

ANNOTATION

UDC 633.11."324":631.5

Cherenkov A. V., Kozzechko V. I. Quality of grain of different sorts of winter wheat depend-ing on agro-technology methods of cultivation in the conditions of the northern Steppe.

Key words: wheat winter, sort, seeding date, seeding rate, quality of grain, harvest.

Results of the conducted pilot researches testify that at cultivation of various sorts of wheat winter after a spring rape in the conditions of the northern Steppe of Ukraine, receiving the most qualitative grain, the third class of quality, provides sowing on 25 September and on 5 October. Sowing on 5 and 15 September provided grain, generally the fifth and fourth classes of quality. Among sorts of wheat winter which were studied in the ex-periences, the greatest protein content (11,2–13,0 %) and glutens (17,5–22,7 %) in grain Selyank's sort differed. The smallest Podolyank's sort of – 10,6–12,5 and 17,1–21,9 % had these indicators respectively. The volume of the bread received from a flour of wheat of winter of a sort of Selyanka, was the highest. So, on the average for 2008–2010 it fluctuated from 495 cm³ when sowing on 5 September seeding rate of 4 million units germinating seeds/ha to 612 cm³ when sowing on 5 October the same norm. Influence of seeding rate on indicators of quality of grain is established. So, high protein content and glutens in grain, and also the volume of bread are noted on experience options where sowing carried out norm of 4 million units germinating seeds/ha. The increase in seeding rate led to reduction of these indicators.

Average, over years of research, the highest yield sort Selyanka formed (4,89 t per ha) when sowing on 25 September norm of 5 million units germinating seeds/ha. The maximum productivity of a plant of a grade of Zolotokolosa – 4,20 and 4,19 t per ha formed, respectively, when sowing on 5 October norm of 6 million units germinating seeds/ha and on 25 September seeding rate of 5 million units germinating seeds/ha. The low among grades productivity was formed by a sort of Podolyanka at which it fluctuated, during carrying out researches, within 2,99–3,75 t per ha. – P. 3–9.

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Solodushko N. N., Yavdoschenko N. P., Romanenko A. L. Vliyanie terms of sowing on the productivity and development of illnesses of wheat in the conditions of north Steppe.

Keywords: winter wheat, terms of sowing, illnesses of plants, productivity, north Steppe.

Steppe of Ukraine – the main supplier of commodity and food grain winter wheat in Ukraine. A cha-racteristic feature of the climate of the region is its aridity, which is caused by insufficient rainfall, uneven distribution of them throughout the growing season, enough is often complicated by high temperature re-gime.

In each of the technologies of growing agricultural crops, including winter wheat, except consumables technological measures, there are effective methods that do not require additional costs and require only one thing – ensuring that existing for each soil-climate zone recommendation regarding the ap-propriate use of certain elements technology. Among those that effectively influence the development of major food crops – winter wheat, its hardiness, productivity and phytosanitary condition of crops are par-ticularly important sowing.

Taking into consideration vital issues, the lack of consensus regarding the best timing of sowing winter crops in the northern steppes, Sinelnikovskaye Breeding and Experimental Station of the Institute of Agriculture steppe zone the Academies at the rotation lab technology growing winter crops conducted the study and analysis of yield and defeat diseases of winter wheat depending on sowing time during the more than 20-year period.

Studies have shown that in recent years there has been a marked shift sowing winter wheat, which contribute to obtaining high yields, towards the later. If, for example, between 1996 and 2000 was more effective seeding from 5 to 25 September, from 2006 to 2010 – from 20 September to 5 October. But in general, if we take into account the more than 20-year period of research, the most effective in the area of the northern steppe is sowing from 10 to 30 September. When comparing the average yields of winter wheat, which vysivalasya in optimal (15–25 September) and early (25 August – 5 September) and later periods (30 September – 10 October) The decrease in harvest indices, respectively, 11–25 % and 9–13 %. Conducting sowing in nadpizni time (15 October), which often occurs in households steppe region, as in sowing 25 August, led to a decrease in yield of 25 %.

Analysis of data on the impact of seeding on the development of disease states in early autumn crops often a pretty wide spread in winter wheat powdery mildew and Septoria and less – rust and root rot. For example, in the autumn of 2006, 2008 and 2012 was observed early escalation, and some even optimal sowing time. Such lesions crops plants with powdery mildew reached 100 %, Septoria 5–40,

1–5 rust and root rot – 3–10 %.

These data indicate that early sowing of winter wheat sowing in autumn is much stronger affected disease compared with optimum and late. In the spring and summer growing season mildew growing stronger in the later crops, and brown rust, Septoria and root rot – early. It should be noted that disease-resistant varieties are much less responsive to sowing more sensitive, but the highest performance and endurance to illnesses shaped plants optimum sowing time. – P. 9–14.

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Horishko S. A., Kozelskiy O. M. Efficiency of agrotechnological increased grain production of winter wheat in the northern steppes of Ukraine.

Keywords: wheat winter, sorts, sowing time, harvest, feeding, fertilizers.

As a result of the research was the dependence of the level of grain productivity of modern sorts of winter wheat (Pysanka, Skarbnitsya, Apogei Luganski) of these technological elements, as precursors and the level of mineral nutrition. It was found that the greatest impact on grain yield sorts that have been studied in our experiments, it was the interaction of elements of productivity of winter wheat, in particular, the density of productive stalks and spike productivity. The effect of each of these elements on yield alone was less significant.

Carrying out of winter feeding nitrogen fertilizer ammonia-urea mixture (AUM) compared with ammonium nitrate, contributed to the formation of more productive shoots of plants per unit area. Formation of the greatest number of productive stems plants of different sorts of winter wheat celebrated on variants of the experiment, which contributed to the fall and spring background fertilizer fertilizing crops conducted ammonia-urea mixture (AUM) dose of N_{30} in the phase of tillering. So, when grown on black couple maximum value of the indicator was observed in sort Skarbnitsya (475 pieces/m²) after peas and sunflower – at sort Pysanka, 331 and 305 pieces/m² respectively.

The maximum values of the mass of grain ears were marked on the variants of the experiment, which provided for the introduction of the background, followed by fertilizer fertilizing crops ammonia-urea mixture (AUM) (N_{30}) in the phase of tillering in spring. When grown on black couple in sort Skarbnitsya this figure was 1,54 g, the sorts Pysanka and Apogei Luganski – 1,53 and 1,49 g respectively. When sowing after peas and sunflowers in these sorts of grain weight were, respectively, 1,42; 1,44; 1,40 and 1,35; 1,36; 1,34 g.

The maximum crop yields, on average for years 2007–2010 years all sorts provided at preplant fertilizer followed by dressing ammonia-urea mixture (AUM) (N_{30}) in the phase of tillering in spring. At this level of supply the highest yield on black pair formed a sort Skarbnitsya (7,30 t per ha), after the peas and sunflowers – sort Pysanka, respectively, 4,76 and 4,15 t per ha. The effective conduct of feeding confirmed by 15,0 % of the increase grain yield when grown on black couple; 15,9 % – after pea and 16,2 % – after sunflower, compared to embodiments where only background was added fertilizer.

According to the research found that feeding nitrogen fertilizer ammonia-urea mixture (AUM) during tillering autumn boosted grain yield on black couple at 0,12–0,15 t per ha, after the peas and sunflowers – within 0,17–0,19 and 0,15–0,19 t per ha, respectively, compared with areas without fertilizing.

Adding ammonium nitrate frozen soil N_{30} on the ground, with respect to an embodiment with only background making fertilizer obtained by allowing further few black from 5,0 to 5,1 % of the grain. After pea yield increase was 5,1–5,4 %, after sunflower – 5,5–5,6 %. Adding ammonia-urea mixture (AUM) ensured increase in yield on these predecessors at 10,0–10,3 %; 10,5–10,7 and 10,8–11,0 %, respectively.

On average for the years of research the maximum increase in grain yield, relative to control, in experiments provided the background preplant fertilizer followed by ammonia-urea mixture (AUM) (N_{30}) in the phase of tillering in spring. Thus, depending on the sorts, on black couple he was 18,7–18,8 %, after the peas – 23,7–24,4 %, after sunflower – 26,7–28,4 %.

Fertilizing crops in the heading stage urea (N_{20}) and ammonia-urea mixture (AUM) (N_{20}) did not contribute to an increase in grain productivity of winter wheat. Wheat yields in these areas was on par with a yield of winter wheat under which contributes only pre-sowing fertilizer.

Thus, the results of studies found that obtaining the maximum level of productivity provided the background of mineral fertilizers followed by fertilizing crops ammonia-urea mixture (AUM) (N_{30}) in the phase of tillering in spring. On this diet, when grown on black pair, the highest yield provided sort Skarbnitsya (7,30 t per ha). When placing the winter wheat after pea and sunflower harvest proved more sort Pysanka, grain productivity which was, respectively, 4,76 and 4,15 t per ha. – P. 14–18.

UDC 631.51:633.16

Tsilyuryk A.I., Shapka V.P. Tillage under spring barley in conditions of northern Steppe Ukraine.

Keywords: *spring barley, the main tillage, agro physical properties, productive moisture, fertilizers, yield.*

Studied influence the different of basic soil tillage under barley spring on agro physics properties soil, moisture mode of ordinary chernozeme, weediness of crops, productivity and cost-effectiveness of the production of crops.

Research has shown agro physical parameters of soil, regardless of its cultivation methods were optimal parameters. The density structure of the soil (bulk density) was less than optimal limit – 1,35 g/cm³ in process able layer and was plowing – 1,18, chiseling – 1,25, disking – 1,26 g/cm³.

The hardness of the soil at plowing in the layer 0–30 centimeters was minimal – 8,7 kg/cm², and the use of disk and chisel tools boosted performance in accordance with 11,9 and 13,3 kg/cm², without overwhelming the optimal parameters to 21 kg/cm² for spring barley.

Structural analysis of the soil, conducted in the spring before sowing barley showed that regardless of the amount of tillage methods agronomically valuable structural units 10–0,25 mm size ranged 73,2–75,9 %. Tendency to increase in most of the structural units size 7–0,25 mm back-ground chisel and disk tillage.

Chiseling soil tillage in dry conditions of the northern steppe of Ukraine provides growing accumulation of soil moisture during the autumn and winter of 18,1 mm (181 t/ha), thanks to soil surface plant residues predecessor and wavy nanorelief, which guarantees maximum stocks productive moisture in spring compared to other methods of primary tillage.

In phase earing spring barley soil moisture reserves in 1,5 meter layer compared to the first definition in the spring, decreased significantly in ways to experience performance 14,9–50,4 mm. That is, in this period, which was marked shortfalls of rainfall, plants spend more soil moisture to form their vegetative mass. More developed plants by habit against the backdrop of plowing and chiseling using maximum number of –115,1–136,8 and 123–137,9 mm, respectively, and the use of disk tillage Lowering this figure to 110,0–121,5 mm. Adding fertilizer also contributed to the increase moist consumption ascending plants without fertilizers – N₃₀P₃₀K₃₀ – N₆₀P₃₀K₃₀.

Use shallow disk tillage (10–12 cm) in barley leads to increased weed–infested crops, especially ambrosia artemisiifolia (*Ambrosia artemisiifolia* L.), which is value increases to 45,9 – 48,7 % of weeds that is one of the reasons for the decline in productivity spring barley 0,20–0,46 t/ ha, with respect to the plowing and chiseling.

Use shallow disk tillage (10–12 cm) in the technology of spring barley, despite the decline in grain yield, provided, compared with plowing and chiseling, fuel economy – 13,2–12,0 liter/ha, reduce labor costs 0,91–0,62 man-hours/ha and funds worth 260–191 UAH/ha respectively.

When plowing and chisel tillage, received significantly higher grain yield, than when disking, which favorably impact on the cost of grain production and profitability of production. Highest level of profitability provided chisel tillage – 48,7 %, slightly lower figures obtained by plowing – 44,7 %, and the minimum, of course, for the cultivation of disking – 41,0 %. – P. 19–22.

UDC 633.854.78:631.5](251.1)

Tkalich Yu. I., Tkalich I. D., Bochevar O. V., Kohan A. V. Agrotechnical ways to improving agroce-nosis of sunflower in the Steppe.

Keywords: *sunflower, row width spacing, herbicide, crop yield.*

The article revealed features formation of sunflower productivity depending on the methods of sowing and plant stand density. Expediency growing sunflower crops in rows of 30–35 cm, 15 cm even at stand density 70–75 thousand plants / ha. When narrowing between rows through a fair distribution of plants in the area, reduce competition between them by environmental factors can obtain higher yields of sunflower seeds than on standard inter-row.

The results of the study of this question in the Dnepropetrovsk region (former Institute of Grain Farming) in 1997–1999. Show that in narrow rows (15-30 cm) increase in yield of sunflower hybrids was observed in the case thickening of crops to 60 thousand plants / ha. In wide-plated (70 cm) higher yield seeds formed at density 50 thousand plants / ha. Further thickening of crops led to a decrease in yield of seeds from 1 ha of cultivated area to 0,19–0,23 t/ha. And the absolute yields were lower than the narrow rows – to 0,29–0,42 t/ha, while the density of 40 thousand plants/ha were the same.

For the same density planting between rows narrowing to some extent influenced by the amount of assimilation surface per plant and leaf index. Thus, average years of research (2011–2013) with density 35 thousand plants/ha and 35 cm rows, this rate was 1,27 m²/m², but on 70 sm – 1,16 m²/m². Over 52 thousand density plants/ha layers index reached respectively 1,74 and 1,61 m²/m², but on 75 thousand

plants /ha – 2,33 and 2,15 m²/m².

The studies during 2011–2013 was established a significant difference in weed-infested crops of sunflower with rows 35 and 70 cm. By number and weight of weed control (unattended) was the most we-ediness, though, that because weeds were growing slowly on high temperature and drought. Thus, row spacing of 35 cm there were 25 pcs./m² – dry mass 251 g/m², on 70 cm – 32 pcs./m² and 335 g/m², respectively. High weediness was in variant, where conducted only pre- and post-emergence harrowing. And in there a mass of weeds was smaller (191 g/m²) than on standard row spacing (293 g/m²), that is associated with better weed foliage of shading culture by narrowing rows.

Through the application of herbicide harness, 2,5 l/ha dry weight of weeds was decreased compared with control in crops of rows 35 cm fifteen fold, 70 cm – sevenfold. Before compiling its indices are equal to respectively 17 and 46 g/m². Addition the betanal expert at phase 3–4 pairs of leaves in sunflower slightly affected the weeds due to high temperatures. However, this preparation made by the stairs weeds in crops decreased weediness on rows 35 cm by 86 %, and the wide-crops – 87 %, compared with controls.

Plants formed smaller baskets with smaller seeds with increasing stand density and narrowing between the rows, but in this variant was much more baskets than in crops with rows 70 cm. Within each mode of sowing traced significant influence methods of care. Thus, in variants with row spacing 35 cm and with use Harnesses, 2,5 l/ha and Harnesses 2,5 + betanal expert, 1 l/ha was for-med larger seeds. Here was higher weight of 1000 seeds (47,5–47,8 g) than in other variants. Also and plants were more productive here (54,2–55,1 g of seeds from the basket), and therefore received the highest yield – 4,07–4,15 t/ha.

In plots with rows 70 cm were better options with the introduction Harnesses, 2,5 l/ha and with additional of one row cultivation. The yield in here was 3,34–3,38 t/ha, which is lower yield of sunflower seeds compared to with narrowed rows spacing – to 0,69–0,81 t/ha.

Estimation of economic efficiency agrotechnical practices in our study showed that the highest profit was in variants with row spacing of 35 cm and using Harnesses, 2,5 l/ha in soil application, or in soil ap-plication of said herbicide and with spraying of sunflower plants in the phase 3–4 pairs of leaves betanal expert, 1 l/ha – 9350–9460 UAH/ha. However, for the last herbicide it is not registered to use on sunflower, so it can be used only in case studies in small areas. – P. 22–27.

UDC 633.15:631.81

Chaban V. I., Kliavzo S. P., Podobed O. U. The contents of chemical elements in plants of corn and an estimation of a mineral nutrition.

Keywords: corn, chemical compound, plants, a grain, receipt, diagnostics.

Recently the increase in volumes of manufacture of corn in all soil – climatic zones of Ukraine is observed. Simultaneously with expansion of the areas of its cultivation application of fertilizers remains the most effective factor of increase of its productivity. However, for last years application of fertilizers under corn was reduced in 3,2 times (55 kg/ha), that alongside with droughty conditions does not allow culture to realize high potential of efficiency. An output from developed position the control over a condition of plants during vegetation. In this connection, the purpose of work – to establish zone features of element structure of plants of corn and to define possible directions of optimization of a mineral nutrition.

By preparation of a material the file of the analytical data macro and microelements structure of plants of corn for last 25 years, received is generalized and analysed at carrying out of stationary experiences in a steppe zone of Ukraine. Used standardized methods of the analysis of a vegetative material. Experimen-tal data processed with the help of programs of mathematical statistics.

The corn is exacting to conditions of a mineral nutrition to what parameters of a chemical compound testify. The contents of elements essentially varies depending on a phase of development, a level of a nutriti-on and weather, and climatic conditions. At early stages of growth (5–6 – 9–10 leaves) plants are characte-rized by the maximal contents of nitrogen and leach elements that is connected to excess of receipt of ele-ments over accumulation of dry substance. Further return law is shown and relative decrease reduction in their quantity in vegetative weight is observed. The deviation in the contents of macronutrients from average values on phases of development of plants made 5–28 %. The most essential (31–86 %) it was in full ri-peness.

Fertilizers make active rates of receipt of chemical compounds in vegetative fabrics, and their con-tents, on the average raised up to 19 %. To a lesser degree it was shown for a grain. Thus the contents of nitrogen raised on 12 %, for phosphorus the tendency to increase (3 %), quantity potassium was shown

only remained at one level. Receipt of basic elements of a nutrition in plants occurs non-uniformly. Their peak (42–81 %) falls at the period of an active gain of weight.

Presence of high correlation connection ($r = 0,55-0,83$) between the contents of nitrogen is established and we heat in plants at early stages of development and in a grain. The given fact testifies to expediency of diagnostics during this period.

Changes of the contents of microelements in plants during vegetation it is similar to dynamics of macronutrient reduction in their concentration to a phase of full ripeness.

Average values of the contents microelements in a grain and cormophyte to weight are established. The maximal share, among elements, falls Fe (50 %), Zn (30 %), Cu and Mn (4–7 %), and the quantity of other metals (Ni, Cr, Pb, Co, Cd) is not exceeded with 1 %. To their contents, behind exception Zn ($V = 15,5$ %), high variability ($V = 34,2-44,9$ %) is peculiar. The structure of the microelements of a commodity output differs the greater variability ($V = 31,8-92,6$ %).

According to factors of biological absorption the selective need of plants of corn in the microelements on the basic phases of development which is submitted as lines is established: Zn > Cu > Mn > Co. – P. 27–32.

UDC 631.522:58.083.5

Satarova T. M., Cherchel V. Yu., Abraimova O. E., Borisova V. V., Goncharov Yu. O., Starosti-na O. M. Abraimova SNP-genotyping and allele status in early maize inbreds.

Keywords: maize, single nucleotide polymorphism, SNP-marker, early maturing, early-middle inbreds, middle inbreds, late-middle inbreds.

The results of the analysis of single nucleotide polymorphism (SNP) on 384 DNA-markers for Uk-rainian maize inbreds of different maturity groups are represented. Alleles of top-SNP-markers which are specific for early inbreds in comparisons with early-middle, middle and late-middle ones are determined. – P. 32–36.

UDC 633.15: 631.53.01: 631.56

Kirpa M. Ya., Styurko M. O., Bondar L. N. Formation of quality seed corn under typical corn processing plant.

Keywords: corn, quality, postharvest processing, corn processing plant.

The use of high quality seeds is a necessary condition agrotechnological growing corn and increase the harvest of the crop. To prepare and obtain high quality seeds of paramount importance to its post harvest processing, such as equipment and technology for this.

Technologies include a number of operations and regulations, which include heritage, drying and threshing ears, cleaning, sorting and grading seed, storage and chemical processing. Regulations transactions should take into account biological and technological parameters in the processing of grain, depending on which is formed seed quality. These parameters include humidity, heat resistance, weight, size, durability grains that affect crop quality, including vigor, germination and growth of seeds of force.

In Ukraine, post-harvest processing is performed in the system of maize seed processing plants and farms that have different power and mostly typical physical infrastructure from the stage of acceptance ears to storage of finished products.

Earlier corn processing plant plants were part of elevators and grain firms, since it was provided centrally harvesting and preparation of seed corn hybrids. Despite the different power the technological scheme seed treatment on these plants was typical, from the stage of acceptance ears to the storage of finished products. However, this approach results in terms of quality seeds of maize hybrids and their parental components in particular vary considerably.

The aim was to determine the process parameters and post-harvest handling processes corn seeds in conditions typical corn processing plant, and installation techniques that improve the quality of seeds.

Under the conditions studied the effect of plant processes at laboratory and field germination and yield. Influence studied on the example of maize hybrids: Dnieprovskiyi 181SV, Khmelnytsky, Solonyansky 298SV, Zbruch different maturity groups.

Postharvest treatment of corn on a typical corn processing plant includes the following processes: reserve ears (refining and sorting), drying and threshing ears, cleaning, sorting, sizing and enrichment seed, it veer and packaging. Each process should be carried out in compliance with the technical and technological parameters and provide high yield and seed quality.

Revealed that the quality remained at a high level after thermal drying ears and significantly deteriorated in the process of threshing and cleaning, sorting seed germination reduce amounted to 9,11 %, and the yield reduced to 0,72–0,79 t/ha. Pre-sowing preparation as slack of stimulation slightly

improved seed quality, but still marked the reception was not effective for injuring seed.

The processes which are primarily subject to optimization, technical and technological modernization of corn processing plant owned operations thrashing ears and clean seeds that will reduce self falling content in weight and their earlier collection in order to not allow self falling reduction to the optimum number of movements seeds nori and their softer mode, limiting the height and speed of seed fall flowing through pipes and their manufacturing of polymer material, reducing its degree of mechanical injury. – P. 36–40.

UDC 633.13:633.16:631.816.12

Gyrka A. D. Agrobiological features of increasing the oat and spring barley productivity in northern Steppe of Ukraine.

Keywords: oats, spring barley, predecessors, mineral fertilizers, grain, crop yield.

The article reflects the results of researches to identifying the effective agrobiological methods of increasing the grain productivity in oat and spring barley plants. It is established, that spring small cereal crops, placed after recommended predecessors, much better reacts to increasing agrochemical background. Cultivation of oat and spring barley after predecessor winter wheat by application $N_{40}P_{40}K_{40}$ and subsequent feeding plants by nitrogen in the phase of tillering (N_{30}) and spraying micronutrients reacom provides the largest grain harvest – 3,96 and 3,32 t/ha, respectively, in of oat and barley plants, while reducing the pesticide load on agrocoenosis. – P. 40–45.

UDC 632.2:632.9

Gorschar E. A., Pedash T. N., Gorschar V. I. Anticipatory treatment of spring barley seed by the biological preparation mikosan-N.

Keywords: ячмінь ярий, збудники пліснявіння, біопрепарат, протруювання насіння.

Barley is the food and forage important cereal crop. But the diseases cause the significant damage in the barley growing and storage, the agents of disease are transmitted by seeds. The considerable danger to the grain is pathogenic fungi of the genera *Fusarium*, *Aspergillus*, *Penicillium* and their toxins. *Fusarium* is a major yield pollutant by the fuzariotoxins-dezoksynivalenol and zearalenone. Particularly dangerous toxins are secondary metabolites of fungi of the genus *Aspergillus*-aflatoxins, which are highly toxic, and in some cases they have carcinogenic and mutagenic effects. By the biological hazards, along with *Fusarium*, *Aspergillus* and *Penicillium* it can be put some fungi of the genus *Alternaria*. In recent years it has been noted a rapid increase of the grain contamination by fungi of this genus.

The problem of the spring barley seed quality preservation from sowing to harvesting re-quires to be addressed at a higher level. There are several areas of regulation of the pathogenic organisms' biological activity. One of them is the usage of the biologically active substances from mushroom polysaccharides that are able to induce protective functions of plants and thereby to increase their immune system. A promising drug, created in Ukraine is biofungicide mikosan-N, which is a 3% alkaline extract of the fungus *Fomes-fomentarius*.

The researches were conducted during 2011–2013 in laboratory and field conditions at the Institute of Agriculture of steppe zone. The species composition determining of barley mould pathogens were carried out by the standard methods.

In the experiment it has been involved the sort of spring barley Ilot. The seeds were treated with drug mikosa-N, 3 %, the different rate of application, and with vitavaks 200 FF, 2,5 l/t (standard).

The initial infestation of spring barley seeds was 20,1 %, the lesion intensity was 8,6 %, and the laboratory germination was 95,0 %.

The most effective option was mikosan-N with the rate of application 5 l/t, so long as the increasing of the grain damage by the mold pathogens is checked over a preservation period. Thus, the reducing of the total seeds destruction was 7,8 % after the treatment. After eight months of storage the seeds injury was reached 15,3 %, it was 13,5 % less than in the control variant and it was 4,8 % less than their original rates. It should be noted that the drug had a positive impact on seed germination – after the treatment the seed germination was increased by 1,6 %, and at the end of the storage period it was 3,8 % higher than in the option without processing. With the rate of drug application increasing it was also noted its high efficiency – almost on a level with the option of rate of mikosan N application 5 l/t, but from an economic point of view the increasing is not reasonable and justified. With the rate of drug application decreasing it was observed fall in the drug effectiveness on the seed germination and affection.

After harvesting, the average for three years, the major pathogens were the field fungi: *Fusarium* – 5,9 %, *Helminthosporium* – 8,5 %, *Alternaria* – 5,5 %. With the shelf life increasing of the inoculum was observed the upgrowth control of the toxigenic fungi. Thus, in all versions except the version of the

rate of drug application 5 and 7 l/t there was a seed infestation by fungi of the genera *Penicillium* and *Aspergillus*. With the rate of drug application decreasing it was observed the inessential quantitative reduction of pathogenic fungi. But with further storage of barley this rate was increased, and at the end of the storage period it was reached the control variant values.

So, for the anticipatory treatment of spring barley seed it is reasonable to apply a biological preparation mikosan-N with the rate of application 5 l/t to save the spring barley seeds sowing quality on the high level, to dispirit and contain the seed infection growth. – P. 45–49.

UDC 633.13:633.3:631.5

Grabovskiy M. Yields of corn for silage, depending on the level of mineral nutrition under forest-steppe zone of Ukraine.

Keywords: fertilizers, silage corn, hybrid yields, yields.

Important factor in intensifying the cultivation of maize is balanced mineral nutrition, based on the rational use of fertilizers. Without them, plant productivity is reduced and their correct application increases plant resistance to low temperatures, increases the proportion of heads in the crop silage increases the yield of protein, starch and feed units of area sown.

The aim of the study was to investigate the influence of mineral nutrition on yield of silage corn hybrids of different maturity groups in the central steppes of Ukraine.

Field experiments were conducted during 2011–2013, experienced field Bilotserkivskiy National Agrarian University.

The study was conducted according to the scheme: maize hybrids (Factor A) Early Tovtryanskiy 188 SV, mid-early hybrid Bilozirskiy 295 SV, middle hybrid Monica 350 MV, medium late Bystriza 400 MV; dose of fertilizer (Factor B) control (no fertilizer); $N_{60}P_{40}K_{40}$; $N_{80}P_{60}K_{60}$; $N_{100}P_{80}K_{80}$.

In our studies, a positive effect of fertilizers on the intensity of the formation of leaves of maize plants affected the size of the leaf surface. Increasing the area of assimilation of plants under the influence of fertilizer was observed before the onset of panicle, but the maximum leaf area was formed into a phase of flowering heads. By Phase milky-wax ripeness marked decrease in the area of plant leaf surface in 10–18 % of all hybrids due to drying of leaves.

Accounting yield of corn silage showed that it is mainly dependent on the morphological and biological properties of the hybrid maize, the level of mineral nutrition and weather conditions of the growing season. The maximum yield in almost all the years formed medium late Bystriza 400 MV and the lowest level of performance provided early Tovtryanskiy 188 SV.

Considerably affected the yield of the studied forms exercised weather growing season. In more favorable for hydrothermal regime in 2011 and 2013 yield of silage in the background $N_{100}P_{80}K_{80}$ in early Tovtryanskiy 188 SV was 40,3–42,0 t/ha, mid-early hybrid Bilozirskiy 295 SV – 45,4–46,5 t/ha in the middle Monica 350 MV – 52,3–52,9 t/ha, while the medium late Bystriza 400 MV – 50,6–56,2 t/ha.

In the stressful environment of 2012, due to high temperatures, the yield of corn silage decreased the most in medium late Bystriza 400 MV on average 22,2–27,4 %, depending on the variant of fertilization. Decreased yield in early maturing hybrid Tovtryanskiy 188 SV and mid-early hybrid Bilozirskiy 295 SV was 5,6–11,2 % and 17,2–22,2 %, which probably indicates that they are better adapted to the climatic conditions of the steppes.

On average over the three years the highest yield obtained in silage hybrid Bystriza 400 MV in making $N_{100}P_{80}K_{80}$ – 50,6 t/ha, higher than the control at 21,1 t/ha.

Fertilization in a dose $N_{100}P_{80}K_{80}$ provides a yield of maize for silage in early maturing hybrids – 39,4 t/ha, mid-early – 42,6 t/ha, middle – 49,0 t/ha and medium late – 50,6 t/ha, whereas in the control version, the figure was 24,8; 25,1; 29,8 and 29,5 t/ha, respectively. Higher productivity observed middle Monica 350 MV and medium late Bystriza 400 MV superior in yield early Tovtryanskiy 188 SV and mid-early hybrid Bilozirskiy 295 SV on 13,1–25,2 %. – P. 49–53.

UDK 633.15:531.52:632.95.954

Yakunin A. A., Zavertalyuk A. V., Zavertalyuk V. F. Resistance of Gostinets snap corn hybrid plant to the phytotoxic action of herbicides.

Keywords: snap corn, herbicides, plant height, leaf area, grain yield.

The corn plants, especially food subtypes are characterized by the weak competitive capacity to the weeds. Against the background of the strong infestation it is impossible to obtain a high yield of grain without the effective weeds control in the corn crops. The results of the studies showed the influence of

the weed control chemical agents on the corn plants of the odontoid and flinty subspecies. The reaction of snap corn plants at the herbicides is not enough studied.

The aim of our research is to establish the reaction of the snap corn plants to the soil and postemergence herbicides, to find out the features of the grain yield formation in comparison with the control without herbicides.

In the field experiments, which were carried out on the ordinary humus chernozem of the Dnepropetrovsk Experimental Station of the Institute of Vegetables and Melons, it is determined the response of the snap corn plants to the phytotoxic action of herbicides. To control the weeds it is only used the soil Harnes herbicide in doses of 2,5 and 2,0 l/ha, and it is also used the post-emergence Esterone herbicide (0,5 and 0,7 l/ha) on the background of the soil Harnes herbicide. The reference option was the variant with the carrying in of the soil Fronter herbicide, 1,4 l/ha and the post emergence Dialen herbicide, 2,0 l/ha. The soil herbicides were carried in before the sowing cultivation, the post-emergence herbicides were carried in 3–5 leaves phase. The corn forecrop was wheat. During the experiment, there was one inter-row tillage and hand weeding for the weeds annihilation. In the experimentation we used the common techniques.

Weather conditions during the years of studies are characterized by the high air temperatures and the irregular precipitation. According to these indicators the weather conditions were more favorable for the plant growth and development of the snap corn in 2011.

It is determined the plant height and the leaf area to find out the influence of the herbicides on the growth processes and the leaf formation during the panicle stage. The experiment results showed that in the options where the herbicides were added in the doses recommended in the odontoid and flinty corn subspecies, the height of the snap corn plants decreased compared to the control (no herbicides, hand weeding) by 11–15 cm. The area of leaves per plant decreased 12,0– 16,3 %. Within this range the greatest decrease in plant height and leaf area of the snap corn was in the reference variant by the using of the Harnes herbicide in dose 2,5 l/ha. In the option where the soil Harnes herbicide was added in the dose 2,0 l/ha and the post-emergence Esterone herbicide was added 0,5 l/ha the plant height compared with the control was reduced by only 5 cm, and the leaf area by 2,7 %. The data show that, depending on the dose, the studied herbicides are not equally influence on the growth processes and leaf area of the snap corn plants.

Depending on the chemical agents of the infestation controlling the corn grain yield is varied. Analysis of the grain yield data showed that these changes by the experiment variants were not identical and they were generally depended on the dose of the herbicides. The greatest decrease of the snap corn grain yield in comparison with the control (0,22–0,30 t/ha on average over three years) is marked on the reference option (Fronter, 1,4 l/ha + Dmalen, 2,0 l/ha) using only the soil Harnes herbicide in dose 2,5 l/ha, and in the option with the carrying in the post-emergence Esterone herbicide 0,7 l/ha on the Harnes background, 2,0 or 1,5 l/ha. In options with the using only Harnes herbicide, 2,0 l/ha or the post-emergence Esterone herbicide 0,5 l/ha the decrease of the snap corn yield compared to the control was the least, 0,13–0,16 t/ha. In all the years of research, these rates were not significant.

Thus, the study of the chemical agents of the snap corn infestation controlling showed that the least phytotoxic effect on the growth process, the formation of the leaf area and the grain yield was noted by using the Harnes herbicide in dose 2,0 l/ha or the post-emergence Esterone herbicide, 0,5 l/ha. It is necessary to take into account the field experiment results when the snap corn is grown. – P. 53–56.

UDK 631.527:635.67

Klimova O. E. The cluster analysis recombinant line of the sugar corn on the basis of breeding sign.

Keywords: sugar corn, lines, signs, genoplasma, genetic distances, dendrograma, different qualitative, kinship.

The defining role in heterosis of the breeding of the sugar corn belongs to the inbred a line. At the last years with use different biotypes corns in Institute of the agriculture of the steepe zone of NAAS Ukraine is created quite a number new line. Amongst them – the recombinants lines, got as a result combination-transgression breeding between sample of the sugar corn and line-carrier specific gene biosynthesis car-bohydrate. The classification these line on variety morphobiological sign, determination their genetic struc-ture on heterogening plasm and level genetic kinship are a guarantee of efficient their use in process breeding improvements of the sugar corn.

The detection line and their cluster analysis is conducted on minimum genetic distance ave-rage relationships on the basis of sign breeding-genetic value with use software package "Statistica 6.1" in

2012–2013. As genetic distance of the relationships is installed intrinsically aspectual specification line, but for factor of the standard deflection is installed their different qualitative in genotypic ambience of the sample.

The information is explicated at analysis dendrogram about nature of structuredness genoplasma line at a rate of clustering and is rendered concrete their relationship inwardly groups clustering. The valued lines are differentiated in two main cluster. To one clustering is referred lines PKI17 and PKI18 with inwardly cluster by distances distance $D = 12,0$ and $15,0$ in 2012 and 2013. They, showing high degree kinship between itself, genetic divergent from line second clustering ($D = 16,0$) and its source form KI346-21 ($D = 10,0$ and $6,0$). Between cluster distances ($D = 24,9$ and $20,5$) in 2,07 and 1,66 and in 1,37 and 1,28 times exceed the intrinsically cluster. Under recombinogenesis parental component these line were created new polygenic complexes, which with high expression influenced upon shaping beside them genetic code different from source form and other line. They is united in one heterosis group, which base line is PKI18.

The second clustering has united the broad set a line – from remote related before close related. Genotype these line contains the different amount of the embryonic plasma of the sugar corn of the previous cycles to breeding, that determinant mixed type genoplasma in them.

The distribution on group line on dendrograms of the different years in most cases was identical. The heterogeneous composition determined underclustering given modifications by variability to organizations morphogenesis and genetic system of the rule-oriented process both beside line, and beside their test-cross at influence different factor surrounding ambiances. For undertaking the cluster analysis follows to use the data, got under growing corns in optimum condition, as the most objective reflecting estimations.

The revealed hierarchies of the relationships degree to genetic remoteness genotype certify the available diversification a line at a rate of cluster and their determined different qualitative and consolidation within groups and with their own source forms. This provides rational their use in different program of the breeding of the sugar corn. Chosen base lines of the separate groups can be used as standards to identifications new line. Bring possibility of the appearance of the positive shift at improvement of the linear material of the sugar corn when use genetic modified mutation. This increases facility of the source material and intensifies power of the genetic potential this culture. – P. 56–62.

UDK 633.15: 631.5

Krasnenkov S. V., Dudka M. I., Berezovskyi S. V., Nosov S. S. Influence of sowing time on yield and moisture of grain of corn hybrids of different ripeness groups.

Keywords: corn, hybrids, sowing terms, individual productivity, yield, moisture.

The results of the study of the productivity of corn hybrids depending on sowing time are given. The advantage of the first sowing time above the second and third time in yield index and grain moisture has been defined.

The experimental data on the influence of hydrothermal conditions of the growing season on the individual plant productivity has been analyzed.

Sowing terms are of great importance for corn growing. They depend on the timeliness, evenness and population of sprouts, rate of plant growth and development, as well as on harvest rate. Both early and late sowing terms significantly reduce plant productivity.

The research was conducted within 2012–2014 years at Erast Experimental Station of the State Establishment, the Institute of Agriculture of Steppe Zone of the National Academy of Agrarian Sciences of Ukraine. Soil of the area under investigation is common thin-humous loamy chernozem, contents of organic matter in plowing layer amounts to 4,0 %.

Winter wheat after autumn fallow was the corn's predecessor. Subsequent to its harvesting stubble disking and under-winter ploughing was carried out. The fertilizers were introduced in autumn within the course of basic soil cultivation in a dose of $N_{30}P_{30}K_{30}$. In spring the fall-plowed land dragging and pre-sowing cultivation to the depth of seeding-down was carried out.

It was planned to sow four hybrids belonging to the main maturity groups in three different periods: the first one – when the soil temperature at the depth of seeding-down reaches 8–10 °C, the second and the third one – in 10 and 20 days respectively. After sowing the Harness herbicide was introduced in a dose of 2,5 l/ha for dragging.

Besides, the sowing was processed with star-wheeled rollers to improve the moisture access to the corn seeds. Area of the elementary seedling plot amounted to 107,1 m², while are of the re-corded one – to 62,4 m². Three replications had taken place.

The subject of the study was the selection of maize hybrids of State Institute of Agriculture of steppe zone of Ukraine of NAAS of Ukraine Pochayivskiy 190 MB, Yarovets 243 MB, Krasyliv 327 MB and Bystrytsya 400 MB. Research methods used were field and laboratory field experiments. They have been carried out pursuant to the generally accepted methodologies.

The were formed on 100 plants from 78 (Bystrytsia 400 MB of the third sowing time of the year 2012) to 124 (the same hybrid of the first sowing time of the year 2013) full corncobs. The second economically valuable corncob was formed on the plants of all hybrids only in the year 2013. The following year this trend was found only in some plants of mid-season hybrid Krasyliv 327 MB, and in 2012 no hybrid was differentiated with a similar quality.

The corn hybrids grain yield was directly dependent on their sowing time. For all hybrids over years of research, this figure was the highest for sowing time from the 20th of April to the 25th of April. During the sowing time from the 30th of April to the 5th of May the reduction of yields on average during the years of research amounted from 6.3 (middle-early hybrid Yarovets 243 MB) to 10,8 % (early-season hybrid Pochayivskiy 190 MB).

The sowing from the 10th to the 15th of May more significantly decreased grain yield compared to the first period, from 16.8 (middle-late Hybrid Bystrytsia 400 MB) to 26,0 % (middle-early hybrid Yarovets 243 MB).

The corn hybrids grain moisture at harvest increased with the shift of sowing time from the first to the third one. This figure was the lowest in hybrid Yarovets 243 MB during the first sowing time in the year 2012 – 12,9 %, and the highest one was in hybrid Bystrytsia 400 MB during the third sowing time in the year 2014 – 27,0 %.

Individual productivity of corn hybrids varied significantly depending on sowing time, but most economically suitable corncobs were formed by the plants of the first and second sowing time (except middle-early hybrid Yarovets 243 MB). The yield of grain of all hybrids decreased with shifting of sowing time from the 20th–25th of April to the 10th–15th of May by 16,8–26,0 %.

The moisture of hybrid grain grown from the first to the third sowing time by 2,8–8,9 %. Based on the experimental findings it is fair to say that the optimal sowing time of hybrids Pochayivskiy 190 MB, Yarovets 243 MB, Krasyliv 327 MB and Bystrytsia 400 MB in the northern subzone of Steppe of Ukraine is the 20th–25th of April. – P. 62–66.

UDK 631.41:631.811

Kramaryov S. M., Krasnenkov S. V., Artemenko S. F. Agricultural chemical evolution of black soil.

Keyword: soil, fertilizer, degradation, fertility.

The study of changes in agrochemical properties of ordinary hard loamy black soils under the influence of anthropogenic factors prolonget action. For this purpose, a comparative assessment of two soil profiles in arable land and virgin soil was conducted. In the arable land was seen the agrochemical properties deterioration, especially in the upper layers. – P. 67–71.

UDC 632.7: 632.9: 633.11

Gorschar E. A., Tokarchuk G. A., Gorschar V. I. Usage of drugs mixtures for grain treatment to protect against general pests.

Keyword: species composition of cereal banks pests, winter wheat, insecticides, bio preparations, mixture of preparations.

In Ukraine it is recorded 116 species of granary pests that damage grains and grain-new products during the storage. Each year, because of them it is lost 5–10 to 30 % of the harvested grain, in addition, it is significantly reduced its food, forage and crop quality. The most common ones are: collar (*Sitophilus (Calandra) granariys L.*) and rice (*Sitophilus (Calandra) oryzae L.*) weevils, little flour (*Tribolium-confusum Duv.*), rhopalocera (*Tribolium castaneum Hrbst*) beetles, Surinam (*Oryzaephilus surinamensis L.*) and red brachycerous (*Laemophloeus ferrugineus Steph.*) grain beetles, grain bostrichidae (*Rhizopertha domini-ca F.*), pea beetle (*Bruchus pisorum L.*), south collar (*Plodia interpunctella Hb.*) and mill (*Ephestia küchniella Zell.*) pyralids, the grain moth (*Sitotroga cerealella Oliv.*), flour mite (*Acarus siro L.*), typical hairy mite (*Glycyphagus destructor Schrk.*).

Feeding the grain the pests pollute it by their excrements, molting skins, dead individuals, there are the worn spots and cobweb in the grain mass. The grain sticks together in clumps, com-pacted, it is increased the temperature and humidity in places of pests congestion. With damaged grain it is received the poor qua-lity, with reduced baking and taste, flour. The damaged grains were occupied much faster by

the mold fungi which synthesize mycotoxins that cause poisoning of people and animals and emit toxic and carcinogenic substances.

We used the generally accepted methods in the studies. The species composition of pests was established with the using of the insects determinants.

During three years of studies it was found the representatives of 7 species of pests: collar weevil (*Sitophilus granarius* L.); rice weevil (*Sitophilus oryzae* L.); rhopalocera flour beetle (*Tribolium castanet-um* Hb.); grain bostrichidae (*Rhizopertha dominica* F.); south collar moth (*Plodia interpunctella* Hbn.); collar grain moth (*Sitotroga cerealella* Oliv.); surinam grain beetle (*Orizaephilus surinamensis* L.) in selected sam-ples. The quantitative composition of the pests in some years is decreased, but the species composition is invariable.

To solve the problem of the prevention and overcoming of the grain stocks pests populations resistance with the application of the insecticides it is necessary to conduct research to ascertain the compatibility potential of the drugs with different chemical structures of active ingredients. In the studies it is examined the effectiveness of the biological product aktofit 0,2 %, r. e. (Aversektyl) in mixture with insecti-cides aktellik 500ES, r. e. and prostor 420, r. e. In various combinations of mixtures the content of the che-mical component was 50, 25 or 10 %, and biological product was 50, 75 or 90 % of the recommended stan- dard. A month after the soaking of the research insects in the different preparations processed grains it is counted their deaths.

The obtained data indicate a high biological effectiveness of the binary mixtures of insecticides and biological products in small doses of the recommended application rate of each component. To receive the highly efficient mixtures with the part decreasing of chemicals (aktellik or prostor) to 50 % of the recom- mended standards it should be added 50 % aktofit of its standard, to 25 % + 75 %, to 10 % + 90 %, respec- tively. A month after the grain processing these versions there was complete loss of all kinds of test insects. It is marked the same effectiveness in variants where insecticides are used aktellik and proctor at the recommended doses. In testing aktofit with the full rate (100 ml/m²), the mortality of the collar and rice weevils, small rhopalocera beetle was 100 % and the death of the colorful trohoderma larvae was 92,7 %.

Thus, during three years of studies in selected samples it was met insect pests of 7 most common types: collar weevil, rice weevil, rhopalocera flour beetle, grain bostrichidae, south collar moth, grain moth, surinam grain beetle. The safe protection against pests complex for long-term grain storage is ensured its processing by mixtures in which the proportion of insecticide aktellik, or prostor is reduced to 50, 25 and 10 %, and biological product aktofit is respectively 50, 75 or 90 % of the recommended application rate of each component. – P. 71–75.

UDC 581.1

Tkalich Y. I, Matyukha V. L, Boguslavskaya L. V. Aftereffect of herbicides on guaiacol-dependent peroxidase system of maize seedlings.

Keywords: peroxidase, fractions, stress, herbicides, maize.

Modern agriculture in the world involves the use of a large number of plant protection chemicals that require proper use of these reagents. In particular, it is important the study of the kinetics degradation of herbicides and degree of contamination of the products plant growing by herbicides. It is known that ripe seed of maize, has grown on plots that treated with herbicides, contains a number of them. Protective mecha- nisms of a plant are based on the self-regulation of biochemical processes that occur because of changes in activity and catalytic properties of enzyme systems Protective mechanisms of plant organism are based on self-regulation of biochemical processes which are carried out through changes activity and catalytic proper- ties of enzyme systems. Different fractions of the enzyme have varying sensitivity to the unfavorable en- vironment. The highest activity and sensitivity to the action of the stress is inherent in free and ion-bonded fractions. Under the action of stress factors on the cell there are changes of its sub- molecular organization that cause a decay of weak bonds of supramolecular structures, which leads to the release of the part of sor- ted-built in them proteins. As a result of these processes it is changing the ratio between free and bound forms of the enzyme. The result of the research shows that the after- effect of herbicides causes changes in ratios of enzyme fractions in the roots and shoots of maize. The most part of peroxidase is linked by ionic bonds with biomembranes of cell that reflects in increasing activity of ionic and covalently-bound peroxidase fractions. The obtained results show that for an objective evaluation of changes in peroxidase activity in plants under conditions of herbicides aftereffect it is necessary to consider, together with a free, also bound fractions of enzyme. It is determined that the highest level of peroxidase bond with cell's compartments was found in roots and shoots of corn after the joint action of

herbicides compared with other variants of the experiment. The minimum values of the structuring coefficient of peroxidase were determined after action of herbicide Stellar in roots and shoots and also adenho in shoots. – P. 75–80.

UDC 633.16”324“:631.5:338.43.05

Artemenko S. F., Rybka V. S., Kovtun O. M. Agrotechnological and economic features of growing of winter barley after soybean in short rotation crop rotations at various levels of saturation of fertilizers.

Keywords: winter barley, fertilizer application system, predecessor, short rotation, costs of production, economic efficiency.

In the area of domestic agricultural production solve the problem of ensuring of reliable balance of food and feed grains is inextricably linked to the stabilization of the production of barley. This culture playing a positive role not only in increasing the productivity of livestock industry and improving its economic situation but also in improving the efficiency of grain production in general. Food industry also interested in the production of winter barley.

In terms of significant climate change area under crops of winter barley are growing rapidly. Crop of winter barley is almost at the level of winter wheat and greater than grain productivity of spring barley.

In the Erastivska research station of the Institute of Agriculture of the Steppe zone of NAAS of Ukraine in 2011–2014 researches have been conducted purpose aimed to study the effect of soy as its predecessor and fertilizer system in winter barley short rotation crop rotations in specific soil and climatic conditions of the Northern Steppe.

In short rotation crop rotations, it is better to place winter barley after soybeans with proper soil preparation and creation of favorable conditions for winter barley plant nutrition. The seedbed preparation for winter barley should be carried out immediately after harvesting of soybean in accordance with existing guidelines. Soya as predecessor is the most suitable for the quick and quality preparation of soil before sowing under this culture. At ripening of soybean its plants shed their leaves that rot through fully before the harvesting. The stems at harvesting by modern harvester-thresher are crushed well and distributed evenly across the field. Early varieties of soybean field are getting free early.

In this article presents the results of studies of the influence of soy as a predecessor and nutrition systems on winter barley productivity in short rotation crop rotations with different levels of saturation of soybeans. The best results were obtained at saturation of four-field crop rotation by soybean to 50 % (soy-bean – winter barley – soybean – corn) in areas at recommended doses of mineral fertilizers, which ensured the growth of winter barley yield on 0,67 t/ha, and according soil diagnostics in areas at high doses of fertilizers on the planned yield – on 0,97 t/ha.

Economic evaluation of the results of experiments carried out according to generally accepted methods. Basic economic indicators: cost price and profitability of grain production were determined to evaluate the effectiveness of winter barley growing after soybean in short-rotation crop rotation.

By growing in three- and four-field crop rotations after soybeans instead of spring barley winter barley have received much better indicators of economic efficiency. In particular, as the analysis of economic indicators of cultivation of winter barley after soybean in the investigated short rotation crop rotations factors show essential influence have factors of fertilizers and saturation of crop rotations by soybean. The latter confirms the results.

Analysis of economic efficiency in the studied crop rotations gives reason to conclude that of yield growth is a prerequisite as for lowering of the cost price of production, as at the same time for increase the conditional the net profit per hectare. In particular, according to calculations, the highest indicators of effectiveness of growing of winter barley after soybean are analogical to variations in the background of the recommended dose of fertilizers ($N_{60}P_{30}K_{30}$) when you make before sowing in autumn phosphorus-potassium and by additional nutrition nitrogen fertilizer in the spring. The highest indicators of profitability of growth of winter barley (98,5 %) were got in four-field crop rotation at recommended doses of mineral fertilizers, and without using of mineral fertilizers these indicators accounted 91,5 %. Profitability was the smallest and accounted to 68,8 % three-field crop rotation with soybeans saturation to 33,3 % by growing of in areas which ensured of high doses of fertilization where fertilizers were used according soil diagnostic on the planned yield; and at recommended doses of mineral fertilizers of profitability higher to 86,9 % and without mineral fertilizers was 86,2 %. That excess cost was due to the use of higher doses of fertilizers, which are quite expensive.

The results of comprehensive experimental studies and calculations show that in a Steppe of Ukraine in favorable weather conditions concerning humidification in autumn after soybean as predecessor is recommended using high-yield varieties of the winter barley instead of spring barley using the recommended dose of fertilizer. – P. 80–83.

UDC 633.25 "321":631.5

Dudka M. I. Fodder productivity of early summer agrophytocenosis depending on specific structure at cultivation on a green forage in northern Steppe.

Keywords: one-year early summer cultures, joint agrophytocenosis, productivity, green mass, dry matter yield.

For the purpose of definition of productivity of joint agrophytocenosis of early summer annual agricultural crops of the families bluegrass (Poaceae) and leguminous (Fabaceae) with participation of a oil radish (*Raphanus sativus* L. var. *oleifera* Metzg., a family cabbage – Brassicaceae) at cultivation on a green forage in northern Steppe of Ukraine, experimental field researches was carried out in the course of 2009–2011 at Erastivska experimental station of State Institution of Institute of Agriculture of a Steppe Zone of National Academy of Agrarian Sciences of Ukraine.

By phenological researches it is established that on duration of the interphase periods of early summer plants and terms of approach of the main phenological phases, the most suitable for cultivation in joint agrophytocenosis with barley summer are garden pea on grain use and oil radish, and with triticale summer and oats – vetch summer and oil radish as culture of the prolonged term of use.

The received results of field experimental researches indicate that introduction in a traditional barley-pea mixture of such component as oil radish on the average for three years has caused acceleration (for 4 days) occurrence hay cutting ripeness of three – component herbage (duration of the period "sowing – harvesting" was reduced from 50 till 46 days) that has allowed to raise simultaneously productivity of green mass of the mixture on 3,36 t/hectare, and harvest of absolutely dry matter – on 0,32 t/hectare.

Concerning use in this group of herbages two – componential and three – componential mixtures with participation of limited occurrence fodder culture – triticale summer, and also oats and vetch summer are perspective. Replacement of specific structure in such fodder agrophytocenosis allows extending the period of their use in system of the green conveyor for 7–9 days. Introduction in structure triticale – vetch mixtures of oil radish has allowed not only to receive the green forage for 4 days earlier, but also to raise thus on the average for years of researches productivity of green mass on 1,49–1,98 t/hectare, and harvest of absolutely dry matter – on 0,08–0,10 t/hectare.

Use in joint agrophytocenosis with participation of oats of the cabbage component allows to increase duration of use of the mixture by the green forage at simultaneous reduction of the period of its vegetation (for 5 days) from sowing before approach hay cutting ripeness relative to vetch – oats mixture and to raise productivity as green weight (on 1,77–2,98 t/hectare), and harvest of absolutely dry matter (on 0,06–0,14 t/hectare).

Thus, use of the oil radish in the conditions of northern Steppe in early-spring crops of different time ripening two-component and three-component mixtures with participation triticale summer, oats and vetch allows to raise the productivity of new formation agrophytocenosis on productivity of green mass (on 20,9–60,5 %) and harvest of absolutely dry matter (on 11,6–51,6 %) compared with the traditional barley-pea mixture and provides conveyor supply of the green forage of the third decade of May throughout 20 days. – P. 84–89.

UDC 581.151:631.52:635.656

Sukhova G. I. Peas' productivity depending on characteristics of grains of high quality in the conditions of the Steppe.

Key words: pea, variety, productivity, morphotype, leaf-type, leaves-off type.

Traditional way of breeding research in Lugansk Institute on Agrarian and Industrial Production is raising new sort of pea. Phased implementation of the programme on pea breeding re-research is allowed to select and transfer more than 20 diverse varieties of pea with different economic and biologic qualities for the procedure on state variety testing. 19 grades among these 20 varieties have been cultivated or recorded in the registers of plant varieties of Ukraine, Russian Federation and other countries at different times. The varieties of leaves-type Vinets and Lugansky as well as high-grade types Kombajnovy 1 and Stepovyck with moustache-type of the leaf recently became the most widely distributed grades in the industry.

The most important element of modern technologies is the use of sort morphotype. The main advantage of moustached forms is that in a closed stems there are conditions for good aeration of the lower tier of the stem due to the highly developed and strongly cohesive moustaches, which greatly increases the resistance of plants to lodging. It allows harvesting the crops by direct combining.

The introduction of leaves-off varieties with increased resistance to plant lodging and shedding plant seeds which have also short maturation period allows using more efficiently material and technical base and to reduce costs and improve quality of commodity and seed production by collecting a harvest in a single-phase. The variety Kharkiv standard was the most precocious among others pea varieties. Its vegetation period was 80 days comparing to Modus variety which has been ripened later and which vegetation period was 84 days, and Luhansk variety with vegetation period was 85 days. Pea varieties of leaves-off morphotypes Kharkiv standard and Modus had a field germination at 94,2–94,6 % while the variety Lugansk with leave-morphotype had field germination at 1,7 % lower than Kharkiv standard grade. However during the vegetation period all varieties of peas had relatively the same survival of plants rate which comprised of 84,0–85,0 %. The morphotype Modus has shown the most high and stable productivity indicators. This variety has provided the highest grain yield at the level of 2,98 t/ha, and conditionally net profit. The level of profitability in the cultivation of Modus varieties was the most high – at the level of 157,2 %. – P. 89–94.

UDC 633.11:631.527

Kozachenko M. R., Chetverik O. O. Morphobiological peculiarities of winter wheat varieties in the conditions of east part of forest-steppe of Ukraine.

Keywords: winter bread wheat, varieties, sign, productivity of plant, structural elements of the productivity, wintering.

In the laboratory of selection and physiology of winter wheat of plant Institute of Production n. a. V. Ya. Yuriev HAAS in 2012–2014 the display of quantitative signs of simultaneously unstudied in those behalf different origin varieties of bread wheat have been investigation.

A research aim was to establish the plant-breeding value of comparatively unstudied winter-bread varieties of wheat by the complex of signs and the wintering of plants in 2012–2014 in the conditions of east part of Ukraine Forest-steppe.

14 varieties are studied from 10 scientific organizations of six countries in the conditions of droughty in the period of vegetation 2012 and more favourable 2013 and 2014. A structural analysis for 50 plants of every varieties on eight quantitative signs in three reiterations are conducted. Importance of distinctions between varieties by the analysis of variance was defined.

Essential high indexes of the productivity of plants had varieties Analog, Yuvilar Mironovski, Doridna and Harus, of productive bushyness – Analog, Gordovita, Doridna and Harus, of grains in an ear amount are Bohemia, Yunona, Harus and Allianse, of the 1000 grains masses is Analogue, Yuvilar Mironovski, Torrild and Doridna, of plants wintering at varieties as with high (Analog, Doridna and Harus) so with the middle productivity of plants (Bohemia, Bunchuk, Gordovita and Allians) in absence of extreme conditions for wintering.

In years with the different meteorological conditions of east part of Ukraine Forest-steppe the essential differences of quantitative signs indexes of plants the productivity and her structural elements of unexplored simultaneously of varieties different origin winter bread wheat annual are established. The best from them as varieties sources of valuable signs for the use in a selection was distinguished. – P. 94–96.

UDC [631.531.04+631.816.12] : [631.559:633.11 “321”]

Rozhkov A. A. Formation of biometric parameters and grain yield of spring wheat hard, depending on the effect of seeding rate and sowing method

Keywords: seeding rate, method of sowing, wheat hard spring, phase of development, dynamics of growth, dry weight, plant height.

Constant updating and introduction of new high-performance variety hard spring wheat is the need for clarification of the combined effect of factors that determine the level of competition between plants on the dynamics of the formation of biometric indicators, it is from them to some extent depends on the level of implementation genetically caused potential grain productivity of plants.

Research conducted at the experimental field of KNAU the name after V. V. Dokuchaev in conditions of rotation department of plant during 2007–2010, by the conventional method. The object of the research was peculiarities of formation of biometric parameters of spring wheat varieties Kharkivska 41. The subject of research – methods of sowing and seeding rates.

Sowed spring wheat string and band method, seeding rate ranged from 4,5 to 6,0 million similar seeds/ha (gradation 0,5 million/ha). Sowing string method was performed seeder C3-3.6, band – APP-6 "Frigate". By band pass way of seeds sown band 15 cm wide with a width between the centers of the bands 30 cm.

Effect the band-pass seeding method was greater when comparing performance air-dry weight of plants per unit area and explained by the preservation of more plants per unit area. For example, in the flowering stage mass per plant for the band seeding method was 5,5 % greater than the string, and the mass of 1 m² plants – by 7,3 %.

Effect of seeding rate to increase air-dry weight of plants more manifested in the flowering stage, because there was the greatest weight per plant provided increasing seeding rate from 4,5 to 6,0 million seeds/ha – from 1,29 to 1,11 g variants of string method and from 1,30 to 1,21 g – strip method.

On average over the four years of research yield of wheat hard spring by the strip method compared to the string grew by 0,27 t/ha, LSD₀₅ – 0,09 t/ha. The effectiveness band pass method was highest at a rate of 6,0 million seeds/ha. On average over the four years of research on grain yield strip sowing methods at seeding rates: 4,5; 5,0; 5,5 and 6,0 million seeds/ha was respectively 0,15 t/ha (5,7 %); 0,20 (6,9 %); 0,32 (10,8 %) and 0,40 t/ha (13,5 %) higher compared to string.

Highest grain yield in the experiment (3,37 t/ha) was formed in variants with band sowing method and rate of sowing 6,0 million seeds/ha. In string sowings of the highest values were 2,97 t/ha at sowing rate of 5,5 million seeds/ha.

In studies of high efficiency band pass seeding method for improving the biometric indicators of plant and grain yield, that is the basis recommends this method of sowing for manufacturing. The advantage of band pass method increases with increasing seeding rate.

By band pass sowing method in all phases of the highest statistically significant value of air-dry weight of hard wheat plants per unit area of spring sowing seed rate was at 5,5 million, while on a string – 5,0 million of seeds/ha. Installed regularity is caused by weakening competitive struggle between plants in a strip sowings that creates conditions for the full development of more plants per unit area of sowing. Highest yield of grain band sowings formed by seeding 6.0 million, while a string – 5,5 million of seeds/ha. – P. 97–102.

UDC 633.1:631.5

Popov S. I., Avramenko S. V., Kurylov O. S. The yield and grain quality of soft winter wheat for the fall feeding in the eastern forest-steppe zone of Ukraine.

Keywords: autumn fertilizing (feeding), doses of fertilizers, soft winter wheat, grain yield, grain quality.

During 2010–2014 the Plant Production Institute nd. a. V. Ya. Yuryev of NAAS conducted a study from the formation of the yield and grain quality of winter wheat depending on autumn basal fertilization of crops in different forms and doses of fertilizers. The authors found that the – ding than the type of fertilizer. The biggest grain bonus derived in 2010 from the variants with fertilization in doses N₃₀P₃₀K₃₀ and N₁₅P₁₅K₁₅, and a dose of carbamide N₃₀ – 1,00; 0,86 and 0,68 t/ha respectively when the control yield was 3,62 t/ha.

The use of different forms of nitrogen fertilizer on their same dose shows that at the lowest dose (N₁₅) was an advantage for the ammonium nitrate, but with increasing the dose to N₃₀ the higher yield provided by carbamide. Thus, in 2011 for autumn feeding of ammonium nitrate in a dose N₁₅ the yield was on 0,18 t/ha higher than carbamide. The lack of moisture in autumn 2011 crop productivity in 2012 was significantly lower than in the previous year, and ranged from 2,80 to 3,22 t/ha. Thus in all kinds of feeding we received a significant grain yield bonus in carbamide N₃₀. 0,35 t/ha, ammonium nitrate N₁₅ – 0,33 t/ha and N₃₀P₃₀K₃₀ – 0,42 t/ha when the control yield was 2,80 t/ha. Compared with the use of carbamide the grain yield bonus is 0,31 t/ha higher when feeding crops ammonium nitrate at a dose of N₁₅. Under favorable conditions in the 2012–2013 growing season, the highest yield was obtained by introducing a dose of NPK fertilizer in N₁₅P₁₅K₁₅, carbamide ammonium nitrate N₃₀ and N₁₅ – 0,59, 0,54 and 0,49 t/ha respectively under 4,05 t/ha control yield. For a dose of nitrogen N₁₅ the significant difference in the level of grain yield between ammonium nitrate and carbamide were not observed. In the growing season 2013–2014 under favorable weather conditions the efficiency of autumn fertilizing were decreased compared to other years. The largest grain yield bonus was provided by NPK fertilizer in doses N₁₅P₁₅K₁₅, N₃₀P₃₀K₃₀ and ammonium nitrate in doses N₃₀ – 0,17; 0,23 and 0,36 t/ha respectively.

In average for the 2011–2014, the highest yield (4,68 t/ha) of winter wheat was get in the combination of autumn basal fertilization in a dose N₃₀P₃₀K₃₀. However, the bonus yields was unstable

(max-min = 0,77 t/ha). The most stable bonus of grain yield (max-min = 0,30 t/ha) was provided by ammonium nitrate at a dose of N₃₀, while its rate was 0,35 t/ha with an average yield 4,53 t/ha.

The best indicators of the grain quality were received from the use of ammonium nitrate in doses N₁₅ in 2011. In the other variants of fertilizing the grain quality indicators belong to the fourth grade. In other years the highest grains quality received by autumn fertilizing at a dose N₃₀P₃₀K₃₀. The main parameters that restrict the grain class were: in 2011 – the number of declining, 2012 and 2014 – glassiness, 2013 – wet gluten content. – P. 103–107.

UDC 633.11:631.582:631:559

Lebed E. M., Desyatnik L. M., Lerinetz F. A., Fedorenko I. E., Lib I. M. The productivity of corn on grain in fallow link of crop rotations depending on soil tillage and fertilizers.

Keywords: corn on grain, fallow, cultivation, soil fertilizers, productivity.

Corn is one of most valuable agricultural culture in Steppe. It occupies an important place in the production of grain. Corn exceeds all grain-crops on the productivity. It has a good reaction on optimization of terms of vital functions of plants, which are created by application of crop rotations, soil tillage and application of fertilizers. Yet there are untapped reserves of increase of the productivity at growing in a crop rotation of grain-crops, in particular corn. Consequently, these questions need the subsequent detailed study.

In stationary experience on Erastivka experimental station (northern part of Steppe), researches of efficiency of different kinds of fallow and of their influence on the productivity of corn, grown after a predecessor wheat winter-annual and also of ploughing (on a depth 25–27 cm) and shallow treatment (on 12–14 cm) soil tillage and different fertilizers during 2007–2013 were conducted. A sowing area of lot of land is 105 m², registration area is 56 m², repeated of experience is 4 multiple, placing of variants is systematic. The generally accepted method of carrying out the field tests after the recommended zonal technologies of growing of the field cultures was used.

Climate in the area of location of the station is moderate-continental. Average annual temperature of air is 8,2 °C, January temperature -5,6 °C, July temperature 21,2 °C. An average annual rainfall is 510 mm, their considerable part (65 %) falls out during April – October. Ground cover is black earth ordinary a little humus hardness loamy on a loess. Table of contents of humus in top-soil is 4,0 %. Content of mineral nitrogen is 30,5 mg/kg, P₂O₅ – 105 mg/kg, K₂O – 145 mg/kg. Material well-being of soil of the mobile forms of nutritives is sufficient. The reaction of the ground solution is near neutral (pH 6,5–6,9).

The analysis of productive data shows that the highest harvest of corn got in a link of crop rotation with black fallow. The decline of harvest of grain in the link of crop rotation with concerned fallow made 0,21 t/ha, and from green manure – 0,52 t/ha, that less than in 2,5 times by comparison to a link with concerned fallow. Practically the same conformity to law of shortage of harvest of corn both in favourable and in unfavorable on weather terms years is exposed.

Substituting of ploughing by a depth 25–27 cm by shallow tillage on a depth on 12–14 cm in all links of crop rotations resulted in a decline of the productivity of corn (on 5,1–8,8 %). The conformity to law of decline the productivity on a background shallow treatment of soil in all links of crop rotation is same as on background with ploughing: the first place occupies link with black fallow, second – with concerned fallow, third – with green manure.

The application of fertilizers promoted the increase of the productivity of corn both on a background of ploughing tillage and shallow tillage. In the link of crop rotation with black fallow indexes of collection of grain of corn was grown on a background ploughing tillage on 0,3 t/ha, and at application of shallow tillage – on 0,52 t/ha, with concerned fallow – on 0,46 and 0,58 t/ha, and from green manure – on 0,61 and 0,71 t/ha accordingly. Consequently, more effectively fertilizers operated during a leadthrough of shallow tillage of soil in all links of crop rotations.

Application of fertilizers in a link with black fallow allowed the increase the harvest by comparison to a variant without fertilizers on 6,8 % on a background of ploughing and on 12,9 % on a background of shallow tillage. For a link with concerned fallow an increase of harvest from the application of fertilizers was 10,9 and 14,6 %, and for a link with green manure – 15,6 and 19,1 % accordingly.

Thus, introduction to the crop rotation concerned fallow and green manure something diminishes the productivity of corn by comparison to black fallow. But with the purpose of increase of collection of grain in northlands of Steppe it is expedient to place it in these links of crop rotations. Application of fertilizers increased the productivity of corn both on a background of ploughing tillage and shallow tillage of soil, but under a corn it is better to conduct ploughing on 25–27 cm. But with the purpose of economy

money-material resources, is possible the application of shallow till at growing of corn on grain. – P. 108–111.

UDC 633.16"324":631.5: 581:111

Benda R. V. Water use efficiency of winter barley depending on the terms sowing and norms of sowing seeds.

Keywords: winter barley, efficiency of water consumption, productive moisture, terms sowing, norms of sowing seeds.

In the Steppe zone of Ukraine the main factor that limits the growth of grain yield of winter crops is the level of moisture crops. The share of arable land with an annual precipitation of 700 mm (which corresponds to favorable conditions for agriculture) in the United States is 60 %, while in Ukraine this amount of rainfall is only 25 % of the territory and not the whole territory of the precipitation is in the area of agriculture. Every third year is somewhat dry, which leads to lower yields of agricultural crops, including winter barley. Therefore the aim of our researches was a study of influence of terms of sowing and norms of sowing on the feature of accumulation of productive moisture under sowing of winter barley in basic phases development of plants and determination of efficiency of water consumption.

Maximal accumulation of moisture in soil, that in further is used on development of plants and forming of harvest, takes place during a fall-winter period. Precipitations of summer period do not almost come plants to the chums – their greater part is spent on evaporation. For the plants of winter barley the optimal level of the moisturizing in a time of proceeding in a spring vegetation the presence of the accessible ground moisture is considered a not less than 110–130 mm. After the biological features a winter barley well uses fall-winter supplies of moisture and comparatively with a barley furious provides a greater harvest.

The most level of the moisturizing plants of winter barley, on results our researches, was marked in a period proceeding in a spring vegetation, it is explained by that during a winter there is a maximal satiation of the ground profile by moisture. But swift increase of temperature of air at the beginning of spring vegetation and practical absence of precipitations resulted in the rapid loss of moisture from soil, especially from his epiphases as a result of intensive evaporation. Already in the phase of the output of the plant tube stock of productive moisture decreased significantly. It is considered that supplies of productive moisture in the phase of exit in a tube in the meter layer of soil less than a 80 mm is insufficient for kind development of plants.

The amount of moisture in the meter layer of soil inphase exit of plants in a tube hesitated on years depending on technological events a from 42,4 to 83,4 mm. In 2008 by us the most supply of productive moisture, that folded depending on the terms of sowing and norm of sowing in the layer of soil a 0–50 cm, was marked: a 41,5–46,8 mm, and in a meter are a 74,9–83,4 mm. Such level of productive moisture depended on the record amount of precipitations what burning in April (in 2008) is a 91,7 mm, that there was a more norm on a 54 mm, and the sum of precipitations for April-May exceeded a mean annual rate on 56,5 %. And in the conditions of spring in 2007 an amount of productive moisture in soil was most subzero, a height and development of plants of winter barley passed in droughty terms. During the spring-summer vegetation of plants and passing by them basic phases of development, the amount of productive moisture substantially went down and purchased the least value inphase complete ripeness of grain.

On the average for years researches, regardless of phase of development of plants, the most subzero supplies of productive moisture were marked at the early term of sowing (on September, 15), that increased with displacement of terms of sowing late. The maximal supplies of moisture in soil marked at sowing on October, 25. Increasing seeding rates from 4 to 7 million viable seeds/ha leads to a decrease in the number of productive moisture in the soil layer 0–100 cm: 3,4 % in the period of the renewal of spring vegetation; 2,9 % in the phase of the tube; 7,1 % – in the phase of earing and 11,6 % in the phase of full ripeness.

Considering the peculiarities of the water consumption of winter barley should be noted that plants of later sowing time having an underdeveloped root system and aerial part, consumed the least amount of moisture during the growing season. So, on average, over years of research, Seva September 15 marked the highest total water use by plants (2562 m³/ha). At every next term of sowing this index diminished. Most effectively sowing used moisture, at sowing on September, 25, what the coefficient of water consumption, a size of that was the least, testifies to, and presented 481 m³/t.

In the research we have identified the influence of sowing density on water consumption. Liquefied cenosis on a hot day, much more water evaporates than where the soil is completely shielded

by leaves. Therefore liquefied crops are more likely to fall in a stressful situation from lack of water than with optimal density. Even faster using the moisture and stronger suffer from lack of dense crops. Therefore, the sowing density has a significant impact on water use efficiency. Crops sowing which was carried out by seeding rate seeds 5 million viable seeds/ha effectively used the moisture from the soil.

It is revealed that the water consumption of the plants of winter barley during the growing season, usually uneven and depends on the degree of development of aboveground plant mass, duration of vegetation and the supply of water from precipitation. Great value for the characteristic features of the plants water is the total water consumption, which depends on many factors: soil and climatic conditions, planting dates and plant density.

It is established that in the Northern part of the Steppe of Ukraine when growing winter barley on sternotomy predecessor (barley) the most economical water consumption on the formation of 1 ton of grain (481 m³/t) was in plants sowing on September 25, when the rate of seeding 5 million viable seeds/ha. – *P. 111–116.*

UDC 632.93:633.1

Pinchuk N. I., Gyrka T. V. Species composition and density dynamics of insects of order coleop-tera in grain crops.

Keywords: winter wheat, spring barley, corn, phytophagous, zoophagous, saprophages, population dynamics.

Modern technologies of growing crops aimed at area harmonious exploitation, management to prevent environmental and nutritional stress, plant protection against hazardous organisms. They provide an environmentally focused use of artificial and natural mechanisms for regulating the number and activity of hazardous organisms. Integrated protection system requires environmental and economic optimization. At limited amount of pesticide application it is need to widely use of performance the entomophagous efficiency levels.

To effectively protect plants from hazardous organisms advisable scientifically justify the possibility of restricting herbivores harmfulness by studying the species composition of harmful and useful species, their correlation in agrocenoses.

Experimental studies were carried out in the laboratory of plant protection of SI Institute of Agriculture of steppe zone of NAAS Ukraine by trial establishments: laboratory, laboratory-field and field experiments, guided by the methods of the Institute of Plant Protection of NAAS and other recognized guidelines and recommendations.

In order to monitor the phytosanitary condition of grain crops were conducted fixed-route longitudinal study of production crop sowings in different ownership form farms of Dnipropetrovs'k region (an area from 20 to 100 ha), including at the state enterprise Experimental Farm "Dnipro". The studies was carried out on varieties that are listed in the State Register of varieties available for distribution in Ukraine and recommended for Northern Steppe zone – winter wheat. In agrocenoses of winter wheat were discovered 124 species of herpetobion insects belonging to 15 families, of which 52 species are zoophagous, 54 – phytophagous and 18 – saprophagous. In spring barley agrocenoses were recorded 62, in corn – 39 species of coleopterous.

High density of herbivorous insects was observed in May and was 7,2–8,7 specimen per 10 trap-day in August decreased to 0,3–0,6 specimen per 10 trap-day. Among them prevalent were *Opatrum sabulosum* L., *Blaps lethifera* Marsh., *Anisodactylus signatus* Pz., which were not significantly damaged to corn plants.

Density of saprophages during the vegetation was low – 0,4 specimen per 10 trap-day, it was mainly species *Anthicus hispidus* Rossi., *Formicomus pedestris* Rossi., *Aelosomus rossi* Germ., *Silpha obscura* L., *Athous haemorrhoidalis* F. *Crypticus quisquilius* Pk.

It was established two peaks of insect activity that lives in the ground. The highest density of zoophagous for three years of research was observed in May and first ten-day period of September – respectively 15,6 and 50,9 specimen per 10 trap-day. In this period of life the beneficial insects are most vulnerable to chemical treatments applications. Prevention or economical usage of chemical treatments during this period will help to preserve the number of natural populations of entomophagous.

It was determined the number of insect species composition of order Coleoptera and their trophic links on cereals. It was specified the greatest activity of zoophagous beetles that must be considered when applying chemical measures against pests in order to maximize efficiency and conservation of natural populations of beneficial insects. – *P. 116–120.*

UDC 635.677: 631.5

Semenyaka I. N., Semenyaka O. I. The tillage of soil and terms of sowing depending on a precursor as the factors of the adaptability of pop corn to the conditions of insufficient moistening.

Keywords: pop corn, precursor, soil tillage, term of sowing, productivity, efficiency.

There were adapted and economically justified the terms of sowing of pop corn depending on the precursors and the tillage of soil in the conditions of the Northern Steppe of Ukraine.

The researches were conducted in the Kirovograd SAES of the NAAS for 2011–2013 in order to establish the reaction of pop corn for the complex of agronomical measures at the insufficient moistening and to adapt the parameters of the technology of growing to biological needs of food corn.

The hydrothermal coefficient (HTC) changed from 2,52 (June) to 0,17–0,37 (May, August and September) in 2011, and during May – August it was within 0,33–0,57 in 2012. In May – June of 2013 the HTC was 0,89–0,92, and in July – August it was 0,38 and 0,29.

The experiment was laid on the background of three precursors – a sunflower, a soybean and a corn for grain. The soil tillage: 1. Moldboard (plowing at 25–27 cm); 2. Boardless (disking at 8–10 cm); 3. Zero (no tillage – direct seeding). The corn was sown in three terms by the seed cod of direct sowing Great Plains PD 8070 with the temperature of soil 8–10, 12–14 and 16–18 °C.

Growing of pop corn without tillage led to a significant increase of weediness of crops even when used the soil and postemergence herbicides, compared to the moldboard cultivation, especially at sowing with $t_d = 8–10$ °C. By the number of weeds in the period of harvesting the early crops were weedier in the background without tillage after a sunflower – 146 and after corn for grain – 95 pc/square meter, and greater wet and dry weight of weeds – 352 and 219 g/m² was after its pre-cursor a soybean. A low degree of weediness of crops after various precursors was mainly at sowing with $t_d = 12–18$ °C (in a sunflower – at $t_d = 12–14$ °C) in the background of a moldboard plowing, and after the soybean also for a boardless tillage. In these variants the quantity of weeds during the harvesting was 2–5 pc/square meter, and the wet and dry weight was 6–18 and 14–42 g/m². The growth and development of a pop corn in such crops was favorable to the fuller realization of a potential of productivity.

The impact of weather conditions on the formation of productivity of corn was 44 %. The productivity of grain of pop corn was higher when grown after the soybean compared to the precursor corn for grain on 0,72 t/ha or 22,2 %, and to the precursor sunflower – on 0,94 t/ha or 29,1 %. The moldboard plowing to a depth of 25–27 cm provided higher and more stable indices of productivity, and a shortfall of grain productivity of pop corn on the background of a diskings to 8–10 cm was on average 0,7 t/ha or 20,3 %, without tillage – 1,61 t/ha or 47,3 %. A higher productivity the pop corn formed on the background of a moldboard method of tillage: after a corn – 3,36–3,69 t/ha at sowing with $t_d = 8–14$ °C, and after a soybean and a sunflower for sowing with $t_d = 8–18$ °C – accordingly 3,80–4,08 and 2,86–3,26 t/ha.

A greater conditionally net profit – 10910 UAH/ha, with a profitability 202,1 % was received by a sowing of pop corn with $t_d = 8–10$ °C in the background of a plowing after the soybean. The high indices of profit – 9127–9699 UAH/t also provided the following terms of sowing on the background of plowing. Growing of the pop corn after the corn for grain and the sunflower was less effective, but highly profitable – 159,6 and 149,3 %. By the precursor the corn the higher profit – 9071 UAH/ha was for sowing with $t_d = 12–14$ °C, and by the sunflower – 7807 UAH/ha for sowing with $t_d = 8–10$ °C on the background of a moldboard way of tillage.

So when growing the pop corn in the conditions of low moistening the preference should be given to the precursor soybean and plowing of the soil to a depth of 25–27 cm. The corn for grain and the sunflower are also admissible precursors. The sowing of the pop corn after the soybean and the sunflower is appropriately to conduct with $t_d = 8–10$ °C, and after the corn for grain with $t_d = 12–14$ °C. – P. 120–126.

UDK 631.5:633.13

Gyrka A. D., Ischenko V. A., Andreichenko O. G. Features of formation the grain weight of hulled and naked spring barley in Northern Steppe of Ukraine.

Keywords: hulled and naked spring barley, mineral fertilizers, seeding rate, predecessor, biopreparation, growth regulators, crop yield, grain.

The elements of crop yield structure of spring small cereals are the density of productive stems, the number of grains in the ear and their weight. Each of these elements can significantly vary depending

on the agro technical growing measures, which resulted an increasing or decreasing the crop yield. Therefore, the development of hulled and naked spring barley growing technology elements, that would have allowed greater use the culture potential for increasing an ear productivity in a Northern Steppe of Ukraine is an extremely important and will increase the crop yield and economic efficiency of growing crops.

The aim of investigation was to determine the influence of mineral fertilizers, seeding rate, growth regulators and bio preparations on ear productivity of naked and hulled spring barley when grown after predecessors: soybeans, winter wheat and sunflower.

Field experiments were conducted in Kirovograd State Agricultural Experimental Station of NAAS. Soil of experimental field – ordinary chernozem, deep medium humic, heavy loamy. Used varieties of hulled spring barley Statok and naked – Gatunok. Trial established by laying blocks at systematic variant placement, with four replications. Elementary plot area – 32 m², accounting – 25 m², plot drill – SN-16. Gro-wing technology is generally accepted, except in the cases envisaged by experimental design.

As a consequence of investigations, the grain mass of main spike and of plant of hulled and naked spring barley depended on the precursor and the use of mineral fertilizers. Thus, at a local fertilization, grain weight of main spike of hulled spring barley averaged 1,03–1,06 g, compared with the control (0,92 g) for 0,11–0,14 g, while feeding of N₃₀ in the phase of tillering, on the background of fertilization the increment ranged from 0,06 to 0,12 g or 6,5–13,0 %. The average weight of grain from the main spike was lower after unflower for 0,05 g or 4,8 %, and after winter wheat by 0,03 g or 2,9 % compared with the cultivation after soybean (1,04 g).

It is determined, that the average weight of grain at growing the hulled spring barley with seeding rate 4,0 million grains per 1 ha was 0,92 g. At an increasing it from 4,5 to 6,0, it has grown to 0,07–0,12 g (7,6–13,0 %). At seeding rate 4,0 million grains per 1 ha the grain weight of main spike after soybean was 0,93 g, after sunflower – 0,87 g and winter wheat – 0,97 g. At an increasing the seeding rate from 4,5 to 6,0 million the grain weight goes up for 0,03–0,12; 0,11–0,15 and 0,02–0,11 g in accordance to predecessors. Higher performance it was after soy at the seeding rate 5,0 million (1,05 g), after sunflower – at 4,5 million (1,02 g) and after winter wheat – at 5,5 million (1,08 g) grains per 1 ha.

Use of growth regulators at hulled spring barley growing on average contributed increased grain weight of main ear at seed treatment for 0,07–0,10 g or 7,7–11,0 %, at spraying crops – 0,08–0,11 g or 8,8–12,1 % and varied within 0,98–1,01 and 0,99–1,02 g, respectively.

When growing naked spring barley, usage of growth regulators for preseeding seed treatment, on the average, provided formation the grain mass of main ear at a rate of 0,96–1,02 g, at crop spraying – 0,99–1,04 g.

Summarizing the results of experimental studies, it should be noted that the use in modern grain production the science-based standards of seeding rate, doses and timing of macro-and micronutrients application, as well as biological products and growth regulators, provides a real opportunity to gain a significant increase in grain weight of main ear and per plant at large, as naked, as hulled spring barley. – P. 126–133.

UDC 633.11."324": 631.5

Zhelyazkov A. I. Influence of agrotechnical methods of cultivation on grain productivity of winter wheat cereal predecessors.

Keywords: winter wheat, sorts, disinfectants, microfertilizers, yield, mass of grain from an ear, quantity of productive stalks.

The studies found a significant effect pre-sowing treatment and foliar feeding on grain crops micro-fertilizers productivity of modern sorts of winter wheat, with its growing cereal predecessors. On average for years of researches, the lowest productivity of winter wheat was noted in control option where didn't carry out processing of seeds and top dressing of crops. Thus productivity of sorts Zolotokolosa and Zamozhnist was 4,10 and 3,68 t per ha respectively. Sowing of seeds, etched vitavaks 200 FF, 3 l/t and selest Top 312.5 FS, 1,5 l/t, even without fertilizing crops, contributed to the growth of productivity in the sorts: Zolotokolosa – by 4,1 and 8,5 %, Zamozhnist – 4,1 and 7,9 % respectively. Inlay seeds affect the yield of winter wheat in less than etching. The growth of the crop to control the areas of experience where pre-sowing treatment included the use of micronutrients reacom-s-grain and reacom-plus-grain, without subsequent foliar feeding of winter wheat, in the sort Zolotokolosa was 2,4 and 3,4 %, Zamozhnist – 2,2 and 3,3 % respectively. Analysis protectants showed that a large grain yield observed when using the drug selest Top 312.5 FS seed treatment before sowing, alone or in conjunction with

microfertilizers. In embodiments without further plant nutrition reacom-plus-grain highest yield obtained by pre-treatment of seed protectants select Top 312.5 FS, 1,5 l/t and microfertilizer reacom-plus grain. At sorts Zolotokolosa and Zamozhnist the figure was 4,61 and 4,15 t per ha, respectively. Fertilizing winter chelate fertilizer during the growing season contributed to the growth of productivity. On average for the years of research higher grain productivity sorts Zolotokolosa (5,05 t/ha) and Zamozhnist (4,64 t per ha) was observed in the experimental variants, where planting was carried seeds treated with drugs select Top 312,5 FS, 1,5 l/t and reacom-plus-grain, followed by fertilizing plants microfertilizer in the phase of tillering in spring. Due to foliar feeding chelate fertilizer yields of these varieties increased by 9,5 and 11,8 %, and at the expense of pre-sowing treatment protectants seleste top 312.5 FS, 1,5 l/t microfertilizer reacom-plus-grain – 11,0 and 17,2 %, respectively. It should be noted that smaller doses of the fungicide at 30 % for the treatment of seeds, together with microfertilizer reacom grain yield was lower compared to the one that uses the full rate of the drug. The difference in grain yield in this case was minimal and ranged from 1,0 to 5,7 %. More effective protectants appeared among the preparation select Top 312.5 FS. So, high yield varieties Zolotokolosa (5,00 t per ha) and Zamozhnist (4,37 t per ha) was formed in versions with pre-treatment of seed protectants select top 312.5 FS, 70 % of the norm and microfertilizer reacom-plus-grain, followed by dressing plant reacomom-plus-grain in the phase of tillering in spring. – P. 133–139.

UDC 633.13:631.816.12

Kulyk I. A. Peculiarities of formation productivity naked oats under the influence of dose, the manner and timing of use of mineral fertilizers after different predecessors.

Keywords: naked oats, fertilizers, micro-fertilizers, predecessors, grain, productivity.

Increase production and expand the range of dietary products, baby food and feed young livestock and poultry – an important task of agriculture of Ukraine. It is known that high-quality raw materials for this industry can serve as oats. Digestible protein oats, their amino acid composition, the presence of a significant amount of dietary fiber has long made this an indispensable element of culture diet diets. In recent years, the production appeared naked varieties of oats, which have several advantages over conventional hulled forms. Naked oats exceeds hulled oats by fat, vitamins and protein. In order to obtain raw materials for health food with naked oats facilitated due to the absence of grains flower flakes, which significantly (20–30 %) reduce production costs flakes.

Forms naked oats now less common due to insufficiently developed technology growing, so it is necessary to prove the possibility of their use and to develop technological methods of cultivation technologies that facilitate the expansion of acreage of this crop. For this purpose, laboratory technology growing spring cereals and legumes laid field experiments on the effects of a system of mineral nutrition on plant productivity naked oats.

Experimental work was carried out after three predecessors: winter wheat, corn and sun-flower. Fertilizers scheme developed by the experiment made by pre-sowing cultivation, local nitrogen fertilization was carried out in the phase of tillering, spraying micronutrients Reacom-SP-Grain – in the late phase of tillering. In the field experiment used a variety of naked oats – Skarb of Ukraine.

Improving mineral nutrition of naked oats contributed to an increase in plant height average 15,1–34,6 %. The biggest indicator of this was after winter wheat predecessor variant $N_{40}P_{40}K_{40} + N_{30} + \text{Reacom-SP-Grain}$ – 91,9 cm.

Grain productivity plants is strongly correlated with the size of panicle. Studies have shown that the length of inflorescences increased in variants where feeding was conducted in comparison with options without feeding, depending on the background fertilizer. Thus, the highest panicle length in oats (22.2 cm) noted variations in the experiment, which used $N_{40}P_{40}K_{40}$ – in the main introduction + $N_{30} + \text{Reacom-SP-Grain}$. The data show that by feeding plants with nitrogen in the phase of tillering, panicle length oats increased by 18,1–32,4 %.

When combined fertilization with nitrogen fertilizers using oat panicle length increased to 32,5–56,3 %. However, found a positive effect of fertilizers on grain weight per plant. Thus, in the form of oats with the introduction $N_{40}P_{40}K_{40}$ grain weight of 1 plant increased (compared with control) at 0,02–0,47 g, and in the form $N_{40}P_{40}K_{40} + N_{30} + \text{Reacom-SP-Grain}$ – in 0,31–0,57 g, de-pending on the predecessor. These options provide the formation of highest weight of 1000 grains – 23,5–26,0 g. In determining the weight of 1000 grains found that it was the largest in crops after winter wheat predecessor: 26,0 g, which is 8,3 % higher than after corn and 10,6 % – than after sun-flower.

Studies on optimization of doses, methods and timing of fertilizer use found increased yields of naked oats from 2,8 to 3,4 t/ha after winter wheat predecessor, from 2,5 to 3,6 t/ha – after corn, and from 2,3 to 3,2 t/ha – after sunflower. Increase productivity by making $N_{20}P_{20}K_{20}$ and $N_{40}P_{40}K_{40}$ relative to

control was, respectively, 7 and 10 % after winter wheat predecessor, 25 and 29 % – after corn, and 12 and 24 % – after sunflower. Marked increase in grain yield under the influence of growing plants spraying micro-nutrients Reakom-SP-Grain on 6 % after winter wheat predecessor, the 12 % – after corn and 14 % – after sunflower. The highest yield of naked oats was obtained in the form $N_{30} + \text{Reakom-SP-Grain}$: the back-ground without fertilizers (3,21 t/ha) – after winter wheat predecessor; against the background $N_{20}P_{20}K_{20}$ (3,48 t/ha) and $N_{40}P_{40}K_{40}$ (3,59 t/ha) – after corn. – P. 139–142.

UDC 633.16"324":581.14:631.5

Pryadko Y. N. Features of growth and development of winter wheat on fall sowing depending predecessors.

Keywords: winter wheat, green manure cultures, sowing time, rates of mineral nutrition.

The study was conducted on the experimental farm "Dnipro" of the State Institution Institute of Agriculture of Steppe Zone of NAAS, in the field three-factor experiment, which was laid using the method of successive plots, in a systematic way. The area of the elementary plot was 60 m². Repetition in the ex-periment: three times.

The main objective of our research was to study the characteristics of growth, development and formation of grain productivity of winter wheat using winter cabbage and bean crops – canola, mustard and vetch as green manure compared with black fallow. In the experiment were seeded winter wheat varieties Lytanivka soft.

Studies indicate that wild seed germination was lowest in 2011 and ranged from 91 to 93 %, depending on precursors and sowing. Average for most field studies during germination was recorded at sowing September 25 – 95,1–95,3 %.

Late sowing adversely affect the seed germination rate field, which was at sowing in early October 92,1–92,5; by sowing winter wheat in early September similarities field also slightly decreased compared with the optimum sowing time and was – 94,4–94,6 %.

Significant increase in tillering coefficient with increasing mineral nutrition background observed more in the early and optimal seeding time. Since experimental data show that by sowing in early September, this figure increased from 3,1–3,2 without fertilization and in making $N_{30}P_{30}K_{30}$ to 3,5–3,7 in making $N_{60}P_{60}K_{60}$ and $N_{90}P_{90}K_{90}$ on black fallow, and 2,8–3,0 3,2–3,6 to in areas where sowing was carried out on green-manured fallow.

When sowing in the second decade of September tillering rate increased from 2,7 to 3,1 on a black couple, and from 2,6 to 3,0 on green-manured predecessor, particularly with increasing mineral nutrition standards.

Over the years, research plant winter wheat regardless of precursors and sowing accumulated sufficient number of wintering carbohydrate. For sowing in early September the number was 32,3–34,2 %; by sowing in early September and a pair of black 31,3–32,9 % by green-manured fallow. By sowing in the second decade of September the number was 33,6–34,1 % on black pair and 33,3–35,7 % by green-manured fallow. In late-term crop (October 5) plants in average years of research have gained this amount of car-bohydrates: 32,6–33,6 % – on black pair and 31,6–33,2 % – on green-manured fallow.

Studies found that when making $N_{60}P_{60}K_{60}$ and optimal sowing (third decade of September) plants in all investigated predecessors, the time of termination of the autumn vegetation are tillering rate from 2,6 to 3,6 and accumulate a sufficient amount of carbohydrates (31,6–35,7 %) in the tillering nodes that provide good wintering them. – P. 143–147.

UDC 633.11"324":631.524.8

Palchuk N. S. Photosynthetic activity of plants of different varieties of winter wheat depending on the level of mineral nutrients under conditions of a northern steppe.

Keywords: winter wheat, variety, fertilizers, leaf surface area, photosynthetic activity, net productivity of photosynthesis.

The work was performed during 2011–2012 in experimental farm "Dnipro" of the Institute of Agriculture in the Steppe Zone in a three-factor field experiment which was laid using the method of successive plots in a systematic way. The area of an elementary plot was 60 m², of an accounting plot – 40 m². Repetition in the experiment – three times.

The aim of research was to determine the level of influence of mineral nutrients (nitrogen fertilizing in different phases of plant development) on the leaf surface area and photosynthetic activity of plants of different varieties of winter wheat.

The largest area of the leaf surface of plants of the varieties under the study during the growing season was noted in the earing phase. Depending on the level of mineral nutrition, in particular on the

amount of nitrogen applied in Zira variety, it ranged within 44,5 to 48,5 thousand m²/ha in Zamozhna and Rozkishna varieties – 46,2 to 47,9 and 48,0 to 50,1 thousand m²/ha respectively. The largest area of the leaf surface in winter wheat plants was noted in the option where the nitrogen fertilizer was applied in the spring tillering phase with the application rate of N₃₀.

The value of net productivity of photosynthesis experiment in areas where feed is not performed, the varieties that have been studied, were within 2,9–3,3 g/m² per day. During fertilization before sowing in a dose N₄₅P₄₅K₄₅ and subsequent feeding of plants with nitrogen N₃₀ on MTH value net productivity of photosynthesis varieties Zira, Zamozhnist and Rozkishna increased, respectively, by 16, 18 and 20 %.

During the research observed different grades reaction to growing conditions, due to their genetic properties and biological characteristics. For example, the varieties Zira and Rozkishna value of net photosynthesis productivity were higher compared with the sort of Zamozhnist.

The highest photosynthetic potential of crops was received in the option of the experiment with the background application of N₄₅P₄₅K₄₅ and N₃₀ followed by nourishment with MTH and N₃₀ locally in the tillering phase in spring. In Zira variety this figure amounted to 2,5 million m² days/ha and in Zamozhna and Rozkishna varieties – 2,3 and 2,7 million m² days/ha respectively.

Thus, the results of studies showed that when growing winter wheat after soybean, application of the complete fertilizer at the rate of N₄₅P₄₅K₄₅ (background) and nitrogen (N₃₀) during the pre-sowing cultivation on half-thawed soil and in the phase of spring tillering of plants provides formation of the largest area of leaf surface and the highest indices of photosynthetic capacity and net photosynthetic productivity of crops of different varieties. Zira and Rozkishna turned to be the best varieties according to a complex of indices. – P. 147–151.

UDC 633.15:632.954

Kravets S. S. Effect of soil herbicide on germination of corn inbred lines.

Keywords: inbreeds line, herbicide application rate, completeness stairs.

It is known that inbred lines are the specific forms of corn created by a force self-pollination of plants during 5–6 years. They substantially differ from F1 of corn, have reduced viability and productivity, weak height and weak root system. In this connection on the seed areas of corn at the high level of potential weediness next to the agrotechnical methods of growing it is necessary to apply the soil herbicides. Presently one of the most widespread and high-efficiency soil herbicides able to repress most biological groups of weeds are herbicides with the operating substance of acetochlor. It was set before by the scientists of Institute of agriculture of Steppe zone, that the inbred lines of corn are sensible enough to acetochlor as a result of low viability.

Experiments were conducted in 2013–2014 on the base of Institute of agriculture of Steppe zone. Ground cover of experience areas is chernozem ordinary littlehumus medium-loamy with content in a plow layer of soil: humus – 3,1–3,5 %; gross nitrogen – 0,17–0,19 %; phosphorus – 0,12–0,13 % and potassium – 2,1–2,2 %. Reaction of the soil solution is neutral. Lines sowed at the temperature of soil on the depth of seeding 10–12 °C with sower "СУПН-8". The norm of sowing was set from a calculation of harvesting stand density 60 thousand plants/ha. The soil herbicide was brought in by hanging portable sprayer OM-5,6. Completeness of shoots was determined by the count of plants on plots both with bringing of herbicide and without him (control). An accounting sowing area of plots – 7 m². Repetitiveness is triple.

Analysis of experimental data 2013–2014 revealed the row of differences in development of inbred lines under action of different norms of bringing of the soil herbicide of acetochlor. The analysis of reduction of the field germination of plants on average in two years of investigation specifies on negative influence of active substance of acetochlor depending on the norms of bringing. At the norm of bringing of the soil herbicide 2,5 l/ha on the average germination of shoots averaged 81,7 %. The decline of norm of bringing of herbicide to 2,0 l/ha increased germination of plants to 90,1 %.

Thus, data testify that the operating substance of acetochlor in composition the soil herbicide influences on the capacity of seed for a germination depending on the genotype of inbreeds lines of corn. At reduction of norm of the use of this herbicide the field germination of seed of inbreeds lines grew. Among investigational inbreeds lines depending on the dose of bringing of the soil herbicide such standards appeared most resistant as ДК 257 3М СБ, ДК 276-1 МБ СБ. The field germination of these forms was at the level of control (without bringing of herbicide). – P. 151–153.

UDC 636.085

Kosir V. S. Increased digestibility and nutritional value of roughage.

Keywords. Straw, stalks and cobs of corn, ammoniation, digestibility, nutritional value.

Influence of chopped straw ammoniation from winter wheat, also stalks and ears of corn after threshing grain on their digestibility and nutritional value is studied. It is proved that the use of feed increases the energy growth of calves for fattening. – P. 160–162.

UDK 636.4.082

Khalak V. I. The content of total calcium and inorganic phosphorus in the serum of young pigs and their relationship with physico-chemical and chemical indicators of the longest muscles

Keywords: young pigs, serum inorganic phosphorus, total calcium, physico-chemical and chemical characteristics of the longest muscles, correlation, coefficient of linear regression.

The intensification of the selection process in the pig industry provides a number of zootechnical activities aimed at the assessment of replacements on the grounds of their own performance, sows and boars-producers – on the grounds of the reproductive abilities of young animals for fattening – on performance of fattening and meat qualities. The relevant issue here is the systematic control of the qualitative composition of muscle tissue, as well as the search for effective biological markers predict.

The aim was to investigate the content of total calcium and inorganic phosphorus in the serum of young pigs of large white breed, physico-chemical and chemical properties of the long back muscles, as well as to conduct correlation and regression analysis between characteristics of the interior and qualitative indicators of muscle tissue.

The experimental part of the study conducted under conditions of breeding reproducer breeding pigs of large white breed LLC "AF "Dzerzhinets" Dnepropetrovsk region, Scientific research center for biosafety and environmental control of resources AIK Dnipropetrovsk state agrarian economic university, laboratory of livestock analysis Institute of pig breeding and AIP NAAS of Ukraine (2011–2013).

The object of research was the young pigs of large white breed, obtained from sows and boars-manufacturers of similar genotype english and french breeding breeding lines 77639/14674, 77362/14670, Power Up 19-2/003301, Champion Boy 6401. The level of total calcium and inorganic phosphorus in serum was investigated complexometric and Fiske-Sbarro, physico-chemical and chemical properties of the long back muscles – by standard methods. The distribution of animals on classes conducted on the basis of 0,67 mean-square deviation from the arithmetic mean of these biochemical parameters of blood. Biometric processing results of research carried out by the method to E. K. Merkurewa and others (1991), V. P. Ko-valenko and others (2010).

The study of biochemical parameters of blood serum of young pigs showed that animals in the experimental group, the content of total calcium was 2,72, inorganic phosphorus – 3,10 mmol/l. On the content of inorganic phosphorus in animals of the experimental group observed increase in blood 0,61 to 1,47 mmol/l Samples long back muscles was characterized by the following indicators physico-chemical and chemical indicators of the long muscles of the back: moisture contain ability was 61,44 %, the intensity of color – 73,50 % of ext. $\times 1000$, tenderness – 9,63 c, pH – ceiling of 5,60 units acidity, content of total moisture – 75,00 %, the content of air dry matter – 26,48 %, fat – 2,26 %, the protein content – 21,63 %. The indicator "energy value" is equal to – 126,67 kcal.

The coefficient of variation of physico-chemical and chemical parameters of muscle tissue ranged from 2,87 (total moisture content) to 47,98 % (fat).

Study of physico-chemical and chemical composition of the samples the longest back muscle of young pigs in the experimental group, depending on the content of total calcium in serum showed that water-holding ability the air content of dry matter, protein and fat of the animal class M^+ (content of total calcium 2,88–3,17 mmol/l) was dominated by age-class M^- (the content of total calcium is a 2,36–2,54 mmol/l) 3,37 (td = 1,07; $P < 0,95$) is equal to 2,94 (td = 2,67; $P > 0,95$) is of 1,12 (td = 1,27; $P < 0,95$) and 1,47 % (td = 2,57; $P > 0,95$), respectively. Energy values of muscle tissue, the difference was 18,66 kcal (td = 2,45; $P > 0,95$). Maximum performance «loss during heat treatment» and «total moisture content» were detected in animals of the class M^- – 22,9 and 76,37 %, respectively.

Analysis of the results of research aimed to study the influence of the content of inorganic phosphorus in the serum of young pigs on the qualitative composition of the muscle tissue indicates that animals with the concentration of a given chemical element from 2,01 to 2,80 mmol/l (M^-) is characterized by the following indicators: intensity of color – 80,66 % of ext. $\times 1000$, the total moisture content – 76,32 %, fat – 2,84 %. Compared with animals of the opposite class distribution on the content of inorganic phosphorus in serum (M^+) the difference in intensity of colouring rock 10,66 % of ext. $\times 1000$ (td = 6,83; $P > 0,999$), the total moisture content – 2,50 % (td = 1,23; $P < 0,95$), fat content of 0,77 % (td = 0,90; $P < 0,95$). The air content of dry matter, protein, as well as in terms of "energy value" maximum figures were found in animals of the class M^+ – 27,68, 22,96 % and 122,65 kcal, respectively.

The coefficient of variation of parameters characterizing the physico-chemical and chemical composition of the longest muscles in animals of different classes of distribution of the content of total calcium in serum ranged from 0,42 to 47,16 %, the content of inorganic phosphorus from 0,71 to 58,35 %.

Significant correlation coefficients are set for the following pairs of characteristics: total moisture content \times the amount of inorganic phosphorus in serum ($r = -0,655$, $tr = 2,74$), the content of air dry matter \times the amount of inorganic phosphorus in serum ($r = 0,648$, $tr = 2,69$), protein \times the amount of inorganic phosphorus in serum ($r = 0,815$, $tr = 4,45$).

According to our results the maximum regression coefficient set for a couple of signs "energy value \times the content of total calcium in serum and energy value \times the amount of inorganic phosphorus in serum" received 19,82 and 11,97, respectively. – *P. 162–167.*

UDC 636.2.085:636.2.034

Petrenko V. I., Dimchia G. G., Maystrenko A. N., Porvas N. G., Sytenko I. L. Efficiency use of energy and nutritives of rations by high producing cows in different periods of lactation.

Keywords: cow, feeding, ration, energy, productivity, standard, conversion, efficiency.

Determination of efficiency use of energy and protein of rations during lactation was the purpose of researches by cows with productivity a 6000–8000 kg of milk at different technologies of maintenance taking into account the regional features of chemical composition of foods, structure of rations and new domestic norms of feeding.

Investigations were made in the agricultural private enterprise "Chumaky" Dnipropetrovs'k region on the Holstein cows with productivity a 6000–8000 kg of milk during all lactation, in the conditions of winter and summer seasons.

On conditions content of cows without tether technology actual day's consumption by cows (BW 580–600 kg) in the first half of lactation made maintenances and feedings by the TMR: dry matter (DM) 16,86–17,5 kg/head, metabolisable energy (ME) – 179,9–180,55 MJ; crude protein – 2497–2678 g. Density of ME of ration made 10,28–0,71 MJ/kg. In the second half of lactation the daily allowance parameters of feeding were following: dry matter intake is 14,77–16,81 kg per day, ME – 149–171,8 MJ per day, crude protein 2466–2585 g per day. Density of energy in rations made here: 10,1–10,2 MJ ME/kg DM.

During all lactation rations on basic afore-mentioned parameters corresponded new to the domestic norms. However, in connection with that rations were planned on middle yield of milk on technological groups, for the most producing cows density energy in ration in the first half of lactation was below from their necessities.

The maximal yield was on the second month of lactation and did not practically differ at the use of winter and summer foods. Accordingly in this period and the NE_L of yield was also higher. Oscillation fat and protein in milk of cows were insignificant and on the whole depended from the period of lactation.

Body weight of cows during experience diminished to the ninetieth day of lactation, then was gradually stabilized and to the end of lactation was grown. The BCS of cows for period of experience also diminished from $3,65 \pm 0,046$ units (5-scale) at the calving to $2,37 \pm 0,074$ units in 90 days of lactation, where upon dynamically increase to $3,09 \pm 0,084$ units at the end of lactation.

Conversion energy of ration into energy of milk was high enough and stable on the extent by 7 months of lactation and only in closing 100 dates of lactation went down gradually. The conversion crude protein of ration into protein of milk changed like.

Between conversion of energy, protein and yield of milk from one side, and dry matter intake with other, positive correlation communication is set ($r = 0,70–0,85$ $P < 0,01$). Like high positive correlation communication is marked between conversion of energy and protein and the ME intake and yield ($r = 0,81$, $P < 0,01$). There were no close correlation communications between crude protein intake and his factions with conversion of energy into milk. Thus, conversion crude protein of ration into protein of milk negatively correlated with crude protein and his degradable fraction intake ($r = -0,44–0,51$ $P > 0,05$). Milk yield and conversion of energy and protein had positive communication with the NDF intake ($r = 0,65–0,71$ $P < 0,05$). Density of crude protein in ration and crude protein and his degradable fraction with energy ratio did not influence on conversion of energy into milk. At the same time, conversion crude protein of ration into protein of milk negatively correlated with density crude protein in ration and crude protein and his degradable fraction to energy ratio ($r = -0,71–0,75$ $P < 0,01$).

Thus, nutritives of daily allowance rations is most effectively used by high producing cows during the first 7 months of lactation, when conversion of energy and protein from foods into energy and protein of milk makes 0,419–0,454 MJ and 0,309–0,353 g accordingly. In subsequent 100 days lactation the level conversion energy and protein of foods and efficiency of their use goes down gradually. – P. 168–173.

UDC 636.2.082.4:636.2:612.014.42

Logvinenko V. I., Zeldin V. F. Method of increasing the vital functions of calves for fattening.

Keywords: surge current, electrical, meat productivity, young cattle.

The results of studies on the action of pulsed current as a factor stimulating the vital functions of calves for fattening.

Established that surge current causes certain parameters in animals such physiological changes, in which the proventriculus and enhanced work processes of digestion, increased consumption and nutrient digestibility of the diet. This leads, in turn, enhance the growth and development of animals within certain limits and raising the average growth rate of body weight.

Research has established that to electrical stimulation, motor activity in the rumen of the experimental animals was on average 3,2 to reductions in 2 minutes. In the period of stimulation was recorded inhibition of gastric motor function of the complex to 0–1 contractions ($R \geq 0,999$).

In some animals in the last minute of stimulation of rumen motility palpation we felt. After 1 hour after switching off the current amount of scar contraction was below the background rate in the 1,6 to 2 minutes ($R \geq 0,999$), then the number of contractions increased gradually and within 3 hours after stimulation of the original data exceeds 0.4. In subsequent periods the number of studies of rumen contractions grew. The maximum increase was observed at 4–10 days, when the frequency of rumen contractions in 2 minutes increased from $3,9 \pm 0,36$ and up to $3,8 \pm 0,36$ ($p < 0,95$). It should be noted that after exposure for 10 days grew and force of contraction of the scar. After the deadline gastric motility slowed slightly to 2–3 con-tractions in 2 minutes.

Thus, during electrical stimulation, when the analgesic state of the animals, we can distinguish three periods: the oppression, agitation and normalization of motor scar. Thus, stimulation causes cattle stable, long, within the physiological capabilities of high activity state ruminal motility. This condition develops from the action of electric current on the nervous system of the body, resulting in a functional reorganization of the central regulation mechanisms of the processes of digestion.

In addition, we found a positive effect of electric current on the growth and development of young cattle. At the same time noted that calves experienced groups willingly ate the food, were more mobile, the wool has got a brilliant hue and tight to the body. The most optimal is the option in which the stimulating effect of the current lasted 10 minutes. Calves of group average daily weight gains were higher by 21 % compared with calves which had not been applied electrical stimulation ($R \geq 0,999$).

The studies found a positive effect of stimulating factors on the growth and development of young cattle. In the experimental animals as compared to controls improved palatability of feed ration physiological function of the gastrointestinal tract and promoted the average daily gains.

Indicators of our experiments are consistent with the data used in production analgesia fattening steers on a balanced diet and got an average daily gain of 16,9 % ($R \geq 0,999$).

It is known that the factor which determines the formation Myasna productivity of young cattle – is the level of energy consumption and increase the intensity of growth. At the heart of the action of this factor on the principle of improving the efficiency of feed utilization. Thus, the basic patterns of the life processes of growing, is to increase the degree of utilization of the energy feed to increase and to reduce the heat pro-duction per unit of feed. Thus, the electrical pulse causes in animals such physiological changes in which amplifies and processes the work rumen digestion, increased consumption and assimilation of nutrients in-take. This leads to increased growth and development of animals to higher average daily gain on 13,2–16,3 % without additional feeding costs, without changing the content and production technology. – P. 173–176.

UDC 636.034

Denisyuk A. Dynamics of the live weight of cows of different genotypes in early ontogenesis and its association with subsequent milk production.

Keywords: cattle, genotype, ontogeny, live weight, yield, correlation.

Determined by weighing the growth of animals and the Ukrainian Red Holstein dairy cattle breeds in early ontogeny, its relationship with the subsequent milk production. According to the research animal growth of different genotypes have some differences. Thus, the live weight of heifers at the date of

birth of the Ukrainian Red dairy and Holstein breeds equal to $38,2 \pm 0,56$ and $37,8 \pm 0,51$ kg, 3-month – $84,2 \pm 1,30$ and $89,6 \pm 1,67$ kg, 6 months – $175,0 \pm 0,90$ and $177,7 \pm 0,85$ kg, 9-month – $234,8 \pm 1,03$ and $237,3 \pm 1,10$ kg, 12 months – $284,3 \pm 1,04$ and $288,9 \pm 1,98$ kg, 15 months – $324,7 \pm 1,75$ and $340,1 \pm 2,51$ kg and 18 months – $359,3 \pm 2,54$ and $381,8 \pm 3,58$ kg. Average daily gains for the period from birth to 3 months of age reached $0,501 \pm 0,0134$ and $0,574 \pm 0,0186$ kg, from 3 to 6 months – $0,992 \pm 0,0174$ and $0,962 \pm 0,0211$ kg of 6- to 12 months – $0,656 \pm 0,0114$ and $0,655 \pm 0,0114$ kg, from 9 to 12 months – $0,542 \pm 0,0113$ and $0,559 \pm 0,0221$ kg, from 12 to 15 months – $0,441 \pm 0,0162$ and $0,547 \pm 0,312$ kg of 15- to 18-month old – $0,382 \pm 0,0193$ and $0,448 \pm 0,0352$ kg, from birth to 18-month old – $0,586 \pm 0,0049$ and $0,624 \pm 0,0068$ kg. The coefficient of variation features live weight of young Ukrainian Red Dairy and Holstein breeds were in the range – 3,2–14,2 %.

For absolute increase in body weight during certain periods of heifers Holstein breed yearling significantly dominated Ukrainian Red Dairy breed. In particular, from birth to 3 months of age by 6,7 kg ($P > 0,999$) from 12- to 15-month old – 9,7 kg ($P > 0,999$) and for the period from birth to 18-month old in 21,3 kg ($P > 0,999$) in other ages was not significant difference

According to a relative increase in body weight young Holstein breed heifers dominated Ukrainian Red Dairy for the period from birth to 3 months of age to 18,1% ($P > 0,99$) from 9- to 12-month – 0,3 % ($P < 0,95$) from 12- to 15- month – 3,4 % ($P < 0,95$), from 15 to 18 months of age by 1,4% ($P < 0,95$) and from birth to 18 months of age by 59 % ($P > 0,99$) only in the range from 3 to 9 and 9- to 12-month old best average in heifers Ukrainian red Dairy breed by 11 % ($P > 0,99$) and 0,9 % ($P < 0,95$)

Heifers Holstein breed average were fertilized at the age of $566,5 \pm 15,03$ days of live weight $381,8 \pm 5,41$ kg, 76 days earlier compared with animals Ukrainian Red Dairy breed for live weight – $374,0 \pm 4,16$ kg

The highest milk yield of Holstein breed characterized firstfruits ($5673,9 \pm 120,05$ kg) are significantly dominated by peers Ukrainian Red Dairy at $324,5$ kg ($P > 0,95$) milk. Traditionally, the latter characterized by higher milk fat ($3,80 \pm 0,004$ %) compared with the first in which the fat content in milk lower by 0,02 % ($P > 0,999$) and averaging $3,78 \pm 0,004$ %.

In terms of milk produced per 100 kg live weight (coefficient milk) and a large significant difference between the groups is not installed. Yes, the firstfruits of Ukrainian dairy cattle, the figure is $1025 \pm 17,86$ kg, a decrease of 52,6 kg ($P < 0,95$) than yearling Holstein breed.

Investigation of milk production firstborn different genotypes of the dynamics of their live weight in early ontogeny suggests mostly insignificant ($r = -0,154 - +0,208$) and false correlation value. Only cows Ukrainian Red Dairy breed found probable positive correlation ($r = + 0,424 \pm 0,0942$, $P > 0,999$) between live weight at 18 months and milk production by 305 days of lactation. For these reasons it is evident that in these conditions the limiting factor in milk production no longer appears live weight in individual age periods early ontogeny (except 18-month heifers Ukrainian Red Dairy breed), and other factors.

As a result of two-factor analysis of variance revealed that among the general level of diversity factors force genotype and live weight at 18 months of age at the rate of milk production – hope for 305 days of lactation is respectively 3,5 % ($\eta^2 = 0,035$; $F = 4,96$) and 3,2 % ($\eta^2 = 0,032$; $F = 4,43$). – P. 176–180.