Summary

Vozhehova R.A. Strategy for the development and adaptation of agriculture in the Southern Steppe to climate change // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P.5-9.

Purpose. Determination of climate change in the southern region and the development of measures of confrontation against its consequences.

Methods. Complex use of methods of system analysis and field experiments.

Results. For 135 years the average daily air temperature during summer months increased by 0.1 to 0.60, although at different times were observed during periods of warming or cooling. In the last 20-30 years have seen the greatest rise in temperature with a minimum value of +1.30 ºC in May and a maximum value of + 4,70 ºC in September.

Average long-term precipitation has increased over this period by 32.5% and for the last 50 years is kept at the level 447,6 mm. However, a significant increase in temperature at low relative air humidity did not improve crops water regime.

Under these conditions, the main directions of scientific research should be the development of measures to confront the increasing aridity of the climate in the Southern Steppe of Ukraine. Such activities should be comprehensive and cover all possible agricultural practices that could improve conditions for plants on climate change.

They should consist of such main blocks as:

1. Activities aimed at formation of adaptation potential;
2. Activities aimed at reducing the risk from creating stressful situations;
3. Activities aimed at obtaining benefits from changes in climatic conditions.

Key words: climate, temperature, precipitations, irrigations, drought-resisting cultures, shelterbelts.

Kovalenro A.M. **Effectiveness of the use of microbial preparations after culture of short-term rotation in the Southern Steppe //** Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 9-12.

Purpose. Increase of biological activity of the soil and productivity through the optimization of the use of modern microbial preparations.

Methods. Field stationary test and associated laboratory studies.

Results. Determined the influence of microbial preparations of nitrogen fixing and phosphate-mobilizing bacteria on biological activity, nutrient regime of the soil and yield of winter wheat, spring barley and sunflower in different soil cultivation systems.

Conclusions. To increase the yield of winter wheat and sunflower, use Diazophyte for deep and shallow soil cultivation, and Microhumin for the spring barley – only for the shallow soil cultivation.

Key words: microbial preparations, Diazophyte, Microhumin, Polymicsobakterin, Phosphoenterin, yield.

Vozhegova R.A., Belyaeva I.M., Kokovikhin S.V., Piliarsky V.G., Pilyarska O.A., Shepel A.V. Comparative characteristics of ecological and ameliorative indices of Ingulets and Dnieper irrigation water using the cluster analysis method // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 12-17.

The article reflects the results of studies on the establishment of regularities in the formation of ecological and ameliorative indices of Ingulets and Dnieper irrigation water using the cluster analysis method.

The purpose of the study was to scientifically and theoretically substantiate and implement the cluster analysis method for grouping and modeling the qualitative indicators of irrigation water from the rivers Ingulets and Dnepr.

Methods. For cluster clustering and modeling of ecological and reclamation indicators of irrigation water, special computer programs and methodological recommendations in the field of land reclamation, irrigated agriculture and information technologies were used.

Results. It is established that on average for the period "May – September" the growth trend of the studied indicator was less significant – an increase of 8.0-21.9% was noted. In general, for a long period from 1882 to 2016, Using the correlation-regression analysis, linear equations of the theoretical precipitation amount are obtained, which reflect the general trend of this index increase, both in the mid-annual plane and the conditional period "May-September". Regression equations are characterized by a high degree of correlation: for the average annual precipitation, the determination coefficient is – 0.7844, and for the period "May – September" – 0.7764. Variational analysis has shown that throughout all the years of the study period (2005-2016) the coefficient of variation is very large, which indicates a significant uneven precipitation during the most important period for the moisture supply of plants from the beginning of May to the end of September.

The developed models must be used to make timely management decisions that include irrigation regime, irrigation and irrigation norms, irrigation water irrigation quality, monitoring the dynamics of the level of cation-anionic water composition and its mineralization, dynamics and degree of secondary salinization and solonetzation of soils, rationing of ameliorants, etc. Using the data of a cluster analysis of the ion-salt composition of irrigation water generated by us in the STATISTICA program, it is possible, by modeling, normalized graphs, charts, histograms, track different depending on the specific variables for research and the production level – to improve irrigation performance.

Conclusions. Based on the results of our research, the effectiveness of the application of cluster analysis methods has been proved and implemented in the STATISTICA software and information complex, for example, the clusterization of the cation-anion content of Ingulets and Dnipro waters obtained in the irrigation laboratory of the Institute Irrigation Farming of the NAAS for the period from 1973 to 2015. The k-mean clustering method allowed us to find inter-group variances for the investigated

indices of the ion-salt composition of Ingulets and Dnieper irrigation water, which are compared with intra-group variances for decision making, are average for individual variables in different populations.

Key words: irrigation, melioration, soil quality, mineralization, cluster analysis, modeling.

Kabanets V.M., Kityev O.I., Krivoshapka V.A. Functional diagnosis of adaptivity of canabis plants under the procedure // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 17-22.

Goal. Assessment of resistance to drought and heat resistance of varieties of Cannabis seedlings and selection of the best genotypes resistant to stress factors of the summer period for subsequent selection. **Methods.** Field, spectrometric methods were used, results were processed according to generally accepted methods in agriculture, plant growing, and statistics. **Results**. The relevance of studies on the fluorescence induction of chlorophyll from the assessment of the impact on the functional condition of the hemp varieties of drought conditions. The determination of the functional state of the photosynthetic apparatus of plants of 8 varieties of culture by induction changes of fluorescence of chlorophyll is carried out. The changes of photosynthetic processes in the leaves have been analyzed, which showed that all the hemp plants sown in August have an insignificant intensity F_o, which is 3.7-4.1 times smaller than the main maximum of the induction curve F_{p1}, that is, only a small fraction of chlorophyll does not participate in photosynthesis. It was established that the most resistant to drought in the complex of indicators of photochemical and photophysical processes in chloroplasts of leaves are Glesia and Harmony varieties. **Conclusions**. It was determined that the K_{pL} parameter allows to estimate the effect of insufficient moisture on the level of damage to the reactive centers of chloroplasts of varieties of hemp seedlings. The highest value of K_{pL} was recorded in the plants of Mikolaichik varieties – 0.24, Glyana – 0.22 and Artemida – 0.20. Relatively low proportion of inactive reaction centers indicates a sufficient stability of hemp plants sown to drought.

Key words: leaves of cannabis seedlings, fluorescence induction of chlorophyll, light phase, drought tolerance, photosynthetic processes.

Romanenko O.L., Kushch I.S., Zayets S.O., Solodushko M.M. Terms of sowing of winter wheat (*Triticum aestivum* L.) in the conditions of rise in temperature in the Steppe zone // Irrigated agriculture: interdepartmental thematic scientific collection. – 2017. – Issue 66. – P. 23-27.

Purpose. To investigate and set the optimal and possible terms of sowing of winter wheat (*Triticum aestivum* L.) soft at the terms of rise in temperature in the Steppe zone.

Methods. Measure sowing plot – 20 square meters, examination – 17,2 square meters, repetition – four-time. The rate of fertilization and agrotechnics are recommended for the steppe zone. The mortgaging of reseach, their carrying out, and the account of the harvest were carried out in accordance with the method of BA A. Dospehov.

Results. On results researches on Zaporizhzhya DSGDS in 1990–2012 years sort of wheat soft winter (*T. aestivum* L.) Albatros Odesa Black Pair secured the maximum yield at seeding on September 25–6.09 t/ha; at early sowing, yields decreased by an average of 0.58 t/ha (September 5th) and 0.28 t/ha (September 15), while late ones – by 0.68 t/ha (October 5). According to the six-year data (2007–2012), the Ermak variety after black pairs the highest crop in the crops also formed on September 25 (6.35 t/ha), and slightly lower – on October 5 (6.15 t/ha). In the years 2009–2012, Yermak wheat cultivars were studied productivity in ten-year-old sowing. The best result was received for sowing on October 5 (5.92 t/ha), September 25 (5.88 t/ha) and September 30 (5.83 t/ha).

During 1990–2012 years, for the sowing of September 25, wheat Albatros Odesa ensured the highest crop in 52% of the year, 29% year-on-year on September 15, 14% on October 5, 5% on September 5.

Conclusions. Based on the results of many years of research carried out in the southern Steppe, significant adjustments were made to the seed campaign strategy, as well as to the most important factor in the technological process – the term of sowing. Due to global warming, the duration of autumn vegetation of winter crops increased. The optimal parameters of the development of the vegetative mass of winter wheat during the autumn vegetation period, which ensure the formation of maximum yield, have been changed in the direction of their reduction.

Key words: winter soft wheat, term of sowing, yield, weather conditions, variety, predecessor.

Vozhegova R.A., Balashova G.S., Boyarkina L.V. Information support of the process of successing and reconstruction of initial material in primary seeding of potatoes in the conditions of irrigation of the south of Ukraine // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 27-34.

The main aim. Based on practical research results and analyzed literature and electronic sources, to create an electronic information and reference database "Seeding of potato in the South of Ukraine", which allows you to more quickly organize information retrieval and, on its basis, create normative directories, develop computational modules, mathematical models and the like. **Methods**: laboratory, field, mathematical-statistical and system analysis. The database is designed as a website. Directories of the database are presented in the form of web pages. In its development, program packages Macromedia Dreamweaver 8. Copyright © 1997-2005 Macromedia, Inc.; Microsoft Office Front Page © 2003 Microsoft Corporation. The check up work of elaboration carried out with assistance of the most famous Internet browsers: Opera, Internet Explorer, Chrome, Mozilla Firefox. **Results**: The information of literature, electronic sources and data of the results of field and laboratory studies of the potato biotechnology laboratory of the IIA NAAS on the management of potato seed production was analyzed and structured. The main elements of the technological process are represented by separate blocks and the block describing the reproduction of the improved initial potato material in nurseries of primary seed production is given. **Conclusion**. The base we have created allows the researcher to get to know the sources of necessary information on issues of seed potato management in the south of Ukraine as quickly as possible. In the future, it can serve as a basis for creating normative directories, calculation modules and software and information complexes that will allow users to optimize the choice of a set of measures for growing seed

potatoes under irrigation conditions and will contribute to improving the efficiency of irrigated agriculture in general.

Key words: electronic information base, potato seed production, microtubers, minitubers, *in vitro* culture, combined irrigation.

Goloborodko S.P., Poginayko E.A., Sergienko S.V. Forming of the harvest of alfalfa seeds in the conditions of regional climate change in the southern Steppe of Ukraine // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 34-41.

Goal. Determination of the influence of regional climate changes on the formation of the yield of alfalfa seeds of the variegated Anzhelika variety under conditions of natural moistening of the southern part of the Steppe zone. **Research methods:** field – to determine the impact of regional climate change; measuring-weighting – for analyzing the structure of the crop when establishing economic characteristics; morphological – to take into account the structure of the crop and seed productivity; laboratory – to determine volatility, moisture deficit and moisture ratio; Calculation-comparative – for economic and energy assessment of cultivation of a alfalfa on seeds; mathematically statistical – to assess the reliability of the results of research. **Results of the research.** The article presents the results of studies on determing the influence of weather conditions on the forming of the harvest of conditioned alfalfa seeds in conditions of natural moistening (without irrigation) under regional climate change in different years in terms of precipitation.

Analysis of influence the regional climate change on the production of alfalfa seeds in the first and second years of use indicates that in the southern part of the Steppe zone, along with an increase in the mean daily temperature and a decrease in the relative humidity of air to dry (95%) years in precipitation, has occured the decvease in precipitation which fell out both during the growing season, and in general for the year. During the years of research, the insufficient amount of precipitation during the spring period, compared to the average multi-year period for 1945-2010, was 22.6 mm (24.1%) and autumnal – 66.4 mm (64.6%).

Conclusions. It was established that during the studied years the seedlings of alfalfa grew in the third decade of March and, depending on the average daily air temperature and the amount of precipitation that fell during the autumn-winter and vegetation periods, formed yield of conditioned alfalfa seeds in the limit of 84-181 kg/ha.

Key words: climate, moisture supply, atmospheric precipitation, evaporation, seeds, alfalfa.

Pisarenko P.V., Andrienko I.O., Reznichenko N.D., Lopata N.P., Voronyuk L.A. The dynamics of the water regime of the soil depending on the irrigation regimes and the main cultivation of the soil during the cultivation of corn in the south of Ukraine // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 42-45.

Aim. Investigation of the dynamics of physical and mechanical parameters of the soil depending on irrigation regimes and basic soil cultivation in the cultivation of corn for grain in the south of Ukraine.

Methods: Field, Laboratory, Analytical.

Results. The optimum density of dark chestnut soils for maize is 1.10-1.30 g/cm^3. Exceeding the optimum density worsens the use of plants moisture from the soil. Porosity significantly affects the development of plants, because of this indicator depends on the air and water regimes of the soil. Due to excessive compaction in the soil biological activity, soil filtration decreases. These studies indicate that in the period of stairs porosity measurements of the soil layer of 0-40 cm were almost identical. The difference between the variants of the experiment did not exceed 1.5%.

The water permeability of the soil differed in different variants of the main treatment. The highest water permeability in the experiment at the beginning of vegetation was observed in the plowing variant at 28-30 cm at a level of 3.4 mm/min. Replacing plowing by 28-30 cm without tillage by 20-22 cm resulted in a decrease in porosity.

Conclusions. By results of researches it is established, that plowing on 28-30 cm positively influences parameters of density, porosity and water permeability of soil. In all cases of deep plowing, the most optimal physical and mechanical properties of the soil were observed, which in turn positively influenced the growth and development of maize plants. The most compacted soil turned out to be using surface or disk processing to a depth of 12-14 cm, which in turn led to a decrease in the porosity and permeability. Optimum density, porosity and water permeability parameters were observed when applying the soil protection irrigation regime.

Key words: corn, irrigation regime, soil cultivation, density of addition, porosity, water permeability.

Voshehova P.A., Borovik V.A., Rubcov D.K. Fumigation of the seed of soybean variety of Svyatogor depending on the fertilization and the density of plant standing under irrigated southern Ukraine // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 45-49.

The purpose: to study the dependence of the formation of the yield of seeds of the new soybean variety Svyatogor in the conditions of the South of Ukraine on the density of standing of plants and elements of the fertilizer system.

Methods: the laboratory, field, statistical

Results. The article presents the results of scientific work on the study of the influence of nitrogen fertilizer doses and plant density on the yield of soybean seeds of the Svyatogor variety.

The analysis of the data showed that the highest yield of soy in the control version (without fertilization) was obtained for the density of 500 thousand plants /ha (2.90 t/ha). Significant decline in the productivity of the crop was due to the introduction of N30 (3.67-3.28 t / ha), N60 (4.23-3.63 t / ha), and excessive thickening of plants – from 700 thousand to 1 million. per hectare, on average by factor. A similar pattern was observed in increasing the dose of ammonium nitrate (from N30 to N60) and reducing the plant density (from 500 to 300 thousand pcs / ha). The negative effect of excessive thickening leads to premature yellowing and falling leaves, incomplete use of light, moisture, nutrients, reducing the biological fixation of nitrogen from the atmosphere; Beans are formed in the upper part of plants. In the rarefied crop, the lower beans are formed on the lateral branches, have low attachment, which largely determines the loss of yield in mechanized

harvesting. Consequently, the greatest effect was observed on the factor A – the dose of nitrogen fertilizers, whose share of influence ensured the formation of a crop of 80,0%. The effect of the plant density (factor B) was significantly lower – 12.0%, which is explained by the plasticity of plants of the middle-aged soybean variety Svyatogor to change the density of sowing. The interaction of factors, as well as the residual values of the effect's share, were insignificant and amounted to 4,0%. **Conclusions**. The analysis of two–year research results shows that in order to obtain the maximum yield of seeds of the middle–aged variety Svyatogor it is necessary to add nitrogen fertilizer with a dose of N60 for the density of plant standing 600 thousand pcs./ha.

Key words: bean culture, ammonium nitrate, irrigation, density of plant standing, influence of factors.

Granovs'ka L.M., Dymov O.M. Association of water users as a component of the system of effective management by water-economic and reclamation complex // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 49-54.

The main aspects of improving the management structure of water- economic and reclamation complex through the establishment of water users' associations as an element of the management of the complex have developed and scientifically substantiated in the article.

Purpose. The aim of this article are the justification of measures for the establishment of water users' associations as part of an effective management system by water-economic and reclamation complex in Ukraine based on the analysis and experience of other countries in the world.

Methods. To achieve the objectives of the study used methods of analysis, synthesis, historical, statistical, monographic for the analysis of the modern state and specific features of water-economic and reclamation complex of Ukraine and the practice of other countries on issues of improving the system of management of the complex and formation of water user associations as an element of effective management of water resources.

Results. There argued that the existing in Ukraine system of water resources management and water use is largely of a sectoral and territorial focus and the unbalanced mechanism of reproduction and protection of water resources. It is found that the improvement of the management system is impossible without the study of main stages of modernization and reconstruction activities industry, providing a progressive and tolerant devolution of water resources management and operation of water reclamation systems between the State Agency of Water Resources, regional authorities and public bodies-private partnerships – associations of water users.

The features of the system of water resources management in countries all over the world and countries of the former Soviet Union through the creation of associations of water users and based on their experience developed the main aspects of the creation of water users' associations in the system of water- economic and reclamation complex of Ukraine. The necessity of improving the existing methodological support for the formation of cost of services for the supply of water for irrigation for both the Association members and other water users is substantiated.

Conclusions. It is proved that the strengthening of the role of State Agency in management of water resources will give the opportunity for integrated, ecologically safe and balanced their use at the national level, and the creation of water users' associations should ensure effective management of water resources and operation of infrastructure at the lower level.

Key words: management of water-economic and reclamation complex, irrigation, a public-private partnership, the Association of water users, modernization, reconstruction.

Belyaeva I.N., Piliarskaya E.A., Klubuk V.V., Sinelnik L.M. Marketing communications and promotion of scientific and innovative developments as an effective tool for the development of National science // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 54-57.

In recent years, the Institute of Irrigated Agriculture of the NAAS in the market of intellectual property objects of agro-industrial production (APP) is actively achieving the image of a competitive institution. In the coordinated work of all scientific units, the Institute created innovative projects.

Methods. The introduction of scientific developments is a complex, multifaceted task, in the solution of which various methods are used. One of the universal methods for promoting products to the consumer, the formation of the author's image is the presentation during scientific and popularization events such as: exhibition-fair, seminar, conference, etc.

Results. During the period 2010-2015, the Institute concluded 330 licensing agreements for the amount of 1,684.0 thousand UAH. And 156 economic agreements for the amount of 3195.0 thousand UAH. According to the results of marketing activities in the field of commercialization of scientific products and science-intensive products in 2016, 29 licensing agreements were concluded and 506.64 thousand UAH were received; 40 economic contracts and received 3696.4 thousand UAH, and also received 3584.84 thousand UAH. For the realization of science-intensive products.

Conclusions. The attraction of innovative developments in the agro-industrial complex promotes the increase in the efficiency of agricultural production. Effective measures to increase the popularity of innovation in state scientific institutions in Ukraine are exhibition fairs, field days, seminars, conferences, etc., as well as the presentation of science-intensive products through the Internet.

Key words: marketing, scientific and innovative developments, intellectual property, advertising, Internet.

Maliarchuk N., Gribinyuk K., Winter wheat productivity under different soil cultivation methods for irrigation in the south of Ukraine // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 57-60.

On the basis of application in crop rotation on irrigation of different methods of basic cultivation its influence on density of compaction, permeability, total consumption is established.

The **purpose** of the study was to study the four basic soil cultivation systems. A commonly recognized system for irrigated lands is adopted for the control of the ground-based system of differentiated basic cultivation, where rotation of the crop rotation alternates deep, shallow and

superficial methods with rotation and without rotation of the chute.

Methods: Field, laboratory, statistical, and calculation-comparative methods were used for conducting research.

Results: It was established that the lowest soil compaction density was formed in the case of chisel cultivation at a depth of 23-25 cm in a system of multi-depth bezpolovogo loosening during rotation and varied over years of research from 1.18 to 1.21 g / cm³.

Conclusions: it was found that wheat of winter after soybeans in short rotation crop rotation on irrigated lands it is expedient to apply discounts to a depth of 12-14 cm in the system of basic cultivation, during which during rotation, the smooth free-field loosening under grain cereal alternates with deep chisel processing with the application of mineral fertilizers the dose of $N_{120}P_{40}$ and provides a profit of 20298-21873 UAH / ha and a profitability of 268-356%.

Key words: soil cultivation, density, water permeability, crop rotation, winter wheat, water consumption, soil, research.

Zaiets S.O., Netis V.I., Kuts G.M., Stepanova I.M. The influence of various technological measures on the quality of soybean seeds under irrigation // Irrigated agriculture: interdepartmental thematic scientific collection. – 2017. – Issue 68. – P. 61-64.

Goal. To study the effect of varieties, nutrition background and seeding rate on chemical composition of soybean seeds under irrigation and to determine the process activities which provide formation of seeds with a high content of protein and fat.

Methods: field, laboratory, analytical.

Results. Chemical composition of soybean seeds greatly depends on the type of background diet and seeding rates. Under the influence of these factors, the protein content in seeds varied from 30,1 to 34.0%, fat – from 20,4% to 23.5%. Optimization of these factors makes it possible to generate high-quality soybean seeds. More protein in the seeds of varieties of Aratta and Sophia were kept at inoculation of seeds, and add to inoculation, mineral fertilizers $N_{30}P_{40}$ and $N_{60}P_{40}$ did not lead to further increase of its content. Seeding rate influenced the protein content in seeds depending on the variety. The seeds grades of Aratta more protein was kept at the seeding rate of 600 thousand seeds per 1 ha, and increasing or decreasing it led to a decrease of its content on all backgrounds food. The variety Sofia the sowing rate had little impact on the protein content in seeds. Varieties of Aratta and Sophia had almost the same protein content in seeds – an average of 32.9 and 32.7 per cent respectively. The seed varieties Sofia contained more fat, on average, by 1.8% than in Aratta. Inoculation and mineral fertilizers increased the content of fat in seeds varieties Aratta and reduced it in the varieties of Sofia.

Conclusions. The largest collection of protein and fat both varieties are provided at the seeding rate of 600 thousand/ha on the background of power $N_{30}P_{40}$ + inoculation of seed.

Key words: soybeans, seed quality, variety, nutrition background, sowing rate.

Granovska L.M., Podmazka O.V. Directions of irrigation restoration on the basis of ecological and ameliorative zoning of agricultural lands // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 64-69.

Goal. The theoretical substantiation of the need to restore irrigation in the Southern region of Ukraine to ensure food security and to prevent the emergence of degradation and desertification of agricultural lands, which were previously irrigated by implementing ecologically-meliorative zoning of the territory depending on the main indicators characterizing the ecological, hydrogeological and land-reclamation condition of agricultural lands at the irrigation zone.

Methods. The following methods were used: historical, analysis, deduction, induction, statistical, comparative, graphical, the method of ecological monitoring; the method of ecologically-meliorative zoning. The method of ecologically-reclamation zoning of the territories is updated and complicated, as it presumes the allocation of territorial units (zones, taxons) that differ in terms of ecological and hydro-geological and land reclamation state of the land and factors influencing them.

Results. The analysis of the dynamics of indicators characterizing the hydrogeological and reclamation state of agricultural lands and adjoining territories was carried out: depth and mineralization of ground waters, salinization and alkalinization of irrigated soils, reclamation and ecological state of reclaimed lands and adjoining territories, levels and areas of floodplains. With the help of the software, the distribution of the territory of Kherson Prysyvashshia to four main integrated zones was performed. It was noted that the northeastern part of the district (zones 3 and 4) is in a relatively good ecological and reclamation state, and the areas of the southern part of the district (zones 1 and 2) are in the unsatisfactory state, within which, despite the operating drainage systems, unsatisfactory hydrogeological -melioration status of irrigated lands and adjoining territories is noticed. The factors influencing negatively on the hydrogeological and reclamation state of agricultural irrigated lands by zones separately are determined. Based on the identification of the factors of negative impact for each zone, appropriate environmental, engineering and reclamation measures have been developed.

Conclusions . As a result of the researches, it has been established that the intensive development and functioning of the water management and reclamation complex for many years, the application of insufficiently scientifically grounded irrigation regimes, and the presence of groundwater infiltration feeds due to the reduction of efficiency of irrigation canals and inefficient work of vertical and horizontal drainage, natural hydrogeological conditions have deteriorated considerably. Recommendations for auxiliary activities that are not specific for each of these zones are also developed.

The cost of each activity to improve the hydrogeological and land reclamation state of lands is calculated according to standard costs, the calculation of the total amount of funds for the implementation of basic measures is calculated, it is the basis for calculating the cost of supporting measures for each of four zones, by the number of factors being in each of them, which are taken into account by the coefficients : for zone 1 – 0.71 from the cost of the main activities; 2 zone – 0.17; 3 zone – 0.12; 4

zone – the coefficient is absent, since only the group of main activities is implemented.

Key words: water management complex, hydrogeological and land reclamation conditions, ecological and land reclamation zoning, zones, engineering and reclamation measures.

Vlashchuk A.M., Kolpakova A.S., Vlashchuk O.A., Kopylov S.A., Halyliuk V.V. Development of the technological elements of growing annual white sweet clover under the conditions of the Southern Steppe of Ukraine // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 69-73.

Purpose. To determine the seed productivity of various varieties of annual white sweet clover depending on inter-row spacing and nitrogen fertilizer doze taking into account the factors of their cultivation. intensification and effective use of the Ukrainian Southern Steppe lands.

Methods. In the process of research, the authors used field, visual, measurement-weight, laboratory, mathematical-statistical and computational-comparative methods. Yield data were processed by the methods of dispersion, correlation and regression analysis using a personal computer and the Agrostat software and information package.

Results. The highest yield of seeds, on average for the 2016-2017 years – of 0,61 t/ha was formed in annual white sweet clover Yuzhnyi variety under sowing at inter-row spacing of 45 cm and nitrogen fertilizer doze of N_{60}.

Conclusions. The research carried out in 2016-2017 showed that seed productivity of the crop varies significantly depending on the nitrogen fertilizer doze. The study established that the average yield of annual white sweet clover was 0,30-0,61 t/ha for Yuzhnyi variety, and 0,29-0,50 t/ha for Annual Donetskyi variety.

Based on factor A (variety), on average for the 2016-2017 years the highest yield – of 0,45 t/ha was recorded in Yuzhnyi variety. In the varieties under study, the highest seed yield of 0,47 t/ha was observed at inter-row spacing of 45 cm (factor B). As to to factor C (nitrogen fertilizer doze), the maximum values of this indicator (0,50 t/ha) were obtained at N_{60} nitrogen fertilizer doze.

The maximum average seed yield of 0,61 t/ha in annual white sweet clover in 2016-2017 was in Yuzhnyi variety at inter-row spacing of 45 cm and N_{60} nitrogen fertilizer doze.

Key words: research methods, inter-row spacing, nitrogen fertilizer doze, seeds, productivity.

Fedorchuk M.I., Sviridovskyi V.M. Productivity and economical and energy efficiency of the technology of growing onions in the conditions of drip irrigation // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 73-76.

Aim. Establishment of economic and energy efficiency of the technology of growing onions, depending on irrigation regimes and schemes of plant protection against pathogens in cultivating culture in the system of drip irrigation in the south of Ukraine.

Methods: Field, Laboratory, Analytical.

Results. According to the results of the research, it has been determined that the best results ensure application of a drip irrigation method in compliance with the irrigation regime of 80% of LM (lowest moisture) in the soil layer of 0.5 m and the chemical protection of plants against pests and pathogens of diseases by the integrated scheme. It was proved by economic analysis that the maximum net profit at the level of 37.7 thousand UAH/ha for profitability of 129.3% was obtained when growing onions with an irrigation regime with a pre-oil threshold of 80% LM on the background of chemical protection of plants.

Conclusions. The minimum inflow of energy was in the irrigation regime of 70% LM and without the use of biological and chemical means of plant protection. The highest energy coefficient was in variants with irrigation of 70-80% LM and use of chemical protection of plants.

Key words: onion, drip irrigation, plant protection, yield, economic efficiency, energy estimation.

Bidnyna I.O., Kozyriev V.V., Morozov O.V., Reznik V.S., Melnyk M.A. Assessment of the suitability of the soils of the Kherson region for the cultivation of corn in terms of fertility // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 76-79.

Purpose. Provide an assessment of the suitability of the soils of the Kherson region for the cultivation of corn in terms of fertility.

Methods: field, analytical, computational and comparative, mathematical statistics.

Results. The feasibility of comparing the materials of standard soil monitoring with the optimal parameters that require corn is justified. It has been established that the most favorable conditions for the suitability of soils are formed in the southern chernozems in four regions of the Kherson region according to the depth of the humus horizon and the humus content in the plow layer. Specific areas with optimal soil parameters for growing corn allow planning its location, sowing areas, reclamation measures.

Conclusions. The most favorable conditions of soil suitability for fertility indicators were formed in the Velyko Aleksandrovsky, Vysokopilsky, Novovorontsovsky, Velikolepetysky districts of the Kherson region.

Key words: evaluation criteria, norms of fertility indices, humus content, depth of humus horizon.

Minkin M.V., Minkina G.O. Energy potential for industrial vineyards // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 79-84.

Purpose: To determine the orientation and dynamics of the flow of energy in the system of soil – industrial grape planting, clearly and reliably allows only a detailed analysis of these flows of energy.

Methods: field, analytical, computational and comparative, mathematical statistics.

Results. During the 9-year period of cultivating grape plantations, energy costs amount to 427.3 GJ/ha, of which only 284.3 GJ/ha or 66.5% are provided by artificial man-made energy (manure, mineral fertilizers) and partly by plant residues origin. Such an energy imbalance caused an energy deficit of 142.9 GJ/ha, and reduced its energy potential by an average of 5%.

Conclusions. The most promising method of solving the problem of energy potential improvement can be the development and subsequent widespread adoption of

adaptive, bioorganic technologies in industrial vine growing. The theoretical basis for the development of such technologies may be a comparative bioenergy assessment of traditional and new fertility regeneration technologies.

Key words: soil, energy, grapes, stages of cultivation.

Malyarchuk N.P., Voronyuk L.A. Influence of soil cultivation methods and sowing on soybean productivity in crop rotation on irrigation in the South of Ukraine // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 84-87.

Aim: to develop an optimal method and determine the depth of basic soil cultivation, and to determine the effectiveness of sowing in previously untreated soils, with their impact on agrophysical properties and the water regime of dark chestnut soils for different doses of mineral fertilizers when growing soybeans in crop rotation on irrigation.

Methods: Field, laboratory, statistical, and calculation-comparative methods were used for conducting research.

Results: It was found that the methods of cultivating under soya on the background of the long-term application of systems of the main differentiated, non-polygonal, multi-depth and single-depth small and zero cultivation in crop rotation had an effect on the density of compaction, porosity and permeability of the soil.

Conclusions: The best conditions for the formation of soybean crops are created during chisel cultivation at a depth of 28-30 in a system of multifield polygonal cultivation and mineral fertilizers with a dose of $N_{120}P_{40}$.

Keywords: soil cultivation, No-till technology, soil density, soil permeability, water consumption, soybeans, irrigation.

Halchenko N.M. Productivity of perennial grasses depending on the method of sowing and the composition of grass mixtures in the southern Steppe of Ukraine // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 87-90.

Purpose. To carry out the selection of cereal grass and legumes perennial grass the most adapted to conditions of soil insufficient moisture which supply the sustainable production of feedstock, and to develop technological methods for their creation and use on the non-irrigated lands of the southern part zone of the Steppe.

Methods. The studies were carried out using methods common in crop production.

Results. The main indicators on the productivity and economic efficiency of the use of crops of legumes and cereal perennial grasses of the first year use with the width of the rows of 15 and 30 cm are given. It is determined that the most favorable conditions for the growth and development of perennial grasses in non-irrigated conditions are created by sowing them with a row spacing of 30 cm. In these conditions, plants are better provided with moisture and elements of mineral nutrition. The greatest productivity of grass stands was obtained from grass mixture of *Medicago sativa* (L.) + *Bromopsis inermis* (Leyss.) + *Elytrigia intermedia* (Host.) + *Agropyron pectinatum* (Bieb.) with row spacing of 30 cm: harvest of feed units was 2.29 t/ha, exchange energy – 3287 MJ/ha, digestible protein – 0.44 t/ha. The highest conditionally net profit – 3469.2 UAH/ha, with a profitability level of 136.5%, was also obtained from the specified grass mixture,

Conclusions. To increase the yield of feed units and balanced feeds for the digestible protein, as well as to increase the fertility of dark chestnut soils, planting poly-species grass mixtures of perennial grasses should be carried out in an ordinary way with a row spacing of 30 cm.

Key words: grass mixtures, dry matter, fodder unit, digestible protein, exchange energy, prime cost, profitability level.

Vasylenko R.M. Energy efficiency cultivation of agricultural lands of sweet sorghum in the South of Ukraine // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 90-93.

The author discusses the results of studies on the bioenergetic efficiency of cultivation in agricultural lands of sugar sorghum depending on the timing of top dressing fertilizer in the conditions of natural moisture and under irrigation. There are elements of technology that help to reduce the energy costs of crop production.

The goal was to examine the economic-energy efficiency of technological methods of sugar sorghum depending on the timing of topdressing nitrogen fertilizer carbamide-ammoniac mixture on an irrigation and without it.

By results of researches it is established that to save production and energy costs, it is advisable to feeding of sorghum plants with nitrogen fertilizers in the phase of 4-5 leaves. The smallest energy expenditures for receiving tones of digestible protein were in the Dovista hybrid as irrigation – 71.9 GJ, and without irrigation – 43 GJ.

Key words: feed unit, digestible protein, sugar sorghum, energy efficiency, mineral fertilizer, irrigation.

Tymoshenko G.Z., Kovalenko A.M., Novokhizhny N.V., Sergeeva Yu.A. Changes in microbiological indices of soil in barley spring crops, depending on the methods of its main processing // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 93-96.

Purpose. To substantiate the optimal parameters and the economically expedient system of basic tillage in the rotation for spring barley (*Hordeum vulgare* L.).

Methods. The investigations were carried out on the non-irrigated dark chestnut soils of the Institute of Irrigated Agriculture of the National Academy of Sciences for the generally accepted methods of farming, in a stationary two-factor experiment, during 2011–2015.

Results. The number of ammoniophyseal microorganisms was the highest at the beginning of the spring barley vegetation. The highest was under the conditions of carrying out small soil-free tillage. During the period from shoots to barley ear, the amount decreased by 17,1–25,0% for all soil treatment systems. Later, with no-tillage processing, their number remained practically at the same level, and for plowing increased by 4,91 million/g.

In the dynamics of the number of nitryfiguring microorganisms, the direction of their decrease during the entire period of barley vegetation is clearly traced. The lowest was the decrease in the number of these microorganisms under the conditions of an uncontaminated deep soil compost – by 17,8%. In other variants of soil treatment systems, the decrease in the number of microorganisms of this group was quite significant – by 41,7–46,7%.

Conclusions. The number of microorganisms that participate in the transformation of nitrogen compounds in the soil was not stable and varied under the influence of predecessors, soil treatment systems and weather conditions.

Key words: microorganisms, plowing, non-waste deep processing, waste-free small-scale processing, yield.

Kovalenko A.M., Voronyuk L.A., Khribinyuk K.S. Influence of different ways of cultivating soil on the indices of its fertility and the yield of peas in short-rotation crop rotation // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 96-99.

Purpose. To ground the optimal parameters of methods and depth of basic till of soil and sowing in preliminary untilled soil and their influence on the change of agrophysics properties, and nourishing mode of soil, and forming of harvest of pea (*Pisum sativum* L.).

Methods. The research was conducted on the experimental field of the Askanian DSDS IIA NAAS, on dark chestnut soils. Four basic soil cultivation systems are selected for study, which differ in methods, methods and depth of loosening. The research was conducted in 2014–2017 in a stationary two-factor field experiment on unriportable lands in crop rotation peas – sorghum – mustard – wheat yar.

Results. A table of contents of nitrates is in a top-soil, in sowing of pea, at the beginning of his vegetation on conditions of realization of ploughing was the greatest are 37,62–51,01 mgs/of kg, comparatively with other variants. Thus, at shallow and superficial non-waste treatment, and also at direct sowing in preliminary untilled soil maintenance was practically at one level. The highest yield of peas was obtained during plowing to a depth of 20–22 cm, – 2,39 t/ha. Replacing the plow without poles has reduced yields by 0,04–0,10 t/ha, regardless of the depth of soil cultivation. Direct sowing in previously untreated soils reduced yields by 0,74 t/ha.

Conclusions. The calculation of the economic efficiency of different soil tillage systems revealed the overall difference between them. Profit and profitability levels changed in practically the same way as the level of yield.

The least income is got at the terms of sowing in preliminary untilled soil.

Key words: No-till technology, soil density, water permeability of soil, water consumption, peas.

Martynenko T.A., Shkoda O.A. Efficiency of phosphogypsum on drip irrigation when growing onions // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 99-103.

Purpose To define efficiency of phosphogypsum drip irrigation with saline water of onions. **Methods.** Field, analytical, calculation-comparative. **Results.** In the article brought results researches of influence of different forms, doses and methods of applying of phosphogypsum and mineral fertilizers against of drip irrigation in the cultivation of onions. It was established that drip irrigation of mineralized waters and waters with an unfavorable ratio of one and divalent cations led to the accumulation of readily soluble salts in the 0–0,3 m soil layer. The growth of the total amount of salts in the soil solution was due to the increase in toxic salts of Na^+, Cl^-. The experiments have shown that drip irrigation with water of the second class leads to a typical process of soling. The introduction of phosphogypsum both under presowing cultivation and sowing belt ensured a decrease in the proportion of exchange monovalent cations of the soil complex by 0,7-1,1% in compared with the variant on irrigation, that is, the intensity of the process of secondary soling. Joint application of phosphogypsum and calcium nitrate ensured the accumulation of the highest content of exchangeable calcium in the soil-absorbing complex among the variants with irrigation. **Conclusions.** The application of phosphogypsum (1,9 t/ha in the sowing belt) under drip irrigation mineralized and with water effectively counteracts the secondary solonization of dark-chestnut soil. The introduction of ameliorating it he sowing belt against the background of mineral fertilizers ensures the preservation of soil fertility and promotes the formation of the highest harvest of onions.

Key words: crop capacity, fertilizer, ameliorant, dark chestnut soil, soling.

Markovs'ka O.Y., Zorina G.G., Kokovikhina O.S., Galchenko N.M., Melnyk A.P. Simulation of the technology of growing field crops of short-term irrigated crop rotation taking into account the natural-climatic and economic factors // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 103-107.

Aim. The aim of the research was to implement simulation of the technology of growing crops of short crop rotation with the help of the AquaCrop software complex and to compare the obtained simulated scenarios of plant productivity with the volumes of used water in the south of Ukraine.

Methods. Initial data on temperature data, wind speed, precipitation and duration of sunlight in the program were taken from the local weather station data from archives of weather data bases from the Internet resource. The reference evapotranspiration was calculated using software and information complex CROPWAT.

Results. For the modeling of the constituent elements of cultivation technologies, rates of irrigation water consumption, fertilizers and other resources, as well as productivity levels of short-term irrigated crop crops, data bases of the initial indicators were formed. After the introduction of these characteristics, the program automatically calculates the density of cultures and the size of the "cover" of the CC culture.

Also, the simulation allowed establishing the difference between the biologically optimal and water-saving irrigation regime. When applying the first regime, the maximum yield level was obtained, which was 0.49 t/ha or 3.6% higher than the second regime. However, the water-saving scheme provides a reduction of irrigation rate of 254 m^3/ha or by 9.6%.

A biologically optimal irrigation regime was formed in the presence of 50% of the permissible reduction of RAW with an irrigation rate of 231.2 mm and a maximum yield of grain at 4.43 t/ha (biomass 11.85 t/ha). The correlation between the real and potential biomass of barley with the stresses taken into account during the period of development of the crop with a water-saving irrigation regime was 96%, and the yield index decreased to 37%.

After conducting simulation, users are able to evaluate the results of such simulations using the calculation of the

"green cover" of the crop (CC), the parameters of the above ground biomass (B) and the soil moisture content in the rootsoil soil layer (SWC). All of these data are stored as databases in separate AquaCrop files. After launching the simulation process, the software complex compares the modeling data with the field data and provides the results in a graphical format.

Conclusions. It is established that in the developed short crop rotation, the estimated level of yield of soybeans is about 4.2 t/ha with irrigation water consumption at the level of 5510 m^3/ha, and the formation of a watering schedule for a water saving scheme reduces water expenses by 17%. For maize, the potential yield of grain is 13.2 t/ha, with an irrigation water saving of 13%, and for barley, these indicators are equal to 2.9 t/ha and 10%, respectively. Using AquaCrop allows you to simulate natural and agronomic factors, including irrigation regimes at short rotation crop rotation, to quickly and reliably evaluate and choose the most economical variations of irrigation schedules for each crop with a reduction in the cost of irrigation water by 10-17%, to program yields based on the soil parameters, a set of agrotechnological operations, characteristics of varieties and hybrids, weather changes, etc.

Key words: AquaCrop, modeling, irrigation, water consumption, short croprotation.

Dymov O.M., Dymov V.O. Ecological problems of agricultural production of the Kherson region // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue 68. – P. 107-113.

The purpose of this article were to study environmental aspects of agricultural production of Kherson region, highlighting the major environmental problems that hinder sustainable agricultural nature management and providing suggestions for their resolution on the principles of balanced development.

Methods. During the study used the following research methods: analysis and synthesis – to identify the main environmental problems in agriculture; the table is for clarity of the image obtained results of the research; abstract and logical – to formulate conclusions and suggestions.

Results. There are analyzed: the structure of sown areas in the Kherson region before and after the implementation of land reform; the current state of soils on the basis of their agrochemical certification; the situation with the use of mineral and organic fertilizers in the agricultural enterprises of Kherson region; the state of forest belts along border of fields and along main irrigation channels; the reduced area of degraded and unproductive arable land in Kherson region. The reasons that caused the decrease in the volume of fertilizer and ways to replenish soil nutrients are given. Directions of further ecologically safe use and improve the fertility of salt lick and saline soils are outlined. The actions by the Kherson regional state administration aimed at the destruction of unusable chemical plant protection products are given.

Conclusions and suggestions. One of the factors of improvement of the ecological situation in the Kherson region is the reduction of tilled territories, the conclusion of the intensive cultivation of the degraded and unproductive arable lands, expansion of areas under fodder crops and area of natural pastures and hayfields. In terms of reducing the volume of manure a significant factor in the improvement of soil fertility there are the development of cattle breeding branch; the use of all available organic fertilizer, and peat or peat humus; attracting alternative sources of replenishment of organic matter of soil increase in the specific weight of crop rotations perennial legumes and other legumes. Urgent issue is restoration of field forest belts and forest belts along main irrigation channels. With the aim of improving water-physical soil properties it is necessary to conduct chemical reclamation. It needs to implement the disposal of unusable pesticides.

Key words: environment, soil fertility, the structure of sown areas, fertilizers, the plowed of lands, forest belts, chemical reclamation, utilization.

Kolpakova A.S. Water consumption and productivity of maize hybrids, depending on the timing of planting and the density of standing in the conditions of irrigation // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 113-119.

Purpose. To establish the total water consumption of maize hybrids depending on the factors studied and its effect on grain productivity under irrigation conditions.

Methods. The results of three-year studies of the influence of the timing of planting and the density of standing on water consumption and the yield of grain of maize hybrids of various ripening groups in conditions of irrigation of the Southern Steppe of Ukraine are presented. The soil of the experimental site is dark-chestnut medium loamy, slightly solonetzic, typical of the Southern Steppe of Ukraine. At the time of the research, general scientific (analysis, synthesis, observation, comparison, measurement), special (field, laboratory), mathematical-statistical and computational-comparative methods were used.

Results. The article presents the results of water consumption of maize hybrids and its components. The maximum index of total water consumption in the soil layer is 0-100 cm, on average for 2014-2016. – 6136 m3 / ha was installed in the mid-season Kakhovsky hybrid at the second planting date in all habitat density variants, the lowest water consumption coefficient of 446 m3 / t was established in the mid-season Kahovsky hybrid at sowing in the 1st decade of May and plant density of 70 thousand pieces / ha.

Sow in the third decade of April, on average for three years of research, showed the highest yield of corn grain, which amounted to 11.77 t / ha. The maximum yield of grain – 12.70 t / ha was obtained from the Kakhovsky hybrid. With respect to the density of standing, on average, the highest yield indicator – 11.57 t / ha is set at a standstill of 80 thousand pcs / ha.

Conclusions. Most of the total water consumption of crops is covered by irrigation – 36.4-65.6%, 16.4-23.3 from the soil resources of the crop plant, and 17.5-45.9% moisture from the sediments.

For all the hybrids studied in the experiment, optimal seeding is in the third decade of April. At all sowing times, 90,000 pcs / ha for the early Tendra hybrid are optimal, 90,000 pcs / ha for the mid-early Skadovsky hybrid, and 70,000 pcs / ha for the mid-season Kahovsky hybrid.

Key words: Key words: total water consumption, water consumption coefficient, corn, hybrids, sowing time, stand density, yield.

Konovalova V.N. Yield of flax oil in various conditions of moistening and doses of mineral fertilizers in crop rotations in the South of Ukraine // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 119-123.

The article presents the results of researches of 2016-2017 on the yield of varieties of flaxen oil under various humidification conditions and doses of mineral fertilizers in crop rotations in southern Ukraine.

The purpose of our research was to determine the effect of different humidity conditions and doses of mineral fertilizers on the yield of seeds of varieties of flaxen oil.

Methods: Field, laboratory, statistical, and calculation-comparative methods were used for conducting research.

Results: The results of yield counts of flaxseed oil varieties indicate that yields increase with an increase in the dose of fertilizer application. The highest level of flax straw yield of 2.49 t / ha was obtained on irrigation under the condition of fertilizer dose N90P60. In the non-irrigation background, the highest yields of 1.49 t / ha and 1.48 t / ha were provided respectively by the Vira and Orpheus for the dose of N90P60 mineral fertilizers. Reducing the dose of fertilizer application, both irrigation and irrigation irrespective of the variety had a negative impact on the yield of flax seeds.

Conclusions: Studies have established that it is advisable to sow flax oilseed varieties of Vira to unpolluted and irrigated lands of the South of Ukraine to introduce mineral fertilizers with a dose of N90P60, which yields a yield of irrigation of 2.49 t / ha, with a profit of 20043 UAH / ha and a profitability level of 203%, and in the irrigated area, respectively, 1.49 t / ha, 10028 UAH / ha and 128%.

Key words: flax oil, irrigation conditions, mineral nutrition background, density, productivity, yield.

Reznichenko N.D. Formation of winter barley (*Hordeum vulgare* L.) leaf area under different technological methods of cultivation // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 123-126.

Objective: to study the peculiarities of the formation of leafy surface area of winter *(H. vulgare* L.) barley plants in various methods of basic soil treatment and mineral fertilizer doses, as well as to determine the influence of these factors on the yield of modern varieties when cultivated under irrigating conditions.

Research methods: field, laboratory, comparative, and statistical.

Results. The article presents the results of experimental studies on the influence of methods of basic soil cultivation and direct sowing and the introduction of various doses of mineral fertilizers on the formation of the leaf area and yield of varieties of winter barley (*H. vulgare* L.) in growing under irrigation conditions. It is established that deep chisel tillage resulted in the largest leaf area of winter barley plants of a variety called Dostoinyi. When sowing this variety under disk (12-14 cm) tillage, leaf area reduced to 1,64, 0,88, and 2,6 thousand square meters per hectare using different doses of mineral fertilizers. Variety of winter barley (*H. vulgare* L.) called Zymovyi had the largest leaf area during the basic phase of growth under disk tillage on the depth of 12-14 cm. When planting varieties in a raw soil their leaf area was the smallest.

Regardless of the variety and methods of primary tillage, increasing the dose of mineral fertilization from 60 kilograms per hectare a. s. to 120 kilograms per hectare a. s. led to an increase in leaf area up to 25-47%.

When sowing barley (*H. vulgare* L.) in a raw soil and applying a mineral fertilizer dose $N_{60}R_{40}$, both varieties provided the lowest yield: 3.92 tons per hectare (Dostoinyi) and 3.89 tons per hectare (Zymovyi). The highest level of crop capacity, in average for three years, was when applying a fertilizer dose $N_{120}P_{40}$ under shallow (12-14 cm) disk tillage.

Conclusions. When cultivating winter barley (*H. vulgare* L.), it is advisable to apply disk treatments of soil to a depth of 12-14 cm and to add mineral fertilizers to the $N_{120}P_{40}$ dose, which will provide an optimal leaf area of 57,96 and 59,77 thousand $м^2$/ha and will produce the highest grain yield of 6.35 and 6.14 t/ha.

Keywords: winter barley, tillage, No-till technology, leaf area, yield.

Maliarchuk N.P., Isakova G.M., Maliarchuk A.S., Mishukova L.S., Tомnitsky A.V. Influence of the systems of basic treatment and fertilizer on the nourishing mode of soil and productivity of 4-field crop rotation on irrigation. Institute of the irrigated agriculture // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 126-130.

Purpose: establishment of directions of forming of the humus state and nourishing mode of livery soil on conditions of the use on the fertilizer of post harvest bits and pieces and application of the different systems of basic treatment and doses of bringing of mineral fertilizers in a crop rotation on irrigation.

Methods: the field, in-gravimetric, visual, laboratory, calculation-comparative and mathematically-statistical methods with the use of confessedly in Ukraine methods and methodical recommendations.

The results of researches show that at the different systems of basic treatment of soil on the unfertilized background it was backfilled in soil from 16,08 to 19,3 т/ha of area of crop rotation. Bringing on a 1 hectare of croprotation area of mineral fertilizers by the dose of $N_{82,5}P_{60}$ provided the increase of the productivity, and accordingly mass of after clean bits and pieces grew and made 29,39-33,25 т/ha. With the further increase of dose of bringing of mineral fertilizers on a 1 hectare of croprotation area to $N_{120}P_{60}$ mass of post harvest bits and pieces grew on 85,9-94,8% to control**.**

Realization of calculations of formation of humus from done up in soil post harvest bits and pieces testifies that on the unfertilized background negative balance of humus is marked in all variants of the systems of basic treatment of soil and the greatest he was at one depth shallow without tillage and differentiated-2 with indexes accordingly – 0,33 – 0,25 т/ha.

On the fertilized backgrounds with bringing of $N_{82,5}P_{60}$ and $N_{120}P_{60}$ is marked increase of humus. In variants by a different depth dump and differentiated-1 system of basic treatment of soil the increase of humus made +0,78 т/ha., while at different depth without tillage he was below on 14,1% and made +0,68 т/ha. At the system of onedeep shallow without dump treatment and differentiated-2 an increase of humus also was positive, at the same time comparatively with control (different depth ploughing) he was below accordingly on 51,3 and 38,5% and made +0,38 and +0,48 т/ha.

On the whole bringing of mineral fertilizers and use on the fertilizer root bits and pieces assisted creation of different levels of maintenance of elements of mineral feed at the beginning of spring vegetation of озимых and appearance of shoots of spring grain and technical crops.

The increase of dose of bringing of mineral fertilizers to $N_{120}P_{60}$ assisted the height of the productivity of crop rotation on the output of grain-growing units as compared to the dose of bringing of $N_{82,5}P_{60}$ from 12,3 to 14,2%.

Conclusions: the economic justified system of basic treatment of soil is differentiated-1, which foresees realization one time for the rotary press of crop rotation of щелевания on a depth a 38-40 cm on a background bringing of mineral fertilizers the dose of $N_{120}P_{60}$ with the use on the fertilizer of vegetable bits and pieces of cultures of crop rotation, that provided the level of profitability on a 1 hectare of crop rotation area level of 179% against 163,3% on control.

Key words: dose of mineral fertilizers, post harvest bits and pieces, humus, system of basic treatment of soil, tillage.

Grabovskyi M., Grabovska T., Gerasimenko L. Influence of sweet sorghum nutrition area on water consumption and formation of biometric and photosynthetic indicators // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 130-137.

Purpose. To establish the optimum density of plants standing and the width between rows of sweet sorghum, to substantiate their influence on photosynthetic activity, biometric indexes and water consumption of agrophytocenoses in the conditions of the Central Forest-Steppe of Ukraine. **Methods.** Field experiments were conducted during 2012-2016 yrs in the Training and production center of Bila Tserkva National Agrarian University. A variety of sweet sorghum Silosne 42 and a hybrid Dovista with a width between rows 45 and 70 cm and density of plants standing 150, 200, 250 ths pcs/ha were sowed. We used general scientific, special and calculation-comparative methods. **Results.** The increase in density of plants standing from 150 to 250 ths pcs/ha and the narrowing of a width between rows from 70 and 45 cm, affects the reduction of stem diameter, tillering ratio and plant height. There is a tendency to increase field germination with increasing density of plants standing from 150 to 250 ths pcs/ha and a width between rows from 45 to 70 cm. When increasing the density of plants standing from 150 to 250 ths pcs/ha and the width between rows from 45 to 70 cm in sweet sorghum, the coefficient of water consumption decreases on 1.2-8.7%. **Conclusions.** In the conditions of the Central Forest-steppe of Ukraine it is recommended to grow a hybrid of sweet sorghum Dovista with a width between rows 45 cm and a density of plants standing 250 ths pcs/ha.

Key words: density of plants standing, width between rows, photosynthesis, Silosne 42, Dovista, water consumption coefficient.

Maliarchuk A.S., Lopata N.P., Melnik A.P. Influence of doses of fertilizers, basic treatment and sowing on the productivity of grain of corn in a crop rotation on irrigation // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 137-139.

Objective: To study the influence of different methods of basic cultivation, sowing in previously untreated soils and doses of mineral fertilizers on agrophysical properties, water regime of root-bearing layer, and the formation of corn yield in crop rotation on irrigation.

Methods: Field, laboratory, statistical and calculation-comparative methods were used for conducting research.

Results: It was determined that the methods and depth of the main cultivation of corn on the background of the prolonged use of minimized and zero cultivating systems in crop rotation had a significant impact on the saturation of crops, the content of mineral nutrition elements and the formation of grain yield corn.

Conclusions: It was established that chisel cultivation at a depth of 28-30 cm in a system of multi-depth bezpolovogo loosening during rotation of crop rotation and the introduction of mineral fertilizers with the dose $N_{180}P_{40}$ on the background of the integrated system of protection of corn crops from harmful organisms contributed to the formation of crop at 11,3t / ha and ensured receipt The highest profit was 37413 UAH / ha with a profitability of 239.9%.

Key words: basic soil tillage, No-till technology, fertilizer doses, corn, density, total water consumption, productivity.

Zeynalova A.T. Socio-economic necessity of foreign trade in national economic development // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 140-142.

Aim. The purpose of the research was to scientifically substantiate the socioeconomic necessity of foreign trade in national economic development.

Methods: The paper uses the accepted methods of economic research: economic-statistical, abstract-logical, expert evaluations, system-structural analysis and others.

Results. It is established that the role and socioeconomic importance of foreign trade relations should be considered in three aspects: the main features common to the vast majority of countries of the world and are not related to the specifics of Azerbaijan; main features associated with the peculiarities that arose in the modern period of the republic; the main features are necessary in terms of long-term development. The importance of external trade relations in the context of market relations is linked by three factors: the development of commodity turnover and its conclusion beyond national boundaries, with a low purchasing power of the population arose in the conditions of capitalism, as a result of the deepening of the contradictions between the general nature of production and the specific nature of appropriation, and finally, the achievement of higher profits determines foreign trade as the most important factor in development; inequality in the conditions of capitalism. Different industries are "market" for each other and if their uneven development occurs, then a stronger industrial sector will look for a reliable "external market"; development of reproduction in conditions of capitalism, in accordance with the law.

Conclusions. According to the results of researches, it is established that the basis of every economic development is the problem of satisfying the existing general demand to one degree or another. At the same time, in the conditions of real market relations, the uneven development does not depend on the political and ideological aspects. They are conditioned by the ability to effectively

use existing potential and the ability to create competitive advantages. Independence of foreign trade relations, that is, their implementation without state intervention can bring benefits to all countries. This idea is highlighted by the red line in classical and neoclassical approaches. The economic necessity of external trade relations appears kind of mechanically and is perceived as the logical result of the natural - historical process.

Key words: economic development, demand, market, trade relations, reproduction, external trade relations.

Krivenko A.I. The productivity of wheat of winter and oats, depending on the systems of basic tillage and precursors when growing in short-rotation crop rotation // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 142-146.

Aim. To study the regularities in the formation of the yield of grain of winter wheat and oats in a short-rotation crop rotation, depending on various soil treatment systems and predecessors.

Methods: field, laboratory, analytical.

Results. It has been proved that on the average by factor A - the system of basic soil cultivation, the influence of predecessors on the intensity of plant production processes, the photosynthetic activity of crops and, as a result, on the formation of grain yield by predecessors - black steam, syderal steam (winter vetch, pea + mustard); peas for grain. It was established that the highest grain yield was in the first crop after vapors and peas (field No. 3), where this index rose to 3.20-3.52 t/ha. The lowest level of grain productivity was recorded in the fourth crop (field No. 5), when the yield of grain decreased to 1.91-2.28 t/ha, which is 28.8-45.7% less than in the first variant. The average factor productivity of the crop was maximum - in the range of 2.68-2.73 t/ha for predecessors - black steam and peas for grain. After the sideral predecessors (winter vetch and pea + mustard), a decrease in grain productivity to 2.49-2.52 t/ha, or by 5.9-8.8%, was noted.

Conclusions. According to the results of the research it is established that in the first culture the best results for the formation of the yield of winter wheat are created if they are placed after black steam and sideral steam from a mixture of peas and mustard, as evidenced by their average yield of 3.50 and 3.52 t/ha. In 4 cultures, black steam and sideral steam with a mixture of peas and mustard positively influenced the productivity of the grain of winter wheat. The yield of grain was at the level of 2.26-2.28 t/ha, respectively. As a whole, it was shown that in the 1st crop of winter wheat the formation of a yield was positively affected by non-waste processing (3.88 t/ha), while in other crops there was a tendency to increase the yield when dumping soil. On the average for the predecessors, the maximum grain productivity is 2.68-2.73 t/ha, the plants were formed by cultivation of the culture after the precursors - black steam and peas for grain. When cultivated in short-rotation rotation of oats, it was established that the maximum yields were obtained after black steam and sideral steam with a winter vetch, which amounted to 2.63-2.62 t/ha.

Key words: crop rotation, basic tillage systems, precursor, yield, winter wheat, oats.

Poliakov A.I., Makhova T.V. Influence of seeding terms and rates on the performance of productivity elements and the formation of the yield of oil flax in the Southern Steppes of Ukraine // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P.146-149.

Aim. Investigate the effects of seeding time and seeding rates on the performance of the elements and the formation of the yield of flax oil in the southern steppes of Ukraine.

Methods: field, laboratory, analytical.

Results. It was proved that the sowing time and the rate of sowing of weather conditions during the years of research had different effects on the performance of the elements of productivity (the number of bolls and seeds on the plant, the weight of seeds from the 1st plant, the mass of 1000 seeds) and the yield of flaxseed oil. When comparing the results obtained, it turned out that the number of bolls on the plant was more dependent on the seeding rate. During all the years of research, the number of bolls on one plant naturally decreased during both sowing periods with increasing seeding rates.

According to our data, the collection of fat mainly depended on the level of yield and less on the oil content of the seeds. On average, over the years of research, it has been established that the collection of fat flax varieties of oilseeds depended on agro-practices that were studied. So, at a grade Southern night at crop with norm of sowing 3,5 million pieces. of the seeds / ha, the collection of fat from a unit area at both sowing times was almost the same and amounted to 507 kg/ha at the first term and 496 kg/ha at the second term. Increase in the norm of sowing of the variety Southern night to 4.5 and 5.5 million pcs. of the seeds/ha in the second planting period compared to the first sowing period resulted in a decrease in fat collection.

Conclusions. It has been established that the agronomic activities of growing flax oil, which investigated the influence on the formation of the elements of productivity and yield of both varieties that were studied. The largest number of bolls and seeds on the 1st plant, both at the first and second sowing times, were formed at the smallest seeding rate of 3.5 million pcs/ha. In the South night variety, the number of capsules and seeds per plant was 10.8 and 79 for both sowing periods, and for Kivik at the first sowing period 12.8 and 94, at the second term - 12.1 and 89 pcs. Indicators of the weight of seeds from the 1 st plant and the weight of 1000 pcs. seeds in both varieties were also the largest at the slightest seeding rate - 3.5 million pcs/ha. The best conditions under which the highest yield and yield of fat from a unit area were obtained were for the variety South night during sowing in the first (early) period with a seeding rate of 4.5 million pcs/ha (1.44 t/ha and 545 kg/ha), and for the Kivik variety, at both sowing times, with a seeding rate of 4.5 million pcs/ha (1.23 and 1.25 t/ha and 440 kg/ha).

Key words: oilseed flax, variety, sowing terms, seeding rate, productivity element, yield.

Vozhegova R.A., Sergeev L.A., Konovalova V.N., Dubinskaya O.D., Smenov M.V. Seed productivity of winter wheat depending on fertilizers and plant protection in South of Ukraine // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P.150-153.

Aim. The aim of the research was to develop varietal agrotechnics for the cultivation of winter wheat seeds,

depending on fertilizers and plant protection in southern Ukraine, in order to increase productivity and quality.

Methods: field, laboratory.

Results. Studies have shown that winter wheat after stern precursors when fertilizing enough and protecting plants from weeds, pests and diseases provides seed yields of up to 4.50 t/ha.

Fertilizers that increased the yield of seeds by 0.85-1.29 t/ha had the greatest impact on wheat harvest after wheat, due to the low content of nutrients in the soil, primarily nitrogen. At the same time, against the background of plant protection, the increase in fertilizer yields on high nitrogen backgrounds was higher than without protection.

Studies have shown that one-time introduction of nitrogen fertilizers provides fewer yields than in two terms. Thus, for a single application of N_{90} under cultivation, on the background of plant protection, the seed yield was an average of 4.17 t/ha, and when applied in two terms – to the N_{30-60} sowing and in the feed in the early spring N_{30-60} it was 4.37-4.47 t/ha. In all years, plant protection was very effective, due to a significant amount of weeds, diseases and pests after the corn progenitor. Processing of crops with pesticides saved from harmful organisms a significant amount of seed yield – 0.38-0.72 t/ha. The highest yield was 4.37-4.47 t/ha, and the efficiency of wheat after the stern predecessor was ensured when fertilizers $N_{30-60}P_{40}$ were applied for basic tillage and early crop fertilization – N_{30-60}, and plant protection from weeds, diseases and pests.

Conclusions. The best conditions for the production of winter wheat seeds after corn on silage are created when fertilizing in a dose $N_{90}P_{40}$ and conducting integrated plant protection. Nitrogen fertilizers are better to enter in two terms – N_{30} under pre-sowing cultivation, and the rest – early in the spring before the restoration of the vegetation. At high soil moisture and plant protection, it is better to bring nitrogen to the ground, and at low moisture reserves and without plant protection; one-time and fractional nitrogen inputs provide practically the same seed yield. The best conditions for crop formation were created with sufficient mineral nutrition in combination with integrated plant protection.

Key words: winter wheat, seed yield, fertilizer, integrated plant protection.

Lavrynenko Yu.O., Pysarenko P.V., Marchenko T.Yu., Naydenov V.G., Nuzhna M.V., Karpenko A.V. Morpho-physiological and heterosis models of corn hybrids of different maturity groups FAO 150-600 under irrigated conditions // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 153-161.

Aim. The aim of this work was to develop morpho-physiological and heterozyotic models of corn hybrids FAO 150-600 for irrigation conditions. A morpho-physiological model was developed and the FAO 150-600 corn hybrids were created on its basis for irrigation conditions of the South of Ukraine with grain yield 11-17 t/ha. **Methods.** The general scientific, special selection genetic, computational and comparative research methods were used. **Results.** The results of multi- years research for morpho-physiological and heterozyotic models of corn hybrids of different maturity groups within the conditions of irrigation were presented. The main parameters of models of maize hybrids of different FAO groups are determined. The parameters of heterozosis models are determined and the lines with high combining ability were created, which are involved in the pedigree of early-ripening, early ripe medium group, mid-ripening, middle-late and late maturity groups of maturity of newly created hybrids. The results of new hybrids on the irrigation methods and irrigation regime were presented. **Conclusions.** There were created new innovative FAO corn hybrids 150-600 for irrigation conditions, which are possessing a complex of economic complex and valuable features which are able to form high yields during the irrigation(11-17 t/ha.). The irrigation water, mineral macro- and microfertilizers are effective in use in this process. Also new hybrids have a rapid moisture content of grain during the ripening, have a high resistance to major diseases and pests, which are laid in their genetic potential.

Key words: corn, morpho-physiological model, hybrid, irrigation, group maturity FAO, yield.

Balashova G.S., Polyakova E.O. Productivity of potatoes from minitubers during growing in summer planting in conditions of irrigation in the south of Ukraine // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 161-164.

Purpose. To determine the basic technological methods of reproduction of seed potato material in primary seed production in conditions of irrigation in the south of Ukraine. **Methods.** Integrated use of laboratory, mathematical-statistical, computational and comparative methods, and systems analysis. **Results.** Experimental data on the effect of fertilizer, the fractions of minitubers and the area of feeding on the growth, development and productivity of potatoes. **Conclusions.** The maximum yield in the experiment – is 16.65 t/ha it provides landing by the minitubers fraction 31–35 mm according to the scheme 70x25 cm with local application of fertilizers in a dose of $N_{60}P_{60}K_{60}$.

Key words: potatoes, healthy material, minitubers, fractions, fertilizers, area of nutrition, yield.

Vozhegov S.V., Kokovikhin S.V., Nikishov O.O., Knyazev A.V., Gribinyuk K.S. Agrotechnical aspects of optimization of technology of growing winter wheat seeds depending on varietal composition, plant protection and microfertilizers // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 164-167.

Aim. The aim of the research was to determine the seed yield of winter wheat varieties, depending on the different schemes of plant protection and the introduction of microfertilizers in southern Ukraine.

Methods: Field, Laboratory, Analytical.

Results. Field experiments with winter wheat varieties were conducted during 2013-2016 on the territory of the experimental field of the Institute of Irrigated Agriculture of the NAAS in accordance with generally accepted methods of research in plant growing and plant protection. We studied the effectiveness of application of plant protection products – fungicide Unical, biofungicides Trichodermin and Gaupsin and microfertilizers Riverm, Nanovit Micro and Avatar on the seed productivity of wheat varieties of winter wheat Kherson 99 and Konka. Agricultural technology in the experiment was universally accepted for the

conditions of southern Ukraine, except for the investigated factors.

Phytosanitary surveys of experimental sites recorded a different degree of distribution of pathogens of diseases and their maximum level in control variants without treatment with chemical or biological preparations. It should be noted that in different phases of development the impact of plant protection and microfertilizers on the intensity of the spread of diseases such as septoriosis and powdery mildew on seed crops of winter wheat significantly differed. The defeat of septoriosis was manifested in all phases of development of winter wheat, especially in the phase, when the degree of spread of the pathogen increased to 15.7-25.2%. Among the biological preparations used to protect plants from pathogens, the best combination was the use of Trichodermin and Gaupsin.

Conclusions. It was established that photosynthetic productivity of seed crops of winter wheat significantly depends on phases of development of plants, varietal composition, protection schemes against pathogens and microfertilizers. The largest area of the leaf surface of 42.5 thousand m^2/ha was in variant with the Konka variety under the joint protection of plants with Trichodermin and Gaupsin preparations, the introduction of microfertilizer Avatar, and the Kherson 99 grade for chemical protection and without microfertilizers, this indicator decreased by 38.3% The average daily growth of the area of the leaf surface reached its maximum in the interphase period, "vegetation recovery – the output into the tube". Konka variety has produced seed yields at the level of 3.59 t/ha, which is 8.2% more compared to Kherson 99. The use of chemical and biological protection in different ways influenced the seed yield of the studied crop, with the most effective use of the combined application of Trichodermin and Gaupsin

Key words: winter wheat, varieties, plant protection, microfertilizer, performance indicators, yield of seeds, share of influence.

Balashova G.S, Kotova E.I, Kotov B.S. Influence of nourishing environment and growth regulator on intensitivity of potato club formation *in vitro* varieties of various groups of multiple // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 167-170.

Purpose. Determine the optimal mode of potato cultivation *in vitro*, depending on the replacement of the nourishing environment, the growth regulator and the ripening group of potato varieties 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 replacing the nourishing environment on the 20th day of cultivation and the concentration of succinic acid in it on the growth, development, and productivity of potato *in vitro* of various ripening groups are presented. **Conclusions.** Based on the results of two years of research maximum potato productivity in *in vitro* conditions was obtained with a full cycle of cultivation on a liquid nourishing environment of the Yavir variety with an succinic acid content of 1.0 m/L mass of the middle microtuber – 505.7 mg microtubers mass per plant – 503.0 mg microtuber yield mass of more than 350 mg – 83.2%; the intensity of tuber formation is 101.0%.

Key words: *in vitro* culture, succinic acid, seed material, microtuber, productivity.

Marchenko T.Yu., Piliarska O.O., Lavrynenko Yu.O., Mychalenko I.V., Sova R.S., Zabara P.P., Karpenko A.B. The plant density and growth-regulating fungicide impact on the corn lines yield formation under irrigation conditions // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P.170.175.

Aim. The aim of this work was to study plant stand influence and the use of growth-regulating fungicide Retengo in view of the biological characteristics of the corn parent forms and plants productivity during the irrigable growing. **Methods.** During the 2015-2017 field and laboratory studies on the *Institute's of irrigated agriculture NAAS* irrigated lands were realized. The three-factor experience was used. A factor – there are different self-fertilized lines in the FAO groups 270-450: the DK247 line (the Skadovsky hybrid maternal form), the DK205/710 line (the Kakhovsky hybrid maternal form), the DK445 line (the Arabat hybrid maternal form). B factor- growth-regulating fungicide Retengo (without treatment, treatment with Retengo), factor C- density of standing plants(70; 80; 90 thousand plants per ha). **Results**. At a density of standing 90 thousand plants per ha the DK247 line (the Skadovsky hybrid maternal form) showed the maximum yield. The retengo treatment worked towards productivity increase to 0,55 t/ha and was amount to 5.11 t/ha. At a density of standing 80 thousand plants per ha the DK205/710 line (the Kakhovsky hybrid maternal form) showed the maximum yield- 5,41 t/ha. In comparison with untreated fields the treatment with growth-regulating specimen Retengo increased the yield by 0.39 t/ha. At a density of standing 80 thousand plants per ha the DK445 line (the Arabat hybrid maternal form) formed the highest productivity- 6.58 t/ha. During the retengo treatment the yield increased to 7,08 t/ha. The use of growth-regulating fungicide Retengo resulted in yield increasing by 7,13-12,06%. The biggest influence on the corn yield level has the A factor which is the parent form that runs yield formation by 82,2%. The use of the growth-regulating specimen Retengo provided 4,0% of the specific gravity of plant productivity. The plant density influence(C factor) was also low- 5,3%, because of the slight change in the parent corn forms reactions to the crops density. **Conclusions**. The parent lines of midseason and middle-late groups under irrigation conditions have better stability of manifestation of productivity, both actual and potential.In the studied lines of FAO 310-430 the fall of yield was minimal depending on the genotype. It proves that newly midseason and middle-late corn hybrids under irrigation conditions have special advantages over early-maturing hybrids

Key words: the fungicide Retengo, parent forms, self-fertilized line, productivity, hybrids, FAO groups, genotype.

Balashova G.S., Yuzyuk O.O. Productivity of seed potato depending on fertilization and application of growth regulators in the conditions of the irrigation of the southern Ukraine // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 175-179.

The **purpose** of the research is to determine the regularities of growth and development of seed potato of

different groups of maturation under the action of biostimulants at different levels of mineral nutrition. Research **methods**. Field (visual and measuring-weighted), laboratory (chemical) methods; mathematical-statistical and calculation-comparative methods. **Results**: Biennial data on field sprouting, potato plant height, morbidity, yield are presented, depending on the variety, fertilization rates and the type of growth regulator used. **Conclusions**: The most productive combination is mineral nutrition at a dose of $N_{45}P_{45}K_{45}$ with a complex treatment with researched regulators, which resulted in an increase of yield in 1,1 (Emistim C); 2,0 (Stimpo) and 3,1 t / ha (Regoplant).

Key words: mineral fertilizers, growth regulators, potato, crop capacity, tuber.

Kobilina N.A., Lyuta Y.A., Pohorielova V.A. Economic value of the prospective lines of tomatiles of the selection of the Institute of reduced earth // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 179-181.

Purpose: To create and explore perspective tomato lines for the selection of high-yield varieties and heterozygous hybrids.

Methods: Field, laboratory, statistical methods were used for conducting research. Hybridization and selection were used to create promising tomato lines.

Research results. In 2011-2015, 106 hybrid combinations were studied in 3 replicates. Standards were varieties of Naddnipryansky 1, Magnificent and Flora.

Phenological observations showed that the vegetation period of the studied samples was within 104-112 days (Table 1).

According to the general yield, the lines of the Dnieper 1 x SC-1 (73.7 t/ha), Naddnipryansky 1 x Peto 86 (75.2 t/ha), Dnieper 1 x Rio Fuego (73.5 t/ha), (Sparkle x Rio Fuego) x Rio Fuego (79.7 t/ha), Long Kepper x Nevalasha (78.5 t/ha), Hercules x Seven (75.0 t/ha), which exceeded the standard Standard Dnieper 1 per 8-17%, the standard-grade Delicate at 17-27%, the standard-quality Flora by 12-33%.

The above samples had a friendliness of reaching 82-87% and the merchantability of fruits 84-91%.

According to the biochemical parameters of the quality of the fruits, samples were isolated: Naddnipryansky 1 x CX-1 (5.78% soluble dry matter, 3.56% sugar, 21.84 mg-% ascorbic acid); Dnieper 1 x Peto 86 (5.80% soluble dry matter, 3.59% sugar, 21.10 mg-% ascorbic acid); Naddnipryansky 1 x Rio Fuego (5.69% soluble dry matter, 3.64% sugar, 22.58 mg-% ascorbic acid); (Sparkle x Rio Fuego) x Rio Fuego (5.85% soluble dry matter, 3.62% sugar, 21.63 mg% ascorbic acid); etc. against 5,63% soluble dry matter, 3,41% sugar and 21,68 mg-% ascorbic acid in the standard Standard Dnieper 1; 5.27% soluble dry matter, 3.24% sugar and 19.39 mg% ascorbic acid in standard grade Soft and 5.00% soluble dry matter, 3.18% sugar and 21.70 mg-% ascorbic acid to the standard flora.

Conclusions Prospective tomato lines have been created, which will be the basis for selection of new high-yielding varieties and heterozygous tomatoes, suitable for mechanized harvesting, adapted to the conditions of southern Ukraine, which will help to increase tomato production volumes, strengthen the material base of farms and restore the positions of the domestic commodity producer.

Key words: tomato, selection, prospective lines, varieties, standard, yield, achievement friendliness, marketability, weight of fetus.

Kosenko N. P. Influence of methods of storage of root crops at different fractions on the amount of standard mother roots of red beet // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 181-185.

Purpose. To define an optimum method of storage of mother roots of the red beet fractions various on size. **Methods**. The measurement and weight, laboratory experience, mathematical, statistical analyses are the methods of researchers. **Results**. Researchers conducted in stationary storage facility with natural air ventilation showed that the method of storage influence substantially preservation of mother root beet of varieties Bordo Kharkov. In polyethylene bags with perforation it was preserved of root crops by 6,4%, and in a clamp with sand – by 4,2% more, than in polypropylene bags (79,0%). The best results on storage of beet are received in polyethylene bags with punching – 85,4%. In polypropylene bags, the number of useless root crops increased due to sluggish root crops, which are not suitable for planting in the field. The comparative estimation of mother root of different factions (diameter 5-6, 6-8, 8-10 sm) showed that the best preserved 87,8% are medium-sized root vegetables with a diameter (6-8 cm). Regardless of the storage methods, the number of healthy mother roots after storage was 81,8% in variant with large root crops and 78,1% with small steclings. During the period of winter storage in mother roots, the dry substance content is reduced by 0,6%, the amount of sugars – by 0,38%, nitrates – by 59,6%.

Conclusions. The best results were obtained with the storage of beet roots 85,4% in polyethylene bags with perforations. The results of storage in a clamp with sand and polypropylene bags was lower by 4,2 and 6,4%, respectively. The largest percentage of good mother material after the spring selection was in medium-sized root crops with a diameter of 6-8 sm.

Keywords: red beet, storage method, mother root diameter, steclings.

Borovik V.O., Klubuk V.V., Rubcov D.K. Presentation of value indicators in introduced sodium samples in the sources of source of Ukraine // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 185-189.

The purpose: To study introduced soybean samples and isolate genetic sources of basic biological and economically valuable traits for further use in the selection process. **Methods**: the laboratory, field, statistical. **Results.** The results of the researches of the introduced samples allowed to distinguish the varieties by economic characteristics, which have a high practical value: the average height of attachment of the beans above the ground level of 12.1-16.0 cm – UKR0060185, Tanais (UKR); very short vegetation period of the ladder-full maturation 90-100 days: UKR0061001, Marysya; UKR0060190, Kano; UKR0060185, Tanais (UKR); UKR0061010, Chile (CAN); crop over standard: UKR0060186, Khorol; UKR0061009, Podillya Diadem (UKR); UKR0061007, Lisbon (CAN); a complex of signs – a combination of a very short vegetative period of the

ladder-a complete maturation with an average height of attachment of the bean above the ground level – UKR0060185, Tanais (UKR). The best complexes of economic and valuable features of varieties and lines are each year involved in hybridization. In 2017, their number was 23 samples of domestic and foreign selection.

Keywords: bean culture, gene pool, vegetation period, precocity, sources of valuable signs, watering.

Chernichenko I., Chernichenko O. Influence of the period of the cutting seed tubers, fertilizers on productivity seed potatoes in spring sowing and early harvest // Irrigated agriculture: interagency thematic scientific collection. – 2017. – Issue. 68. – P. 189-192.

Purpose. Determine the influence of elements of technology, methods of seed preparation and nutrition of macro- and microelements on growth, the development of potato plants, the formation of a tuber harvest for early harvesting in conditions of drip irrigation. **Methods**. Complex use of field, laboratory, mathematical-statistical, comparative methods and system analysis. **Results.** Experimental data are presented on the use of cut tubers for planting, the use of mineral fertilizers and fertilizers during the growing season, as well as the influence of these factors on the yield of early potato harvesters. **Conclusions.** The cut seed tubers increases plant productivity by 5.91% - 17.13% compared to whole tubers; the maximum yield of 31.18 t / ha and the best economic indicators were formed using pre-cut seeds against the background of local application $N_{90}P_{90}K_{90}$ and Stimovit FERTI - conditional net profit of 75.29 thousand UAH / ha and a profitability of 93.4%.

Key words: potato, cut seed tubers, fertilizer, feeding the plants, productivity, profitability.

Chaban V.O. Productivity and quality of nutmeg depending on the impact of agricultural measures for growing under drip irrigation in the South of Ukraine

Purpose. The aim is to establish the impact of agronomic measures on the yield and quality of medicinal raw materials of sage for its cultivation under drip irrigation in the Southern Steppe of Ukraine.

Methods. Field research to improve the technology of growing sage by using the drip irrigation system was conducted on the lands of PE "Diola" Beryslav district of Kherson region from 2011 to 2017 according to the methodology of the research case.

Results. Harvesting from 3-6 to 11 o'clock in the afternoon and from 19 to 22 o'clock in the evening increases the content of essential oil in the inflorescences of sage compared to hotter times of the day, but does not reach the indicators of early harvest, which was carried out from 6 to 11 o'clock. When determining the yield of essential oil in the second year of use on the first row of sowing in the variant with fertilizer application at a dose of $N_{60}P_{90}$ - the amount of essential oil per hectare - 51.3, and, on average, with variants with different doses of fertilizer - 35.7 kg/ha, in the third year of use in this variant with fertilizers, on average, its amount was 27.0 kg/ha.

Conclusions. It was found that the yield of sage inflorescences during harvest was stable for three years of use, on average, for the first year it was 9.51, for the second - 9.38, the third - 9.69 t / ha. The timing of sowing nutmeg also affected the formation of essential oil in the samples. In the first year of sowing, at the first sowing period, on average over the years of determination, the content of essential oil when applying mineral fertilizers at a dose of $N_{60}P_{90}$ in this variant was 51.1 kg/ha. When determining the yield of essential oil in the second year of use on the first row of sowing in the variant with fertilizer application at a dose of $N_{60}P_{90}$ - the amount of essential oil per hectare - 51.3, and, on average, with variants with different doses of fertilizer - 35.7 kg/ha, in the third year of use in this variant with fertilizers, on average, its amount was 27.0 kg/ha.

Key words: *Salvia sclarea* L., drip irrigation, feeding background, tillage, sowing period, years of use, yield, quality.

Vozhegova R.A., Maliarchuk A.S., Kotelnikov D.I., Reznichenko N.D. Influence of different depth and method of basic tillage on winter wheat productivity indicators in the conditions of irrigation of the south of Ukraine.

The purpose of researches was establishment of influence of the different systems, methods and depth of basic tillage and fertilizer on agrophysics properties and nourishing mode of dark-chestnut soil under sowing of wheat winter on her productivity in crop rotations on irrigation of south of Ukraine

Methods: field, quantitative-weight, visual, laboratory, calculation-comparative, mathematical-statistical and generally accepted in Ukraine methods and methodical recommendations were used.

The results showed that, at the beginning of the growing season the lowest density level of 1.23 g / cm^3 was observed for chisel tillage by 23-25 cm in the system of different depth free-shelf loosening, which is higher than the control of disc tillage by 12-14 cm in the system of differentiated tillage by 3, 3%. The same density level of 1.27 and 1.28 g/cm^3 was found for disk loosening by 12-14 cm in systems of differentiated and shallow single-depth tillage, respectively, and the most compacted soil was formed under zero system of basic tillage 1.34 g / cm^3, which is higher control of 5.5%.

Conclusions. The research results show that on average by factor A, the same level of yield was obtained with disk cultivation of 12-14 cm in the system of differentiated and shallow single-depth cultivation and chisel by 23-25 cm in the system of different-depth shelfless loosening of 6.38 and 6.50 t /ha. The lowest level of yield in the experiment was noted at zero tillage of 5.55 t / ha, which is less by 0.94 t/ha or 16.9% compared to the control.

Key words: addition density, nutritional regime, productivity, winter wheat, tillage.

ПРАВИЛА ДЛЯ АВТОРІВ

Автори надсилають рукописи статей в електронному вигляді виключно через систему їх автоматичного подання на сайті збірнику, або надіслати на електронну пошту: izz.biblio@ukr.net. Назвою файлу буде прізвища всіх авторів.

Статті подають українською, англійською або російською мовою. Обсяг статті – від 8 до 15 сторінок формату А4, включаючи анотації, таблиці, рисунки та бібліографічні списки. Сторінки не нумерують. Якщо стаття містить вагомі наукові результати, за рішенням редакційної колегії її обсяг може бути збільшено.

Поля: ліве – 3 см., праве, нижнє, верхнє – 2 см., шрифт – Arial, кегль – 14 пт, міжрядковий інтервал – 1,0 см, абзацний відступ – 1,25 см, без інтервалу між абзацами. Автоматичне розставлення переносів заборонено.

До статті обов'язково додають код ORCID ID кожного автора. Якщо автор не зареєстрований в ORCID, необхідно обов'язково створити обліковий запис за посиланням http://orcid.org/.

Основні розділи:

– постановка проблеми (опис проблеми, яку аналізують, у загальному вигляді та її зв'язок з важливими науковими чи практичними завданнями);

– аналіз останніх досліджень і публікацій (в яких започатковано розв'язання проблеми і на які спирається автор, виділення нерозв'язаних раніше частин загальної проблеми, яким присвячена стаття);

– мета статті;

– матеріали та методика досліджень (у тексті оглядової статті цей розділ можна пропустити);

– результати досліджень (з повним обґрунтуванням отриманих наукових результатів);

– висновки (підсумки дослідження і перспективи подальших розвідок у цьому напрямі; висновки мають відповідати меті).

Авторські анотації (резюме) до наукових статей подають трьома мовами – українською, російською та англійською. Обсяг – до 1000 знаків з пробілами.

На початку анотації додають: Прізвище та ініціали автора(-ів), назву статті, електронну пошту бажано всіх авторів.

Обов'язковою є така структура анотації: Мета, Методи, Результати та Висновки (російською – Цель, Методы, Результаты, Выводы; англійською – Purpose, Methods, Results, Conclusions).

У кінці – ключові слова (5-8 слів чи словосполучень).

Наявність списку літератури для статті є обов'язковою.

Список використаної літератури має складатися з двох частин:

1) Використана література – джерела мовою оригіналу, оформлені відповідно до Національного стандарту України ДСТУ 8302:2015 «Інформація та документація. Бібліографічне посилання. Загальні положення та правила складання»;

2) References – ті самі джерела, але англійською мовою, оформлені за міжнародним бібліографічним стандартом APA.

ВИДАВНИЧЕ ОФОРМЛЕННЯ СТАТТІ

– індекс УДК (шрифт – 14 пт, зліва без абзацного відступу);

– через один рядок – назва статті великими літерами. Шрифт – напівжирний, 14 пт, посередині;

– через один рядок – прізвища та ініціали всіх авторів (зазначають спочатку прізвище, а потім ініціали автора(-ів). Науковий ступінь, вчене звання авторів вказувати обов'язково. Шрифт – напівжирний, 14 пт, зліва без абзацного відступу;

– з нового рядка – повна назва установи (установ), де працює(-ють) автор(-и), електронна пошта відповідального автора для листування. Шрифт – 14 пт, зліва сторінки без абзацного відступу;

– через один рядок – код ORCID ID усіх авторів (шрифт – курсив, 12 пт, зліва сторінки без абзацного відступу);

Наприклад, Olena Piliarska – https://orcid.org/0000-0003-3251-2564

– через один рядок – Вступ (назву розділу виділяють напівжирним шрифтом, 14 пт, зліва з абзацним відступом);

– з наступного рядка – Мета досліджень (назву розділу виділяють курсивом, 14 пт, зліва з абзацним відступом);

– з нового рядка – Матеріали та методика досліджень (назву розділу виділяють напівжирним шрифтом, 14 пт, зліва з абзацним відступом);

– з нового рядка – Результати досліджень (назву розділу виділяють напівжирним шрифтом, 14 пт, зліва з абзацним відступом);

– з нового рядка – Висновки (назву розділу виділяють напівжирним шрифтом, 14 пт, зліва з абзацним відступом);

– через один рядок – **СПИСОК ВИКОРИСТАНОЇ ЛІТЕРАТУРИ** (назву розділу виділяють напівжирним шрифтом, великими літерами 14 пт, по ширині сторінки з абзацним відступом. Текст розміщують з наступного рядка);

– через один рядок – **REFERENCES** (назву розділу виділяють напівжирним шрифтом, великими літерами 14 пт, по ширині сторінки з абзацним відступом. Текст розміщують з наступного рядка);

– через один рядок – анотація українською мовою (назви підрозділів виділяють напівжирним шрифтом у суцільному тексті, 14 пт, ключові слова – напівжирним шрифтом, зліва з абзацним відступом);

– через один рядок – анотація російською мовою (назви підрозділів виділяють напівжирним шрифтом, 14 пт, ключові слова – напівжирним шрифтом, зліва з абзацним відступом);

– через один рядок – анотація англійською мовою (назви підрозділів виділяють напівжирним шрифтом, 14 пт, ключові слова – напівжирним шрифтом, зліва з абзацним відступом).

Стаття повинна мати внутрішню рецензію установи, де працює (навчаються) автор та довідку про авторів довільної форми (прізвище, ім'я, по батькові, науковий ступінь, вчене звання, посаду і місце роботи, службову й домашню адреси, номери телефонів, електронну адресу).

Статті, які не відповідають Правилам для авторів, редакцією повертаються на доробку, або відхиляються