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Influence of the Stimulant Humimax on the Productivity of Repeat Sunflower Crops

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Annotation. In the conditions of the Republic, especially in the southern regions, it is possible to sow cotton, sunflower, rice, potatoes, vegetables of melons, legumes, corn, and other crops as repeat crops after winter wheat, and also get two harvests a year. However, as a result of global climate change due to unfavorable climate, water scarcity, and drought in recent years, problems have been created in obtaining a high and high-quality harvest from repeated crops sown after winter wheat. To solve these problems, it is considered relevant to develop and scientifically substantiate optimal norms and terms for the use of growth stimulants in the cultivation of sunflower sown as a repeat crop after winter wheat. In agriculture, the use of plant growth stimulants is justified by their high efficiency and effectiveness. Stimulants shorten the growing season and also help to correct the condition of crops, due to unfavorable environmental conditions, the treatment of crops with growth stimulants has a positive effect on the growth and development of plants. In the conditions of bald Meadow soils of the Surkhandarya region in the southern zone of the Republic of Uzbekistan, the use of optimal timing and doses of the growth stimulator Gumimax for obtaining a high-quality crop of repeated sunflower crops of the Jakhongir variety was studied. The use of the Gumimax stimulator on repeated sunflower culture before sowing seeds with a norm of 0.75 l t^{-1} and in the phase of the appearance of 3-4 leaves with a norm of 0.4 l ha^{-1}, a seed yield of 1,97 t ha^{-1} was obtained, and oil content of 48.6%, grain yield increased by 0,35 t ha^{-1}, the oil content was higher by 3.1%.

Keywords: sunflower, stimulant, Gumimax, seed and plant treatment, consumption rate, seed germination, growth and development, grain yield, oil content

The limited land and water resources of our country, the constant growth of the population and the development of industry are the reasons for the increase in the demand for agricultural products. This requires the development of modern advanced technologies, efficient use of available land, obtaining high and quality crops, reducing production costs, and obtaining more income.

In the conditions of our republic, especially in the southern regions, it is possible to plant cotton, sunflower, rice, potatoes, vegetable-police, legumes, corn and other crops as repeated crops on the fields freed from winter wheat and grow crops twice a year.

However, as a result of global climate change, there are problems in producing high and quality crops from repeat crops planted after winter wheat due to unfavorable weather, water scarcity and drought in the following years. In order to overcome these problems, it is also important to develop and scientifically substantiate the optimal application period and standards of growth regulators in the cultivation of repeated cotton, sunflower, soybean and corn crops after winter wheat.

In modern intensive farming systems, annual growth agents are widely used to obtain high yields from plants. In particular, growing substances are used not only to affect the processes of growth and development of plants, but also to reduce the negative effects of environmental factors during the growing season (B.Kh. Jerukov, 2011).

Auxin, gibberellin, cytokines are divided into stimulators and inhibitors according to their effect on plant tissues (V.S. Shevelukha, 1990).

New generations of growth regulators have a triple effect on plants, they control physiological processes, make plants resistant to adverse conditions, and increase their immunity (Yu.G. Dyakov et al., 2002, V.K. Novozhilov et al., 1993).

In the experiments of Z.K. Yuldasheva et al. (2019), when sunflower was treated with Uzgumi stimulator at the rate of 0.8 mg/t before sowing seeds of the "Dilbar" variety, plant growth and development accelerated and seed yield increased positively.

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When sunflower seeds were treated with stimulators before planting and during the growing season, the seed yield was 0.22-0.31 tons per hectare and the oil content increased by 0.3-0.5% (O.I. Antonova et al., 2003).
In the experiments of S.V. Ivanov and others (2015), the growth regulator Mival-Agro (20 g/t + 20 g/ha), Albit (250 ml/t + 35 ml/ha), Epin (250 ml/t) was applied to sunflower seeds. + 35 ml/ha) and when treated with Intermag Profi (2 l/ha) compared to the control, the grain yield increased by 0.14-0.39 t/ha, and the quality improved. Also, high results were observed when sunflower seeds were treated with Epin (250 ml/t + 35 ml/ha) during the growing season, compared to the control, the grain yield increased by 1.89 t/ha, and the moisture content increased by 0.9-7.1%.
When using Ekosil and Terra-Sorb foliar stimulators in the cultivation of high and quality sunflower crops, the seed yield is 45.2-46.2 t/ha compared to the control, 0.5-1.5 t/ha, the moisture content is 3.2-3.4% it is noted that it has increased (O.V. Belchuk [2; str. 9-11]).
Z.M. Tsitskiev and others. [4; -S. 10-14] in experiments, before planting sunflower seeds of Master, Flagman, Lakomka and Rodnik varieties, when treated with Zircon, Epin and Regoplant stimulators, compared to the control, seedlings were 2.0-2.5 cm longer in root and 2.7-3.5 cm in stem length. , Flagman and Lakomka varieties, when Regoplanta stimulators were used, compared to other options, the seed yield was 1.5 t/ha compared to the control.
L.P. Beltyukov and others. In the experiments [3, S.6-11], before planting sunflower seeds and during the 6-8 leaf period, Agrovin Amigo, Agrovin Mikro, Agrovin Universal, Mival Agro and Agrofon KU-8 drugs had a positive effect on productivity indicators, and high results were obtained by Mival Agro 20.0 g/t per seed with biostimulator, 20.0 g/ha during 6-8 leaf period.
Research methods
Observations and calculations in the conducted laboratory and field experiments were carried out on the basis of the methodological manual "Metodika polevyx opytov s xlopchatnikom" and "Methods of conducting field experiments" adopted by PSUEAITI. Mathematical processing of productivity indicators was carried out using the method of dispersion analysis based on the manual "Metodika polevogo opyta" by B.A. Dospehov. Also, during the period of use of chemical substances, "Brief methodical instructions for state testing of growth regulators" and "Methodological instructions for testing insecticides, acaricides, biologically active substances and fungicides" were used. The agrochemical analyzes of plants and soil are defined in the method of "Metody agrokhimicheskih, agrofizicheskih i mikroibolicheskih issledovaniy v polivnyx khlopkovyx rayonakh". The amount of humus in the soil was determined by I.V. Tyurin, total nitrogen and phosphorus by I.M. Maltseva and L.I. Gritsenko, nitrate nitrogen by the ionometric method, the amount of mobile phosphorus and exchangeable potassium by the methods of B.P. Machigin and P.V. Protasov. Leaf surface of plants t weight was determined by the method of A.A. Nichiporovich.
Research results
In our experiments, the effects of treatment with Gumimax stimulator during the period of 3-4 pairs of leaves on sunflower seeds sown repeatedly after winter wheat (years 2009-2011) were determined.
According to the data obtained on the basis of our research, the treatment with Gumimax stimulator on repeatedly planted sunflower seeds and during the period of 3-4 pairs of leaves had a positive effect on the increase of grain yield.
According to the results of the research, the average seed yield in the control variant was 16.2 t/ha. When treated with Etalon sodium humate at the rate of 0.8 kg/t, the yield was 17.9 t/ha and 1.7 t/ha more than the control option.
0.5 with Gumimax stimulator for sunflower seeds; 0.75; When treated at the rate of 1.0 l/t (var. 3; 5; 7) the average seed yield is 18.5; 18.7; 18.5 ts/ha, 2.3 more than the control; 2.5; increased by 2.3 ts/h.
Also, 0.5 with Gumimax stimulator for sunflower seeds; 0.75; When processed at the rate of 1.0 l/t and 0.4 l/t when producing 3-4 pairs of leaves (var. 4; 6; 8) seed yield is 18.9; 19.7; 18.8 ts/ha, compared to the control, these indicators are 2.7; 3.5; It was observed that it was more than 2.6 ts/ha.
When sunflower was treated with Gumimax stimulator at the rate of 0.4 l/ha in the period of 3-4 pairs of leaves, the average seed yield was 17.8 t/ha, and 1.6 t/ha additional yield was produced compared to the control.
Based on the information given above, it can be concluded that when treated with Gumimax stimulator at the rate of 0.75 l/t before planting, and 0.4 l/ha during the period of 3-4 pairs of leaves, the germination of

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seedlings is accelerated, and the growth and development of the plant is coordinated. , it was found that seed yield increases by 3.5 tons/ha.

In our experiments, the effect of Gumimax stimulator on the oil content of sunflower kernels was determined. According to the obtained results, the oil content of sunflower kernels was 45.5-48.6% on average in the experimental variants, while this indicator was 45.5% in the control. 47.0% when sodium humate is applied at 0.8 kg/t, as well as 0.5 before planting with Gumimaks stimulator; 0.75; 47.4, respectively, in variants processed at the rate of 1.0 l/t (var. 3; 5; 7); 47.6; 47.4%, 0.5 per seed with Gumimax stimulator; 0.75; 1.0 l/t and 0.4 l/ha in the period of 3-4 pairs of leaves (var. 4; 6; 8) 48.0; 48.6; It was 47.8% and 46.4% when treated with Gumimax stimulator at the rate of 0.4 l/ha in the period of 3-4 pairs of leaves.

In the experiment, when the seeds were treated with sodium humate, compared to the control, the oil content of sunflower kernels was 1.6%, as well as 0.5 before seeding with Gumimaks stimulator; 0.75; 1.0 l/t in processed variants (var. 3; 5; 7) 2.0; 2.1; 2.0%, when treated with Gumimax stimulator at the rate of 0.5-0.75-1.0 l/t and 0.4 l/ha during the period of 3-4 pairs of leaves (var. 4; 6; 8) 2 ,5; 3.1; 2.4% and 1.0% increase was observed when treated with Gumimax stimulator at the rate of 0.4 l/ha in the period of 3-4 pairs of leaves.

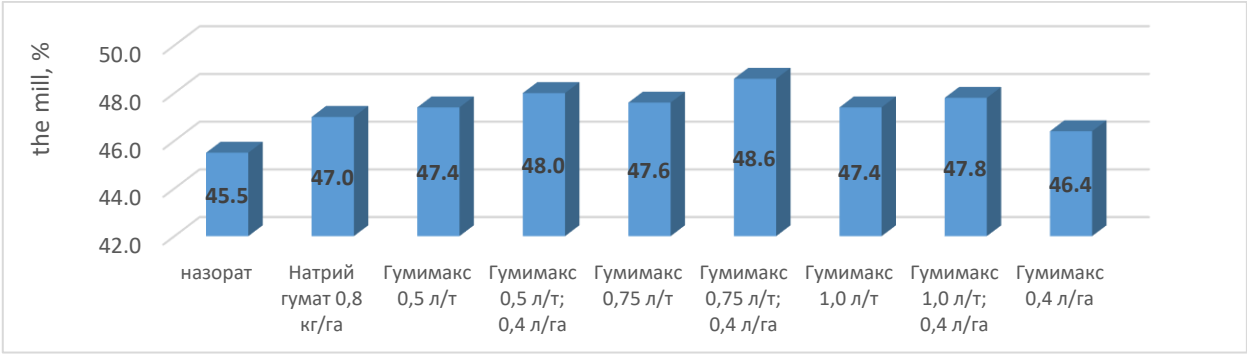

Figure 1. Effect of Gumimax stimulator application on replanted sunflower on sunflower seed yield (2009-2011)

Based on the data, it can be concluded that 0.75 l/t before sowing and 0.4 l/ha in 3-4 pairs of leaves before sowing with Uzgumi stimulator, 3.1% increase in the moisture content of sunflower seeds was achieved.

So, when 0.75 l/t is applied to sunflower seeds before sowing, 0.4 l/ha during the period of 3-4 pairs of leaves, 3.1% increase in sunflower seed oil content is achieved compared to the control.

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