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EFFICIENCY OF USING GROWTH PROMOTERS AND MICROFERTILIZERS IN GRAIN MAIZE SOWING IN SOUTHERN UKRAINE

Today, studies of the effectiveness of the use of microfertilizers, plant growth regulators, and bacterial preparations in the technologies of growing agricultural crops are gaining more and more popularity. Studying the impact of microfertilizers is especially promising and relevant in the conditions of reducing the amount of organic and high-cost mineral fertilizers. The analysis of literature data indicates that the use of complex microfertilizers makes it possible to significantly reduce the application rates of macrofertilizers, contributes to the realization of potential opportunities embedded in the body of plants, in particular certain immune reactions and vital energy, and also reduces the content of nitrates, heavy metal ions and of radionuclides in products, significantly weakens the mutagenic and teratogenic effect of herbicides [1].

The manifestation of the characteristics of corn hybrids of different FAO groups was determined and their relationship with grain yield when grown under drip irrigation in the conditions of the Southern Steppe of Ukraine was investigated. The influence of microfertilizers on the dynamics of biometric indicators and plant productivity indicators of corn hybrids was established, and agrotechnical recommendations for growing high yields of corn grain were substantiated.

An important aspect of the experiment is the possibility of determining the level of influence of individual biometric indicators on the formation of corn grain yield. It was established that there is a close direct correlation between plant height and grain yield of hybrids. Thus, in the phase of milk ripeness, the correlation

coefficient between plant height and grain yield of hybrids was +0.873.

It was established that there is also a correlation between the height of the attachment of the first cob and the grain yield of hybrids. Thus, in the phase of milk ripeness of the grain, this indicator was +0.741. A high correlation coefficient indicates the possibility of visual preliminary selections for productivity based on the height of the cob attachment.

Treatment of corn plants with microfertilizers had a positive effect on the dynamics of the area of assimilation surface of hybrids in separate phases of development. This is confirmed by calculations of the polynomial dependence of the leaf surface area of hybrid plants and grain yield. The correlation coefficient was +0.883.

It was established that there is a close direct correlation between the raw above-ground mass and the grain yield of hybrids. Thus, in the phase of physiological maturity, the correlation coefficient between the accumulation of raw above-ground mass and the grain yield of hybrids was +0.912.

It was established that there is a close correlation between the accumulation of raw above-ground mass, dry above-ground mass and the grain yield of hybrids at the level of +0.912, +0.863, which may indicate the possibility of conducting a preliminary visual assessment of productivity in the field based on these characteristics.

The study of the correlation dependence between yield and other main economic and valuable features is of practical importance for determining optimal parameters in the process of developing agrotechnology of corn hybrids for specific agro-climatic growing zones. According to the analysis of the correlation dependences between the indicators of the structure and the yield of corn grain, a high connection between them was established. Thus, the correlation coefficient between grain yield and cob length was r = +0.915, cob diameter r = +0.624, number of rows of grains r = +0.581, and grain weight per cob r = + 0.864.

The ratio of the structure of hybrid cobs by maturity group and yield level showed that for the mid-early maturity group, the optimal structure of the cob is length: 17.9 cm, cob diameter 43.0 mm, number of rows of grains 15.6, weight of grain from one cob 165 .8 g, the weight of 1000 grains is 252.2 g, and the grain yield is 11.2–11.5 t/ha. For the medium maturity group of corn hybrids, the optimal ratio of the structure of the cob is: length 19.0 cm, diameter of the cob 43.2 mm, number of rows of grains 16.3, mass of grain from one cob 216.0 g, mass of 1000 grains - 322.2 g with grain yield at the level of 11.8–12.2 t/ha. For mid-late hybrids, the optimum indicators of the structure of the cobs to ensure the highest grain yield (over 13 t/ha) are within the following limits: cob length 22.6 cm, cob diameter 52.4 mm, number of rows of grains 19.1, weight of grain per cob - 289 .7 g, the weight of 1000 grains is 327.3 g.

Studies have shown that processing with microfertilizers affects the formation of elements of the structure of corn grain yield. The highest indicators of all structural elements were observed for the sowing of hybrids of medium-ripening and medium-late FAO groups when treated with Avatar-1 microfertilizer. The maximum values of

indicators of cob structure and yield were observed in mid-late hybrid Chongar, after treatment with Avatar-1 microfertilizer.

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MANIFESTATION AND VARIABILITY OF THE TRAIT LEVEL OF "GRAIN MASS PER COB" IN THE PARENT LINES OF CORN HYBRIDS

Creation of the latest generation of high-yielding corn hybrids with strong adaptive potential, which would meet the requirements of commodity producers, is one of the crucial tasks facing breeders today. One of the directions for creating such a generation of corn hybrids is to involve in the hybridization of lines contrasting in FAO groups and different in genetic origin. Great prospects for such crossings are revealed in the irrigated conditions of the south of Ukraine, where thermal, nutrient and water regimes make it possible to use the genetic abilities of corn forms of all maturity groups from FAO 150 to 500.

The phenotypic and genotypic variability of the trait "grain weight from the cob" in parental lines was established and the level of heterosis for it in F1 hybrid combinations was established.

No significant diversity was observed among the Lancaster plasma for the "cob grain weight" trait. In the vast majority of its components, the "mass of grain from the cob" was within the average group indicator. The following lines were characterized by a low level of paratypic variability of the studied trait: DK2/17-3 (Vm =2.5%), DK296 (Vm =2.6%), Kr9698, X475 (Vm =2.7%). In all these lines, the value of Vm was lower than the group average, and in line X33 it was the minimum in the Lancaster plasma group and amounted to 2.2%.

The weight of the grain from the cob in the line of this plasma was the