed with the simultaneous use of biological products AKM and Rizobofit. Analysis of variance revealed the absolute advantage of influencing the yield of plant peas - plant growth regulators - 53.0%, varietal composition accounts for 35.0%, and the interaction of factors is 5.9%. On average, the weight of 1000 grains depended weakly on plant growth regulators. Of all the varieties, the Otaman variety with the lowest values 212 g in 2016, 215 g in 2017 and 223 g in 2015 shows the worst performance in terms of this indicator. Achieved on the Deviz variety and the integrated use of AKM and Rizobofit.

Key words: sowing peas, variety, seed inoculation, productivity, variability of productive traits, grain quality.

Kobylina N.O., Luta Yu.O., Bondarenko K.O. The efficiency of gamete selection methods of tomato in the creation of a new source selection material

The purpose of the research is to create the source material of tomato, maximally adapted to local conditions of cultivation by using the method of selection at the level of gametophytes.

Methods. Complex use of selection method at gametophyte level and field experiments.

Research results. It was established that more viable pollen (62–74% of live pollen grains) had samples taken from plants Red Skay F1, Primula and Laguna.

The most sensitive to the treatment with a temperature of + 57° C was the pollen of the Primula, Laguna, Red Skay F1 hybrids and lines (Titan x Schyt) x Rio Fuego and Peto 86 x. The beginner, the reduction of viable pollen grains in comparison to control was 19–25%. Less sensitive was pollen of Anaconda, Jubilee, Cimmerian, Inguletskiy, and hybrids Uno Rosso F1, Brixol F1, reduction of viable pollen grains in comparison to control was 12–18%.

Treatment with temperature of the parental forms' pollen influenced the fruit setting of tomato plants. The maximum number of fruits were set under the pollination with the warmed pollen, was obtained in combinations Naddnipryanskiy 1 x Primula (58%), Naddnipryanskiy 1 x Laguna (60%), Inguletskiy x Primula (54%), and others.

The highest number of seeds per 1 fruit was in the hybrid combinations of Lehin x Primula (40 pcs.), Lehin x Red Skay F1 (33 pcs.), Lehin x Uno Rosso F1 (35 pcs.), Lehin x Laguna (36 pcs.), Lehin x Anaconda (20 pcs.), Lehin x Inguletskiy (19 pcs.), Kumach x Jubilee (21 pcs.), Kumach x Kimmeriyets (21 pcs.), Kumach x [(Titan x Schyt) x Rio Fuego] (20 pcs.), Kumach x (Peto 86 x Novice) (26 pcs.).

Conclusions. It was established that treatment of pollen of different tomato breeding samples with the temperature of + 57° C effects the viability of their male gametophytes in different ways. The temperature treatment of the parental forms pollen effects the setting of fruits and the formation of tomato seeds after the pollination with the pollen, which was treated with high temperatures (+ 57 C). Thus, as a result of the research, the source material of tomato was created by the method of selection at the level of gametophytes, which is resistant to the extreme conditions of the South.

Key words: tomato, source material, selection, male gametophyte, pollination, fruit setting.

Kolisnik O.M. Creation of common hybrides of maize with different resistance to diseases and pests summary

The purpose of the work was to develop and identify self-pollinated lines for resistance to major diseases and pests, to identify the determinants for the development of the principles of selecting parental pairs in creating corn hybrids resistant to the complex of entomo- and phytopathogens adapted to the conditions of the forest-steppe of right-bank Ukraine.

The results of the gradation grouping show that among the self-pollinated lines of the working collection 28.0% had a high, 50.0% average and 22.0% - low yields. While simple hybrids were characterized by the fact that 10.5% of them belonged to the group with high yields, 54.6% - to the average, and 34.9% - to the low-yielding. Taking into account that among these 10.5% hybrid combinations with yields above 5.5 t / ha, hybrid combinations with complex resistance to diseases and pests are present on the basis of our self-pollinated donor lines of resistance to entomo- and

phytopathogens, points to the confirmation of the principles we set ourselves for the selection of parental couples. The most uniform distribution was recorded for damage to the corn butterfly, with a high resistance to which 42.0% of self-pollinated lines and 29.1% of simple hybrids were characterized.

The determined sources of stability for the correlation analysis confirmed their overall efficiency in hybrid combinations. Outlined self-pollinated lines that are considered valuable and perspective from a position of further use in breeding practice for the establishment of entomotomy and phytopathogenic resistant are recommended for future study and use.

The conducted research has become the basis for the development of practical recommendations and the improvement of the method for determining the resistance of corn plants to pathogens of flying and corn smut.

Keywords: corn, self-sawing lines, head and corn smut, assessment of sustainability, group of ripeness, selection.

Kostrya I.V., Ostapenko M.A., Bilozor I.V. Peculiarities of the winter wheat winter period and its yield, depending on the agrotechnical measures in growing under the conditions of the Prisivash

Results. The interrelation of meteorological factors with the state of winter wheat crops during the winter period under conditions of global warming is investigated. The stable tendency of weather conditions changes in the direction of temperature regime increase in the winter months in the Prisivash region, reduction of the winter period and improvement of vegetation conditions of winter wheat plants are determined. The influence of predecessors and methods of sowing on the depth of freezing of the soil, the formation of snow cover height, changes in the minimum temperature at the depth of the nesting plant and the extinction of winter wheat plants have been established, which makes it possible, through optimal combination of agronomic measures, to improve the conditions of hibernation of winter crops. The search for optimization of agro-preserves (precursors, mineral fertilizers and seeding methods) was carried out to obtain a high, economically justified yield of winter wheat in conditions of the Southern Steppe of Ukraine.

Key words: winter wheat, mineral fertilizers, black pairs predators, grain sorghum, sunflower, direct sowing, yield, depth of freezing of the soil, winter period of plant dying.

Krentsiv Ya.I. Influence of weather conditions of growing year on the variability of plant height of collection soybean varieties

Purpose. The purpose of our research was to determine the effect of weather conditions on the change in the height of soybean plants. **Methods.** Field, laboratory, visual, mathematical and statistical. **Results.** The article presents the results of studies on the influence of weather conditions on the change in the height of plants of soybean varieties in a collector nursery. Determination of plasticity, stability variations, growth conditions index and coefficient of variation by years on the basis of plant height. **Conclusions.** As a result of the research, varieties of middle-aged group of ripeness, which have been adapted for cultivation in the conditions of the Northern Steppe of Ukraine, have been identified.

Key words: soybean, selection, plasticity coefficient, stability variation, growth conditions index, coefficient of variation

Lazeba O.V. Foliar feeding with complex microfertilizers as a means of increasing the harvest of sunflower hybrids (Helianthus Annuus L.) in the conditions of the Left-Bank Forest-Steppe of Ukraine

Purpose. To identify the most effective variants of using the liquid complex microfertilizers as well as their combinations while foliar feeding to increase the sunflower productivity. **Methods.** Experiment laying and research conducting corresponded to generally accepted methods of field researches in agriculture and crop production. Productivity parameters (head diameter, the weight of seeds per head, the weight of 1,000 seeds, yield, oil content) were determined in accordance with the methods of state variety trial. **Results.** A positive reaction of hybrids of Ukrainian breeding “Pochatok” and “Kamenyar” to complex microfertilizers in the conditions of the Left Bank Forest-Steppe of Ukraine has been found. Among the foliar feeding variants studied, complex 3 (treatment of plants in the phase of 5–7 leaves and in the budding phase) ensured an increase of economic effectiveness level by 28.3% (+0.68 t/ha) for “Pochatok” hybrid and by 26.2% (+0.65 t/ha) for “Kamenyar” hybrid. **Conclusions.** The research results showed that foliar feeding of sunflower hybrids with complex microfertilizers in the phase of 5–7 leaves and in the budding phase promoted growth and development of plants, additional yield formation and more intensive accumulation of oil in the seeds. Each of foliar feeding variants proposed (bio-fertilizer-biofungicide, boron and a combination of microfertilizers of the complex 2) provided significant results as compared to control. The data revealed that the variant with complex 3 was the most effective in foliar feeding of sunflower with liquid complex microfertilizers.

Key words: sunflower hybrids (Helianthus Annuus L.), foliar feeding, complex microfertilizers, yield, productivity.

Lytvynenko M.A., Lytvynenko D.M., Shcherbyna Z.V. The schemes of breading seed production due to level of heterogeneity of bread winter wheat varieties (*Triticum aestivum* L.)

Purpose. Elaborate the methodology of differential choice most rational schemes of breading seed production of the bread winter wheat varieties depend on their level of heterogeneity and improvement the new varieties and advance lines to necessary homogeneity on the different stages of breeding and seed production processes. **Methods.** Modifications of breeding seed production technique practice according to four schemes and variants with different number lines in seed nurseries; field yield trail, morphometric analysis, electrophoresis of storage protein, mathematic, statistical. **Results.** Some of famous Ukrainian bread winter wheat varieties and considerable share modern varieties registered in Ukraine are characterized certain level of heterogeneity. It is very imported genetic factor which largely increase ecological plasticity and adaptive potential of the varieties. Therefore the methodology of breading seed production due to heterogeneity level of bread winter wheat varieties is a vital question. B use five varieties preliminary identified different level of heterogeneity effectiveness of four original seed production schemes and three-four variant with different number lines in seed production nurseries have been investigated. Criterions of effectiveness were as a following: duration of cycle of breading seed production; completeness of genetic restoration of the variety; yield capacity of the varieties in final original seed production nurseries (seed multiplication nurseries of first and second years). According to their criterions necessity differential approach in choice rational schemes breading seed production with taking mind heterogeneity level of the varieties have been proved. It is necessary to keep methodological principle: the higher heterogeneity level the higher complexity of the schemes and the more number of lines should be used in seed pro-

duction nurseries. Differential choice of the schemes enables to reduce cycle duration of original seed production of monolineal (purelinial) varieties for 2–3 years and reach high degree genetic restoration heterogenetical varieties. Simultaneously it can be decided the task of purifying (reach the homogeneity) of the varieties that is very important under market condition for juridical protection of breading achievements (right intellectual property). It is necessary emphasize that the effectiveness method of inter varietal selections also depend on heterogeneity level of initial variety and its genotype peculiarity according to value and range of variability valuable trains and features. The optimal results of use this kind of methods is to improve full uniformity of the variety before its transferees in state variety testing. **Conclusions.** It is necessary to choice the rational schemes of breading seed production differentially depend on heterogeneity level of bread winter wheat varieties. The methodological principle is a following: in order to get fool genetic restoration of the variety so as its heterogeneity level become higher the schemes and methods should be complicated and number of lines for study in seed production nurseries should be increased. To decide the task of juridical protection of breading achievements specific methods and practices have to be used to reach necessary homogeneity of varieties and lines at a different stage of selection and breading seed production with taking into consideration genetic peculiarity breading and pedigree seed material.

Key words: bread winter wheat, variety, heterogeneity, homogeneity, schemes of breading seed production, methods and practices of breading and seed production.

Malyuk T.V., Kozlova L.V. Operative planning of the young plantations of sweet cherry trees irrigation regime in the conditions of the Southern Steppe

Purpose. To substantiate the resource-saving mode of micro-irrigation of sweet cherry trees intensive plantings by applying a calculation method for defining the terms and norms of watering for operative management of southern light loam black soil irrigation regime. **Methods.** The research was carried out at Melitopol Research Fruit Growing Station named after M.F. Sydorenko Institute of Horticulture NAAS during 2016–2018 in young sweet cherry trees plantations of 2015 planting according to the requirements of “Methodology of conducting field research with fruit crops”. Soil is a southern light loam black soil. Soil keeping system is black fallow. Garden watering is a stationary system of drop irrigation. Soil humidity was determined in the dynamics according to the thermostat-weighted method. The evaporation (E_0) was calculated according to the formula of M.M. Ivanov, total water consumption for vegetation – according to the simplified formula of water balance. **Results**. The decisive influence of weather conditions and irrigation regimes on the processes of moisture inflow and consumption in the soil in the sweet cherry trees plantations is proved. A close direct-proportional dependence of the actual total water consumption of sweet cherry trees, determined by the thermostat-weighted method, with the calculated evaporation, was ascertained. The coefficients of proportionality which take into account the biological characteristics of sweet cherry trees when determining the irrigation regime are ascertained. Thus, the deviations of water rates defined by the thermostat-weighted method and at the variant of 70% and 90% (E_0 – O) did not exceed 15%. Together with agronomic efficiency, the lowest costs of energy, material and labor resources make use of the calculated method of watering in comparison with the traditional thermostat-weighted method. **Conclusions.** For young non-bearing plantations of sweet cherry trees it is advisable to assign watering at 90% and 70% from the balance between the evaporation rate and the precipitation amount (i.e., using coefficients of 0.7 and 0.9 for E_0 – O) during the vegetation, which helps maintain soil moisture of not less than 70% of least soil moisture, and provides the optimum intensity of physiological and biochemical processes and the saving of material and energy resources.

Key words: irrigation regime, drip irrigation, total water consumption, evaporation, sweet cherry trees planting, southern black soil.

Maliarchuk N.P., Isakovaa G.M., Bulygin D.A., Shkoda E.A., Luzhanskiy I.Yu. Productivity of sorghum of grain-growing at the different systems fertilizer and treatment in a crop rotation on irrigation

Purpose – to set efficiency of doses of bringing of mineral fertilizers on a background the use of side products of cultures of crop rotation in technology of growing of sorghum grain on conditions of irrigation. **Methods:** the field, analytical, calculation-comparative, mathematical statistics. **Results.** Experimental researches show that for years researches at the beginning of vegetation of plants of sorghum humidity of layer of soil a 0–100 cm in the variants of basic treatment of soil was high enough and was within the limits of 86.4–91.5% LC with the insignificant (245–362 м^3/ha) deficit of moisture. Requirement in water invariants with different methods and in depth treatments of soil provided on 20–22% due to the productive supplies of soil, on 23–25% due to the fallouts of vegetation period and on 52–55% due to irrigation. The greatest level of the productivity of grain of sorghum – 6,26 т/ha is got in a variant which combines the shallow (12–14 cm) disk loosening with fissure on a 38–40 cm in the system differentiated – a 1 treatment of soil in a crop rotation. Productivity of sorghum without top-dressing, on the average on a factor In, made 2.58 т/ha. Bringing of $N_{90}P_{60}$ assisted her heightin 2.46 time. The increase of dose of fertilizers with $N_{90}P_{60}$ до $N_{120}P_{60}$undersowingofsorghumisnoteffective, the increase of the productivity from their use was made by 0.19 т/ha, that is within the limits of error of experience. **Conclusions.** At growing of sorghum grain in the conditions of South Steppe of Ukraine in a grain and tilled crop rotation on irrigation it is expedient to apply the combined treatment which combines the shallow disk loosening on a 12–14 cm with fissure on a 38–40 cm in the system differentiated – 1 treatment.

Key words: yield, total water consumption, moisture reserves, method of tillage.

Maliarchuk N.P., Pisarenko P.V., Kozyriev V.V., Maliarchuk A.S., Mishukova L.S. Efficiency of growing of wheat winter at the different methods of basic till of soil and doses of mineral feed

Purpose: establishment most economic effective method of basic treatment of soil and dose of mineral feed at growing of wheat winter in the conditions of irrigation of south Ukraine. **Methods:** the field, analytical, calculation–comparative, mathematical statistics. **Results:** experimental researches show that for years researches the productivity of wheat winter, depending on factors which was studied in experience, hesitated scope from 2.70 to 6.90 т/ha. Comparing the productivity of culture there was certain dependence on the methods of treatment of soil. So at ploughing on a depth a 14–16 cm in the system of different deep dump treatment of soil without top–dressing, the productivity made 3,15 т/ha, and at chizel treatment on the same depth in the system of the nonmoldboard loosening – 3.01 т/ha or was below on 4.6%. The shallow disk loosening at protracted his use in a crop rotation resulted in the decline of the productivity, as compared to the

different deep systems, on 14.3 and 11.5% accordingly. Most power an effective variant is experience with the use of dose of mineral fertilizers of $N_{120}P_{60}K_0$, in spite of power expenses which at bringing of this norm of fertilizers were anymore comparatively with other ($N_{90}P_{60}K_0$) background of mineral feed. **Conclusions.** On a livery soils of south of Ukraine in the short rotary press irrigated crop rotations it is expedient to recommend disk tillage on a depth a 8–10 cm in the system of the differentiated treatment of soil with one subsoiling for a rotary press on a background bringing of mineral fertilizers the dose of $N_{120}P_{60}K_0$ for achievement of the productivity of grain of wheat winter at the level of 7.0 т/ha with the level of profitability 166% and by a power coefficient 3.0–3,4.

Key words: criteria of estimation, settings of norms of indexes of fertility, content of humus, depth of humus horizon.

Maliarchuk N.P., Tomnitsky A.V., Maliarchuk A.S., Markovska E.E. Productivity of soy at different methods and depth of treatment of soil and doses of fertilizers in a crop rotation on irrigation

Purpose is establishment most of the economic justified method of basic treatment of soil and dose of mineral fertilizer at growing of soy in the conditions of irrigation of south of Ukraine. **Methods:** monographic, field, analytical, calculation-comparative, mathematical statistics and abstractly logical**. Results.** The most favorable terms for the accumulation of nitrates were folded in soil of variant of plowing on the depth of 25–27 cm within the moldboard tillage system in a crop rotation, where the value of this index at the dose of fertilizers of $N_{60}P_{60}$ made 48.1 mgs/kg Maintenance of nitrates on the period of harvesting of soy diminished considerably. Table of contents of mobile connections of phosphorus in the period of shoots of soy higher was in the layer of soil a 0–40 cm at plowing on a depth a 25–27 cm and made from a 33.4 mg/kg a to 45.6 mg/kg On the period of harvesting maintenance of mobile connections of phosphorus diminishes in soil of the investigated variants, the above-mentioned conformity to law is saved at the same time. Maximal maintenance of exchange potassium in the layer of soil a 0–40 cm was formed at different depth treatment with the turn of layer on a 25–27 cm and accordingly backgrounds of feed 279 made, 312 and 322.3 mgs/kg of soil. In using of exchange potassium of considerable divergences it is not educed for the different doses of fertilizers. The greatest productivity of seed of soy is got in the variant of ploughing on a 25–27 cm in the system of the protracted different depth dump treatment and at disk treatment on a 14–16 cm in the system differentiated – 1 treatment of soil with bringing of dose of fertilizers of $N_{60}P_{60}$, where her level made 4.34–4.31 t/ha accordingly. **Conclusions.** On dark chestnut, medium loamy soils of south of Ukraine in short crop rotations on irrigation it is expedient to apply plowing on a 25–27 cm in the system of the protracted different depth dump treatment and disk treatment on a depth a 14–16 cm in the system differentiated-1 treatment of soil with one subsoiling for a rotation on a 38–40 cm with bringing of mineral fertilizers the dose of $N_{60}P_{60}K_0$.

Key words: productivity, soy, method and depth of tillage, doses of fertilizers.

Mammadova Shakar, Babayeva Ulkar. Vegetation cover of Lankaran's physical-geographical region and protection ways of them

Results. Lankaran's physical geographical region is characterized by rich vegetation cover. The presence of specific type of composition of vegetation cover, including of a large number of endemic and relic plants in the region attract attention. But during historical periods the forest areas inside region are reduced. From this point of view in article the species variety of vegetation cover of Lankaran's physical-geographical region have been learned, factors causing decline of forest areas have been investigated, the protection ways of vegetation cover have been noted.

Key words: Lankaran, Talish, vegetation cover, forest, landscape scenery.

Marchenko T.Y., Lavrynenko Y.O., Piliarska O.O., Sabara P.P., Khomenko T.M., Michalenko I.V., Ivaniv M.O. The dynamic of the crude and dry aboveground biomass accumulation by the maize hybrids in conditions of the dropping irrigation

Purpose. The goal of the research is to justify the regularities of accumulation of the crude and dry matters as the important indicators of yield of corn hybrids using complex microfertilizers over drip irrigation in the conditions of the Southern Steppe of Ukraine. **Methods**. The comparative, analytical, field, statistical and mathematical methods were used. **Results**. The processing of corn plants by microfertilizers has had a positive effect on the accumulation of aboveground raw masses of hybrids, at separate phases of development. The greatest impact on the formation of crude mass caused the preparation Avatar-1, the maximum value reached the milk maturation phase – 54.71 t/ha in the Chongar hybrid, which exceeded control by 2.4%. The microfiber Nutrimix, on average, has had a minimal impact on the growth processes (an increase of 0.50–0.83 t/ha in the development phases). Among the hybrids which were studied, the highest rates of accumulation of crude mass were observed in the medium-late hybrid "Chongar" (FAO 420) for the use of integrated microfertilizer Avatar-1 and during the development phases increased to 54.71 t/ha in the milk ripeness phase. **Conclusions.** There is a close correlation connection between the accumulation of the crude aboveground mass, dry ground mass and the grain yield of hybrids at the +0.912, +0.863 level, which may indicate the possibility of a preliminary assessment of these characteristics for the productivity in the field conditions.

Key words: yield, grain, FAO group, microfertilizer, irrigation.

Minza F.A. The yield of apple fruit, depending on the method of appointment of irrigation time

Purpose. Determining the factors that allow the maximum use of the potential opportunities of drop irrigation, and affect the increase in yield, is the basis for conducting relevant experiments.The purpose of the article is to establish the influence of methods for determining the timing of watering of apple varieties Reneet Simirenko on the M-9 rootstock to yield, marketable quality and biochemical parameters of the fruits. **Results.** The necessity of using drip irrigation as a factor for ensuring the receipt of guaranteed high yields is substantiated. The specific consumption of irrigation water per unit of production and the coefficient of irrigation efficiency depending on the method of determining the terms of irrigation are calculated. **Conclusions.** It has been proven that the largest volume of production and maximum yield are obtained when irrigation is appointed using the iMetos automatic soil moisture internet station. It is recommended, taking into account the confirmed efficiency, to assign the timing of irrigation based on the data of the automatic Internet station of soil moisture.

Key words: drip irrigation, automatic Internet station of soil moisture,quality, perennial plantations, apple.

Pohorielova V.O. Forming of the seed productivity of tomato (Lycopersicon esculentum Mill.) depending on variety quality properties and fertilizer at drip irrigation

Purpose. To examine the influence of variety quality properties and elements of technology on the forming of the seed productivity of tomato at drip irrigation. **Methods.** Field, laboratory, measurement and calculation, comparative, mathematical and statistical analysis. **Results.** The seed productivity of one tomato plant of the variety Lehin is 4.16 g and that of the variety Yuvileinyi is 3.93 g. The sowing scheme of 150 cm exceeds the scheme 100+50 cm by 0.96 g. The application of the fertilizer contributed to an increase in the seed productivity of one plant by 57.9–67.2%. The seed productivity of 1 t of the fruits of the variety Lehin was 1.85 kg/t and that was by 0.22 kg/t more than that of the variety Yuvileinyi. The seed productivity of 1 ton of the fruits under the sowing scheme 150 cm was 1.7 kg/t. The yield of the variety Lehin was 117.62 kg/ha, that of the variety Yuvileinyi – 112.63 kg/ha. The fertilization of the tomato plants resulted in an increase of the seed yield within the range of 56.95–67.04%. **Conclusions**. The highest seed yield of 159.91 kg/ha was characteristic of the variety Lehin with the variant of a complex fertilize under the sowing scheme 100+50 cm.

Key words: tomato, variety, fertilizer, seed productivity, yield of seed.

Sendetsky V.M. Productivity of soybeans depending on the joint application of straw, side rates and organic fertilizers in the forest-steppe of Western

The goal is to study the effect of the joint application of straw, organic fertilizers in combination with the side rate on the growth and development of plants and the yield of soybean varieties Bohemians in the Western Forest-Steppe. **Methods.** The research was carried out in accordance with existing generally accepted methods. **Results.** It was established that on the experimental variants the straw was destroyed in combination with the application of organic fertilizers and sowed side rate, the field similarity was 87.8–89.0%, the survival of plants was 90.6–92.1%, which, respectively, was 3.2–4.4% and 1.5–3.0% more control. In the “end of flowering” phase, the area of the leaf area of plants was 39.2–42.1 thousand m^2/g or 5.3–8.2 thousand m^2/g was greater, compared with control, the photosynthetic potential of soybean crops – 0.265–0,464 million m^2/g, net productivity of photosynthesis of plants in the flowering phase – by 0.87–1.82 g/m^2 per day. The best indicators of 11.68 g/m^2 per day were observed on the variant: Vermistym-D, 7 l/g + Bio–farms, 4 t/g + white mustard. The highest yield of Soybeans. Bogemians is 3.57 t/gor1,33 t/g more compared to the control indicated in the same variant. **Conclusions.** The combined use of Vermistim-D (7 l/g) for the destruction of straw and plant residues with the application of organic fertilizers Biohumus, or Bioproferm (4 tons/g) or manure (10 tons/g) and subsequent sowing white mustard, improves soil fertility and an increase in the yield of soy Bogemian variety is 1,04–1,33 t/g.

Key words: soybean, straw, Biogumus, Bioproferm, white mustard, growth and development, photosynthesis, productivity.

Shevchenko I.V., Minkin M.V., Minkina G.O. Inflorescence of industrial plantings of grapes and efficiency of modern methods of control of the number and development of weeds

Purpose. Studying the influence of methods of controlling the size and development of weeds on the infestation of industrial plantings of grapes. **Methods**: Field, Analytical, Calculation-Comparative, Mathematical Statistics. **Results** Regardless of the technological methods of regulating bulbar placing, the potential yield of berries is lost throughout the bush vegetation. However, depending on the level of inbredness, the maximum loss is achieved during the phases of growth of shoots-flowering. Careful control of the number and development of weeds in the second half of the growing season greatly improves the conditions of bush growing, but the loss of the harvest of the berries of the first half of the vegetation does not compensate, that is, the negative changes in the development of the bushes that occurred in the first half of the vegetation are irreversible. Similar consequences also results in a violation of the regime of the implementation of technological techniques for regulating bullying of plantations. **Conclusions**. The problem of control of indigestion remains one of the most urgent in the history of agriculture, and therefore, the search for effective methods of regulating the size and development of weeds is particularly important in modern conditions of farming. All the techniques used in the practice of industrial viticulture to reduce the damage from weeds such as preventive measures, as well as measures that include various mechanical, physical, chemical, biological chemical and mechanical methods require additional research, since their effectiveness depends on the level of freezing characteristics of crop care, value, etc.

Key words: grape berry harvest, control of indigestion, methods of regulation of bullying.

Ushkarenko V.O., Chaban V.O., Shepel A.V., Kokovikhin S.V. Conditional consumption of nutrients by plants of *Salvia sclarea* L. for cultivation in the conditions of the Southern Steppe of Ukraine under drop irrigation

Purpose. The purpose is to scientifically substantiate a set of agrotechnical measures for growing nutmeg under drip irrigation for the rational use of nutrients from the soil.

Methods. Field research to improve the technology of growing sage 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. Conditional consumption of nutrients and release of CO_2 from the soil was established by special methods.

Results. Against the background of $N_{60}P_{90}$ conditional consumption of nutrients by sage plants in the second year of use was higher in the variant of plowing by 20-22 cm In the fourth year of use conditional consumption of nitrates when plowing to a depth of 20-22 cm was higher on unfertilized background by 15.6% than on deep plowing. Spring crops, especially in the first decade of April, judging by the accumulation of nitrates and their conditional consumption by plants of sage, do not require the use of nitrogen fertilizers. During the period of mowing of sage inflorescences of nutmeg, the indicators of released CO_2 were the highest. $N_{60}P_{90}$ fertilizers contributed to the maximum release of CO_2 in the second year of crop use, in the fourth year - the amount of gas decreased, according to the average three-year data, against the background of fertilizers and the first sowing period from 4.28-5.87 g CO_2/m^2 per day to 3.62-3.80. The dependence of phosphate accumulation on steam areas on the studied factors is similar, but the level of indicators of content and conditional consumption by plants is much lower. Analysis of variance data on the accumulation and conditional consumption of nitrates by plants of sage shows that the significance of differences in the options and effectiveness of the studied factors.

Conclusions. According to the results of research, it was determined that the conditional consumption of nitrates during plowing to a depth of 20-22 cm was the largest on an unfertilized background. It was found that the accumulation and conditional consumption of phosphates by plants of the *Salvia*

sclarea L. had a similar pattern that was obtained with respect to nitrates, but in some cases it was lower. In the fourth year of using sage, a significant decrease in phosphates (up to 5.9 mg/kg) was observed in the unfertilized version with plowing to a depth of 28-30 cm and sowing in the first decade of April. Biological activity of soil is determined by the intensity of devel-opment and activity of different types of soil microor-ganisms. Its study is necessary to establish the envi-ronmental efficiency and safety of the cultivation tech-nology used. The obtained data indicate that the intensity of CO2 release from the soil significantly depended on all the studied factors. Fertilization at a dose of N60P90 contributed to the maximum increase in CO2 emissions in the second year of crop use. In the fourth year - this figure decreased.

Key words: *Salvia sclarea* L., drip irrigation, feeding background, tillage, sowing period, years of use, conditional consumption of nutrients, CO2 release.

Vozhegova R.A., Kotelnikov D.I., Maliarchuk V.M. Biological activity on maize crops by different methods and depth of basic cultivation against the background of organo-mineral fertilizer systems under irrigation conditions in the south of Ukraine.

The aim of the research was to establish the influence of different systems of basic tillage and fertilizer on the activity indicators of soil microorganisms and its further influence on the yield of corn. **Methods.** During the experiment, field, quantitative-weight, visual, laboratory, calculation-comparative, mathematical-statistical 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 Askanian SARS of IIA NAAS of Ukraine. **Results.** Studies have shown that the lowest density at the beginning of the growing season of corn in the soil layer 0-40 cm 1.14 g / cm^3 was formed by chisel tillage at 28-30 cm in the system of shelfless shallow tillage in crop rotation. The use of chisel tillage by 12-14 cm increased the density to 1.26 g / cm^3, which is actually higher by 8.6%, while the maximum indicators in the experiment were the option of zero tillage 1.28 g / cm^3, where the figures were higher by 10,3% compared to control. The largest indicators of accumulation of ammonifying and oligonitrophilic microorganisms are 26.44 and 20.43 million units. in 1 g of absolutely dry soil detected under a differentiated system of basic tillage (control) not much lower indicators were the variant of shelf-free shallow tillage 26.32 and 20.20 million pieces. in 1 g of absolutely dry soil, and the lowest indicators in the experiment were observed at zero tillage of 20.54 and 15.91 million pieces. in 1 g of absolutely dry soil accordingly. **Conclusion.** The best conditions for the formation of the corn harvest were developed during deep chisel tillage, where compared to the control (plowing) the increase in yield averaged 0.4 t/ha, or 3.8%. With shallow disc cultivation decreased by 0.18 t/ha, and sowing the crop in previously untreated soil led to a significant shortage of 1.29 t/ha of crop at LSD05 0.33 t/ha, which averaged 14.2%.

Key words: irrigation, biological activity, tillage, yield, corn.

Balashova H.S., Boiarkina L.V. Yield and seed productivity of early-ripening Serpanok potato variety under different methods of seed preparation and feeding conditions

Objective: to present the results of research on the influence of seed preparation methods and conditions of potato nutrition on its seed productivity in the conditions of irrigation of the Southern Steppe. Materials and research methods. Field studies were performed on irrigated lands of the Institute of Irrigated Agriculture of NAAS in the area of the Ingulets irrigation system. Factors were studied: A – method of preparation of seed material – whole tubers weighing 50-60 g, cutting tubers before germination into particles of 50-60 g, cutting tubers before planting into particles of 50-60 g, B – feeding background: control (without fertilizers), topical application of fertilizers at planting in doses N45P45K45 and N45P45K45 + Stimovit FERTI and N90P90K90 and N90P90K90 + Stimovit FERTI. Agricultural techniques in the experiment, in addition to the studied factors, are generally accepted for irrigated lands of southern Ukraine. According to the results of research Treatment of whole tubers with the drug Stimovit FERTI allowed to increase the yield by 2.0 t/ha (22.0%). Topical application of N45P45K45 and N90P90K90 provided a yield increase of 5.4 (59.3%) and 8.1 t/ha (89.0%), respectively, and with the combined use of N90P90K90 and the Stimovit FERTI complex, the increase in yield was 9.7 t/ha (106.6%). The use of cut seed material for planting increased the yield of conditioned seed tubers by 14.6 (10.0%) and 17.2 thousand units/ha (11.7%), respectively, when cutting before germination and before planting. Nutrition had a more significant effect on seed productivity. When applying fertilizers in doses of N45P45K45 and N90P90K90 locally during planting, the excess in relation to the control was 27.9 (22.1%) and 53.5 thousand units/ha (42.3%), respectively, and the use of fertilizers in those the doses with the Stimovit FERTI complex increased the difference to 40.5 (32.0%) and 66.1 thousand units/ha (52.3%), respectively. Conclusion. According to the results of the study of seed preparation methods and the influence of nutritional conditions on the growth, development and seed productivity of the early ripening potato cultivar Serpanok, the following was provided: maximum yield (20.4 t/ha), yield of conditioned seed tubers (214.8 thousand pieces)) the largest mass of conditioned seed tubers according to the experiment was formed in the variant with the application of fertilizers at a dose of N90P90K90 with the complex Stimovit FERTI when planting whole tubers and was 127.0 g.

Key words: potato seed material, spring planting, early harvesting, Stimovit FERTI complex, local application of mineral fertilizers, yield.