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## **THE PRODUCTIVITY OF CORN HYBRIDS DEPENDS ON THE TECHNICAL EFFICIENCY OF BIO PREPARATIONS UNDER IRRIGATION CONDITIONS**

Maize is affected by pathogens of many infectious diseases, especially in the Southern Steppe of Ukraine under irrigation, where optimal conditions exist for their development. Each of the causative agents of diseases has its own biological features, a certain cycle of development and causes characteristic symptoms of diseases.

The biological preparations under study showed a positive effect on resistance to fungal diseases. Thus, on the early-ripening line DK 281, all biological preparations affected the development of blistered corn smut (*Ustilago zaeae* Beckm.). Biopreparation Fluorescin BG reduced the incidence of the disease by 1.9%, biopreparation Trihopsyn BG – by 3.0%, biopreparation Biospectr BT – by 3.2%.

The technical efficiency of biologics in case of blistering powdery mildew was different depending on the genotype of the lines. The highest technical efficiency was recorded on lines DK 411 and DK 445 (FAO 420) when using Biospectr BT and Trihopsyn BT biological preparations (31.3–34.5%).

The technical efficiency of the biological preparation Trihopsyn BT in the case of damage to corn plants by the stem (corn) moth (*Ostrinia nubilalis*) was from 13.4 to 25.9%, the biological preparation Biospectr BT showed technical efficiency from 14.3 to 25.0%. Biopreparation Fluorescin BT is not an insecticide, so it had no effect on the stem (corn) butterfly (*Ostrinia nubilalis*).

The incidence of fusarium head blight decreased with the use of biological preparations. The most effective drug was Biospectr BT. The incidence of fusarium head blight in lines decreased by 2.8–4.0%. Line DK 247 was characterized by the lowest incidence of fusarium head blight when Biospectr BT was used (8.9%). Affected by the stem butterfly decreased with the use of biological preparations Trihopsyn BT and Biospectr BT, which have insecticidal and fungicidal and growth-stimulating effects. The reduction in damage was 2.3–2.8%, depending on the genotype of the lines. The technical efficiency of the drugs when used against the stem butterfly was the highest in lines DK 247, DK 411, DK 445 when Biospectr BT was used (20.9–25.9%). The technical efficiency of Trihopsyn BT was somewhat lower, especially in the early ripening lines DK 281 and DK 247 (13.4–17.5%). Research has established that the seeds of hybrid corn of large fraction have greater growth power, which means higher sowing quality, compared to small fraction. Therefore, we paid attention to the influence of biologics on the structural parameters of seed yield of parent lines of hybrids.

The mass of 1,000 grains and the mass of the cob grain increased with the use of biological preparations. The biological preparation Fluorescin BT increased the weight of 1000 grains the most. The mass of grain from the cob significantly increased thanks to the use of the preparations Trihopsyn BT and Biospectr BT. The drug Fluorescin BT was significantly effective, but with a smaller positive effect.

The analysis of the relationships between the seed yield of parent lines of corn hybrids and the weight of 1000 grains showed their strong dependence. The correlation coefficient was  $r=+0.961$ , which indicates a positive effect of treatment with biological preparations on the mass of 1000 grains and seed yield. The weight of grain from the cob had an even higher dependence. This indicates that the use of biological preparations has a positive effect on certain indicators of the yield structure, which has an additive effect on the main utilitarian feature - seed yield of parent lines of hybrids.

The results of accounting for the yield of parental components (corn lines) showed that under the influence of agrotechnical elements under irrigation conditions, the productivity of the studied corn lines on average in factor A ranged from 3.75 to 6.11 t/ha. It was established that treatment with the Biospectr BT biological preparation contributes to the formation of the highest grain yield of parent forms of corn, which on average amounted to 4.63 t/ha, yield increase - 0.44 t/ha (10.5%). Treatment with Trihopsyn BG biological preparation had a positive effect on productivity, which averaged 4.54 t/ha. It provided an increase in productivity of 0.35 t/ha (8.4%). Treatment with the biological preparation Fluorescin BG provided an increase in yield of 0.14 t/ha (3.3%). The parent form of the mid-late group DK 445 showed the maximum productivity in the experiment when treated with the biopreparation Biospectr BT - 6.11 t/ha.

The studied biological drugs showed high technical efficiency in the studied diseases. Biopreparation Fluorescin BT showed technical efficiency against corn smut ranging from 24.0% to 30.4%. Biological drug Trihopsyn BT showed technical efficiency from 38.2% to 57.9%. And the biological preparation Biospectr BT showed technical efficiency from 46.0% to 58.6%, respectively.

The technical efficiency of the biological preparation Fluorescein BT against Fusarium head blight (*Fusarium moniliforme* Scheld.) ranged from 20.5 to 25.0%, the biological preparation Trihopsin BT showed a technical efficiency of 19.4 to 38.9%. The biopreparation Biospectr BT showed technical efficiency from 31.3 to 53.2%.

The technical efficiency of the biological preparation Trihopsyn BT when infecting corn plants with the stem corn moth (*Ostrinia nubilalis*) ranged from 7.5 to 28.4%, the biological preparation Biospectr BT showed technical efficiency from 10.3 to 29.8%. The biological drug Fluorescein BT is not an insecticide, so it had no effect on the stem (corn) butterfly (*Ostrinia nubilalis*).

The results of yield accounting showed that, under the influence of agrotechnical elements under irrigation conditions, the productivity of the investigated corn hybrids, on average, ranged from 10.71 to 17.68 t/ha (Table 4).

It was established that treatment with Biospectr BT biological preparation contributes to the formation of the highest yield of corn grain, which, on average, was 14.8 t/ha. After treatment with Trihopsyn BT, the grain yield of corn hybrids was

slightly lower - 14.7 t/ha. After treatment with the drug Fluorescin BT, the yield of corn grain is 14.4 t/ha.

Compared to the control, the yield increase from the use of Biospectr BT was 1.3 t/ha or 9.6%. The increase in yield from the use of Trihopsyn BT was 1.2 t/ha or 8.9%, the increase in yield from the use of Fluorescin BT was 1.0 t/ha or 6.7%.

The Arabat hybrid, on average during the research period, was the most productive - the average grain yield was 16.7 t/ha. The Arabat hybrid showed the maximum yield at a density of 70,000 plants/ha when treated with Biospectr BT - 17.6 t/ha. A slightly lower yield was obtained in variants with the Chongar hybrid - 16.9 t/ha. The maximum yield of the Steppe hybrid is 12.7 t/ha, with a density of 90,000 plants/ha, when treated with Biospectr BT.

The hybrid genotype had a specific response to plant density. The early-ripening Steppovy hybrid showed the highest yield at a density of 90,000 plants/ha - 11.9 t/ha. The mid-ripe hybrid Kakhovsky produced the maximum yield at a density of 80,000 pieces/ha - 12.9 t/ha. Mid-late hybrids Chongar and Arabat showed the maximum yield of 16.7 and 17.3 t/ha, respectively, at a density of 70,000 plants/ha. The maximum yield in the experiment was shown by the Arabat medium-late group hybrid at a plant density of 70,000 plants/ha and 17.6 t/ha treated with Biospectr BT.

Conclusions. The technical efficiency of the biological preparation Fluorescin BT in the case of fusarium head blight (*Fusarium moniliforme* Scheld.) was from 6.8 to 19.6%, the biological preparation Trihopsyn BT showed technical efficiency from 13.7 to 25.2%, and Biospectr BT - from 20.6 to 31.5%. The highest technical efficiency of biological preparations in the case of vesicular powdery mildew was recorded on lines DK 411 and DK 445 (FAO 420) with the use of biological preparations Biospektr BT and Trihopsyn BT (31.3–34.5%). The technical efficiency of the drugs when used against the stem butterfly was the highest in lines DK 247, DK 411, DK 445 when using Biospectr BT (20.9–25.9%). The technical efficiency of Trichopsin BT was somewhat lower, especially in the early ripening lines DK 281 and DK 247 (13.4–17.5%). Biopreparations Fluorescin BT, Trihopsin BT, Biospectr BT had a positive effect on the structural parameters of the seed yield of the parent lines of the hybrids. Treatment with the biopreparation Biospectr BT contributes to the formation of the highest grain yield of parent forms of corn, which on average amounted to 4.63 t/ha, and the yield increase was 0.44 t/ha (10.5%). Treatment with the biological preparation Trihopsyn BG had a positive effect on yield, which averaged 4.54 t/ha, and ensured its increase by 0.35 t/ha (8.4%). Treatment with the biological preparation Fluorescin BG provided an increase in productivity by 0.14 t/ha (3.3%).

It was established that treatment with Biospectr BT biological preparation contributes to the formation of the highest grain yield of corn hybrids, which, on average, amounted to 14.8 t/ha. Compared to the control, the yield increase from the use of Biospectr BT was 1.3 t/ha or 9.6%.

The Arabat hybrid, on average during the period of research, was the most productive - the average grain yield was 16.7 t/ha. The Arabat hybrid showed the maximum yield at a density of 70,000 plants/ha when treated with Biospectr BT - 17.6 t/ha.