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THE EFFECT OF BIOSTIMULANTS AT DIFFERENT RATES ON THE YIELD OF REPLANTED OILSEED SUNFLOWER

Yuldasheva Zulfiya Kamalovna 1,
Karabaeva Dilfuza Jo‘raevna 2
1 Candidate of Agricultural Sciences, Associate Professor
2 Termez State University, Faculty of Natural Sciences, Termez, Uzbekistan

Abstract
Microfertilizers, biostimulants, microfertilizers and growth substances contained in the immunostimulant have been found to have a positive effect on the growth, development and formation of seeds in the basket of sunflower of the local Dilbar variety, on the weight of 1000 seeds and on the yield. The use of MERS microfertilizer made it possible to increase the productivity of one plant by 362.9-430.4 grams, the use of Fitovak immunostimulant by 288.1-388.0 grams, and the use of Biodux biostimulant by 107.7-287.7 grams.

Keywords: sunflower, biostimulant, standard, immunostimulant, microfertilizer, norm, yield, growth, development.

Introduction

In our country, special attention is being paid to the consistent development of the chemical industry and the expansion of the production of various chemical products for agriculture. New types of fertilizers are being created by our scientists, produced on the basis of local raw materials, which accelerate the growth of plants, increase their productivity, resistance to various diseases and cold. Biologically active substances (BAS), including plant phytohormones - regulators (stimulators) of plant growth and development (RPGD) are becoming increasingly important in modern conditions. Their application in agriculture, plant science and forestry has the potential to produce results that cannot be achieved by other means. The use of RPGD makes it possible to better realize the genetic potential of crops, to increase the resistance of plants to stress factors of biotic and abiotic nature, and as a result, to increase the yield and improve the quality. Plant growth stimulants are special nutrients that accelerate plant metabolism and stimulate the accumulation of green mass in representatives of the flora. Plant growth regulators are now widely available. They are available in different types. Some of them affect the formation of roots, increase the germination rate of seeds, Others affect the development and growth of the stem more, regulate flowering, are able to regulate the formation of seeded nodes.

The level of study of the problem. One of the advanced technologies of sunflower cultivation is the use of mineral fertilizers, which is one of the main factors of increasing productivity. It is important to nutrition the sunflower in time according to its demand,

therefore, it is possible to obtain a high-quality and high yield if the amount and duration of the mineral fertilizer applied to it are determined [2].

Plant growth regulators cannot replace mineral fertilizers, but complement them in the plant nutrition system, increase the coefficient of use of soil and fertilizers. "UZGUMI" biofertilizer is applied mainly before planting seeds and is sprayed when sunflowers form 3-5 leaves. In this case, the yield increases by 0.22-0.31 t/ha and the oil content by 0.3-0.5%. [7]

It is necessary to use the latest scientific achievements and apply the innovative technologies of our advanced farms in order to achieve high productivity in sunflower cultivation and obtain a large amount of income and profit from it [1].

Under the influence of plant regulators, it increases the effectiveness of pesticides applied to seeds and during the growing season. Some growth regulators reduce white and gray rot diseases of sunflower, and sugar beet diseases by 30-50% or more [3,8].

Employees of the Institute of Agroresurc of Ukraine (Ponomarenko SP, 2003] note that for the agricultural producer growth regulators are no less valuable than mineral fertilizers and plant protection products. A new direction of improving sunflower production technology is the development of a system of effective use of modern plant growth regulators that control individual stages of plant growth and development to activate their immunity and, as a result, increase the yield and quality of sunflower seeds. (Sonin K.E., 2010; Petrichenko V.N., 2010). Therefore, the development of technology for the use of biostimulants that regulate growth and increase immunity is of the utmost importance [4, 5, 6].

MATERIALS AND METHODS

As a repeated crop, field experiments were conducted at the Thin Fiber Cotton Research Institute. The experimental field is an irrigated grassland barren soil with a reddish color barren soil that has undergone severe erosion. Soil total nitrogen is 0.4%, phosphorus is 0.6%, potassium is up to 1.5-2%, mobile phosphorus is 15-20 mg/kg, mobile nitrogen is 3-5 mg/kg, mobile potassium is 150-200 mg. /kg around. The amount of biohumus in the soil of the studied experimental area is 0.5-0.6% in the layers and decreases towards the lower layers. Methods of conducting field experiments (UzPITI 2007y), "Metodika polevogo opyta" (B. Dospekhov, 1985y) were used in the research. Field experiments were systematically arranged as simple, 4 replicates, 8 variants. The area of the field unit taken into account is 24 m^2 in each option. The number of counted plants is 20. In the experiment, seeds of the Dilbar variety of sunflower were treated with "UZGUMI" biofertilizer 0.6 l/t, Fitovak 200 ml/t, Bioduks 2.0 ml/t and MERS 0.1% - 3.0 ml/t, then 7-8 leaves in the formation phase, biofertilizer "UZGUMI" was used at the rate of 0.4 l/ha, Fitovak immunostimulator 300 ml/ha, Biodux 2.0 ml/ha, and MERS 0.1% - 0.5 l/ha.

RESEARCH RESULTS

Several doses of microfertilizers and biostimulants were applied to the Dilbar variety of sunflower, and the effects on field germination of seeds, the transition of sunflower phases, the height of the plant, the number of leaves, the size of baskets, the number and weight of

seeds were studied. According to experiments, the height of the stem of the local Dilbar variety of sunflower is about 2 meters because it is planted in irrigated land. In the experiment, the height of the Dilbar variety grew to an average height of 161.7 cm in the control variant, it was found that the use of biostimulants had a positive effect on the plants, and the height of the plant grew from an average of 179.0 cm to 213.8 cm in these variants (Figure 1)

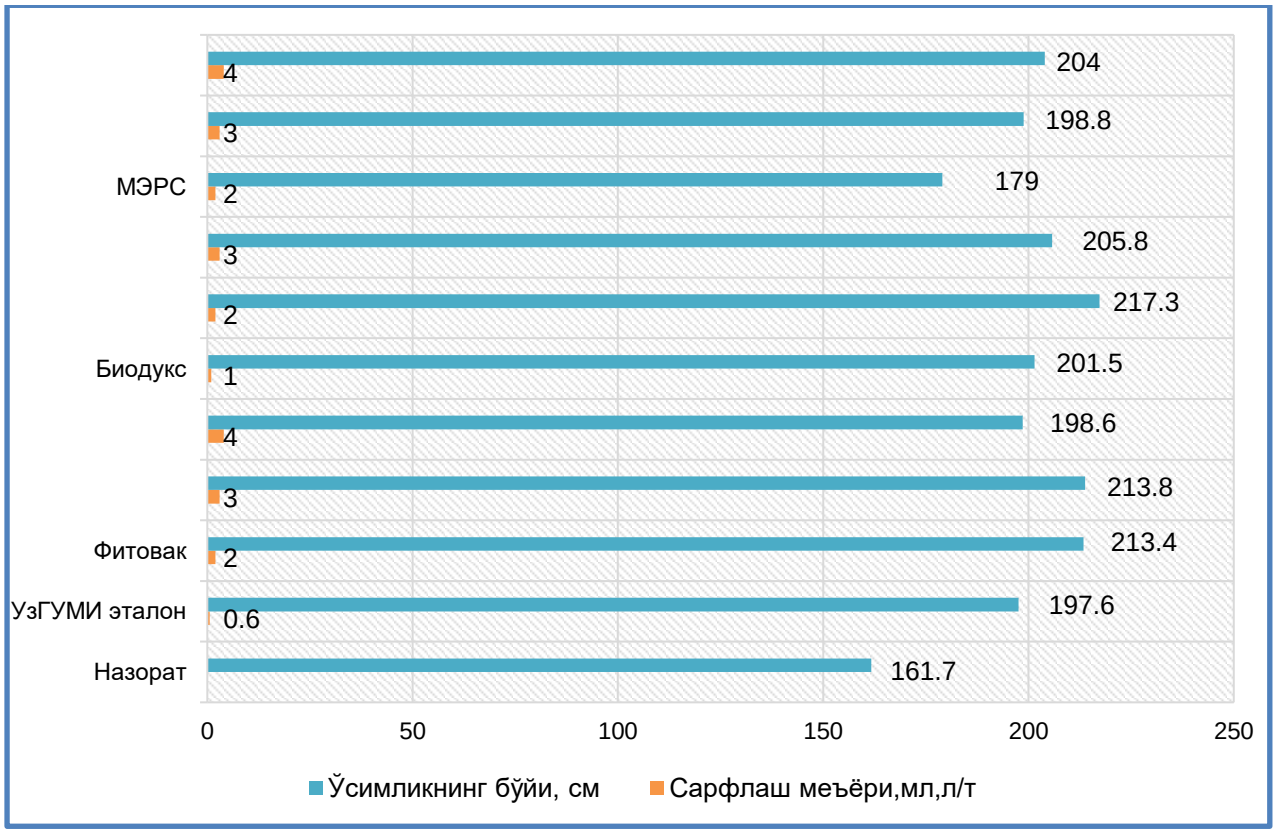

Figure 1. Effect of biostimulants on stem height of sunflower, grain

When UzGUMI biostimulant was applied to sunflower seeds at 0.6 l/ton, the average height of the plant was 197.6 cm, and the biostimulant had a positive effect on the growth of the plant stem, making it 35.9 cm taller than the control option. In the variant where Fitovak immunostimulant was applied to the seed in the amount of 300 ml/ton, the height of the plant was found to be 213.8 cm, and it was 52.1 cm higher than the control and 16.2 cm higher than the standard UzGUMI. In the variant where Fitovak immunostimulant was used in the amount of 200 ml/ton per seed, it was observed that the height of the plant grew at the same height (213.4 cm) as in the variant where the quantity of 300 ml/ton was used in the seed, but increasing the rate of the immunostimulant to 400 ml/ton per seed showed a decrease in the effect on the growth of the plant stem, and the stem height increased by 15.2 cm compared to the second option and 14.8 cm compared to the first option. The use of Fitovak immunostimulant made it possible to increase the height of stems by 51.7 cm compared to the first option, 52.1 compared to the second option, and 36.9 cm compared to the third option compared to the control option. 39.8 cm higher than the control and 3.7 cm higher than the UzGUMI standard in the case of applying Biodux biostimulant at 1.0 ml/ton of seeds, 55.6 cm higher than the control and 19.7 cm higher than the UzGUMI standard in

the case of applying 2.0 ml/ton of seeds /ton of seed was found to be 44.1 cm higher than the control and 8.2 cm higher than the UzGUMI benchmark. It was found that the height of the plant was 204.0 cm in the variant where MERS microfertilizer was applied at 4.0 ml/ton, and the stems grew shorter (198.9 and 179.0 cm) when the application rate of microfertilizer was reduced. If increasing the rate of MERS microfertilizer led to the growth of plant stem, on the contrary, it was found that increasing the rate of biostimulants in Bioduks and Fitovak biostimulants had a negative effect on plant height growth. One basket develops in oilseed sunflower, in the experiment, the formed complete seeds in one basket were counted in the experimental plants and the following were found (Figure 2).

In the control variant, the total number of complete seeds in one basket was 956.6 units. It was determined that UzGUMI produced 298.0 more seeds on average compared to the control. The variant using MERS microfertilizer at 2.0 ml/t yielded an average of 1387.0 seeds from one basket, and it was distinguished by the production of more seeds than all the variants studied in the experiment. The use of biostimulants, especially MERS microfertilizer and Fitovak immunostimulant (1344.6 units), was found to have a positive effect on the increase in the number of seeds in the basket.

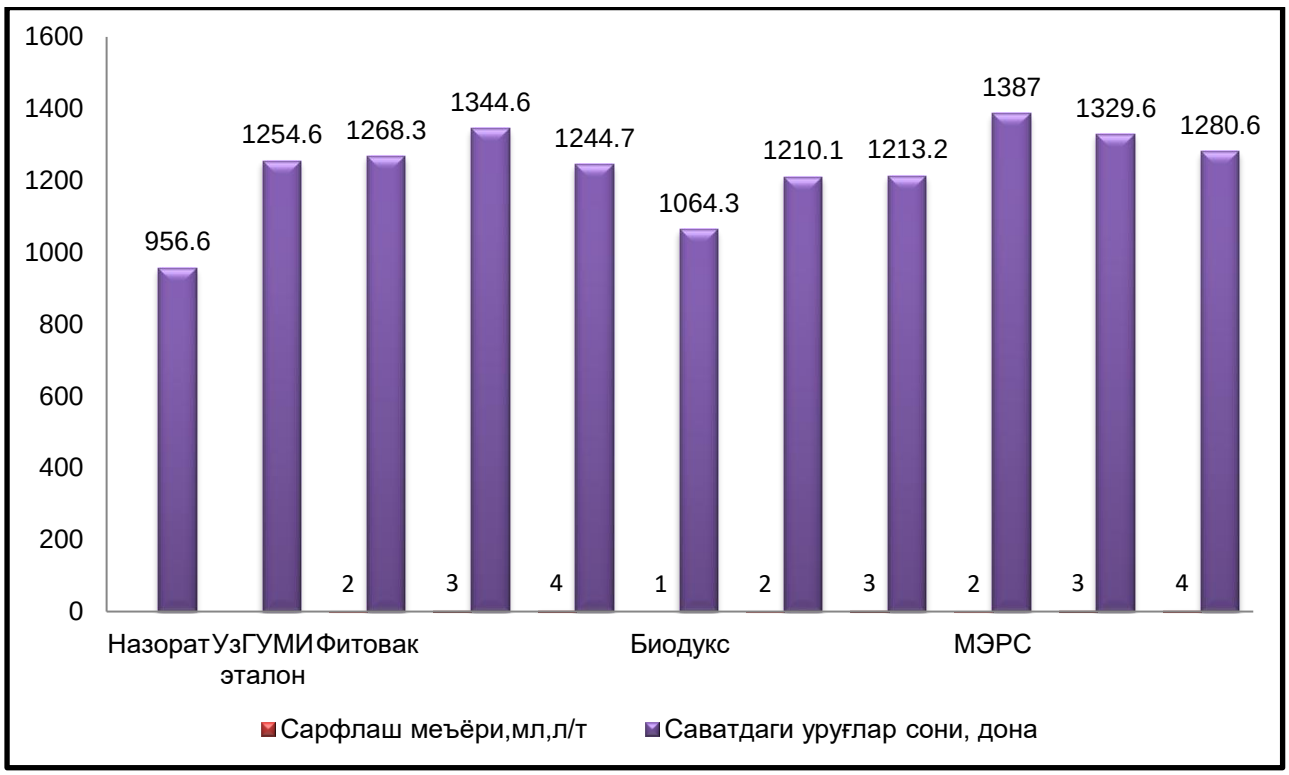

Figure 2. The effect of different rates of biostimulants on the number of seeds in the sunflower basket, pcs

The amount of seeds in one basket was 430.4 more than the control, and 132.4 more than the UzGUMI standard in the case of MERS microfertilizer 2.0 ml/t. Among the options that used biostimulants, the option that formed the least seeds was observed in the option that used Biodux biostimulant at the rate of 1.0 ml/t (1064.3 units). In this variant, compared to the control, 107.7 seeds were formed and UzGUMI formed 190.3.7 seeds less than the standard.

It was found that the productivity of one plant was positively affected by the use of biostimulants in different rates, especially when MERS microfertilizer was used from biostimulants, a high yield was achieved. This microfertilizer is applied at the rate of 2.0 ml/ton of seed and 144.2 grams, 3.0 ml/t during the growing season. 140.9 grams and 4.0 ml/t when used. 124.9 grams were obtained when used.

Table 1. The effect of biostimulants on the productivity of one plant and the weight of 1000 seeds.

Options	Consumption rate ml,l/t (factor V)	Productivity of one plant, gram	1000 seed weight, grams
Sample	-	94,8	87.9
UZGUMI (benchmark)	0,6l/t	112,9	97.5
Microbiofertilizer MERS	2,0 l/t	144,2	107,5
	3,0 l/t	140,9	95,6
	4,0 l/t	124,9	89,4
Biostimulant Biodux	1,0 ml/t	119,6	106,3
	2,0 ml/t	119,0	104,6
	3,0 ml/t	131,0	93,8
Иммуностимулятор Фитовак	200 ml/t	143,6	99,6
	300 ml/t	126,0	100,5
	400 ml/t	126,0	91,3

This means an additional yield of 49.4, 46.1 and 30.1 grams per plant, respectively, compared to the control. 31.3, 28.0 and 12.0 grams of additional yield was obtained in comparison with UzGUMI standard. The yield obtained from one plant when using the biostimulant Biodux. In the experiment, it was found that the yield was less than the variants using other biostimulants. 1000 seed weight was found to be heavier in the variant using MERS microfertilizer compared to other biostimulants used in the experiment. In this case, in the variant used in the amount of 2.0 ml/t, compared to the control, UzGUMI was heavier by 10.0 grams compared to the standard. When Fitovak immunostimulant was used, the results were similar to the options where MERS myrobiofertilizer was used and 300 ml/t. in the used option, it was determined that the weight of 1000 seeds was 100.5 grams. Applying Biodux biostimulant at 1.0 ml/ton of seed resulted in 106.3 grams per 1000 seeds, while

increasing application rates indicated that the seeds could be relatively light. The lightest weight of 1000 seeds was observed in the control variant (87.9 grams) (Table 1).

CONCLUSION

It was found that the growth substances contained in various biostimulants have a positive effect on the growth, development and yield of the local sunflower variety Dilbar.

It led to an increase in the number of seeds in one basket, and the application of microfertilizer, immunostimulator and biostimulants depending on the type had a positive effect on the increase in the number of seeds in the basket, compared to the control, the number of seeds in one basket increased from 42.4 to 107.7, and these seeds were distinguished by the formation of more seeds and the fact that these seeds were large and whole. stood up Based on this, it was proved that the weight of 1000 seeds is higher than 100.5-107.5 grams.

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