

агропромислового виробництва України» («Інноваційний розвиток»). В рамках якої виконується дві тематики:

41.02.00.43.П. Інтенсифікація та підвищення ефективності трансферу інновацій у агропромисловий комплекс Миколаївської області

41.02.00.47.П «Провести агроекологічне вивчення та розробити економічне обґрунтування трансферу нішевих олійних культур в агропромисловому комплексі Миколаївської області.

Миколаївська сільськогосподарська дослідна станція Інституту кліматично орієнтованого сільського господарства Національної академії аграрних наук України також активно співпрацює з іншими установами щодо реалізації нових та актуальних напрямків досліджень. Зокрема за підтримки Української освітньої платформи та благодійної організації DanChurchAid (DCA) активно функціонує студентський осередок в рамках реалізації проєкту «Наукова молодь».

Зустрічі із студентами проводяться на базі філії кафедри землеробства, геодезії та землеустрою та філії кафедри рослинництва та садово-паркового господарства Миколаївського національного аграрного університету. Де обговорюються нагальні питання дослідницької роботи вчених агрономів, проводяться зустрічі із фермерами, виїзди на досліді в польових умовах тощо.

Тож, в цілому дослідна станція продовжує роботу над розробкою та впровадженням Нових та актуальних напрямків досліджень.

UDK 633.15:631.52

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## **THE EFFECTIVENESS OF BIOLOGICAL PREPARATIONS FOR THE PROTECTION OF DIFFERENT FAO GROUPS MAIZE HYBRIDS IN THE NORTHERN STEPPE OF UKRAINE**

Previous studies on the effects of biopreparations under irrigation conditions have demonstrated high efficiency at optimal moisture levels. Considering that significant areas of irrigated land in Ukraine were destroyed due to the criminal destruction of the Kakhovka Reservoir, the main maize planting areas are currently concentrated on non-irrigated lands with more challenging agroecological conditions [1].

The damage to maize hybrids by the European corn borer (*Ostrinia nubilalis*

Hübner) was similar among the hybrids 'Stepovyi', 'Oleshkivskiyi', and 'Tronka', ranging from 14.2% to 14.7%. The hybrid 'Hileia' showed slightly lower damage at 15.4%. The hybrid factor had minimal impact on the damage level and was mostly insignificant among the hybrids, indicating the difficulty of developing genotypes resistant to the corn borer through traditional breeding methods.

The application of Biplan M and Biospectrum BT reduced damage by the European corn borer from 14.6% to 11.1–11.2% in the 'Stepovyi' hybrid. In the 'Oleshkivskiyi' hybrid, damage was reduced from 14.5% to 11.5–11.8% with these treatments. For the 'Tronka' hybrid, damage decreased from 14.7% to 11.5–11.9%. The 'Hileia' hybrid experienced significantly higher damage in the control group at 15.4%, which is attributed to its longer growing season and extended pest activity period. There was no significant difference between Biplan M and Biospectrum BT in reducing pest damage.

The biopreparations also positively influenced resistance to fungal diseases. In the early-maturing 'Stepovyi' hybrid (FAO 190), the biopreparations suppressed the development of common smut (*Ustilago zaeae Beckm.*) – Biplan M by 3.8% and Biospectrum BT by 3.9%. They also reduced the incidence of fusarium ear rot (*Fusarium moniliforme* Scheld.) – Biplan M by 2.6% and Biospectrum BT by 3.8%.

In the mid-early hybrid 'Oleshkivskiyi' (FAO 280), Biplan M reduced common smut by 2.9%, and Biospectrum BT by 4.8%. The incidence of fusarium ear rot was reduced by 3.8% with Biplan M and by 4.9% with Biospectrum BT.

For the 'Tronka' hybrid (FAO 380), disease incidence was reduced by 4.9% with Biplan M and by 5.0% with Biospectrum BT. Fusarium ear rot incidence decreased by 3.8% with Biplan M and by 3.9% with Biospectrum BT.

In the 'Hileia' hybrid (FAO 420), these biopreparations also reduced common smut incidence. Biplan M decreased incidence by 5.3%, and Biospectrum BT by 5.5%. Fusarium ear rot incidence was reduced by 3.4% with Biplan M and by 3.7% with Biospectrum BT.

Yield assessments showed that under the influence of the biopreparations, the grain yield of the studied maize hybrids ranged from 6.15 to 8.51 t/ha over the research years.

It was found that the application of Biospectrum BT resulted in the highest average grain yield of maize, averaging 7.72 t/ha across the hybrids. Treatment with Biplan M resulted in a slightly lower yield, averaging 7.58 t/ha. Compared to the control, the yield increase from using Biospectrum BT was 0.72 t/ha, or 10.2%. The yield increase from using Biplan M was 0.58 t/ha, or 8.2%.

The 'Stepovyi' hybrid (FAO 190) showed an average grain yield of 6.98 t/ha without biopreparation treatment. With biopreparations, its yield increased to between 7.34 and 7.67 t/ha. The highest yield for 'Stepovyi' was achieved with Biospectrum BT at 7.67 t/ha, which is 9.9% higher than the control.

The 'Oleshkivskiyi' hybrid (FAO 280) was the most productive on average over the study years, with a grain yield of 7.72 t/ha without biopreparations. The highest yield for 'Oleshkivskiyi' was achieved with Biospectrum BT at 8.51 t/ha, a 10.2% increase. The effect of Biplan M was less pronounced, with a yield of 8.42 t/ha and a

yield increase of 9.1%.

The 'Tronka' hybrid (FAO 380) showed an average grain yield of 7.57 t/ha over the study period, slightly lower than the previous hybrid. The highest yield for 'Tronka' was achieved with Biospectrum BT at 7.87 t/ha, a 10.1% increase. Biplan M had a smaller impact on yield, with an increase of 0.61 t/ha.

The 'Hileia' hybrid (FAO 420) showed the lowest average yield during the study period at 6.53 t/ha. The reduced yield was due to the hybrid's longer growing season and higher moisture requirements, which were not met by the natural precipitation levels in the Northern Steppe's agroecological conditions. The highest yield for 'Hileia' was achieved with Biospectrum BT at 6.81 t/ha, with an increase of 0.66 t/ha, or 10.7%. The yield increase from using Biplan M was 0.52 t/ha, or 8.5%.

It was found that treatment with Biospectrum BT resulted in the highest average maize grain yield across hybrids, averaging 7.72 t/ha. Treatment with Biplan M resulted in a slightly lower yield, averaging 7.58 t/ha. Compared to the control, the yield increase from using Biospectrum BT was 0.72 t/ha, or 10.2%. The yield increase across all FAO groups from using Biplan M was 0.58 t/ha, or 8.2%.

Maize hybrids with shorter growing periods (FAO 190–290) exhibited higher grain yields under the non-irrigated conditions of the Northern Steppe of Ukraine.

The use of biological protection agents for maize is feasible in organic farming to produce food and feed grain without chemical preparations.

## References

1. Vozhehova R., Lavrynenko Y., Marchenko T., Piliarska O., Sharii V., Tyshchenko A., Drobit O., Mishchenko S., Grabovsky M. Water consumption and efficiency of irrigation of maize hybrids of different FAO groups in the southern steppe of Ukraine. *Scientific Papers. Series A. Agronomy*. 2022. LXV(1) P. 603–613.

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## ФІТОСАНІТАРНИЙ МОНІТОРИНГ ГОРОХУ ПІДЗИМОВОГО ПОСІВУ

Бобові (лат. *Fabaceae*, *Leguminosae*, *Papilionaceae*) родина дводольних рослин, багато з яких має високу харчову цінність, в деякі вирощуються як