

ANNOTATION

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Lebed E. M., Desyatnik L. M., Lerinetz F. A., Fedorenko I. E., Lib I. N. Efficiency of the fallow field in the north steppe.

Keywords: winter wheat, predecessors, crop rotation, fallows, fertilizers, basic soil tillage, yield productivity.

In Steppe of Ukraine supply of moisture takes the first place among factors which provide the increase of the productivity of agricultural cultures. The level of the productivity of winter wheat (basic food culture in Steppe) is determined by the supplies of productive moisture in the sowing layer of soil in a time of its sowing. As a rule, the black fallow provides the sufficient supplies of moisture. Therefore introduction of him to the structure of crop rotation is the most effective mean of accumulation of moisture in soil. In addition, black fallow is the unique field in a crop rotation, where at droughty terms in a time of optimum term of sowing of winter wheat, after which soil contains the enough supply of moisture, up-diffused evenly on all layers of soil. Due to what black fallow annually guarantees appearance of timely complete young growth of winter wheat and normal development of plants in autumn. After concerned fallow of such sowing it is been 70–90 %, and after unfallow predecessors this index is yet less.

Bean cultures, longterm grasses and concerned fallow are also good predecessors for the winter wheat. One kind of concerned fallow is the green manure fallow (the perspective predecessor, which allow to supplement supply of organic substance of soil).

The winter wheat sowing are placed both of the black fallow and another predecessors (including of unfallow predecessors) in dependence of specialization of agricultural farm.

Taking into account it, on the Erastivka experimental station (north Steppe) in 2007–2012 was conducted researches from the study of efficiency black, concerned and green manure fallow and to influence of different kinds fallow on the productivity of winter wheat.

The greatest harvest of winter wheat stored after black fallow (4,22 t/ha). A pea is one of favourable predecessors to the winter wheat. But a reduction of harvest of grain of wheat winter placed after a pea, by comparison to black fallow was most – 1,10 t/ha. Decline of the productivity on concerned fallow was made by 0,8 t/ha, and for green manure fallow – 0,55 t/ha. Placing of winter wheat in the field after concerned and green manure fallow, by comparison to sowing after a pea, increased the harvest of grain of wheat on 0,30–0,55 t/ha. Comparison of the productivity of winter wheat on concerned and green manure fallow shows that it was on 0,25 t/ha greater after green manure fallow.

Depending on predecessors found out analogical conformity to law of forming of harvest of winter wheat both in years, when the high crop was taken and in years with a low harvest. An especially large decline of grain was in 2007 droughty. In such terms, sowing of winter wheat after black fallow placed formed 50 % of yield from a middle mean for 2007–2012. In years with the greatest level of the productivity the grain after this predecessor was in 2,7 times more high, and in years with a low harvest – in 1,3 times below than middle indexes. At placing of winter wheat after a pea, concerned or green manure fallow, by comparison to the placing of black fallow, diminishing of harvest of grain in 2007 (with most bad harvest) made 2 times.

The study of influence of the basic tillage of soil systems under a winter wheat showed, that there was not a substantial difference in a harvest at replacement of turn tilling of soil (by ploughing) to unturn (by chisel tillage) by the same depth under black fallow and pea.

Most effectively fertilizers operated at placing of wheat on concerned fallow and after a pea, and least – in the field after black fallow. The productivity in these variants grew on 0,63; 0,72 and 0,21 t/ha, or on 18,4; 23,1 and 5,0 % accordingly. Application green manure culture as fertilizer provided the increase of harvest of 0,29 t/ha, or 7,9 %.

It was set in our researches that, in north part of Steppe without crop rotations with black fallow it is impossible to stabilize the grain growing and avoid the unfavorable action of drought. Introduction in crop rotations concerned and green manure fallow by comparison to a pea as predecessor promote the growth of indexes of collection of grain from the hectare of sowing.

The organic and mineral fertilizer application stipulate for the productivity of winter wheat grows. – P. 3–6.

Tsylyuryk O. I., Gorbatenco A. I., Gorobets A. G. The effectiveness of no-tillage and direct sowing by cultivation of grain crops in the Steppe.

Keywords: zero tillage, direct sowing, winter wheat, corn, factors of fertility, weediness, roductivity, economic efficiency.

Experimental work was guide during the years 2008–2010 in a stationary field experiments Institute of Agriculture steppe NAAS of Ukraine, Dnipropetrovs'k.

In modern conditions economic priority areas of agriculture development Steppe is conservative (minimum, zero) tillage systems, the widespread use of by-products of agricultural crops, introduction integrated methods of protecting plants from harmful objects. These trends are caused by, above all, the need to improve the fertility of arable land, by climate change, environmental threats, lack of labor people and energy resources.

The purpose of research – set agro economical aspects of traditional and conservative (minimum tillage, no-tillage) of soil for growing winter wheat and corn in the steppe Ukraine.

It is established that chernozem ordinary humus content of 4,1 % of direct sowing crops does not lead to the deterioration of its properties agrophysical, while untreated soil better and retains moisture accumulates rainfall in sowing layer, which is crucial for a full stairs.

As it turned out the processes of accumulation and evaporation of soil moisture is directly dependent on the capacity, porosity and homogeneity mulching layer. By uniform coating 60–80 % of the field stubble remains of the precursor (2–4 tone/hectare) in stocks of sowing and plow layer soil before sowing of winter wheat and maize by zero tillage were higher compared to other agrofon at 20–60 m³/hectare. Unhandled soil is better and the has accumulated atmospheric precipitation namely kept the in the upper horizons, which is crucial for obtaining valuable stairs, establishment and development of plants in early growing season. By the level the accumulation of moisture meter soil layer during the cold season not inferior plowing and minimum tillage.

No-till adjustments technique requires conditions of plant nutrition and phytosanitary continuous monitoring of crops. The main risks associated with proper controlling weed-infested fields and the introduction of herbicides fall on for sowing from winter wheat – July-August, corn – April-May. Crucial in this are timeliness, consistency and bylaws of application of herbicides total fighter and insurance actions.

It is known that phytocoenotic ability of maize to the biological suppression of weeds almost 10 times lower than the winter wheat is well the developed. It is this features of culture leads certain risks when growing it into a system of No-till.

Accounting of conducted by in phase 3–5 leaves of maize, showed availability a smaller number of wild flora in crops for zero tillage relatively plowing and minimal tillage, because of the deterrent effect of herbicide Roundup, introduced in before sowing period. Type in the weed-infested plots without soil for plowing defined as less typical agrophytocenoses (erigeron – polygonum – lactuca) of this culture, and the variants of soil cultivation as a more typical polygonum – convolvulus – ambrosia.

According proper phytosanitary condition of crops recommended short period zero tillage in crop rotation to ensure identical level of crop yield of grain (winter wheat – 5,46–5,50 tone/hectare, maize – 3,66–3,78 tone/hectare).

Direct sowing of grain crops provides a significant fuel savings (14,4–40,6 liters/hectare) and labor (1,0–2,1 man-hours/hectare), however, because of the high costs of technique and equipment plant protection, second technological schemes, built on superficial plowing or hoeing the soil, on indicators of cost and profitability of grain production.

Depending on soil and climatic conditions and landscape main arguments in favor of zero tillage, even lower productivity of arable land may be preventing soil erosion, carbon sequestration, mitigation of the greenhouse effect, biodiversity.

Thus, the effectiveness of zero tillage depends largely on the biology of culture, duration of use in crop rotation systems and chemical protection of plants. More suitable for direct sowing of winter wheat appeared to be less – corn when growing it into a two-year zero agrofon. No-till technology provides substantial savings in fuel and labor, while yield to traditional flow sheet, built on deep plowing or shallow loosening soil, on indicators of cost and profitability of grain production. – P. 6–11.

Gyrka A. D., Gyrka T. V., Kulyk I. O. Formation of oats productivity under the influence of macro- and micro-fertilizers in northern Steppe of Ukraine.

Keywords: *oats, macro-fertilizers, micro-fertilizer, grain, elements of yield structure, crop yield.*

Plant productivity and yield of oats is affected by many internal and external factors. Managing quantity and quality of crops is possible by optimizing and balancing of mineral nutrition regime. The use under oats fertilizers increases the level of productivity obtained and the removal of soil nitrogen, phosphorus, potassium and micronutrients. Lack of micronutrients for plants can be compensated through the use of micronutrients that promote not only increase productivity, but also improve the quality of products.

Questions about the effectiveness of applications the preparations containing microelements on oats in the Northern Steppe of Ukraine studied are insufficiently detailed. There is only fragmentary information on these questions.

The aim of our research was to study the influence of separation and complex application in oat variety Skakun macro- and microfertilizers. For this purpose in 2011 in the laboratory of growing technology of spring grain and leguminous crops (on the basis of Erastivka experimental station of Institute of Agriculture of the Steppe zone of Ukraine NAAS, Pyatihatyk district, Dnipropetrovsk region). Research conducted by well-known methods.

The soil in the experimental plots – an ordinary black soil with low humus content, heavy clay. The humus content in arable soil layer (0–30 cm) – 4,0–4,5 %, total nitrogen – 0,23–0,26 %, phosphorus – 0,11–0,16 %, potassium – 2,0–2,5 %, pH of water extract – 6,5–7,0. Growing technology is generally accepted, except in the cases envisaged by experimental design. Placement in variants in a field experiment systematic, with three replications, accounting area 50 m². Predecessor – winter wheat.

The experiment involved the uses of oats micronutrients reacom-C-grain, also NPK-fertilizer were used, including top dressing of plants by ammonium nitrate. Micro-fertilizers used for seed treatment (3 l/t) and spraying plants in the phase of tillering (3 l/ha).

Meteorological conditions in the years of research (2011–2013) were characterized by significant fluctuations of agroclimatic indicators, but in general, from the methodological point of view, have been successful, because through this can be establish reaction of oat plants to all manifestations of weather conditions that happen in Northern Steppe. Thus, in 2011, during the vegetation period of oats was 245 mm rainfall, which is 25 mm more than the long-term yearly average rate, the average temperature was 17,7 °C. Extremely dry was 2012, which is characterized by higher temperatures (9,1 °C above the norm) and a deficit of rainfall (during the growing season fell to 172 mm, 50 mm less the norm). The weather conditions in 2013 included both periods of drought and periods of abundant moisture. The total rainfall during the growing season in 2013 totaled 141,2 mm and average temperature 17,6 °C.

Application in modern grain production the microfertilizers in combination with top dressing of plants by nitrogen provides a real opportunity to get a significant increase in grain yield. It is established that exposure to the elements studied farming, namely the combination of seed treatment and spraying of plants in the vegetative phase of tillering by micronutrient reacom-C-grain with feeding plants in the tillering phase by ammonium nitrate increases the productive tillering rate by 6 %, the number of grains per panicle – by 37,1 %, panicle weight – by 26 % and weight of 1000 grains – by 20 %.

Influence of mineral nutrition on realization of the potential crop yield of oats was significant in all variants of the experiment. It was established that the yield of grain oats averaged over three years increased the separate application of fertilizing with nitrogen and micronutrients by 0,22 and 0,30 t/ha or 6,41 and 8,75 %, respectively.

Application of micro-fertilizers without mineral fertilization increased yield by 0,31 t/ha or 9,04 %, but on a background of N₂₀P₂₀K₂₀ – to 0,49 t/ha or 14,29 %. The most crop yield increased for 0,67 t/ha or 19,53 % were obtained in the experiment with a compatible version of the application fertilizing with nitrogen and macronutrients on the background of N₄₀P₄₀K₄₀. – *P. 11–14.*

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Belikov E. I., Kuprichenkova T. G., Shymanskiy L. P., Nadtochaev M. F. Environmental Testing of Early Maturing Maize Hybrids in Belarus.

Keywords: *maize, plasticity, sustainability, adaptive capacity, grain yield, silage, environmental testing.*

Maize is the primary agricultural crop in Belarus. This is why their sown areas are constantly increasing. It's primarily used as green fodder or silage for animals. In the best weather conditions, maize will also be grown and used for the seeds. Hence special attention is needed on universal maize hybrids, which have yields of green mass, dry matter and grain which will help farmers to successfully manipulate the final destination of this crop sowing, depending on the weather.

Until recently, the selection of silage and grain maize was separate. It can be explained in a few

different criteria which was present before these hybrids and before architecture of plants. In addition, silage hybrids should be collecting dry matter no less than 25 % of green weight and high forage quality. Grain hybrids should quickly lose moisture during maturation.

In maize hybrids, the breeding laboratory of the Government Agency Institute of Agriculture in Steppe zone and the National Academy of Sciences (NAS) of Ukraine have created new early maturing hybrids that combine their genotype traits characteristic which were inherited from grain and silage hybrids in cultivation. Good examples of such hybrids can be found in Gardemaryn 185 SV, Gias 182 SV, Diana 180 SV, Zhayvir 198 MV, Elf 197 MV, Epos 151 SV and Eney 200 SV.

Environmental Testing was done with those hybrids from 2009 to 2011 in 2 different places in Belarus, the town of Zhodino and the village of Krynychne. Weather conditions during testing varied, but the total amount of effective temperatures above 10 °C was sufficient for early-maturing maize hybrids during those years.

As a result of environmental testing found that early-maturing maize hybrids have high heterosis potential not only for grain yield, but also for green mass and dry matter.

Growing corn for experimental use is common for this area of Polissya. Plot size was 10 m². Plant stand density before harvesting was 80 thousand/ha. The sowing was repeated 3 times. The hybrid yield was compared from the standard yield of early hybrid group Poliskiy 212 SV in 2009 – 2010 and Poliskiy 103 in 2011.

On average it took over 3 years of research in 2 environmental areas of Belarus to yield 4 hybrids that significantly exceeded the standards of early maturing types – Polesky 212 ST and 103 Polesky by the yield of green mass on 3,3–10,5 t/ha, 6 hybrids by the yield of dry matter 0,9–4,1 t / ha and all the hybrids exceeded standards for grain yield 1,8–3,18 t/ha.

The highest yield of dry matter represented among the hybrids was from Eney 220 SV and it was 18.5 t/ha compared with 14.4 t/ha in the hybrid standards. Onemore hybrid Elf 197 MV showed up. On average over 3 years it's yield was 11,23 t/ha which was to 3,18 t/ha more than early maturing hybrid standards Poliskiy 212 MV and Poliskiy 103.

Environmental testing makes it possible not only to evaluate maize hybrids for their average yield, but also to study the response of genotypes to environmental effects. Key indicators of the degree of reaction rates to changes in environmental conditions is the flexibility and sustainability of maize hybrids. Environmental sustainability is the ability of the genotype to maintain a certain phenotype in different environments as a result of regulatory mechanisms, and plasticity is a re-action of genotype on changes in environmental conditions, which is evident in the phenotypic variability.

To calculate parameters ecological stability and plasticity we used 2 methods which complemented each other and determined the various parameters associated with the stability of genotypes under unfavorable environment. These methods are A. V. Kilchevskogo, L. V. Hotylevoy, V. Z. Pakydina and L. M. Lopatinoy.

High plasticity of yield of dry matter and grain showed Elf 197 MV hybrid but the most sustainable were Gias 192 SV and Epos 151 SV. Particularly noteworthy is Enei 200 SV, which depending on the weather conditions can be grown for green forage, silage or grain herewith has high and stable yields. – *P. 14–19.*

UDC 633.15:633.04

Bokun O. I. Comparative effectiveness of chemical and mechanical means of weed control in corn crops in the Steppe of Ukraine.

Keywords: corn, herbicides, productivity, weeds.

The main goal of the research was to achieve full control of weeds in growing corn by mechanical and chemical means to ensure more efficient use of limited moisture reserves and nutrient supply.

The work on the study of effectiveness of different systems of corn protection from weeds was performed in 2007–2009.

The soil of the experimental plot was ordinary low humic loam chernozemic soil. The potential soil infestation with vegetative reproductive organs of perennial rootstock and grassy weeds was 30–50 thousand/ha and annual weed seed infestation was 350–500 million units/ha in the top soil. The soil-applied herbicides (Harness (acetochlor), Dual Gold (S-metolachlor), Lumax (metolachlor + mesotrione + isoxadifen-ethyl), Primextra TZ Gold (S-metolachlor, terbuthylazine) and herbicides for post-emergence use (Callisto (Mesotrione), Milagro (Nicosulfuron), Lumax (metolachlor + mesotrione + isoxadifenethyl), Master (foramsulfuron, iodosulfuron, isoxadifen-ethyl) and TASK (rimsulfuron, dicamba) were studied in the experiments.

The investigation showed that the biological crop weediness was high (472 g/m² of air dry weight), which negatively affected the yield of corn which decreased to 2,73 t/ha or by 65 % compared to manual weeding out. Before harvesting the smallest air dry weight of weeds under chemical crop protection was in cases where not only the composition of soil-applied Harnesses (2,5 l/ha) and post-emergence Dialen Super (1,25 l/ha) had been used but also post-emergence herbicides alone, such as Master (150 g/ha) and TASK (385 g/ha), as well as mixtures of Callisto (0,2 l/ha) and Milagro (0,8 l/ha).

As a result of the regulated use of the above mentioned pesticides and their mixtures there was obtained a high crop yield which approached to the version with manual weeding out. Moreover, the use of new post-emergence herbicides in limited doses was not only more economical but also an environmentally friendly way to regulate pollution which opens wide prospects for their future use in the transition to the subsoil tillage.

For competitive relations in agrophytocenosis, the total removal of NPK elements from a unit area is more important than their content in the organic mass of weeds. In the absence of measures of weed control in corn crops the losses of nitrogen, phosphorus and potassium were high. Thus the weeds removed 15,3 kg/ha of nitrogen, 6,8 kg/ha of phosphorus and 5,60 kg/ha of potassium from the soil under control (without crop tending).

The most effective was the use of the composition of such soil-applied herbicides as Harness (2,5 l/ha) and post-emergence Dialen Super (1,25 l/ha), which helped to minimize the loss of nutrients to 12,5 kg/ha. The same level of weed removal of mineral nutrients was reached when post-emergence herbicides Master (150 g/ha) and TASK (385 g/ha) were used alone.

Due to more intensive transpiration of moisture the weeds were distinguished as an aggressive element of competitive relations not only in the absorption of mineral nutrients, but in the consumptive water use as well. If under controlled conditions, with mechanized care, corn used 2900 m³/ha of water, its greater consumption was in unattended crops. The largest water consumption was observed with manual weeding out (3320 m³/ha). With the chemical care of crops the use of water by the crop occupied an intermediate position and ranged within 3075–3210 m³/ha depending on the efficiency of suppression of weeds.

With regard to pesticide residues in corn grain, a significant amount of them was found only after utilization of Harness soil-applied herbicide and only their traces were found after utilization of Dialen Super post-emergence herbicide, and as a result of action of the herbicide of the next generation Master they were not detected at all.

Thus the yield of corn is determined by the soil moisture supply and weediness of the crops which indicates the necessity of directing the entire complex of farming practices to maximum accumulation and rational use of moisture. – P. 19–22.

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Cherchel V. U., Marochko V. A., Maximova L. A., Plotka V. V. Evaluation and selection for cold resistance maize lines S₃-S₄ generations derived based early siliceous materials.

Keywords: maize, breeding, breeding, inbreed lines, family, cold resistance.

Corn thermopiles tropical crop which had long hindered its spread in the temperate zone. Introduction of corn in Europe was preceded by some adaptation to the world long day and low positive air temperatures during the growing season. It is now determined by culture of late sowing, which can germinate only when a soil temperature 8–10 °C, and biologically active temperature for its development temperature is above 10 °C. During the long period of folk and scientific plant breeding has been getting lots of different genotypes northern ecotype, which contributed to the progress of its implementation in countries with a limited energy sources, including in Ukraine. It is known that silicon forms have better cold tolerance, and greater stamina throughout the growing season characterized by plants in the seedling stage and stairs.

Over the past 5 years have seen the growth of corn acreage in Ukraine, due to economic conditions, climate change and breeding success in making early ripe genotypes, thus sowing corn in the forest steppes and woodlands compared to 2000 increased by 5 and 10 times respectively. Demand for early ripening corn hybrids for the northern and central parts of the country increased, but also the risks due to the limited availability of energy sources and the probability of frost. Therefore, evaluation and synthesis of new source material parameters of maize cold tolerance is an extremely important problem for modern plant breeding.

The Institute of Agriculture steppe zone studied 7 early ripe lines of maize silicon subspecies in terms of cold tolerance and families S₃–S₄ obtained by self-pollination 42 hybrids created based on these lines. To evaluate the method of cold resistance Protsenko D. F. and Mishustina P. S., 1962.

The evaluation provided an opportunity to determine the level of output cold resistance siliceous constant lines of maize, the coldest resistance DK959 and DK516. Characterized by good cold resistance line

DK204 and DK357A, average – DK205. Do not cold resistance and low cold resistance lines by DK206 and DK273. It is known that cold resistance and seed quality is formed not only by the genetic component, but also a well – ripening seeds on the mother plant. Influence of year cold resistance formation was observed when comparing the results of the tests in lines 2011 and 2012, the seeds for which were obtained respectively in 2010 and 2011 average cold resistance constant lines of maize crop in 2010 was 1 point lower than the harvest in 2011 only not cold resistance line DK206 had lower scores in 2012 Reducing display cold resistance seedling seed harvest in 2010 due to a significant drought that occurred during its formation and led to a deterioration of seed quality.

Analysis of family's cold resistance S_3 – S_4 shows that on average, they had lower scores than baselines but forms a low cold resistance – DK206 and DK273. It should be noted that the resulting family on a line DK206, characterized by the lowest cold resistance in this sample. Families S_3 – S_4 , obtained with high cold resistance lines DK959 and DK516, characterized by unstable manifestation of this index during the study. In 2011, the best results were examples related with the line DK959, and in 2012 – with DK357A. In general, variation in estimates cold resistance 2012 families of all hybrid populations were higher by 10,2 % compared to 2011. Given that family S_3 – S_4 have a high enough degree of heterozygosity, the impact of drought conditions on seed quality crop 2010 manifested less negative than their parental components, and variation in the sample was due to greater genotypic component as defined objective evaluation of prototypes.

Thus, cold-resistant silicon highlighted line DK959, DK516, DK204 and DK357A. It was found that the best donor properties characterized based lines DK204 and DK357A. The structure of distribution options in hybrid populations based on genotypes with different levels of resistance to cold, which makes it possible to accumulate positive effects in breeding sample. The effectiveness of selection for cold resistance depends on effective selection of source material with high rates of induced signs and directional selection of a new sample of northern ecotypes. In the future, the best genotypes for matching capacity, grain yield and cold resistance will examine the environmental testing in Woodlands of Ukraine and Belarus. – P. 23–26.

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Fedko M. M. Selection corn (*Zea mays* L.) hybrids FAO > 400 for high adaptive ability and ecological stability.

Keywords: corn, inbred line, germplasm, heterotic pattern, plasticity, adaptive ability.

Production of maize is based on the interaction and the use of three basic, the most powerful factors: favorable weather conditions, the hybrid composition and modern production technologies, taking into account the biological characteristics of a particular hybrid. That is why, given the sharp fluctuation of agro-meteorological indicators in the steppe zone, which is observed in recent years, and questions of creation and selection of the most resistant to adverse stress conditions maize hybrids.

The area under cultivation of maize (*Zea mays* L.) in Ukraine is constantly growing, changing and updating hybrid composition in production. Proportion of hybrids of FAO 400–500 in the State Register of Plant Varieties of Ukraine gradually decreased from 12,4 % (40 pcs.) in 2007 to 8,6 % (56 pcs.) In 2013, while the number of hybrids FAO > 500 is hardly variable 8–10 pc. in 2007–2013. First of all, this is due to the movement of the corn belt Ukraine in the more humidity of the climate and less risk northern and western regions of the country, a sharp decline in corn silage, applying intensive production technologies, direct combine harvesting, and others. Acreage of corn in the steppe, where mostly traditionally sown hybrids FAO > 400 amounted in 2013 to only 1,2 million hectares, or about 20 % of the total area of Ukraine.

The goal was the creation and selection of adapted genotypes with high ecological plasticity and stability in dry conditions Steppe of Ukraine, development of environmental testing corn hybrids in the widest ecological range of environments and working out common methodological approaches to the study of adaptive mechanisms and adaptability of genotypes depending on the environmental characteristics of points test.

During the period from 2008 to 2011 were tested each year from 83 to 125 genotypes in 5–7 agro-ecological areas. During this time, has been tested 138 maize hybrids FAO > 400 in 25 agroclimatic environments respectively. The starting material was inbred lines of maize FAO 300–500 different germplasm: BSSS, Lancaster C103, Lancaster OH43, Iodent and other. Objects of study were single, single modification and three-way hybrids of maize. They were divided into groups according to the pedigree, combining ability and maturity group. Heterotic for structure was studied 4 heterotic pattern hybrids. The standard used hybrid Bystrica 400 MV.

As a result of long-term ecological research revealed the dominance of the performance of simple hybrids of corn, and increased environmental plasticity and resistance to stress conditions in heterotic

hybrids of more complex circuits.

The maximum general adaptive ability was observed in hybrids heterotic patterns Iodent × C103 and Iodent × BSSS, which have also been the most intense and genotypes model C103 × BSSS – homeostatic. In general, among the tested hybrids was attributed to intensive 2 hybrid each year, and by homeostatic from 1 in 2008 to 4 in 2009, environmental instability was 13,4–22,4 % studied genotypes in different years, there relatively good indicator and indicates the high quality raw material, made to research.

For high-intensity hybrid combinations can be attributed (DK411M × DK640/3) × DK146/ 527 and DK377 × DK411 at 2008, DK633/325 × DK445 in 2009, (DK517C × DK137-2) × DK411 in 2010 and DK633/325 × DK402 in 2011. Hybrids of this type are capable of producing record levels of productivity and maximize the improvement of the conditions of cultivation. But when conditions deteriorate or the lack of one with growth factors, they are not always able to provide a stable yield, so they appropriately grown under adequate moisture and mineral nutrition, such as irrigated Southern Ukraine.

For an optimal combination of plasticity and environmental stability can be identified hybrids the heterotic pattern Iodent×C103.

The results of the research are highlighted in inbred lines of maize, which became part of the best hybrids FAO>400 – DK633/325, DK411, DK445, DKW3151, DKW3451, DK402, DK137-2 and DK6496. They are the bearers of the most favorable alleles of adaptability and their participation in 2010-2012 transferred to the state's standard variety testing hybrids – Shtandart, DN Bereka, DN Vaytkorn, DN Getera, DN Sofia, DN Anshlag and is a registered hybrid Turia (2012). – P. 26–31.

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Tkalich I. D., Gyrka A. D., Bochevar O. V. Productivity of sunflower hybrids in different water charged years.

Keywords: sunflower, hybrids, hydrothermal conditions, seed, crop yield.

The results of long-term experimental researches on productivity and quality of modern sunflower hybrids in the northern Steppe. The obtained data will help substantiated choice by agricultural producers the best sunflower hybrids entered the Register of Plant Varieties of Ukraine.

Evaluation of adopted for the implementation of sunflower hybrids, performed during 2007–2012 in SE EF "Dnipro" SI Institute of Agriculture of Steppe zone NAAS. Soil of test plot – ordinary chernozem, heavy loamy. The humus content 4,0–4,2 %. Accounting area 28 m², with three replications. Sunflower planted after winter wheat with return to a previous place after a 3–5 years.

Farming culture of sunflower was in compliance with zonal recommendations. Plowing was carried to a depth of 25–27 cm, spring cross-harrowing, application of N₃₀P₅₀ and herbicide Harnes (2,5 l/ha) before seedbed cultivation. Sown with seed drill SUPN-8 on 25–29, April. Foreign hybrids were sown with encrusted seeds and domestic – without disinfectant in order to fully discover their response to the disease. During the growing season interspace cultivations were applied. Plant density formed similar in all hybrids. Over the years it has ranged between 56–65 thous./ha. Sun-flower harvested by combine harvester "Nyva".

Weather conditions in 2007 were unfavorable to sunflower cultivation, in 2009–2012 – were favorable.

During the years of research hybrids responded differently to weather conditions, so the actual performance of plant height and length of the growing season varied greatly by year, often do not coincides with the originators data characteristics.

In 2007, the lowest yield of sunflower seeds (2,02–2,78 t/ha) was formed by hybrids Getman, Sonata, Forward, Capral, Zorepad, Ant, Boyiets, Prostir, Oskil, Vsesvit, Siver, Enei, but the highest (3,0–3,4 t/ha) – by Darii, Bohun, Yiason, Romans, Kvin, Odeskyi 122, Zlyva, Hors, Alians, Syntez, Symvol, Imperator, Tytanik, Dragan. However, the hybrids Congres, Odeskyi 123, Riurik, Bliuz, Svitoch formed crop yield equaled to 2,91–2,99 t/ha, so was lower than in the best group of hybrids, discrepancy within experimental error.

In 2008, the highest crop yield (3,93–4,30 t/ha) provided by hybrids Darii, Yiason, Canion, Prezydent, Kvin, Zorepad, Zaporizhskiy 28, Zolotystyi, Imperator. In hybrids Terminator, Alians, Riurik, Stepovyi, it was less – 3,80–3,87 t/ha, while in hybrids Suvenir, Region, Zaporizhskiy 32, Nadiynyi, Poliot, Khortytsia, Prostir, Capral, Hors – not exceeding 2,34–3,42 t/ha. Best hybrids for seed yield had the advantage of high-yield variety Prometei for 0,75–1,12 t/ha.

In 2009, high crop yield formed by hybrids of national selection: Kvin (4,26 t/ha), Zaporizhskiy 26 (4,02 t/ha), Zaporizhskiy 32 (4,14 t/ha), Yiason (4,06 t/ha), Forward (3,85 t/ha), Odeskyi 122 (3,82 t/ha). Among the foreign hybrids almost the same crop yield provided: Tytanik (4,04 t/ha), Milutin (3,93 t/ha), Gena (3,82 t/ha), Kanion (3,81 t/ha), Kongres (3,92 t/ha).

In 2010, the highest seed yield (3,33–3,79 t/ha) provided by hybrids: Yiason, Tytanik, Dragan, Prezydent, Kongres, Gena, Suvenir, Odeskyi 249, Bazalt, Capral, Kvin, Sait, Zorepad. Most hybrids formed crop yield level 3,00–3,28 t/ha.

In 2011 the highest crop yield (2,84 t/ha) provided by mid-season hybrids – Region, Yiason, Hektor, Kvin, Zorepad, Anons, Solist, Odeskyi 1011/1, Romantyk. The next (2,77 t/ha) were early-season hybrids: Suvenir, Kupets, Rezon, Ant, Romans, Uragan, Odeskyi 249 and the last (2,57 t/ha) – late-season hybrids: Odeskyi 423×202, Vivat, Siuzhet, Tytanik, Dragan, Kongres, Prezydent, Gena.

In 2012 the highest crop yield (2,80–3,26 t/ha) formed by hybrids: Yiason, Kupets, Zaporizhkyi 32, Krok, Zorepad, Anratsyt, Anons, Bazalt, Uragan, Trubizh. The lowest yield was in variety Zaporozhskiyi kondyterskyi. For 2,5–2,7 t/ha provided early-season hybrids: Poliot, Suvenir, Region, Kongres, Dragan, Romans, Kursor, Siuzhet, Boyiets. – P. 31–39.

UDC 633.15:631.52

Il'chenko L. A. Features OF selection OF analogues-restorers OF corn fertility OF m AND c types OF cytoplasmic male sterility.

Keywords: cytoplasmic male sterility, fertility, sterile cytoplasm, restorer analog, line.

The important role in distribution of hybrid corn has played the discovery of a character of cytoplasmic male sterility (CMS) independently by M. Rods (1931) and M. I. Hadzhinov (1932). About 90–95 % of the domestic zoned hybrids are grown up on the basis of use of the given character without considerable expenses of manual skills.

The Institute of Agriculture of a Steppe zone of Ukraine conducts researches on use of cytoplasmic male sterility of two types – C and M which have received wide recognition in modern selection.

As research tasks was the following:

- Examination of new samples of an parental material on reaction to sterile cytoplasm;
- Selection among them natural restorers of CMS and fixers of M and C types;
- Reception of analogues-restorers for perspective constant lines.

In accordance with the classical scheme any analogues are created by the means of a method of backcrossing breeding throughout 5–6 generations. For acceleration of process of saturation we use the related genotypes, winter nurseries, haploidy. During tests (2006–2010) we took into consideration the recommendations of M. I. Hadzhinov, G. S. Galeyev, V. A. Gontarovskiy and also applied the classical method of creation of analogues-restorers on the sterile basis, developed by R. C. Eckhardt and M. I. Hadzhinov.

For finding-out of reaction of parental forms on CMS and control of abilities of analogues-restorers of fertility we installed every year a seed plot of checks. In the first it was necessary that correctly to choose the most suitable type of sterility; in the second place – to find out a place of each line in the crossing scheme (the parent or man's form); in the third place – accurately to define percent of plants normally restored on fertility.

In the course of work we had been made classification of the self-pollinated lines of corn concerning reaction to sterile cytoplasm depending on a genetic origin. The researches testified that the majority of lines from heterosis group Ajodent and the mixed plasma are natural restorers C type and fixers of the Moldavian type. At the same time in subgroups Lancaster Mo17, Oh 43 prevailed fixers C type CMS.

Integral part of selection programs on use CMS is creation of artificial restorers which at Institute occurs for today only on a sterile basis. One of essential advantages of this direction is possibility of continuous control of regenerative capacity of lines, on the basis of character of flowering of a panicle.

Features of selection of analogues-restorers of fertility on an example of lines of plasma of Ajodent are elucidated. For transfer of initial forms into sterile cytoplasm took the restored plants of the hybrid or sterile analogue of that line to which needs to give regenerative capacity. Last method proved to be more comprehensible as far as sterile analogues of lines DK744M, DK259M, DK278M, DK411M etc. have been already received.

Therefore we have involved the restored plants of the hybrids specially created in 2006–2007 for specified lines: DK744M x GK57MV, DK278M x DK714/195MV, DK279M x GK57MV, DK259M x DK714/195MV, DK411M x DK57MV, DK411M x DK714/195MV etc. Further we applied in these operating time during the creation of artificial restorers of other heterosis groups.

Thus, as result of our researches became work end under 14 forms which are pollinators transferred in the State Sort Service and the registered hybrids. Seeds of fertility analogues-restorers of the Moldavian type of lines DK232MV, DK247MV, DK273MV, DK633/325MV are received. The area of hybridization plots with use of the created analogues-restorers in 2012 made more than 1200 hectares. – P. 39–43.

UDC 633.11"324":631.5

Cherenkov A. V., Khorishko S. A., Palchuk N. S., Kozelskyi O. M. High-quality features of winter wheat depending on the growing conditions in zone Steppe.

Keywords: winter wheat, variety, predecessors, moisture reserves, morphological parameters, the nodal roots, plant height, number of shoots and oven-dry weight of 100 plants.

The work was carried out during 2010–2013 in the research farm centre “Dnipro” of The Scientific Research Institute of Agriculture of the Steppe Zone. The field three-factor experiment was put in practice by method of sequential allotments with use of systematic technique. The area of elementary allotment was 60 square metres and the record allotment – 40 square metres. The experiment was replicated three times.

The aim of our work was to research the characteristics of growth and development of the modern varieties of winter-annual wheat (Zira, Zamojnist, Rozkishna) with different level of activity in the autumn period of growing season and in cultivation after soya, spring barley and also on a fallow land.

Generally, the characteristics of the different plant varieties, the influence of the fore-crops and also the variability of autumn weather significantly affected the growing conditions and development of the winter-annual wheat in autumnal period of the growing season. For instance, at the end of growing period in autumn the maximal deposit of productive moisture in 1 m layer was recorded on fallow land and for different varieties was varied from 90,6 up to 95,2 mm. After non-fallow fore-crops, such as spring barley and soya, these ranges were 84,9–86,6 mm and 76,0–77,9 mm accordingly. Among varieties of winter-annual wheat, which were grown on a fallow land, the deposit of productive moisture in soil layer of 0–100 cm was greater for variety Zira – 95,2 mm and on allotments with varieties Zamojnist and Rozkishna 91,5 mm and 90,6 mm accordingly. In comparison with fallow land cultivation winter-annual wheat after soya has decreased the deposit of productive moisture of soil: in experiment with Zira – by 18,1 % and by 19 % with Zamojnist and Rozkishna. After spring barley mentioned above difference was 6,4 % in experiment with Zira, and 9,0 % with Rozkishna and Zamojnist.

On average, over the years of the research, a greater number of the nodal roots were recorded for varieties grown on fallow land: Rozkishna – 6,3 roots/plant, Zamojnist – 5,9 roots/plant, Zira – 5,1 roots/plant. Plants of the winter-annual wheat had slightly better development of their root system where soya was previously grown. The number of nodal roots varied within 4,3–5,5 roots/plant depending on varieties` characteristics. After spring barley the plant crops were characterized by a much poorer development of the root system. At the same time the numbers of formed nodal roots were higher for the variety Rozkishna compared with varieties Zamojnist and Zira.

It was shown in the study that accumulation of the vegetative mass of plants with deferent forecrops depends on the development of the root system. For example, the plant height and the duration of the autumnal growing period was varying for variety Zira 21,9–25,2 cm, and for varieties Zamojnist and Rozkishna – 19,8–23,7 and 20,8–24,1 cm accordingly.

Derived experimental data give evidence that the biggest stooling coefficient was recorded for winter-annual wheat grown on fallow land: Zira, Zamojnist and Rozkishna – 4,0; 4,9 and 5,3 roots/plant accordingly. In the case of growing of winter-annual wheat after soya and spring barley the stooling coefficient was decreasing and varying for varieties: Zira from 3,3 up to 3,6 roots/plant; Zamojnist – 4,3–4,5 and Rozkishna – 4,8–5,1 roots/plant.

The bigger mass of a 100 bone-dry plants were recorded for the wheat varieties grown on fallow land: Zira – 31,2 g, Zamojnist – 32,0 g and Rozkishna – 33,1 g. The allocation winter-annual wheat after soya and spring barley was accompanied by decrease of above-ground mass of plants which totalled for breeds: Zira – 25,9–27,9 g, Zamojnist – 26,5–28,5 g and Rozkishna – 27,9–29,9 g.

To sum up, the research experiments showed the significant influence of varieties` characteristics and the growing conditions on growth and development of the winter-annual wheat plants and on their morphological characters in autumnal period of the growing season. It was determined that the best readings of growth and development had the plant variety Rozkishna. – P. 43–47.

UDC 631.582

Lebed E. M., Lerinetz F. A., Desyatnik L. M., Fedorenko I. E. Tye productivity of the field cultures depending on structure of sowing and level of fertilizer in crop rotations of northern steppe of Ukraine.

Keywords: field cultures, structure of crops, crop rotation, fertilizers, productivity.

Growth and stabilizing of the productivity of leading agricultural cultures due to the optimum placing, satiation and correlation in crop rotations with application the optimum system of fertilizer has a substantial value for an agrarian production.

On the Krasnograd experimental station during 10 years there were conducted researches of crop rotations with the different set of cultures and doses of fertilizers. Crop rotations were saturated lead for north Steppe cultures: by a winter wheat – to 50 %, by a corn on grain – to 40 % and by a sugar beet – to 30 %.

The highest harvest of winter wheat provided black fallow (on the average 4,89 t/ha). The lowest harvest were at placing of wheat for wheat repeatedly (3,81 t/ha); after a corn on a silo the shortage of harvest of grain by comparison to black fallow made 0,84 t/ha. The greatest harvest of grain of corn is got at placing it after a sugar beet – 5,53 t/ha – due to the enhanceable doses of mineral fertilizers, brought in under a sugar beet ($N_{120}P_{120}K_{120}$).

In the receipt of high harvests of corn is providing of soil with productive moisture in a period of vegetation (in moist years its harvest was increased twice). The harvest of sugar beet in the link of crop rotation black fallow – a winter wheat – a sugar beet was made 45,6 t/ha. A winter wheat was a quite good predecessor after a corn on a silo (43,8 t/ha). Diminishing of harvest of root crops in a link a sugar beet – a pea – sugar beet (by comparison to a link with black fallow) was most – 8,5 t/ha.

A product output increased at the satiation of crop rotation a corn and sugar beet. Increase in the structure of sowing of corn to 40 % provided the most high harvest of grain (3,92 t/ha), and at a satiation a sugar beet to 60 % most amount of forage units (9,39 t/ha) and digestible protein is got (0,69 t).

In a 5-filds crop rotation with a 100 % satiation of grain-crops increasing of fertilizer doze to $N_{96}P_{96}K_{96} + 6$ t of manure did not provide the considerable increase of the productivity of the grain-crops by comparison to application of $N_{48}P_{48}K_{48}$. More effective is the combined system of fertilizers: 6 t of manure and $N_{48}P_{48}K_{48}$ (an increase of grain due to fertilizers was 31 %).

All cultures, except for a pea, were most demanding to the amount of the bringing nitrogen. In variants with bringing phosphoric-potassium fertilizers without nitrogen the decline of harvest of grain was marked on 0,35 t/ha. The exception of nitrogen from composition of mineral fertilizers resulted in the decline of coefficient of the use all three elements of feed which testifies to prevailing of nitrogen in the feed of plants.

Comparison of 3 crop rotations: 10-fild crop rotation (grain and fallow and cultivated culture with 60 % grain-crops); 7-fild crop rotation (grain and cultivated culture with 70 % grain-crops); 5-fild crop rotation (grain and cultivated culture with 100 % grain-crops), where on a background had 6 t/ha of manure and $N_{63}P_{64}K_{63}$, or $N_{48}P_{48}K_{48}$, or $N_{13}P_{17}K_{13}$ showed that the most increase of forage units is got in a 5-fild crop rotation with $N_{48}P_{48}K_{48} - 2,01$ t/ga. The use of the same dose of mineral fertilizers in a 7-fild crop rotation provided the increase of products analogical to that which is got in a 10-fild crop rotation with $N_{63}P_{64}K_{63}$. Consequently, the important value in the increase of the productivity of crop rotations and stipulate the more effective use of fertilizers on black earth soil has a factor of crop rotation.

In the conditions of reformation of agrarian complex most economic expedient agrarian method is an improvement of structure of sowing areas of crop rotation. Thus structure of crop rotations and system of fertilizers must be flexible and can change into account the dynamics of the ground fertility. In economies which must not possibility promote fertility of soil by bringing of organic fertilizers, it is necessary to diminish specific gravity of cultivated culture and increase the sowing areas of bean cultures and long-term grasses in a crop rotation. On black earths soil of northern Steppe it is expedient to bring in on a background of manure per one hectare of area of crop rotation mineral fertilizers in the dose of $N_{48}P_{48}K_{48}$. The use of mineral fertilizers in doses which exceed 150 kg of operating matter of NRK on fat black soil, brings growth over to the unproductive use of elements of feed and decline of recouplement of fertilizers. – P. 48–50.

UDC 633.11«324»:631.5

Gasanova I. I., Pedash O. O., Konoplyova E. L., Nozdrina N. L., Kozelskyi O. M. Grain quality of winter wheat in northern Steppe.

Keywords: winter wheat, predecessor, mineral fertilizers, bugpentatomid, deadripe stage of standing grain, productivity, quality of grain, protein, gluten.

Field experiments were carried out over a period 2007–2011 in the Pilot farm "Dnipro" of Institute of Agriculture of a steppe zone which functions in northern part of Steppe.

During researches it was provided for to find out features of grain quality formation of modern varieties of winter wheat cultivated on bare fallow and after summer barley; to establish optimum doses of mineral fertilizers for obtaining of food grain of 3rd class of quality after a stubble predecessor; to define an efficiency of protection of winter wheat crops from a bug – pentatomid and foliar additional fertilizing with a carbamide; to reveal, what grain of varieties has the least loses of quality at dead-ripe stage of standing grain.

The received experimental data have shown that in the conditions of northern Steppe on bare fallow on the background of presowing application of fertilizers $P_{60}K_{30}$ and local top dressing of plants of winter wheat in a phase of spring tillering N_{30} the yield of different varieties reached 5,55–6,33 t/hectares. After summer barley at the application of fertilizers $N_{60}P_{60}K_{30}$ under presowing cultivation and at the top dressing of winter wheat crops with nitrogenous fertilizers on 30 kg/hectares acting agent early in the spring on frozen and thawed soil and locally in the end of the tillering phase of plants the productivity of varieties made up 3,51–4,20 t/hectares. The variety of Zolotokolosa has appeared the most productive after both predecessors.

Better quality of grain formed the variety Apogey Luhans'kyi. On bare fallow the protein content in grain of this variety made up 12,89, gluten content – 26,0 %, after the stubble predecessor – accordingly 11,53 and 23,5 %. Indicators of grain quality of variety of Zolotokolosa were the lowest after both predecessors.

After the predecessor summer barley and at top dressing of winter wheat crops of variety Pysanka with nitrogenous fertilizers in total of 90 and 120 kg/hectares of acting agent on the back-ground presowing applying of $N_{60}P_{60}K_{30}$ the grain contained the protein of 11,18 and 11,46 %, gluten – 22,5 and 23,3 % accordingly. At decrease in a dose of nitrogen the quantity of the protein in grain did not exceed 10,52 %, gluten – 20,9 %.

Treatment of crops after the stubble predecessor in the beginning of milky ripeness of grain with insecticide Karate Zeon (0,2 l/hectares) has provided easing of harmful action of larvae of the bug – pentatomid and improvement of time indicators of gluten deformation from 113 to 76 standard units, the grain class improved with 5th to 3rd. At combination of foliar top dressing with the carbamide (30 kg/hectare of acting agent) with plant protection we received grain with the highest parameters of quality, here the protein content in grain exceeded other variants on 0,30–1,37 %, gluten – on 3,1–5,4 %, sedimentation value – on 5–10 ml, and bread volume – on 120–135 sm^3 .

At dead-ripe stage of crops within 15 days the most of all sprouted grains in ears it was marked at the variety of Skarbnytsia. High contents of such grains were also at varieties Sonechko, Lytanivka, Apogey Luhans'kyi. Their least quantity was observed in samples of grain of varieties Favorytka, Esaul, Yuvileyna 100. Grain with germination signs had considerably smaller weight. A glassy of grain at dead-ripe stage of crops decreased with 59,4–72,2 to 24,3–37,5 %. At the same time, for the majority of varieties the quantitative changes of protein and gluten in grain were insignificant.

Thus, in the conditions of northern Steppe the bare fallow as compared with the stubble predecessor, even at the minimum fertilizer of crops of winter wheat, provides the higher grain yield of better quality. The maximum productivity after both predecessors was formed by the variety Zo-lotokolosa, and the most qualitative grain – Apogey Luhans'kyi.

After summer barley for obtaining of grain of 3-rd quality class it is necessary to apply the nitrogen not less than 120–150 kg/hectare. Besides, high-quality grain of winter wheat cannot be received without application of crops protection measures from bug – pentatomid. Efficiency of treatment of crops with insecticide increases at integration of plant protection with foliar top dressing of plants by the carbamide.

In the conditions of adverse weather during the harvest period distinctions of modern varieties in stability to grain germination in ears are accurately shown. – P. 51–57.

UDC 633.358:631.5

Gyrka A. D., Sydorenko Yu. Ya., Ilienکو O. V., Bochevar O. V. Ways to enhance of peas grain productivity in the Northern Steppes of Ukraine.

Keywords: peas, variety, seed treatment, growth stimulators, fertilizers, crop yield, grain.

The results of long-term experimental studies to determine the effective ways of increasing grain productivity of different varieties of peas are presented. It is revealed that the use of best ratio of seed varieties of leafed and mustachioed peas morph types, seeding rate, presowing treatment with aqueous solutions of biological, growth stimulator, and as well as micronutrient preparations in association with the mineral fertilizers provides formation the optimal biometric indicators and elements of crop yield structure of erected sowings that are suitable for direct harvesting.

Researches were conducted in the grain-fallowrow crop rotation of laboratory of growing technology of spring cereal and leguminous crops at the Erastivka Experimental Station of SI Institute of Agriculture of Steppe zone of Ukraine NAAS.

Soil of test plot – ordinary chernozem, heavy loamy. The humus content in arable soil layer is 4,0–4,5 %, pH of water extract – 6,5–7,0. Gross supply of nutrients are: nitrogen – 0,23–0,26 %, phosphorus – 0,11–0,16 %, potassium – 2,0–2,5 %. The level of soil provision by moving forms of phosphorus are

increased, potassium – high.

Experiments carried out after predecessor winter wheat. Sown peas with seed drill SN-16, harvest accounting – after direct combine harvesting by SAMPO-500.

When comparing the productivity of peas mustache morph types varieties (2012–2013) revealed that the highest grain yield formed the varieties of Plant Production Institute nd. a. V. Ya. Yuryev: Deviz (2,6 t/ha), Kharkivskyi yiantarnyi (2,5 t/ha), Oplot (2,5 t/ha), Otaman (2,5 t/ha).

The analysis of pea crop yield in experiment studying seeding rate and percentage of variety assortment in agrocenoses (2012–2013) showed that the highest grain productivity (2,15 t/ha) formed crops in the variant of seeding rate 1,4 mln/ha, and mixture ratio of common variety Khar-kivskyi yiantarnyi and mustache – Kharkivskyi etalonnyi was 50/50 %. And along with this crops were completely suitable for direct harvesting.

The research results (2010–2012) showed that the optimal seeding rate of pea varieties Kharkivskyi etalonnyi on a background of $N_{30}P_{30}K_{30}$ appeared 1,4 mln/ha, but of $N_{15}P_{15}K_{15}$ – 1,6 mln/ha. The pea variety Kamerton increased the maximum productivity when using seed rate of 1,6 mln/ha, Gliants – 1,4; Madonna – 1,2 mln/ha.

Studies on the reaction of different varieties of pea morphotypes to use of growth regulators (2006–2008) showed that without fertilization, preparation agate-25K ensured increase in pea crop yield of mustache morph type variety Kharkivskyi etalonnyi at level of 16,4 %, of common variety Kharkivskyi yiantarnyi – 17,2 %. The use of chelated micronutrient reacom-S-beans on the same fertilization background contributed to higher grain yield of pea varieties by 17,4 and 19,4 %, compared to the control.

Fertilization with $N_{20}P_{40}$ correspondingly to non-fertilized background contributed to increasing plant productivity of pea varieties Kharkivskyi etalonnyi for 10,1–12,7 %, depending on the seed treatment variant, Kharkivskyi yiantarnyi – for 10,8–14,0 %. It indicates a greater sensitivity of common variety to background fertilization.

On a background of $N_{20}P_{40}$ preplant seed treatment of peas by preparations agate-25K and reacom-S-beans provided an additional grain yield of variety Kharkivskyi etalonnyi for 16,3–20,0 % in variety Kharkivskyi yiantarnyi – 18,4–22,8 %, compared to control.

Use for preplant seed treatment of peas mustache morphotype variety Tsarevych by humate microelement and biologic preparations (2008–2009) provided an additional grain yield compared to the control level for 7,5–13,3 %.

The study of fertilization efficiency and peas seed treatments by bacterial and humate microelement preparations (2010–2012) showed that the highest grain yield (2,13–2,15 t/ha) was formed in variants on fertilization background of $N_{30}P_{30}K_{30}$ and seed treatment by GK-A and ryzohumin preparations, which exceeded the control for 0,20–0,22 t/ha. – P. 57–63.

UDC 631.461.5

Kliavzo S., Chaban V., Shaytor T., Kovalyova N. Potential of the mineralization of chernozem ordinary the steppe zone of Ukraine.

Keywords: *chernozem ordinary, potential of a mineralization, nitrogen regime diagnose-tics.*

For diagnostics of security of plants by nitrogen the method of definition of mineral nitrogen (NH_4^+ + NO_3^-) is widely used. It enables to estimate the maintenance of accessible forms of nitrogen at the moment of sampling in ground. However, cultures of the long period of development (the corn, sunflower, etc.) use a significant amount of nitrogen which mineralizes during vegetation and is not taken into account at an early stage of selection (spring) that complicates diagnostics and forecasting of efficiency of nitric fertilizers.

At the same time the more effective method, for the forecast of potential opportunities of ground to provide plants with accessible forms of nitrogen during vegetation is based on use of size of potential of a mineralization (N_0). The given method takes into account all the amount of soil nitrogen which can be mineralized under favorable conditions for vaguely long time. Kinetics of this process is determined by a constant of speed of mineralization (k) which in field conditions depends on temperature and humidity of soil of the grown cultures. In this connection, the purpose of work – to establish parameters of potential of a mineralization of ordinary chernozems and to prove an opportunity of its use at diagnostics of a nitric mode of soil.

In laboratory conditions with use of a biological method of long aerobic incubation (18 weeks) the potential of a mineralization (N_0) zone soils and its changes is determined depending on intensity of use of chernozems. The soils for modeling experience has been selected on a deposit and an industrial site (Eras-tovskya an experimental station), and also from stationary experience (the Zaporozhye experimental station).

Initial maintenance (contents) of N– NO_3 in soils und was in rather wide limits (12,8–27,0 mg/kg). It

can be explained by the intensity of its use. So, their maximal value (27,0 mg/kg) was on a variant where the ground was in a condition of a deposit. On variants where it was exposed to anthropogenous loading, depending on a level of application of fertilizers and efficiency of a crop rotation, the quantity of nitrates made 16,2–23,3 mg/kg whereas on the absolute control where during 35 years of fertilizer did not apply – it was minimal (12,8 mg/kg). Definition of the maintenance of nitrates through the certain interval of time has allowed to observe changes of their accumulation. Also, it is necessary to note presence of two peaks of their maintenance on the majority of variants: the first – falls at definitions after 3 weeks of incubation, that in relative values makes 14,3–5,3 % from total of nitrogen. The second – for the period of definition after 6 weeks (14,8–17,6 %) with the tendency to decrease between the periods. The given regularity was not observed at incubation of soils of a deposit where the greatest quantity of nitrates (16,3–16,2 %) was marked after 4-th and 6-th weeks, with their gradual reduction at the subsequent definitions. In this case, for all period composting the maximum quantity of nitrogen of nitrates (253,9 mg/kg) was collected. It can be explained by the big stocks of organic substance and accordingly, opportunities for a mineralization by microorganisms. Soils that are heavily exposed have the ability to maintenance the plants with nitrogen 57–74 % from the natural analogue.

On the basis of the received data we have calculated potential of a mineralization according to the kinetic equation of the first order. It is established, that the soil which is taking place in a condition of a deposit is characterized by its maximal value (320 mg/kg). Thus, the constant of its speed makes 0,106 week⁻¹. Application of manure, in moderate and high dozes of nitric fertilizers practically did not influence parameters of potential of a mineralization (190–202 mg/kg) and a constant of its speed (0,099–0,103 week⁻¹) that testifies the kinetic uniformity of nitric fund of ordinary chernozem. On the basis of the correlation analysis of dynamics of the nitrate nitrogen the direct correlation dependence close to functional, between N_t and contents of N–NO₃ that it is necessary to take into account in calculation of dozes of nitric fertilizers. – P. 63–67.

UDC 633.15

Semenyaka I. M. Optimization of planting acreage of corn in the Kirovograd region on the basis of analyzing the dynamics of productivity.

Keywords: corn , productivity, total yield, planting acreage, statistics, modeling.

It was done the analysis of statistical data of productivity and total yield of corn grain and grouping of administrative districts of Kirovograd for the efficient use of natural resources by redistribution of planted area under this crop.

A number of factors affect the production of corn in different soil and climatic districts: the conditions of moisture and mineral nutrition of plants, precursors and systems of tillage after them, planting acreage and the level of protection against pests , diseases and weeds.

The aim of our research is to trace the dynamics of productivity, the total yield of grain and areas of harvesting of corn in the Kirovograd region, to investigate the impact of climatic conditions on the productivity of this crop and to perform the mathematical modeling in the Mathcad 15,0 program on the basis of the analysis of statistical data and give the recommendations on the advisability of expanding or reducing the planting acreage of corn in various districts of Kirovograd.

According to the statistical data for the 2000–2011, in 2011 compared to 2000 in the districts of the Kirovograd region it takes place as a constant growth, so a constant differentiation of productivity of corn grain. The majority of districts (13) have a low total yield (up to 100 000 t.) and 8 districts provide the production of corn grain over 1 million t.

As a result of the analysis of agrometeorological data for 2005–2011, the rainfall in May and June had a little impact on the productivity of corn in the Kirovograd district (correlation coefficient ρ is respectively 0,052 or 0,294). The positive impact on the productivity and total yield of corn grain (ρ is 0,463) had the precipitations in July and negative (ρ is -0,815) had the August rainfall.

It was founded a strong direct relationship as between the total yield and harvesting area (ρ is 0,965), so between the total yield and productivity of corn: in the Kirovograd region the correlation coefficient is 0,872, and in Ukraine the ρ is 0,954. There were discovered and classified 3 groups of districts of the region for the productivity of corn and the advisability of further expanding or reducing the planting acreage under the crop on the basis of mathematical modeling of the statistical data from 2000–2011. In the districts of the first group it is observed the unstable productivity of corn grain, and its production is very risky for farms. Among the districts of the second group there is an unstable growth of productivity, and the augmented production of grain is acceptable, but unstable. The third group of districts is the most favorable

for the cultivation of corn due to the stable growth of productivity of corn. The expanding of production of this crop exactly here is potentially profitable and guaranteed.

So, the production of grain of corn in the Kirovograd region is made mainly by the extensive way (by expanding the planting acreage), but in recent years it is observed the trend towards the intensification of cultivation due to the increase of productivity. The greater positive impact on the productivity of corn in the Kirovograd district (ρ is 0,463) had the precipitations in July (the critical period of growth and development of a crop), and the August rainfall had the negative impact on the indicators of productivity (ρ is -0,815), and therefore on total yield of grain.

In order to intensify the production of grain of corn in the conditions of the Kirovograd region we propose to use the natural resources more effectively through the redistribution of the planting acreage under this important crop:

- To expand the planting acreage under corn in the districts of the region which are assigned to the third group: Znamyanka, Kirovograd, Mala Vyska, Novoukrainka, Alexandrivka, Alexandria and Svitlovodsk districts, where the production of grain is the most stable on the productivity growth rates among the districts of the region. Exactly in these districts a growing of corn is not only feasible, but also a potentially profitable and guaranteed;

- To minimize the planting acreage under corn in the districts of the region which are assigned to the first group: Vilshanka, Bobrinets, Dolinskaya, Kompaniyivka, Novgorodka, Petrovo and Ustynivka districts, that will allow to reduce the risks of agricultural producers in the plant growing industry. – P. 76–81.

UDC 635.67: 635-15: 631.51

Danylova J. V. Yield formation and quality of sweet corn, depending on the precursors of tillage and sowing dates.

Keywords: *sweet corn, predecessors, tillage, sowing dates, quality, productivity*

The article presents the previous results of the effect of predecessors of tillage and sowing date on yield of sweet corn.

The purpose of research set features sweet corn yield formation under the influence of a combination of different farming practices in a northern steppe of Ukraine. Factor A – precursors (sunflower, soybean and corn). Factor B – tillage systems (traditional system of soil cultivation or direct sowing without tillage). Factor C – different sowing date depending on soil temperature at a depth of 10 cm (1st – 8–10 °C, 2nd – 12–14 °C, 3rd – 16–18 °C);

The study was conducted in 2011–2012 at the Kirovograd Institute APV in grain-vaportilled crop rotation.

Growing sweet corn after different predecessors without tillage in 2011–2012 was ineffective. Loss of harvest of the ears about 5,04 t/ha or 77,0 % and during the following direct sowing of sunflower precursor in $t_{\text{soil}} = 12\text{--}18^\circ\text{C}$ yield was close to zero. Loss of crops in fields after corn compared to its predecessor soybeans was average 0,72 t/ha (14,5 %) and after the sunflower – 1,98 t/ha or 40,2 %. Significantly higher yield of sweet corn formed when grown after the traditional system of soil cultivation and sowing in soil temperature 12–14°C. After predecessors soybeans the yield was 8,75, corn – 8,07, and sunflower – 6,25 t/ha.

According to the results of studies by the number of sugars difference between the various versions of the experiment ranged from 0,02 to 3,49 %. Higher content of total sugars in the grain was against the background of traditional tillage after predecessor corn and after in both tillage systems on predecessor soybean sowing $t_{\text{soil}} = 12\text{--}14^\circ\text{C}$ – 12,35 and 12,14, 12,38 % respectively.

After Sunflower greater total sugar content in the grain was by direct sowing at $t_{\text{soil}} = 8\text{--}10^\circ\text{C}$ – 11,59 %, as well as the traditional system of tillage and sowing $t_{\text{soil}} = 16\text{--}18^\circ\text{C}$ – 11,16 %. The lowest accumulation of sugars observed with direct sowing in predecessor sunflower by $t_{\text{soil}} = 12\text{--}14^\circ\text{C}$ – 8,86 % of total sugar, 5,10 % sucrose and 3,50 % glucose.

Thus, the best conditions for the formation of yield and quality of sweet corn hybrids were in the traditional system of cultivation after predecessors soybean and corn and sowing at the temperature of 12–14 °C. – P. 73–76.

UDC 633.15:339.13

Bondarenko A. S., Benda R. V., Shyshkina O. Y., Pryadko Y. M. Modern conjuncture tendencies of world and Ukrainian corn market

Keywords: *corn, yield, sown area, hybrids.*

Grain resources are of particular importance in the world economy as they determine conditions provided support of the society. Their value is not only in ensuring people's needs for food, but also in a significant impact on employment of the population and the effectiveness of the entire national production.

In global agriculture corn gross collection and its grain yield take the first place among the major crops. Though in recent years the yield of grain corn in Ukraine has increased from 3,24 t/ha in 2001 to 6,44 t/ha in 2011, it remains lower than the world average – 4,99–5,18 t/ha and significantly lower compared with the leading manufacturers in the world. In the same period the yield of grain corn in the United States ranges from 9,59 to 10,34 t/ha, in France – from 8,81 to 9,44 t/ha, in China – from 5,06 to 5,48 t/ha. Significant increase in corn yield in Ukraine dates back to 2005. This is explained by more intensive introduction of highly-productive varieties of corn and its hybrids to the farms and by focusing attention on the technological issues of corn cultivation.

The aim of our work was to study the major trends and conjuncture of world grain market as the basis of formation of effective export policy. The analysis of the global production, ratio of supply and demand levels of grain crops in the leading countries of the world, fluctuations in grain stocks, the ratio of export and import items are the basis of forecasting of the situation at the global market and ensuring appropriate conditions for domestic producers to sell grain at more profitable market prices, rational using of their own resources and increasing of grain production in the agricultural sector. These are provisions which determine the urgency of this investigation.

A number of research centers have been established in the world which study the potential of each perspective country-exporter and country-importer of grain, track of the production dynamics exchange trade, consumption of grain stocks. These centers also forecast the future. Analysis of these data allows to determine the conjuncture of the global grain market, volumes of grain output and grain consumption, demand and supply levels on the scale of international trade.

As for the corn market, U.S., China, Brazil, Argentina, Mexico, India, the EU, Canada, Ukraine have been the main producers of this crops for a long period of time. In general, they account for about 90 % of its turnover.

In the global corn market the United States occupies the first place exporting about 60 % of grain crops. This year Ukraine will join the three leading world exporters of corn, because it plans to supply over 16,4 million tons of grain to the foreign markets, despite the fact that from 2002 to 2008 the export of corn ranged from 1 to 2,5 million tons per year. The main buyers of this type of agricultural product are Japan (in 2010/2011 marketing year it imported 955 tons of Ukrainian corn), South Korea (during the same period it received 847 tons of corn), Egypt, the European Union (Spain is in the first place) Iran, Saudi Arabia and China.

In the EU, the production of corn is growing under the influence of high prices, which tend to be higher than the intervention and American ones. Such countries as France, Italy and Spain, grow up to 75 % of corn, and including Germany – 86 %. The home market of the European Union is protected by import tax, which enables France and Italy to hold almost all the EU market.

Analyzing the world production, consumption and residual of corn in recent years the following conclusions can be done. Firstly, the production of corn in the world increased from 824,2 million tons in 2009 to 962,6 million tons expected in 2013 and almost by 20,5 % – since 2006. The gross harvest of grain corn in Ukraine has also been increased from 3,4 million tons in 1995 to 26 million tons in 2013 due to extension of sown area and raising productivity.

Long-term studies of the Institute of Agriculture of the steppe zone indicate that when observing optimal technological requirements, optimizing placement and other scientifically-based measures, the gross production of corn in Ukraine may exceed 20–25 million tons per year. But it should be noted that the effective growing of corn requires appropriate selection of hybrids of different maturity groups with good adaptation to different soil and climatic conditions of a particular farm.

Our institution takes one of the leading places in the creation of national corn hybrids. Each year the Institute offers new highly productive corn hybrids of all maturity groups and scientifically grounded technologies for their cultivation, the main directions of which are the implementation of grain yield potential at high level, obtaining products of high quality, increasing adaptive capacity of plants, improving energy and economic indicators. In addition, high yield of hybrids is connected with low harvest grain moisture, cold, drought- and heat-resistant plants, etc. In market terms, it is the main prerequisite for obtaining high profits.

Thus, the increased attention of farmers to such crops as corn has led to the growth of sale prices and increasing demand for grains, which in its turn has stipulated the raising of corn production in Ukraine in recent years. – P. 76–81.

Gyrka A. D., Ischenko V. A., Gyrka T. V., Andreichenko O. G. Efficiency of fertilizer application under spring barley growing in agrocenoses of northern steppe.

Keywords: *barley, mineral fertilizer, predecessor, crop yield, grain.*

The efficiency of preplant use of complex mineral fertilizers separately and in combination with spray dressing of spring barley plants by nitrogen when grown after predecessors: soya, sun-flower and winter wheat, is determined. The highest level of crop yield hulled and naked barley provided at growing after predecessor soya. It is established that local fertilizing by nitrogen of spring barley plants in the phase of tillering and its combination with the introduction of the complex fertilizer was less efficient than their separate application. – P. 82–86.

Tkalich Y. I., Nitsenko M. P. Effect of biological preparations on yielding capacity of sun-flower hybrids in the steppe.

Keywords: *sunflower, hybrids, biopreparations, yield.*

Smart use of fertilizers, plant growth regulators and biopreparations is one of the most important elements of the sunflower farming culture. A special place is held by the microbiological preparations which are able to fix the nitrogen from air and mobilize phosphorous compounds thus helping to reduce consumption of fertilizers and fulfill the potential of the hybrids grown.

In our research we used early-season low-growing hybrid Kiy, middle-early maturing tall-growing hybrid Yason and mid-season hybrid Zorepad. Against the background of the hybrids we studied such bacterial preparations as Diazofit, KL-9, a biocomplex (Diazofit + Phosphoenterin) which were used to treat the seeds immediately before sewing.

Diazofit and KL-9 promote accumulation of nitrogen and apportion its consumption throughout the whole sunflower vegetation period while Phosphoenterin favors the use of undigested by the predecessor phosphorous and hard-to-reach phosphates in soil which makes it possible to fulfill the potential of the hybrid to the fullest extent and to improve the seed quality.

The experiments were carried out according to B.A. Dospekhov on Ptakhivnyche Farm in Novomoskovsk district, Dnipropetrovsk region in 2011–2012. The soil of the experimental plot was ordinary low loam chernozemic soil. The humus content was 4,8 %.

Biopreparations scarcely influenced the rate of the plant development. The difference was observed only among the hybrids. The vegetation period of Kiy hybrid lasted approximately 113 days, Yason completed its growth in 118 days and Zorepad – in 123–124 days. Zorepad hybrid suffered root lodging caused by wind and rain because of the large and heavy inflorescences. The preparations had a substantial effect on the growth and leaf surface of the plants.

Especially effective was seed treatment with KL-9 and biocomplex. The average leaf area and the plant height equaled 6064–8676 cm² and 151–182 cm respectively while the plants under control had 4732–7673 cm² and 142–164 cm respectively. The Yason hybrid plants were the highest (179–182 cm) and the Zorepad plants had the largest leaf area. The early-season hybrid Kiy ranked third. Yason responded to the bacterial preparations best of all, however Kiy showed the highest rate of the plant height and leaf surface growth as well as the plant weight gain. Thus as a result of use of biopreparations the weight gain of one Kiy hybrid plant before the flowering stage reached 16,5 %, Yason – 14,4 % and Zorepad – 14,7 %.

In 2011 Zorepad plants had the heaviest dry weight (222–347 grams) and Kiy plants – the lightest (91–119 grams) which was determined by the genetic peculiarities of the hybrids. The microbiological preparations had a positive effect on the structural elements of the sunflower yields. The seed size, the weight of the flower head and the proportion of seeds in the total weight of plants increased from year to year. Thus if the dry weight of Kiy hybrid plants under control was 42,8 on average over 2011–2012, it increased to 47,1– 48,3 after the use of the preparations. The other two hybrids showed the same tendency, Yason – 43,4 and 47,0– 49,9 g respectively and Zorepad – 48,7 and 51,0–56,8 g respectively.

From among the three hybrids Zorepad had the biggest total water consumption which was 2985–3143 m³/ha and earlyseason Kiy the smallest – 2643–2768 m³/ha. At the same time Kiy used the moisture reserves most effectively; the water consumption ratio of Kiy made up 1149–1222 m³/t which is 0–11,3 % less than that of Yason and Zorepad. With respect to this index Diazofit turned out to be the best microbial product for Kiy hybrid and the biocomplex was most effective for Zorepad and Yason.

It should be noted that Zorepad showed the best crop capacity amongst the studied hybrids. The yield of this hybrid over the years of the experiment was 2,53–3,0 t/ha at the average which is 0,3–0,55 t/ha more

than the yield of Yason and 0,40–0,60 t/ha than that of Kiy. The best amongst the microbial products were KL-9 and the biocomplex (2,97–3,0 t/ha). Similar results were obtained with respect to Kiy and Yason.

Thus the sunflower seed treatment with such bacterial preparations as Diazofit, KL-9, Phosphoenterin and the biocomplex (Diazofit + Phosphoenterin) activates the soil biology, favors mobilization and optimizes nutrition of sunflower plants with nitrogen and phosphorus which improves crop growth and development and increases productivity and quality of the product. – P. 86–89.

UDC 631.522:58.083.5

Satarova T. M., Vinnikov A. I., Khoprichkova S. V. Bioinformatical analysis of maize dwarf mosaic virus genome for maize marker-assisted selection.

Keywords: maize dwarf mosaic virus, maize, nucleotide, amino acid, SNP-marker.

The analysis of genome of maize dwarf mosaic virus (MDMV) is conducted according to computer databases Genome, Nucleotide, Gene, and Protein of bioinformatic server NCBI. It is determined that genome of MDMV includes 9515 nucleotides, but only 8553 of them take place in the encoding of amino acid sequences. MDMV is characterized with economy of genome organization, particularly 2 of 10 genes of this virus are overlapped. In maize the resistance to dwarf mosaic virus infection is controlled by dominant allele of gene *Mdm1*, which is situated in chromosome 6, in bin 6.1 and is localized between nucleotide coordinates 9491573 and 14931786. Markers of single nucleotide polymorphism (SNP-markers) in maize genome closest to locus *mdm1* are determined. The obtained results should be applied to production of maize hybrids resistant to dwarf mosaic virus with methods of MAS-selection. – P. 89–93.

UDC 631.364.6

Kirpa N. Y. Scientific basis of innovative industrial technology of grain storage.

Keywords: grain mass, storage technology, efficiency and practical value.

Due to the increasing of grain production in Ukraine there is a very urgent task of its complete and reliable storage. The analysis shows that the best conditions for storage system are provided by system of certified enterprises that have appropriate material and technical basis subject to application of modern innovative technologies of grain storage.

The objective was to analyze the basic principles and techniques of grain storage, set their effectiveness and possibility at industrial applications. The work was performed by analysis of existing data in grain storages, as well as research and development of new methods and modes providing harvest storage of different crops depending on their condition and destination.

The analysis shows that during storage it should be taken into account the complex structure of the grain mass, which consists of the alive and lifeless objects (main grain, impurities, microorganisms, insects and mites, as well as air). Air refers to special objects and largely differs from atmospheric air, and therefore affects the composition and quality of the grain mass.

The basic factors that affect to alive objects of the grain mass are defined. Such factors include temperature, humidity and the oxygen content in the grain mass, as well as their relationship to each other. Taking into account the main factors the following principles of grain storage were identified: dry, chilled and under confinement. On the basis of these principles there are various technologies of grain storage.

Storage technology in the dry state is carried out at a low moisture content of grain in stationary repository. Humidity should not exceed the critical level that is set for each culture. Significant impact on storage is also provided by technical and technological characteristics and design of the repository. Based on the characteristics there were defined features of the storage of different cultures, as well as the effectiveness of various stationary repositories in industrial environments.

In order to reduce the cost of storage technology in stationary repositories there were analyzed and determined the influence of grain placement in open conditions in polymeric grain sleeves (PGS). Storage in the PGS is provided by limiting the air access to the grain to create modified atmosphere with low oxygen content. However, along with advantages of this storage there are disadvantages – a significant and unregulated influence of environmental conditions on the state of the grain, the defectiveness of polyethylene film, the complexity of monitoring of grain quality.

It was revealed a special meaning and application of preserving of wet corn. First of all such storage is effective for feed purpose of corn, which is harvested with increased humidity and requires considerable energy for final drying. Technology does not require large capital investments and may be carried out in conditions of households and enterprises of procurement system.

In order to obtain high-quality feed there were designed and found basic rules of preservation and

storage of wet grain. These rules include: harvesting of grain with humidity 20–35 % or cobs with humidity 35–45 %; immediate grain grinding (cobs) to particles size of 4,2 mm and containing not less than 80 % of the total weight; loading to the storage and compression of the mil-led mass to 0,8–1 t/m³; mound with plastic wrap and cover the top layer. While respecting these rules grain with high protein content can be obtained.

For preservation and storage of wet grain there are recommended storages, that provide sealing (metal towers, trenches of concrete slabs). Properly stored losses of dry matter associated with grain breathing do not exceed 3–5 % of the total weight.

Thus, the basic principles and factors of grain storage were clarified, that include humidity, temperature, oxygen access to the grain mass. It was defined the base technology of grain storage in the dry state, and cooled under confinement. Innovative energy-saving technologies include grain storage in polymer grain sleeves and preserving of wet grain. – P. 93–98.

UDC 631.527:635.67

Klimova O. E. Breeding of the sweet corn on sinelinikovskoy selekcionno-experienced station.

Keywords: *sweet corn, genes, biosynthesis carbohydrate, lines, hybrids, quality grain.*

Amongst different subspecies of the corn, used for production high energycal provender and for technical conversion important place occupies sugar corn, which will acknowledge biologically valuable vegetable culture. Multi-objective use and ability to grow and form the high productivity in different agro-ecological condition is a premise of the further increase production to her marketable products. In expansion of the sowing areas and increase gross collection this subspecies of the corn main importance gain the directions to breeding new, more making hybrid and methods of the creation, estimations and principles of the selecting the valuable material for hybridization.

For result of the long studies, called on in zone of the unstable moistening north Steppe is illuminated efficiency to breeding of the sugar corn on different stage of their development. The Brought feature created at different years sort and hybrid with specific type biosynthesis carbohydrate, which contents is checked action biochemical effect gene *su1*, *sh2* and genic combinations *su1se1*.

The Deepened study genofund collections of the sugar corn has revealed the variety its linear material for morphological sign and biological particularity. High polymorphism inbred line will Installed for factor quality grain. Existing weakly correlates relationship of the qualitative factors when joining them with high correlates economic-valuable sign raise the possibility an divergence selection high productivity генотипов with perfected gustatory feature grain. Essential divergention line will Revealed for nature ecological reaction. It Is Installed genetic and breeding value line on sign of productivity and quality grain and nature of the inheritance and shaping the system of the genetic checking sign at between linear hybridization.

The Diagnosed sources individual and complex thermo stability and is chosen genetic determinants drought stability. The high activity genotypic ambiances will Revealed beside stress-tolerant cenosis line, relatively with unstable to drought. High practical value inherent ecological plastic and stable firm to defeat pathogen line as well as resistant and tolerant to damaghytoe phytophage genotype. Garmonizaciya genomes parental component at hybridization line with high combinational ability promotes the accumulation in hybrid organism favorable acting on sign alleles, checking with high expression manifestation positive heterocyst. Beside F1 occurs the reorientation to genetic organization of the rule-oriented process, characteristic parental forms. Are they Herewith optimized genotype hybrids and the processes of the shaping structured sign. Reasonable use line with high and separate importance commercial-valuable signs – lengths of the cob and corn, amount sort grain, masses of the cob. The Association in one genotype forms with high combinational ability on productivities and stability adaptive reaction provides creation an high productive hybrids with complex-field resistance to stressful factor and raises buffering genetic system to organizations their rule-oriented process.

It Is Identified embryonic plasma to collections of the corn and is classified lines on heterotic groups. Will Revealed real relationship consolidation line and is explicated their differetion within heterotical of the groups. Clear and significant diversification line optimized the process of the selecting the source material that has provided use the most contrasting line for making high heterotic hybrids.

Called on at the last years enrichment genetic resource of the linear material of the culture with use specific gene biosynthesis carbohydrate in grain and sample of the grain corn of the different embryonic plasmas as well as bursting, using advanced methods of the estimation and receiving the selecting the valuable linear material raises effective technologies to breeding prominent hybrid with high level productive, adaptive and qualitative potential. – P. 98–104.

Aldoshin A. V., Samojlenko A. T., Fedorenko E. M., Yalansky A. V., Cherenkova T. P. Features seed sorghum.

Keywords: *sorghum, acreage, varieties, hybrids, seed, seed-growing technology.*

Features studied on sorghum seed State Institute of Agriculture of the steppe zone of Ukraine NAAS. The purpose of the studies on the prospects and production of sorghum and features of its cultivation. The objectives of the research were: to analyze the dynamics of sorghum acreage in Ukraine and the forecast for the future, according to the forecast to calculate the need for seeds; find security varieties and hybrids, to develop recommendations on technology of cultivation of sorghum.

Illuminated sorghum and biological features considered their place in the world agricultural production. Sorghum is a drought-resistant crops, has a low transpiration rate (300), able to with-stand prolonged drought and tough, resistant to high temperatures of air and soil, can hibernate. Sorghum has a broad palette of Use: corn, green forage, hay, silage, haylage, grass meal, pellets, briquettes, brooms and more. Sorghum grown more than 80 countries around the world, an area of almost 50 million hectares, the average yield of 1,5–2,0 t/ha. The analysis of the sorghum acreage in Ukraine for the period 1950–2013 area under sorghum increased from 6,6 hectares in 1950 to 146,2 thousand hectares in 2013, climate change, reducing acreage of barley (2009 – 4993, 5 hectares, 2013 – 3213.0 ha), especially in the Barrens (2009 – 2935,2 thousand hectares in 2013 – 2022,1 thousand hectares), optimization of crop rotations by the decline of the sunflower, give reason to anticipate an increase in the area under sorghum in Ukraine to 400 thousand hectares in 2020 According to the forecast results of the calculation needs and seeds required for this area of seed crops.

In view of the insurance funds in 2020 must produce 2,8–3,0 tons of grain seeds, 150–200 m – Sugar, 150–200 m – herbaceous and 30–40 m – Technical sorghum. To do this, place the seed crops of sorghum area 0,9-1,8 hectares. Clarified a number of varieties and hybrids of sorghum listed in the State Register of plant varieties suitable for distribution in Ukraine in 2013 to meet the needs of production may be used 84 varieties and hybrids of sorghum, of which 55 domestic breeding, 23 of them created in the Institute of Agriculture control steppe NAAS zone, including 7 – grain sorghum, 2 – sorizu, 2 – vinikovo sorghum , 4 – sorghum, 3 – Sudanese sorghum, 5 – sorghum – sudan hybrids.

Recommendations on technology in cultivation of sorghum seed farms. The precursors under sorghum seed crops are encouraged to use the following crops: winter and spring cereals, legumes, corn. Before plowing must necessarily make 1–2 stubble plowing . Plowing is necessary to align the autumn. Spend 2 spring cultivation. Fertilizers under sorghum expedient to make fall under the spring plowing or topical routes, by norm $N_{60}P_{60}K_{30}$. Sorghum is very sensitive to organic fertilizers, especially in combination with mineral. When making autumn plowing 10–20 tons of manure and $N_{10}R_{10}$ spring when sown sorghum grain yield increase of up to 1 t/ha. Fertilizers not only increase productivity, but also improve the quality of seeds. Binding activity is seed treatment against pathogenic microorganisms and soil pests. The optimum time of sowing sorghum when daily average soil temperature at a depth of 10 cm 12–15 ° C. Recommended plant density of grain sorghum in the desert before harvest should be 100 – 120 thousand, sweet sorghum – 180–200 thousand vinikovogo – 250 thousand Sudanese sorghum 400–600 thousand/ha. At sites of hybridization ratio between the parent lines and masculine forms pick specific to the region, the nature of the variety and availability of harvesting machinery. When growing seeds must comply with the rules of spatial isolation. To reduce the moisture content of the grain used in the early crop desiccation full ripeness.

Conclusions:

1. Area under sorghum increased from 6,6 hectares in 1950 to 146,2 thousand hectares in 2013, is projected for 2020 – 400.0 thousand ha 2. In view of the insurance funds in 2020 must produce 2,8–3,0 tons of grain seeds, 150–200 m – Sugar, 150–200 m – herbaceous and 30–40 m – 3 technical sorghum. For 2013 in the State Register of plant varieties suitable for distribution in Ukraine registered 84 varieties and hybrids of sorghum, 55 of them domestic breeding 4. The recommendations on the technology of cultivation of sorghum. – P. 104–110.

Masliyov S. V. Productivity of sweet corn hybrids at different terms of sowing.

Keywords: *sweet corn, hybrids, sowing terms, interphase periods, productivity of ears.*

Experimental works and field experiments are carried out in the course of 2011–2013 on biology department of Luhans'k T. Shevchenko National University and in the conditions of agroenterprise "Agrobutove" which functions in steppe northern – central moderately droughty subzone of Northern Steppe of Uk-

rairie.

As soils of experimental plots were ordinary chernozems with contents of humus in an arable layer of soil 3,5–3,6 %, hydrolyzed nitrogen – 10,4–11,2 mg, mobile phosphorus – 10,1–10,8 mg, exchange potassium – 14,4–15,3 mg on 100 g. soil. The experiments were carried out in a field crop rotation. Winter wheat was as the predecessor of corn. Soil cultivation included primary tillage, real tillage on depth of 20–22 cm, early-spring harrowing and 2–3 preplanting harrowings. Mineral fertilizers in dose $N_{60}P_{60}K_{40}$ applied under the basic soil tillage and as top dressing at interrow hoeing in corn crops. Seeds of sugar corn hybrids we sowed with seeder SUPN-6 in the single-grain method with row – spacing 70 cm. We manually formed density of planting in a phase of 3–5 leaves at culture. Interrow cultivations were carried out in the phase of 4–5 and 7–8 leaves at corn. A trial establishment, counts and observations carried out according to the standard techniques.

Studying of early and superearly terms of sowing of early-ripening hybrids of sweet corn Arktur, Spokusa, Delikatesna and Konkurent was our research task.

Transfer of sowing terms of corn since May for April is one of ways for obtaining of early production. This question has got a special urgency in connection with occurrence in farm-production of new sweet corn hybrids which seeds are capable to sprout in earlier terms.

On the basis of results of researches it has been established, that duration of the period sowing – seedlings on years fluctuated from 13 (2011) till 18 days (2013), and the period seedlings – milky ripeness of grain differed for 4–6 days and did not exceed at hybrids: Arktur and Spokusa – 70 days, Konkurent – 75 days, Delikatesna – 80 days. As to sowing terms duration of the period sowing – seedlings decreased in a direction from early to late terms and averaged for three years 15 days at sowing on April 15th and 11 – at sowing of seeds on May 5th. The earliest flowering of ears in all years of researches was observed at hybrid Arktur – in 40 days after seedlings, and most later at hybrid Delikatesna – in 47 days. The period from flowering of ears before milky ripeness of grain was the most long at early (April) terms of sowing and averaged 25–27 days, while at sowing of seeds in May – 20–22 days. The general duration of the period from seedlings to milky ripeness of grain averaged at early terms of sowing (on April 15th) from 65 days at hybrid Arktur till 74 days at hybrid Delikatesna, at the latest (on May 5th) – fluctuated from 60 till 71 days accordingly. Thus it is necessary to notice, that despite the greatest duration of the periods from sowing to seedlings and from seedlings to milky ripeness of grain, at corn sowing on April 15th it is possible to receive production of ears for 10–12 days earlier in comparison with other terms of sowing. At sowing of hybrid seeds on April 15th the harvesting of young ears fell to 1 decade of July, and on May 5th – for 2–3 decade of July.

The highest productivity of conditioned ears was provided with hybrid Konkurent – from 7,77 to 7,92 t/hectare, and the least – hybrid Delikatesna – from 6,3 to 6,41 t/hectare.

At early sowing (on April 15th) productivity of ears of milky ripeness at all hybrids of sweet corn was a little smaller, than at sowing on April 25th and on May 5th, but much higher purchase price of production compensated productivity decrease. Conditionally net profit from realization of young ears at sowing on April 15th reached 19,7–23,3 thousand UAH, while at sowing on May 5th – 9,6–11,5 thousand UAH.

At sowing of seeds of hybrids of sweet corn on April 15th duration of the periods sowing – seedlings and seedlings – milky ripeness of grain in comparison with later terms of sowings of seeds (on April 25th and on May 5th) was extended for 4–6 days, however obtaining of ears of milky ripeness was accelerated for 10–12 days. Hybrids Konkurent and Spokusa have generated the maximum productivity of ears (at level of 7,5–8,0 t/hectare).

Cultivation of sweet corn at early term of sowing was most economically expedient in our experiments. – *P. 111–114.*

UDC 632.25: 632.7: 632.9: 633.11: 633.16

Gorschar E. A., Tokarchuk G. A., Gorschar V. I. Efficiency of preparations for zerno-production processing for the purpose of protection against molding and wreckers.

Keywords: wreckers of stocks of grain, molding mushrooms, wheat winter, spring barley, insecticides, fungicides, biological products.

Injuriousness of wreckers of stocks of grain consists in decrease in quantity and quality of seed food

and fodder grain. Annually in a storage time it is lost from 5–10 to 30 and more percent of collected grain.

Eating grain, wreckers pollute it waste of the activity. The damaged grain is occupied much quicker by molding mushrooms which sprouting, spoil it, allocate harmful and cancerogenic substances, form poisonous for people and animal's mycotoxins, sharply reduce sowing qualities of seeds. The shortage of a grain yield of cultures from a complex of diseases makes 12–18 %.

In researches studied efficiency of action of biological products: Aktofit, 0,2 %, к.е. – insecticidal properties, phytopreparation of Ganol, в.с.р, – insecticidal and fungicide properties, Mikosan-N, 3 % в. р. к. – fungicide properties, and also combinations of biological products. Insecticides Aktellik of 500 EU, к.е. and Scope 420, к. е. (standards) – against wreckers and Vitavaks 200 FF (standard) – a protravitel of seeds against diseases.

When carrying out researches used the standard methodical recommendations. Frequency fivefold.

The obtained data testify to high biological efficiency of insecticides Aktellik and the Scope against all test insects, their mortality made 100 %. The full death of all species of insects is noted also at application of a biological product of Aktofit (150 ml/t) and combinations Aktofita (100 ml/t) from Ganolem (400 ml/t). Grain processing Aktofitom with a consumption rate of 100 ml on 1 t, in a mix of this preparation with Mikosan's fungicide (100 + 5000 ml/t respectively) and Ganolem (50 + 400 ml/t) caused 100 %-ny mortality of granary and rice weevils, *Tribolium castaneum*. *Trogoderma* is marked out to pains by high resistance to insecticides and biological products and in these options remained live 20,8–24,0 % of individuals.

Against wreckers Aktofit with the lowered consumption rate (50 ml/t) and Ganol (400 ml/t) had insufficient efficiency. At joint application of these preparations in the specified doses toxicity increase was observed.

It wasn't revealed insecticidal properties at Mikosan's fungicide. At its application in combinations from Aktofitom and Ganolem, mortality of insects was observed due to insecticidal properties of these preparations and amplified Mikosan's addition.

Processing of seeds by preparations (chemical and biological) didn't influence negatively laboratory similarity of seeds. It was at the level of control or in separate options the tendency to its increase was observed. The option where seeds were processed Vitavaksom 200 FF was an exception – laboratory similarity decreased in comparison with control on 4,2 % (wheat) and for 6,0 % (barley).

The prevalence activators of molding of zernovka of wheat made 22,2 %, and barley – 54,0 %. Processing of seeds by biological products which have fungicide properties (Mikosan and Ganol) in pure form, and also in combinations with Aktofitom (a biological product with insecticidal properties) didn't lead to essential decrease in a prevalence of grain by mold mushrooms.

Insufficient efficiency of biological products of Mikosan and Ganol can be explained to that sort *Helminthosporium* mushrooms appeared the activator of molding. This pathogen causes a black germ of seeds of wheat and barley, getting on considerable depth into seeds and extending in a pericarp, endosperm and a germ. Against them effective is protravitel of system action which Vitavaks 200 FF is. Protraviteli of Mikosan's biological nature and Ganol don't destroy an internal infection, and show fungicide action on superficial to a mikoflor. Besides they are capable, without destroying pathogens, to inhibit their development, not to give the chance the same of increase of molding of grain at its storage.

Conclusion. After the conducted researches by us it is established that the combined mixes of biological products with insecticidal and fungicide properties of Aktofit + Ganol, Aktofit + Mikosan protect grain not only from wreckers, but also reduce development of molding of grain. – P. 114–117.

UDC 633.15:631.52

Bondar' T. Combining ability of family S₂ and S₃ obtained on the basis of synthetic population of maize (Zea mays L.) relation with plasma Iodent.

Keywords: maize, the plasma Iodent, sisterly eightlines hybrids, synthetic, starting material.

Synthetic populations are important as a source of new initially material. The idea of synthetics has been widely used in breeding programs of many institutions. There are many ways to create synthetic populations of different complexity and number of components on a broad genetic basis, or sisterly. In synthetics can be relatively easy to combine the gene fond of the most valuable lines of local and exotic populations and thereby increase the concentration of the desired gene (the higher their frequency in the population, the greater the chance of selection are the best lines).

In 2010 the families were tested 51 S₂ received on the basis of two sisterly eightlines hybrids (Synt1, Synt2), with 4 testers – elite lines of plasma Lancaster and Reid (BSSS): DK239MV, DK680, MS814MV, DK298. After selfing families S₂ was obtained 122 families S₃. For complex agronomic traits and total combining ability (TCA) was selected for followed work 8 families S₂ and 13 – S₃.

Research was conducted in the research farm "Dnepr" SI IAS NAAS of Ukraine.

Size 4.9 m² plots repetition three times. Thickness of stand – 50 thousand plants per hectare. Phenological and biometric observations and measurements were performed in the control nursery for 10 plants at each repetition.

Estimate and observation meet guidelines set forth in the "Methodology test crop of the state" and "Methodology of field studies with corn". Parameter estimation combining ability of the system incomplete testcrosses performed in accordance with the method of G. K. Dremlyuka, V. F. Gerasimenko.

Standard for the self-pollinated family line DK411, for hybrids testcrosses: Monica 350 MV middle-ripening, Bystrisa 400 MV medium-ripening.

Vegetation corn in 2011 was held with enough waterprovision and favorable temperature conditions, with the exception of the first decade of June. Agrometeorological conditions under dry, hot weather and dry winds events in spring and summer 2012 were unfavorable conditions for the vegetation and the formation of a full crop of corn.

The results showed that the average grain yield totaled to the families S₂ 10,1 t/ha, at the level of the middle hybrid Monica 350 MV, and 2,4 t/ha less than in the medium hybrid Bystrisa 400 MV. In S₃ families the productivity index has made was 1,89 t/ha, which was at the level of hybrid-standards.

A grain moisture S₂ family was 16,5 %, which is in the level to the middle standard-hybrid Monica 350 MV and 1,2 % higher than medium hybrid-standard Bystrisa 400 MV. In S₃ families this index was higher by 1,4 %, which is comparable to the two standards.

Analysis of hybrid combinations families S₂ and S₃ of *Synt* by the total combining ability (TCA) showed that two years of research on the index of "grain yield" stable positive values marked by a line Synt2 12–4 S₂ among families and among families Synt2 12–42 S₃.

Among the studied material on the index of "grain yield" was found valuable forms that are characterized by consistently high effects specific combining ability (SCA) in the S₂ and S₃ (Synt2 342, 343, 16–22), allowing their use for highly heterosis hybrid combinations.

Stable positive values of TCA (class 1) on the basis of «dry grain» are not marked by any of the studied families. However, the S₂ families active lost moisture the line Synt1 11–1; 17–1, Synt2 16–3. In S₃ families themselves showed line Synt2 343, 13–24. This suggests the possibility of further selection for low grain moisture. Consistently high values marked by the SCA family S₃ Synt2 343.

Selected the best of the family as a source of future lines. – P. 117–120.

UDC 633.15:631.52

Riabchenko E. M. Selection value of doubled haploid lines of corn (*Zea maize* L.) of genetic plasma Lancaster.

Keywords: maize, DH line, combination ability, grain yield.

Researches were conducted in the course of 2009–2011 years in the conditions of the State Enterprise Pilot Farm "Dnipro" of Institute of Agriculture of a Steppe zone of National Academy of Agrarian Sciences of Ukraine. Corn hybrids were grown up in check nursery in accordance with standard agrotechnics for Steppe zone. The plot area made 4,9 m², at 3-fold randomized replication of test, density of stand was 55 thousand plants on hectare.

Studying of selection value of doubled haploid (DH) lines of corn of germinal plasma Lancaster by sign «productivity of grain» was the purpose of researches.

As parental material were 29 DH lines of corn with index Dha, received with the involvement of the sisterly hybrids created on the basis of four inbred lines of plasma Lancaster – DK296, DK633/266, DK633, DK267.

As testers the sisterly hybrids – DK744×DK274-3, DK257M×DK742, DK500×DK307-5 have been involved. As standards were used hybrids – middle-early Khmelnyts'kyi and middle-ripening Solonians'kyi 298SV and parental inbred lines of corn DK296, DK633/266, DK633, DK267.

In 2009–2010 years insignificant fluctuation of number of lines which concerned 1st and 3rd classes was observed. So in 2009 year the relative quantity of lines of 1st class has made up 37,9 % and 3rd classes – 48,3 %, and in 2010 year according to 31 % and 41,4 %. In 2011 reduction of number of lines of 1st class up to 17,2 %, and 3rd classes up to 27,6 % has been fixed. At the expense of reduction of a percentage share of 1st and 3rd classes, the quantity of DH lines carried to 2nd class, has increased in comparison with 2009 from 13,8 %.

The maximum appreciation of effects of the general combinational capacity by sign «productivity of grain» had lines Dha6003, Dha6014 and Dha6016 (10,3 % from the general quantity of doubled haploid lines in which the sum of classes for three years made 3).

By stably appreciation of effects of the general combining ability were characterized the DH lines Dha6015, Dha6025, Dha6017, Dha6021, Dha6018 and Dha6013. The quantity of samples which throughout years of tests concerned to 3rd class, was 13,8 % (Dha6002, Dha6005, Dha6040, Dha6008).

A number DH lines was changed by estimations of effects of the general combining ability at improvement of conditions of cultivation with negative on positive (Dha6007, Dha6010, Dha6012, Dha6050, Dha6026, Dha6019 and Dha6020).

The lines Dha6009, Dha6011, Dha6001 on the contrary raised estimations of the general combining ability under more unfavorable conditions of cultivation of 2009 year.

High variance of specific combining ability in 2009 year were characterized the DH lines – Dha6003, Dha6005, Dha6035, Dha6012 and Dha6026 (0,32–0,51), in 2010 year – Dha6009, Dha6024, Dha6026, Dha6001 and Dha6013 (within 0,35–1,26), and in the more optimal 2011 year – Dha6002, Dha6012, Dha6017, Dha6001 and Dha6020 (0,36–0,75).

DH lines with high positive estimations of effects of the general combining ability by sign «productivity of grain», and low variances of specific combining ability on years which slightly vary in different conditions – Dha6014, Dha6015, Dha6016, Dha6025, Dha6021, Dha6018.

The analysis of grain productivity has shown, that its higher level characterized test cross DH lines: Dha6016, Dha6014, Dha6017 and Dha 6003 which have essentially exceeded standards on – 0,86 – 1,04 t/hectare, at the equal or lowered humidity.

The highest grain productivity is noticed at test cross (DK744 × DK274-3) × Dha6016 in 2011 year (11,18 t/hectare), that on 8,2 % above, than at the best hybrid – the standard Solonians`kyi 298SV (10,26 t/hectare), at the humidity of grain lowered on 1,5 %.

The conclusion: studying of combining ability by sign «productivity of grain» has allowed to allocate the doubled haploid lines Dha6014, Dha6015, Dha6016, Dha6025, Dha6021, Dha6018 which were characterized by positive estimations of effects of the general combining ability and low variance of specific combining ability on years; test crosses (DK744 × DK274-3) × Dha6016, (DK257M × DK742) × Dha6016, (DK500 × DK307-5) × Dha6017 are selected, by which average productivity of grain on this indicator considerably exceeded hybrids-standards. – P. 120–124.

UDC 633.1 «321»: 631.559

Gyrka A. D., Sydorenko Yu. Ya., Iliencko O. V., Bochevar O. V., Ostapenko S. M. Seed incrustation – an important technological way to increase in grain productivity of spring grain crops in the Steppes of Ukraine.

Keywords: spring cereals: triticale, wheat and barley, variety, seed incrustation, crop yield, grain.

The article presented literature review of publications and analyzes the results of our long-term experimental studies on determining the efficiency of seed treatment in growing technology of spring cereals: triticale, wheat and barley.

The characteristic of agrometeorological conditions of the Northern Steppes of Ukraine and the conditions of the place of experiment on growth, development and formation of plant productivity are given.

Scientific researches on determining the effectiveness seed incrustation of spring cereal crops (barley, wheat, triticale) was carried out at the Erastivka experimental station of SI Institute of Agriculture of Steppe zone of Ukraine NAAS.

Experiments were carried out after predecessor winter wheat in a systematic way, with four replications. Sown area 29–44 m², accounting – 21–35 m².

Efficiency of spring triticale seed incrustation by biological products studied for 2003–2005. Varieties of spring triticale – Aist Kharkivskyi and Khlibodar Kharkivskyi with seeding rate of 5 mln/ha. Seed treatment before sowing was carried out by biological growth regulators: humisol, emistym C (10 ml/t) and agat-25 K (20 ml/t).

Phenological observations have shown that spring triticale plants better developed at seed treatment by agents agat-25 K and emistym C, which influences the grain yield formation. Thus, pre-sowing seed incrustation by growth regulators ensured additional grain yield of variety Aist Kharkivskyi for 0,11–0,28 t/ha and Khlibodar – 0,11–0,20 t/ha, compared with a control option. More effective was agat-25 K.

Were studied the impact seed incrustation by growth regulators (humisol, fumar and emistym C, 10 ml/t) on the performance of spring wheat varieties Kharkiv 27 and Kharkiv 30 on a background of fertilizing N₄₀P₂₀K₂₀. Greater influence on the formation of assimilating area, root system of plants and formation of yield structural elements have emistym C and fumar. Grain yield of variety Kharkiv 27 increased by 0,11–0,53 t/ha, and Kharkiv 30 – 0,15–0,55 t/ha. More additional crop yield in both wheat varieties formed at

treatment by emistym C.

During the investigation the influence of growth stimulators during 2009–2012 also studied the effectiveness of micro fertilizer reacom-C-grain for pre-seeding treatment of spring barley varieties Galaktyk, Vakula and Helios. Seed incrustation made by tank mixture of three components: disinfectant – granivit (2,5 l/t), filming agent – mars EL (0,2 l/t) and micro fertilizer reacom-C-grain (4 l/t). Under the influence of seed incrustation, significantly improved growth, development and the formation of yield structural elements of spring barley.

Crop yield of variety Galaktyk on a background of $N_{30}P_{30}K_{30}$ increased by 0,16 t/ha and 0,38 t/ha – on background of $N_{60}P_{60}K_{60}$, compared with variants without a seeds treatment. In varieties Vakula and Helios grain yield in both backgrounds grew by 2,6–4,7 %, compared with the control plots.

In 2013 continuing researches on the determining efficiency of new complex growth regulating preparations Antistress and Deimos for pre-sowing seed incrustation of spring barley variety Galaktyk. Under the influence of preparations has increased the number of grains per ear and their mass, accordingly affected the crop yield of spring barley. Increase of barley grain yield under seed incrustation by Antistress and Deimos without fertilization was 0,16 and 0,06 t/ha, on a background of $N_{30}P_{30}K_{30}$ and $N_{60}P_{60}K_{60}$ – 0,05–0,03 and 0,11–0,03 t/ha, respectively.

Thus, obtained in the course of experimental researches data, give reason to confirm that the use of preseeding incrustation of spring cereal crops by the aqueous solutions of growth stimulating and macro-element preparations in chelated form in combination with disinfectants provides the desired start-up growth at an early stage of plant growth, development, contributing to the formation of biometric parameters and crops yield of spring cereals: triticale, wheat and barley. – P. 125–130.

UDC 632.51: 631.51

Shevchenko M. C., Shevchenko O. M., Shvets' N. V. Agrodynamics of moisture consumption depending on the technological factors of agriculture of steppe zone.

Keywords: moisture, soil, crop rotation, tillage, fertilizers, plant protection, weeds, productivity.

An analysis of transformation of agriculture after his separate functioning directions in connection with climatic thermal anomalies is brought.

The main purpose of research of problem of drought resistance of agriculture was to set influence of base elements of agriculture on the level of accumulation and consumption of moisture by the different components of agrocoenosiss of steppe zone.

Researches were conducted in the field terms of the research station "Dnipro" of Institute of Agriculture of the Steppe zone of the National Academy of Agrarian Sciences in 1997–2013 in temporal and stationary experiments from the study of crop rotations, basic tillage, use of fertilizers and controlling of weed infesting.

A statistical analysis showed that hydrothermal terms appeared a dominant factor in forming of harvest (51 %).

The most contrasting by the level of moistening were 2011 and 2012, when crop yields fluctuated significantly between: for corn – from 3,7 to 9,6 t/ha, for winter wheat after non-fallow predecessors – from 2,8 to 7,3 t/ha, for spring barley – from 1,6 to 3,8 t/ha.

Even at high dependence of the crop productivity on the balance of moisture and warm the regulative ability of the of agriculture systems and technologies of crops farming remains as a factor of the effective overcoming of critical weather parameters. At the accepted scheme of the statistical processing of experimental data the crop rotation determined the size of harvest on a 20%, application of fertilizers on a 13 %, decline of harmfulness of weeds, illnesses and wreckers on 11 %, basic till of soil on 5 %.

Possibilities of adjusting of size of harvest by means of technological receptions depended on that how they influenced on sufficiency of moisture-supply of grain-crops.

Black pairs at droughty terms remain an only guarantor and reserve of moisture, in that time as a sunflower and corn abandon after itself in the moment of sowing of spring cultures in all a 82–90 mm in a 0–100 cm layer of soil.

Therefore part of the cultivated cultures in the structure of sowing areas must not exceed 40 % at presence of pairs and 30 % when pairs as factor of moisture regulation are absent.

The methods of basic tillage (ploughing, spade plough tillage, differentiated disc-boarded) differed after the supplies of moisture within the limits of a 124–139 mm in behalf on differentiated tillage.

The obtained experimental data testify that within the limits of mechanical influence of different instruments of tillage alike agrophysics terms are created for a height and development of agricultural cultures.

At the same time at the present state of black earth a tendency is kept to leadership among the arsenal

of instruments of tillage after the moldboard plowing that due to the best airing, soil aeration and decompaction, microbiological activity provides the productivity of grain on 0,5–3,5 c/ha higher than different variants of ploughless agriculture.

Functions of tillage have changed significantly today in view of full use of stubble and crop residues of different cultures in the form of anti-erosion barrier and moisture-absorbing means. In such a situation moisture-accumulating role of tillage depends not so much on the mechanism of rotation of the layer, as on the time when it is done: or by dominance of evaporation, or by the predominance of the entry of moisture in the form of rain and condensation.

The most dangerous factor of loss of considerable part of resources are weeds that is able to take away on itself 3070 m³/ha moisture, 270 kg/ha of NPK active substance.

Therefore the complex of technological measures of corn farming is built on application of the ground herbicide task 2,5 l/ha and mechanical care upon sowing practically fully will liquidate the threat of loss of resources of life-support of culture.

Thus, optimization of agricultural methods and taking of them to positions of exact agriculture is the only way of effective use of limit resources of the Steppe zone. – P. 130–134.

UDC 636.2.033:631.17

Oliylyk S. O. The use of extruded feed grain at formation of forage behavior of calves.

Keywords: feeding behavior, calves, grain extrudates

Feeding calves in the dairy period contributes to the formation in animals with desirable type of forage behavior and allows to maintain the average daily weight gain their live weight at the level of 800–900 g of being accustomed to the consumption of fodder. – P. 135–139.

UDC 636.2: 053.2

Kozyr V. S. Efficiency of breeding of Herefords in steppe zone of Ukraine.

Keywords: herefords, breed, bull–calf, efficiency costs of feed, internal fat.

Animals of Hereford breed have high meat production. Its value for Ukraine is not only outstanding meat qualities, but also in the possibility to use to create a new high–types and breeds and industrial crosses with rocks milk and combined directions.

These issues were studied by many scientists in the climatic conditions of cattle close to her homeland – moderate temperature, high humidity, the system of pasture and other.

For science and practical livestock Ukraine is of interest both behave purebred heifers in the difficult climatic conditions of the steppe zone of the country.

In the experimental farm «Polyvanovka» Dnipropetrovsk region conducted a study on 60 purebred bull-calf from birth up to 30 months of age. According to the results of monthly hanging birds determined the average weight gain. The most high (1024 g) he was in a period of 8–12 months.

One of the showings of the efficiency of breeding bullscalf, is payment of feed products, which cost structure occupy more than 50%. When growing bulls to 12 months in a nursing period spent 75,9 % of all feed, in 15 months – 64,3 %, 18–56,2; 21–50,6; 24–45,8 and 30 months of 38,0 %.

Reaffirmed that one of the main regularities characteristic of meat cattle breeding: the longer the period of cultivation in afterlactation period, the more level expenses incurred during lactation when the feed is expensive, and are borne by the cost not only the cost of cultivation of young animals, but also all expenses for the maintenance of the basic herd.

The cost of feed to produce 1 kg of live weight in the period from birth to slaughter at the age of 12 months amounted 11,42 food units. In the future they declined: 15 and 18 months of 5,4 and 5,8 %, then stabilized, and further grew: by 0,2 % in 24 months, and 6,2 % in 30 months.

Feed efficiency was high. During lactation 100 food units obtained growth of 6,78 kg, and in 12 months – by 20,4 %, 15 months – 29,1 in the 18 – by 30,5, 21–29,6 and 30 months – 17,3 % more. This ensured good economic showing.

Although the cost of growing bulls–calf and production of basic production (live weight and increase with the age of the animal is growing, and to 30 months costs for cultivation of 1 head of cattle are doubled revenue from its sale increases much more rapidly. 15 – months age compared to the sales in 12 months, it is increased by one and a half times in 18 months – nearly 2,7 times, at the age of 3,3 % in the 30-months age – 3,7 times.

In connection with the fact that in the age aspect of animal production cost and selling price of products in different agro was a research period of 2,5 years, we calculated the average for 14 farms and to

identify appropriate change factors.

Not less indicative of the results of calculating the coefficients increase as compared to 18 months of age. At the subsequent cultivation of live weight of 1 head of the 24-month's age increases to 606 kg (increase of 1,2 times), and in the 30-month – 688 kg (1,3 times more).

The carcass yield is in 18 months 64,55; 24 months – 65,50 and 30 months – 65,73 %. Of course, the output of internal fat increases and 3,45%, but the share of pulp remains practically at the same level, and the coefficient of the meatiness of the high-level reaches the age of gobies (6,87), while the share of the cuts of the first grade – 85 %. The ratio of proteins and fat in the flesh (of 0,8:1), as well as taste and culinary quality beef remain at a level that satisfies the consumer.

On the basis of the carried out researches it is necessary to draw a conclusion, that in conditions of the steppe zone of Ukraine bulls-calf Hereford can effectively grow by all year round keeping up to 18 months of age. Today, however, when the deficit of beef rather high, commodity production at the expense of Hereford you can have up to 30 months of age. – *P. 140–142.*

UDC 636.4.082.084/087

Khalak V. I. The qualitative composition of meat and fat piglets provided different variability of some biochemical parameters of blood serum.

Keywords: young pigs, serum, muscle tissue, subcutaneous fat, total protein, albumin, globulins.

The study was conducted under the conditions of breeding reproducer large white pigs "AF" Dzerzhynets" Dnipropetrovsk region, scientific-research center biosafety and environmental control resources AIC Dnepropetrovsk State Agrarian University, slaughterhouse LLC" Globinskiy meat plant " Poltava region, laboratory analysis zootechnical of Institute pig and agricultural production NAAS of Ukraine during 2011–2012 .

Purpose – to conduct studies of biochemical parameters of blood serum, the physical-chemical parameters of the longissimus dorsi and subcutaneous fat pigs, calculate the correlation between the features of the interior, the qualitative composition of meat and fat, identify markers of early prediction.

Studies of biochemical parameters of blood serum of young pigs was carried out in 6 months of age with the following benchmarks and procedures: total protein content – biuret method, the concentration of albumin and globulins – by color reaction with bromocresol green (V. I. Levchenko et al., 2002). Zootechnical analysis of meat and fat were investigated in accordance guidelines of All-Union Academy of Agricultural Sciences of Lenin (1986).

Biometric analysis of the results of research carried out by the method Merkureva E. K. et al (1991).

Proved that in young large white pigs at the age of 6 months is equal to the total protein content – $71,28 \pm 1,164$ g/l, the concentration of albumin – $38,86 \pm 0,708$, globulins – $32,42 \pm 1,089$ g/l. Physical-chemical and chemical parameters longissimus dorsi samples and blubber meet normal quality (waterholding resolution is $60,02 \pm 0,782$ %, the intensity of color – $72,91 \pm 1,981$ units. ext. $\times 1000$, tenderness – $9,26 \pm 0,236$ with a fat content – $2,49 \pm 0,285$ %, total moisture content – $74,04 \pm 0,328$ %, protein content – $22,28 \pm 0,296$ %. Indicators "loss during heat treatment" and "energy value of muscle tissue" were $21,90 \pm 0,485$ % and $123,48 \pm 2,465$ kcal, respectively. Initial and final temperature of melting blubber of subcutaneous fat ranged from $27,19 \pm 0,097$ to $37,25 \pm 0,144$ ° C, the indicator "number of refraction" was at $1,4590 \pm 0.00003$ units.

The coefficient of variation of indicators characterizing the physic-chemical composition of the longissimus dorsi and subcutaneous fat in animals of the experimental groups ranged from 0,014 (by refraction) to 68,57 % (fat content) .

Based on the analysis of physical-chemical composition of the longissimus dorsi of experimental animals depending on the concentration of albumin found that animals class M-demonstrate better waterholding capacity of the longissimus dorsi, color intensity, the content of protein and fat, and had a maximum rate of energy value.

Within the groups of signs and between the pair correlation coefficients trusted with probability $P > 0,95–0,999$ found between the following pairs: water-holding capacity of muscle tissue tenderness $\times - 0,399 \pm 0,1911$ (tr = 2,08), losses during heat treatment \times water-holding capacity of muscle tissue – $0,416 \pm 0,1896$ (tr = 2,19), water-holding capacity of muscle tissue protein content $\times - 0,484 \pm 0,1824$ (tr = 2,65), water-holding capacity of muscle tissue m \times number of refraction blubber – $0,482 \pm 0,1826$ (tr = 2,63), the protein content \times calcium content in muscle tissue – $0,564 \pm 0,1721$ (tr = 3,27), the protein content \times globulin concentration – $0,413 \pm 0,1899$ (tr = 2 17), the fat content \times energy value of muscle tissue – $0,836 \pm 0,11144$ (tr = 7,30), the calcium content in the muscle tissue concentration \times globulins – $0,431 \pm 0,1881$ (tr = 2,29).

According to the research found that the biochemical parameters of blood of young pigs corresponds

to the physiological norm, physical-chemical and chemical characteristics of the longissimus dorsi and subcutaneous fat as a normal match.

Thus, an effective way to early prediction of pork quality physical-chemical and chemical parameters of the longissimus dorsi and subcutaneous fat (water-holding capacity, tenderness, fat content, color intensity, losses during heat treatment) is to determine the occupational albumin in serum and selection of animals with figures ranging from 32,06 to 35,68 g/l. – *P. 142–148.*

UDC 636.2.085:636.2.034

Petrenko V. I., Dimcha G. G., Maystrenko A. N., Porvas N. G., Sitenko I. L. Effect of fractional composition of protein and carbohydrates diet of cows in the first half of lactation on the conversion of energy and protein in milk.

Keywords: cow, diet, energy, protein degradable, non-degradable protein, neutral detergent fiber, acid detergent fiber, conversion.

The aim was to study the effect of the amount of degradable and non-degradable proteins in the rumen, as well as neutral detergent and acid detergent fiber in diets of high-producing cows in the first half of lactation on productivity and conversion of energy and protein in milk using typical steppe zone feed and balance total ration dry matter, crude protein and energy.

Investigations were carried out in the agricultural private enterprise "Chumaky" Dnipropetrovsk region on 40 Holstein cows black-motley breed (20 goals in the group) with productivity 6–7 thousand kg of milk during the first 150 days of lactation, under winter and summer seasons and use of appropriate feeds.

In a winter period on a ration, that consisted of silage corn, hay of alfalfa, hay of cereal, straw a barley, grain mixture, cake of sunflower and soy-bean oil meal cow by living mass 580–600 kg consumed per day: dry matter(DM) – 17,5 kg, metabolizable energy(ME) – 179,9 MJ, crude protein(CP) – 2497 g, degradable protein – 1966 g, non-degradable – 678g.; the ratio of degradable protein to non-degradable protein in diets of cows consisted 74,3 : 25,6. Concentration of energy in DM such ration made 10,28 MJ ME/kg DM, crude protein – 143 g CP/kg DM or 13.9 g CP/MJ ME (tailings of forages here made 9,7 % from the day's ration).

In a summer period at the use of green mass of alfalfa, green mass of corn, green mass of grass-legume herbages, hay of alfalfa, hay of oat, grain mixture, mill cake of sunflower and soy-bean oil meal actual consumed per day: a dry matter – 16,86 kg, metabolizable energy – 180,55 MJ, crude protein – 2678 g; degradable protein – 2358 g, non-degradable – 666 g.; the ratio of degradable protein to non-degradable protein in diets of cows consisted 78 : 22. Concentration in the ration of energy – 10,71 MJ ME/kg DM, crude protein – 158.8 g/kg DM or 14,8 g CP/MJ ME (tailings of forages made 12,2 % from day's ration).

Structural carbohydrate ratio (neutral detergent fiber to acid detergent fiber) in diets in winter and summer maintenance of cows was respectively 38,1 : 26,1 and 43,8 : 26,3, at a rate of 35 : 20. Not by chance in the summer due to drought and rapid coarsening feed, residues of feed accounted for more than 12 %, which is consistent with a high content of fiber neutral detergent.

Maximum milk yield in both seasons content was the second month of lactation and almost no difference when using winter and summer diets (28,74 and 28,64 kg, respectively). Energy cost of 1 kg of fat corrected milk during the winter content ranged from 6,27–7,9 MJ, in the summer – from 6,3 to 8,11 MJ.

Conversion of energy of the diet into milk energy was high and stable during the 5 months of lactation and average in winter was 0.421 MJ ME/MJ of milk, in summer – 0,418 MJ ME/MJ of milk. At the same time, the conversion of crude protein of rations into the milk protein in balancing of diets on total crude protein in the summer period was on average less 10 %, than in winter and reached 0.305 g of CP of diet/g of protein of milk, and 0,339 g of CP of diet/ g of protein of milk ($P < 0,01$). Obviously, an excess amount of protein in the diet degradable in the summer was the main reason for its wastage. Indeed, a significant portion of green fodder in summer was alfalfa, a protein which has a high solubility in the rumen and degradability.

Thus, when feeding high-producing cows in the winter and summer periods for traditional steppe zone feeds detailing rations in terms of degradable and non-degradable protein and neutral detergent- and acid detergent fiber, found that the ratio of fractions of structural carbohydrates in the diet affects on the dry matter intake of cattle and the ratio of degradable to non-degradable protein – on the degree of conversion of crude protein from the diet into milk protein.

So, for cows with daily milk yield of 25 kg or more is not enough to balance the diet only on the total amount of crude protein and crude fiber. Necessary to consider the degree of the degradability of protein in the rumen and the ratio of structural carbohydrates. – *P. 148–153.*

Zeldin V. F., Khalak V. I., Zeldina Y. S. An integrated approach to the determination of the breeding value of pigs on reproductive ability.

Keywords: pigs, evaluation, reproductive ability, selection index, the evaluation index, breeding value.

The experimental part of the work, the purpose of which was to examine indicators own productivity gilts, sows signs of reproductive ability and effectiveness of innovative methods of breeding value estimation, carried out in conditions of breeding sow SE EF «Runo» Dnipropetrovsk region.

Found that repair of large white breed pigs in early ontogeny have a sufficiently high rate of development and own productivity: live weight at birth date becomes $1,33 \pm 0,012$ (Cv = 9,86 %), on the date of absences – $10,67 \pm 0,116$ kg (CV = 9,86 %), age at live weight of 100 kg gilts large white breed – $267,9 \pm 4,97$ days, the average daily liveweight gain for the period of growth – $0,296 \pm 0,0057$ kg. At the date of the individual weighing, measuring body length and thickness of backfat live weight equal to – $114,0 \pm 0,39$ kg, body length – $125,2 \pm 0,40$ cm, thickness of bacon 6–7 thoracic vertebrae – $30,78 \pm 0,357$ mm, at the midpoint of the back $24,13 \pm 0,319$ mm, on the sacrum – $25,27 \pm 0,278$ mm.

The age of live weight of 100 kg for pigs of large white breed was $267,9 \pm 4,97$ days (Cv = 9,86 %), the average daily liveweight gain for the period of growth from the date of birth on the date of measuring the thickness of bacon – $0,296 \text{ kg} \pm 0,0057$ (Cv = 11,72 %). As of the date of the individual weighing, measuring body length and thickness of backfat live weight of animals – $114,0 \pm 0,39$ kg (Cv = 2,08 %), body length – $125,2 \pm 0,40$ cm (Cv = 1,94 %), lard 6–7 thoracic vertebrae $30,78 \pm 0,357$ mm (Cv = 7,06 %), at the midpoint of the back – $24,13 \pm 0,319$ mm (Cv = 1,94 %) for sacrum – $25,27 \pm 0,278$ mm (Cv = 6,70 %). Index BLUP gilts was $98,25 \pm 1,563$ ball.

Farrow sows after the first farrowing was $8,18 \pm 0,359$ pigs per litter 1, large-fruited – $1,38 \pm 0,022$ kg weight of the nest at the date of weaning – $57,92 \pm 1,855$ kg average live weight gain of piglets to weaning – $0,166 \pm 0,0083$ kg, an index of reproductive ability of sows (I) – $28,08 \pm 0,813$ ball. There was no significant difference found between sows belonging to different genealogical structure of the herd on the basic parameters of their reproductive qualities. In all cases, the comparison, the difference was not statistically significant.

Rating sows BLUP method and index L. Lasha modification N. D. Berezovskogo showed that of the top ten sows index BLUP, best index L. Lasha modification N. D. Berezovsky had 6 goals and 60 %. Similar results were obtained under the condition evaluation index L. Lasha animals modification Berezovsky – 6 goals or 60 % of the animals were the best index BLUP. Calculated Spearman rank correlation coefficient between the estimated index L. Lasha modification N. D. Berezovskogo and BLUP index showed that – $r_s = 0,721 \pm 0,0790$ (trs = 9,12; v = 35).

Number of reliable correlations between indices BLUP, L. Lasha modification N. D. Berezovskogo, features its own productive and reproductive capacity of sows was 87,5 and 42,8 %, respectively. Established significant correlations between features and productivity of sows BLUP indices were 100 % in graduation "greater than 0,4" by force, and thus between the index L. Lasha modification N. D. Berezovskogo – 100 % of the values of the correlation coefficients were in power in graduation "0,7" category.

Thus, effective methods, along with the traditional index are BLUP index and reproductive capacity of sows L. Lasha modification N. D. Berezovskogo ($r = -0,233 \pm 0,0932 - 0,884 \pm 0,0215$; $P > 0,95 - 0,999$). – P. 154–157.

Marshalkina T. V., Zaikina A. V., Krivaya A. A. Epizootological monitoring of parasitic worms and protozoan diseases of poultry of economies of the steppe area of Ukraine.

Keywords: monitoring, parasitic worms, eimeriosis, extensity, intensity, invasion, poultry, poultry farms.

In the article materials are expounded on the spread of helminthosis and eimeriosis invasions of agricultural poultry on the farms of the Steppe area of Ukraine for 2011–2013. Determined the species composition of pathogens, certain extensively and intensity of intestinal invasions alongside with their dependence on the method of maintenance, growing technology, poultry age and season have been determined.

The studies indicate that to invasion of poultry depends on the technology and the maintenance of the general and specific veterinary measures. Thus, in keeping of poultry in cages, parasitic worms and eimeriosis showed no particular specialized farms (LTD "Avias-2000"), which was diagnosed flash eime-

riosis. Not been reported and these infestations on farms where poultry kept on the floor, but which promptly conducted general preventive measures (LTD "Agro-Oven", LTD "Zorya", "Soyuz-DAG" et al.). However, most of the farms and household plots ("Agro-Centre", "Marhanets poultry farm", "Ahropolimerdetal" et al.), which hold the bird on the floor using a walking helminthes and eimeriosis found throughout the year. So, in the winter-spring period chickens were infested *Ascaridia galli* (Schrank, 1788) and *A. dissimilis* (Vi-gueras, 1931), *Capillaria obsignata* (Madsen, 1945), *C. bursata* (Freitas et Almeida, 1931), *C. caudinflata* (Molin, 1858), *Heterakis gallinarum* (Ymelin, 1790), *Thominx collaris* (Linstow, 1873), *Raillietina cesticillus* Molin, 1846 and *Trichostrongylus tenuis* (Mehlis, 1846) to (5,7–90) % of low intensity (single worms), and in young (13,3–100) % of medium intensity – a dozen parasitic worms of different stages of development. Turkeys were infested parasitic worms with EI (10–100 %) and the intensity – single worms.

In geese are kept on the floor using land and water walking helminthes found *Ganguleterakis dispar* (Schrank, 1790), *Capillaria anseris* (Madsen, 1945), *Amidostomum anseris* (Zeder, 1800) and *Trichostrongylus tenuis* (Mehlis, 1846) for the extensity of invasion of 8 to 100 % and a minimum intensity of infestation – single worms.

Ostriches were infested *Ascaridia ostriches* (Soulsby, 1982), *Capillaria ostriches* (Anonymous, 1977) and *Libyostrongylus douglassii* (Muller, 1973), extensity ranged from 6 to 60 %, and intensity – to a dozen parasitic worms different stages of development.

In quail registered *Capillaria quails* (Lund et Chute, 1972) with EI 8% and *Ascaridia quails* (Berkhoff et Kanitz, 1976) – 8,5 %.

Particularly high intensity of infestation helminthes registered in young chickens and turkeys private households in the summer-autumn period. The poultry showed nematodes pathogens and cestodosis with EI – (4–100) % and (28–100) %, respectively.

In geese and goslings during this period were recorded nematodes with EI (4-100) %, and cestodes – *Drepanidotenia lanceolata* (Bloch, 1782), EI which was 16–33 % in the second-ten worms. Ducks were affected *Trichostrongylus sp.* by EI 48 %.

The results of the monitoring of the epizootic situation and parasitological studies on poultry eimeriosis show significant spread them.

Most farms and private households where poultry kept on the floor using a range, eimeriosis of invasion showed throughout the year. In the winter-spring period (6,6–100) % of poultry farms and private households registered and eimeriosis of chickens identified four types: *E. tenella* (Railliet, Lucet, 1891), *E. acervulina* (Tyzzer, 1929) *E. maxima* (Tyzzer, 1929), *E. necatrix* (Johnson, 1930). In turkeys three – *E. adenoides* (Moore, Brown, 1951), *E. meleagridis* (Tyzzer, 1929) and *E. gallopavonis* (Hawkins, 1952), the geese – three (*E. anseris* (Kotlan, 1932), *E. nocens* (Kotlan, 1933) and *E. trunsata* (Railliet, Lucet, 1891), the ducks – one (*Tyzzeria pernicioso* (Allen, 1936), ostriches – one (*E. ostriches* (Fabiyyi, 1980), quail – two (*E. bateri* (Bathia, Pandey et Pande, 1965) and *E. uzura* (Tsunoda et Muraki, 1971). Eimeriosis of infestation intensity was weak-single oocysts eimeria in view of the microscope. During warm season's contamination eimeriosis of poultry of all kinds, grew and ranged from 2,5 to 28 % in adult of poultry and from 50 to 100 % for a sapling. Thus the intensity of infestation was average – a few dozen pathogens in the field of view of the microscope, which was often the cause of outbreaks in farms and private households. – P. 157–161.

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Plys V. N., Martinenko G. N., Chukhlebova A. S. Results nutritious and safe fodder for different types of agricultural poultry.

Keywords: poultry, poultry farms, feed, safety, quality, veterinary and sanitary evaluation of feedstuffs.

The paper summarizes the results of monitoring of nutritional quality and safety of feed for poultry for the 2011–2013. Determine the maximum permissible levels of safety performance and feed their influence on product quality.

Purpose: to monitor the safety and quality of feed for poultry in the Dnepropetrovsk region.

Since 2011, the laboratory of Veterinary Public Institution Institute of Agriculture NAAS steppe zone, in close cooperation with specialists of the Main Department of Veterinary Medicine in the Dni-propetrovsk region, monitors the quality of feed and examines their impact on the realization of the genetic potential of the birds.

Monitoring occurred in poultry farms in Dnipropetrovsk, Mykolaiv, Vinnitsa regions. Research subject feeds, which are made from raw materials to feed mills and feed products produced from farms in kormotseha own material. Research subject feeds (starter, growth, for development, for parent flocks) for

protein content by Keldalyu, trylonometrychni calcium, phosphorus photo-metrically, acidity, peroxide and acid number titration .

In the study of average samples of forage for feeding ducks and geese found that the acidity of the feed rate exceeded 1,9 times increased performance acid number of 10 % and the number of peroxide – 16 %. In the middle of the investigated samples revealed feeds toxicity (toxic fungi) in 25 % prohirklist – 27 and 48 % isolated bacterial microflora.

These changes were seasonal, related to violation of temperature and humidity regime and contributed to the growth of toxic fungi and pathogenic organisms.

In the study of complete feed for industrial egg laying hens aged 23 weeks and older found that the level of crude protein ranged mostly within legal parameters. Total calcium content in compound feed was increased by 14,2 %. Provision of total calcium is also controlled by an indirect indicator, namely the thickness of shell eggs. In the chicken cross " Hayseks white" shell thickness ranged 0,33–0,38 mm. The level of inorganic phosphorus was lower by 18,5 % compared to normative data according to ISO 4120–2002.

In complete feed for broiler chickens revealed that the level of crude protein was lower than the normative performance by 9,7 % – for the birds aged 1–3 weeks, 11,2 % – for broiler chickens aged 4–5 weeks and na18 5 % – for broiler chickens aged 6 weeks and older.

The level of total calcium for broiler chickens cross " ROSS-308 " was above the standard indicators according to ISO 4120–2002 1,4, 2,4 and 1,5 times – for similar age groups, the level of inorganic phosphorus in feed for chickens chickens was lower by 17,5 and 22,8 percent.

Conclusions

1. Monitoring quality indicators of fodder for farm waterfowl, poultry farms held in Dnipropetrovsk region during the years 2011–2013, shows that in the rear base is dominated by low- grain diets high in starch polysaccharides not, cakes and cakes that contain a lot of fiber.

2. Monitoring of feed during 2013 indicates a decrease in the content of vitamin A in compound feed for all poultry species and 50 % of normal. Infringement of the ratio of total calcium and inorganic phosphorus in compound feed for poultry. – *P. 161–164.*