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IMPACT OF HERBICIDES AND GROWTH REGULATOR ON CORN YIELD

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The article describes the influence of soil and insurance herbicides on the number, weight of weeds in corn crops and its yield. On the plots where herbicides were applied, the effect of the growth regulator Zeastimulin on corn plants and its productivity was simultaneously studied. Three years of research have shown that the degree of weediness of corn crops is high. In the agrophytocenosis of corn a mixed type of weediness was formed, in which late spring weeds predominated. After application of Adengo herbicide (soil, 0.35 l / ha), weed accounting showed a 90% reduction in weed agrophytocenosis of corn, compared to the weediness of the control variant. Consistent application of pre-emergence and post-emergence herbicides best controlled weed numbers and reduced their negative effects in maize agrophytocenoses.

Controlling the number of weeds in maize agrophytocenoses before the emergence of seedlings with the help of soil herbicide Adengo (0.5 l / ha) provides an increase in grain yield for an average of three years of research by 3.5 t / ha. Consistent use of Adengo (0.35 l / ha) and MaisTer Power (1.25 l / ha) in the corn phase of 4-5 leaves before sawing gave a grain increase of 4.4 t / ha. Preventing the harmful effects of weeds by chemical means has saved a significant part of the potential yield of corn grain. In the variants, where herbicides were used compatible with the growth regulator Zeastimulin, there was a decrease in weed mass and an increase in grain yield by 7.8% in the variant, where the soil herbicide Adengo 465 (0.5 l / ha) was applied before the emergence of seedlings, and by 6.8% in the variant with consistent use of Adengo 465 (0.35 l / ha) before sowing corn and MaisTer Power herbicides (1.25 l / ha) during the phase of 4-5 leaves in corn.

***Key words**: herbicides, growth regulator, weeds, corn, yield.*
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Formulation of the problem. Weediness in corn agrophytocenoses is one of the reasons for the low yield of this potentially highly productive crop. It belongs to the weak competitors of weeds, especially in the early stages of its growth. Significant reduction in grain yield occurs if weeds in crops grow together for 30-40 days with corn plants. The presence of weeds in the field leads to the fact, that the crop lays the formation of lower productivity. Destroying weeds after a critical period can only partially restore potential yields.

Corn adapts quite well to growing conditions and has certain special requirements. In particular, shading at the beginning of the growing season leads to a sharp decrease in yield. The reason for shading may be the thickening of crops, as a

consequence of incorrectly selected seeding rate. But most often corn plants suffer from the negative effects of weeds. In the absence of proper weed control of corn agrophytocenoses, conditions for strong suppression of cultivated plants are created, as weeds compete with corn for nutrients, water and light. And this, in turn, leads to a sharp decline in its yield.

It is possible to partially improve the conditions of development of cultivated plants, to reduce the negative effect of adverse weather conditions with the help of growth regulators, which stimulate physiological processes and thus increase productivity.

For all the years of independence in 2018, Ukraine received a record yield of corn grain - 78.4 kg / ha. Favorable weather conditions played a significant role in the formation of high productivity, but the latest approaches and individual elements in cultivation technology also had a significant impact.

Analysis of recent research and publications. The United States has the highest average corn yield in the world. However, Ukraine is one of the largest exporters of grain. Phytosanitary monitoring in corn agrophytocenoses is mandatory due to the growth of corn grain exports.

One of the factors that prevents the full use of the genetic potential of the crop is weeds. As weeds become increasingly resistant to herbicides, there is a need to alternate active substances with different mechanisms of action. Combinations of drugs or their consistent use have a better and longer phytotoxic effect on unwanted vegetation in phytocenoses.

At the present stage of agricultural development to control the number of weeds the development and implementation of a scientifically sound comprehensive system of measures is relevant - environmental, phytocenotic, organizational, mechanical, physical, biological and chemical. The need for a comprehensive systemic approach to the problem of weed control is due to the multifactorial production process in agriculture and the biological characteristics of weeds, in particular, their high adaptation to changing environmental conditions [11].

Weediness of arable land in Ukraine for the last 10 years for many reasons has a tendency to increase: a significant decrease in the level of agricultural culture in violation of scientifically sound crop rotations, removal from the system of basic tillage the different depth of stubble peeling, application of unprepared organic fertilizers, partial or complete refusal of herbicides, rapid adaptation of weeds to changing environmental conditions [11].

It is impossible to get a high yield of corn without proper weed control. When cultivating it, it is necessary to take into account that depending on the species composition, density of weediness, duration of competitive relations of the crop with weeds, the grain yield of corn is reduced by 20-70%. Perennial root weeds are the most harmful in corn crops. In the case of excessive weediness of corn crops with pink and yellow thistles, field birch, bitter steppe the yield is reduced by 50-55%, with medium weediness - by 35-40% and with weak one - by 20-30%. For example,

due to the weeds mass of 5 kg / m^2 and more in the Forest-Steppe zone of Ukraine, corn did not form female generative organs [10].

Modern intensive technologies for growing crops traditionally provide a system of crop protection from weeds with the help of herbicides [14].

The results of determining the number of weeds in 20 days after the application of insurance herbicides showed, that less weeded crops,10.1- 21.4 times, were in the variants, where soil and post-emergence herbicides were used, compared to the control (without herbicides). In the variant with mechanized care of crops (pre-emergence and post-emergence harrowing, two inter-row cultivations) the number of weeds was 1.7 times less compared to the control (one inter-row cultivation). Two manual weeding on the mechanized background of crop care reduced weeds by 6.3 times. Thus, in terms of the number of weeds and their mass in the dry state, the preference was given to the variants where soil and post-emergence herbicides were applied [15].

According to Zabolotny O.I. and others such a pattern was established: before harvesting corn, it was noted that the number and weight of weeds increased compared to the previous account. This is due to the germination of new weeds in the period between accounting.

Corn has certain features that should be considered when using herbicides to maintain maximum yields. Wax bloom and the level of wettability of corn leaves may vary, depending on the phase of crop development. From the appearance of the 1st to the 4th leaf, the leaf surface is covered with a dense layer of wax bloom and the level of wettability of the leaf surface is only 25-30%. Due to the low wettability, the so-called lotus effect occurs, when a large amount of the active substance of the herbicide is not absorbed by the cultivated plant. This does not last long, in the phase of 5-6 leaves there is a sharp change in the wax bloom and in the phase of 8 leaves the wettability of the leaf surface reaches 80%. This is evidenced by experiments, conducted by Bayer Company, which also demonstrate the difference in the level of wettability, compared to other cereals.

Young test corn plants, grown from seeds collected in herbicide-treated agrocenoses, are characterized by different levels of oxidative processes, which is probably due to the genotype of each of the organisms. The aftereffect of herbicide treatment was manifested in the intensive functioning of key enzymes of antioxidant protection of plants in the next. This confirms the assumption, that the next-generation plants have a high adaptive potential [9].

Corn crops are considered to be very weakly weeded if at the time of accounting they contain 1–5 annual spring late or winter weeds, and their aboveground crude biomass is up to 100 g / m^2, lightly weeded- if the number of annual spring early weeds is 1–5 pieces / m^2, annual late or winter spring weeds - 6–10 pieces / m^2, and their aboveground crude biomass reaches 101–250 g / m^2. Corn crops with 1–5 pcs / m^2 of perennial monocotyledonous weeds with crude aboveground biomass of 251–500 g / m^2 should be considered moderately weeded. The same are considered crops

where at the time of accounting (in the spring before the introduction of soil herbicides and in the phases of 2-3, 5-6 and 6-10 leaves in the crop) 1-5 pieces / m^2 of perennial or quarantine weeds are found [4].

With high potential soil weediness in the technology of growing corn for grain, the use of basic herbicides Primextra TZ Gold, 50%, s.c. (3.0 l / ha) or Tetra Guardian, 67.9%, s.e. (3.5 l / ha) together with the surfactant remix (0.3 l / ha) ensured the destruction of weeds by 94 and 93%, as a result of which the preserved grain yield was 70% and 69%, respectively. In conditions of low potential weediness of the soil and mixed type of weediness of corn crops, the maximum weed destruction (94%) was observed, when applying a tank mixture of post-emergence herbicides Primextra TZ Gold, 50%, s.c. (3.0 l / ha) and Callisto 48% ,s.c. (0.25 l / ha), as well as Adjuvant Electron (0.25 l / ha), while the preserved grain yield of this crop was 66% [2].

Quality protection of cultivated plants against unwanted vegetation, combination of chemical method of weed control with the use of growth stimulator in corn crops leads to an increase in its productivity [5, 6, 7, 8].

The maximum yield in the experiments was obtained using a full range of plant growth regulators and microfertilizers, ie 12.1–14.5% more, than in the control. Other options for the use of drugs provided much more modest grain allowance (2.3-6.3% to control), which is probably due to the lack of application of plant growth regulators and microfertilizers in the phase of 7-8 corn leaves. It is proved, that in the conditions of Northern Steppe of Ukraine the use of a full set of plant growth regulators and microfertilizers (seed inlay, treatment of corn plants in phases of 3–5 and 7–8 leaves) provides a steady tendency to increase field germination of seeds, 1.5 times increase drought resistance and heat resistance of corn plants, and increase the grain yield by 12.1–14.5% regarding control [13].

Formulation of article's goals: justification of the use of herbicides: soil - Adengo 465 and insurance - MaisTer Power for quality control of weed numbers and mass in corn agrophytocenoses and the use of growth stimulator Zeastimulin for formation of higher grain yield by cultivated plants.

Presenting main material. In the development phase of 2-8 leaves, corn is the most responsive to competition from weeds, because it is not able to adequately resist them at the beginning of the growing season. Therefore, it is during this period that it is extremely important to ensure the absence of weeds among cultivated plants.

According to various research institutions in Ukraine, 57-65% of fields weediness is assessed as high, 20-30%- as medium and 10%- as low. That is why regulating the level of weeds in crops is one of the main problems of modern agricultural production.

At experimental plots the soil is gray forest podzolic. It has the following agrochemical parameters: humus content - 2.4%, phosphorus of mobile forms - 21.3 mg per 100 g of soil and potassium of mobile forms - 9.3 mg per 100 g of soil, pH of salt extract 6.2, the amount of absorbed bases 15 , 4 mg per 100 g of soil.

During the experiment, a medium-ripe hybrid of corn was grown. This is a simple hybrid PR38R92 (from FAO 340). It has medium heat resistance and very good drought resistance, which is relevant for our growing conditions. The size of the accounting plots was 20 m^2, the repetition was three times with systematic placement of options.

The technology of growing corn was typical for the Forest-Steppe Zone, and the weather conditions of the growing seasons of 2018-2020 for growing corn were generally favorable.

The scheme of the experiment

Variants
1. Control (without herbicides and growth regulator Zeastimulin)
2. Adengo 465 0.5 l / ha before the emergence of corn seedlings
3. Adengo 465 0.5 l / ha before emergence of corn seedlings and growth regulator Zeastimulin 20 ml / ha in the phase of 4-5 leaves
4. Adengo 465 0.35 l / ha before the emergence of corn seedlings and Maister Power 1.25 l / ha in the phase of 4-5 leaves
5. Adengo 465 0.35 l / ha before emergence of corn seedlings and MaisTer Power 1.25 l / ha + growth regulator Zeastimulin 20 ml / ha in the corn phase of 4-5 leaves

Source: formed on the basis of own research.

Herbicides and growth regulator Zeastimulin were applied with a knapsack sprayer with a working fluid consumption rate of 300 l / ha. Weed accounting of the experimental plot and establishing the effectiveness of the drugs studied in the experiment were carried out according to generally accepted methods. Quantitative and species composition of weeds among corn plants during the growing season and their air-dry mass a few days before harvesting were determined. Grain yield was determined by the method of continuous harvesting. Statistical analysis was performed by the dispersion method according to B. Dospekhov.

In the crops of cultivated plants the presence of weeds, as well as the ratio of groups, is determined by the technology of growing crops, the presence of their seeds and vegetative reproductive organs in the soil, soil moisture, biological characteristics of certain weeds.

Corn is a light-loving and heat-loving crop. It needs intense irradiation and does not suffer from high temperatures. The more light the cultivated plant receives, the more intensively it grows. That is, the sheet apparatus is formed faster and the lines are closed earlier. The high potential of modern corn hybrids suffers from weediness of phytocenoses.

Corn weed accounting was performed by quantitative method (in 30 days and 60 days after sowing the crop) and quantitative- weight method shortly before harvesting corn grain. The average figure per 1 m^2 was determined by mathematical calculations. It is possible to prevent harmful effects of weeds in modern intensive technologies of corn cultivation with the help of chemically active compounds – herbicides. But the prerequisite for their optimal use is the availability of information on the type and degree of agrophytocenosis weediness.

Phytosanitary monitoring of corn crops continued during the growing season. Due to the analysis of the obtained results according to our research, it was noted, that a mixed type of weediness was formed in corn crops. Characterizing it should be noted, that in the control variant, the ratio of annual weeds to perennial ones was 9:91, the ratio of monocotyledonous weeds to dicotyledonous was 40:60%. A group of late spring weeds dominated in corn crops and it occupies 57.6%.

Before applying herbicides, it is also needed to have information about the air and soil temperature, soil moisture, the condition of cultivated plants. All these factors significantly affect the effectiveness of the chemical method of weed control and the condition of cultivated plants and their future productivity, grain safety, the state of the environment.

To protect corn from weeds Adengo was applied from soil herbicides. Accounting, which was carried out in 30 days after its application at a rate of 0.5 l / ha, showed in the experimental plots 8 pieces / m^2 of weeds, ie 93% less, compared to their number in the control variant. The second account (in 60 days after application) revealed, that the efficiency of destruction was 92%. The presence of weeds at the time of corn harvest was 10 pcs / m^2, which is explained by the appearance of new plants in between rows of the crop. That is, the use of Adengo (0.5 l / ha) ensured the destruction of only perennial weeds in corn agrophytocenoses. Corn protection from negative effects of weeds is based on the knowledge of biological characteristics of cultivated plants; information on the species diversity of weeds, their number and dynamics of occurrence in agrophytocenoses; their accumulation of mass, as well as elements of the technology of growing crops. In corn crops the degree of contamination was determined to be high, in particular with the presence of perennial weeds, so in the fourth and fifth options after the herbicide Adengo (soil, 0.35 l / ha) MaisTer Power herbicide was applied (insurance, 1.25 l / ha) in the phase of crop development of 4-5 leaves. For post-emergence herbicides, the recommended use period for corn is in the phase of 3-5 leaves. This is due to the peculiarities of the formation of crop’s organs. Violation of the timing of application of insurance herbicides leads to a slowdown in the process of formation con’s generative organs. The lack of quality care for corn crops in the control version led to significant weediness, which further negatively affected its yield. Adengo herbicide contains two active substances: isoxaflutol and thiencarbazone-methyl, as well as a new antidote ciprosulfamide. Simultaneously two different mechanisms of action can provide effective and high-quality control of dicotyledonous and monocotyledonous weeds with an effective mechanism against the emergence of weed resistance. It has a negative effect on carotenoids, which form a protective shield against the harmful effects of sunlight on plants. Therefore, the sun's rays enter the cells and cause the destruction of chlorophyll and the destruction of weeds. MaisTer Power is a broad-spectrum post-emergence herbicide for the destruction of monocotyledonous and dicotyledonous weeds. It contains foramsulfuron and iodosulfuron and thiencarbazone-methyl with ciprosulfamide (antidote). The mechanism of action of

the herbicide is manifested in the blocking of the enzyme acetolactate synthetase, which in turn stops the formation of amino acids in weeds and cell division at growth points. Therefore, they immediately stop their growth and competition with cultivated plants. After application of Adengo herbicide (soil, 0.35 l / ha), weed accounting showed a 90% reduction in weed of corn agrophytocenosis, compared to the control variant. But later, late spring and perennial weeds began to grow in the areas of this version. Subsequent application of MaisTer Power herbicide (1.25 l / ha) into the 4-5 leaf phase they were almost completely destroyed. Before harvesting corn crops had an average of 3 pieces / m^2 of weeds, which is 97% less, than in the version without herbicides. Herbological situation in corn agrophytocenoses during the growing season is shown in table 1.

Table 1

Impact of herbicides and growth regulator Zeastimulin on weediness of corn crops, 2018-2020

Variants	Air-dry aboveground mass of weeds, g / m^2	Accounting	Weediness indicators	
			Number of weeds, pcs / m^2	% reduction to control
1. Control (without herbicides and growth regulator Zeastimulin)	881	1-й 2-й 3-й	113 110 105	- - -
2. Adengo 465 0.5 l / ha before the emergence of corn seedlings	373	1-й 2-й 3-й	8 9 10	92,9 91,8 90,0
3. Adengo 465 0.5 l / ha before emergence of corn seedlings and growth regulator Zeastimulin 20 ml / ha in the phase of 4-5 leaves	362	1-й 2-й 3-й	8 9 9	92,9 91,8 91,8
4. Adengo 465 0.35 l / ha before the emergence of corn seedlings and Maister Power 1.25 l / ha in the phase of 4-5 leaves	99	1-й 2-й 3-й	11 4 3	90,3 96,3 97,1
5. Adengo 465 0.35 l / ha before emergence of corn seedlings and MaisTer Power 1.25 l / ha + growth regulator Zeastimulin 20 ml / ha in the corn phase of 4-5 leaves	95	1-й 2-й 3-й	11 4 3	90,3 96,3 97,1

Source: formed on the basis of own research.

Consistent application of pre-emergence and post-emergence herbicides best controlled weed numbers and reduced their negative effects in corn agrophytocenoses. The dry mass of weeds in this variant was 99 g / m^2 before harvesting corn grain. This is because herbicides operate more efficiently on seedlings and young weeds than on grown ones. Considering that weeds for millennia

of join growth with cultivated plants have developed a number of adaptations to survival in culturphytocenoses, farmers need to take these features into account. It is well known, that weeds have a long germination period. If their seedlings appeared at the same time, one destructive measure could solve the problem of weed control for the entire growing season. But their gradual appearance in agrophytocenoses, especially for crops of wide-row method of sowing, creates certain problems for agricultural production.

In general, experimental herbicides have successfully protected corn crops from weeds. This can be seen in the results of quantitative accounting and in determining their mass. Recently, more and more researchers prefer to determine the weight fraction of weeds in culturphytocenoses. Their number does not reflect the level of possible damage to cultivated plants. And depending on the comfort of the conditions for growth and development, weeds can form different masses. That is why it is better to reflect the harmfulness threshold not by the number of weeds, but by their mass. Growth stimulators occupy a leading place in modern technologies of growing crops. They make it possible to get a higher yield by accelerating growth processes and coping with stressful situations. The corn grain harvest is the result of numerous factors, that affect the growth and development of the crop throughout the growing season. In order to achieve the maximum corn yield, it is necessary to protect plants from stress, caused by adverse weather conditions, diseases and pests, as well as deprivation of competition with weeds in the most sensitive phases of growth and development. Therefore, growth stimulators allow the most efficient use of resources and help cultivated plants in the process of their life. They partially solve the problem of nutrient deficiency, contribute to increasing the stress resistance of plants and help to overcome the effects of stress.

In variants where herbicides were used in combination with the growth regulator Zeastimulin, there was a tendency to reduce the mass of weeds. First of all, this is due to the best competitive properties of cultivated plants. The height of corn plants in the phase of 7-8 leaves in plots, where the growth regulator Zeastimulin was used, was 4.0 cm (var. 3) and 4.3 cm (var. 5) higher, compared to variants, where it was not used (94 cm on var. 2 and 4) The diameter of corn cobs on variants, using the growth regulator Zeastimulin increased from 4.7 cm (var. 2, 4) to 5.0 cm (var. 3, 5), and their length, respectively, from 18.6 cm (var. 2, 4) to 21.4 cm (var. 3, 5). Weed-free corn crops make better use of nutrients, moisture, and solar energy and reach their full potential. As the presence of weeds in corn crops was kept below the economic threshold by the action of herbicides, the conditions for cultivated plants growth and yield formation were significantly improved. Conditions, favorable for growth and development of corn plants, which have ensured their competitiveness, have been created. Therefore, we obtained a significant increase of corn yield per grain in the experimental plots due to the extermination measures (Table 2). The dominant position in agrophytocenoses should be occupied by cultivated plants. Corn has low competitiveness against weeds at the beginning of its growing season.

Table 2

Impact of herbicides and growth regulator Zeastimulin on corn grain yield, 2018-2020

Variants	Yield, t / ha				+ to control, t/ha
	2018	2019	2020	average	
1. Control (without herbicides and growth regulator Zeastimulin)	3,5	3,2	2,1	2,9	-
2. Adengo 465 0.5 l / ha before the emergence of corn seedlings	7,4	6,8	4,9	6,4	3,5
3. Adengo 465 0.5 l / ha before emergence of corn seedlings and growth regulator Zeastimulin 20 ml / ha in the phase of 4-5 leaves	7,8	7,3	5,7	6,9	4,0
4. Adengo 465 0.35 l / ha before the emergence of corn seedlings and Maister Power 1.25 l / ha in the phase of 4-5 leaves	8,3	7,8	5,9	7,3	4,4
5. Adengo 465 0.35 l / ha before emergence of corn seedlings and MaisTer Power 1.25 l / ha + growth regulator Zeastimulin 20 ml / ha in the corn phase of 4-5 leaves	8,8	8,4	6,2	7,8	4,9
SSD_{05}, t/ha factor A (herbicide action)	0,63	0,65	0,51		
factor B (action of Zeastimulin)	0,43	0,48	0,35		
AB interaction	0,71	0,67	0,59		

Source: formed on the basis of own research

Therefore, there is a task for the agronomic service - to protect crops from the harmful effects of unwanted vegetation. The segetal group may be suppressed by corn in the second half of the growing season, but the basis of the future harvest is still being formed. Controlling the number of weeds in corn agrophytocenoses before the emergence of seedlings with the help of soil herbicide Adengo (0.5 l / ha) provides an increase in grain yield by 3.5 t / ha. Consistent use of Adengo (0.35 l / ha) before sowing and MaisTer Power (1.25 l / ha) in the corn phase of 4-5 leaves gave a grain increase of 4.4 t / ha. Therefore, the prevention of the harmful effects of weeds by chemical means has saved a significant part of the potential corn grain yield. Treatment of corn crops with the growth regulator Zeastimulin provided an increase in grain yield by 0.5 t / ha in the version, where herbicides were applied.
Regular observations of growth and development of corn, constant monitoring of the level of weeds in its crops, analysis of the obtained information allowed to form valuable scientific material.

Conclusions. As a result of the analysis of the obtained results, it was noted, that a mixed type of weed formation was formed in corn crops. The group of late spring weeds dominated in total and accounted for 57.6%. The use of Adengo (0.5 l / ha) ensured the destruction of only annual weeds in the agrophytocenoses of corn, which reduced the level of weeds by 90% and their mass to 42%, compared to the control variant. Consistent use of Adengo (0.35 l / ha) before sowing and MaisTer Power (1.25 l / ha) in the corn phase of 4-5 leaves provided an average of 3 pcs / m^2

of weeds in corn crops before harvesting, which is 97% less than in the variant without herbicides and reduced their mass by 89%. Analyzing the results of research, it was determined that high-quality technological support, which involved the consistent application of soil herbicide Adengo 465 (before the emergence of corn seedlings 0.35 l / ha) and post-emergence herbicide MaisTer Power (in phase 4-5 leaves, 1, 25 l / ha) provides an increase in corn grain yield by 4.4 t / ha. Spraying corn with growth regulator Zeastimulin increased the yield by 7.8% in the variant of application of soil herbicide Adengo 465 (0.5 l / ha) before the emergence of seedlings and by 6.8% in the variant with consistent application of herbicides Adengo 465 (0.35 l / ha) before sowing corn and MaisTer Power (1.25 l / ha) in the phase of 4-5 leaves in corn.

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АНОТАЦІЯ
ВПЛИВ ГЕРБІЦИДІВ ТА РЕГУЛЯТОРА РОСТУ НА УРОЖАЙНІСТЬ КУКУРУДЗИ

Охарактеризовано вплив ґрунтового та страхового гербіцидів на кількість, масу бур'янів у посівах кукурудзи та її урожайність. Одночасно вивчався вплив регулятора росту Зеастимулін на рослини кукурудзи та її продуктивність. У посівах кукурудзи ступінь засміченості була визначена як висока, зокрема із присутністю багаторічних бур'янів. Після внесення гербіциду Аденго (ґрунтового, 0,35 л/га) облік бур'янів показав зниження забур'яненості агрофітоценозу кукурудзи на 90% в порівнянні із забур'яненням контрольного варіанту.

Послідовне застосування досходового та післясходового гербіцидів найкраще регулювало чисельність бур'янів та зменшувало їх негативну дію в агрофітоценозах кукурудзи. Суха маса бур'янів на такому варіанті становила 99 г/м^2 перед збиранням зерна кукурудзи. Це пояснюється тим, що гербіциди ефективніше діють на проростки та молоді рослини бур'янів, ніж на дорослі особини. Контролювання чисельності бур'янів в агрофітоценозах кукурудзи до появи сходів культури за допомогою гербіциду ґрунтового Аденго (0,5 л/га) забезпечує зростання урожайності зерна в середньому за три роки досліджень на 3,5 т/га. Послідовне використання до посіву культури Аденго (0,35 л/га) та МайсТер Пауер (1,25 л/га) у фазу кукурудзи 4-5 листків дало прибавку зерна 4,4 т/га.

Запобігання шкодочинній дії бур'янів хімічним методом зберегло значну частину потенційного врожаю зерна кукурудзи. На варіантах, де застосовувалися гербіциди сумісно із регулятором росту Зеастимулін відмічено зниження маси бур'янів, та зростання урожайності зерна на 7,8 % у варіанті де вносили ґрунтовий гербіцид Аденго 465 (0,5 л/га) до появи сходів культурних рослин та на 6,8 % у варіанті із послідовним використанням гербіцидів Аденго 465 (0,35 л/га) до посіву кукурудзи та МайсТер Пауер (1,25 л/га) під час 4-5 листків у кукурудзи.

Ключові слова: *гербіциди, регулятор росту, бур'яни, кукурудза, урожайність.*

Табл. 2. Літ. 15.

АННОТАЦИЯ
ВЛИЯНИЕ ГЕРБИЦИДОВ И РЕГУЛЯТОРА РОСТА НА УРОЖАЙНОСТЬ КУКУРУЗЫ

Охарактеризованы влияние почвенного и страхового гербицидов на количество, массу сорняков в посевах кукурузы и ее урожайность. Одновременно изучалось влияние регулятора роста Зеастимулин на растения кукурузы и ее производительность. В посевах кукурузы степень засоренности была определена как высокая, в частности с присутствием многолетних сорняков. После внесения гербицида Аденго (почвенного, 0,35 л/га) учет сорняков показал снижение засоренности агрофитоценозов кукурузы на 90% по сравнению с засоренностью контрольного варианта.

Последовательное применение досходового и післясходового гербицидов лучше регулировало численность сорняков и уменьшало их негативное воздействие в агрофитоценозах кукурузы. Сухая масса сорняков на таком варианте составляла 99 г / м^2 перед уборкой зерна кукурузы. Это объясняется тем, что гербициды эффективнее действуют на проростки и молодые растения сорняков, чем на взрослые особи. Контроль численности сорняков в агрофитоценозах кукурузы до появления всходов культуры с помощью гербицида почвенного Аденго (0,5 л/га) обеспечивает рост урожайности зерна в среднем за три года исследований на 3,5 т/га. Последовательное использование до посева культуры Аденго (0,35 л/га) и Мастер Пауэр (1,25 л/га) в фазу кукурузы 4-5 листьев дало прибавку зерна 4,4 т / га. Предотвращение вредоносного действия сорняков химическим методом сохранило значительную часть потенциального урожая зерна кукурузы. На вариантах, где применялись гербициды совместно с регулятором роста Зеастимулин отмечено снижение массы сорняков, и рост урожайности зерна на 7,8% в варианте где вносили почвенный гербицид Аденго 465 (0,5 л/га) до появления всходов культурных растений и на 6,8% в варианте с последовательным использованием гербицидов Аденго 465 (0,35 л/га) до посева кукурузы и мастер Пауэр (1,25 л/га) при 4-5 листьев у кукурузы.

Ключевые слова: *гербициды, регулятор роста, сорняки, кукуруза, урожайность.*

Табл. 2. Лит. 15.

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