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Influence of Growth Stimulant Uzgumi on Soybean Yield When Re-Sowing in the Southern of Uzbekistan

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Abstract: In the conditions of Surkhandarya region, the use of the growth stimulator Uzgumi for obtaining a high-quality yield of the repeated crop of soybean variety Nafis was studied. When using the growth stimulator Uzgumi, it is recommended (seed treatment at a rate of 0.6 l/t-1; spraying plants in the phase of 3-5 leaves 0.2 l/ga-1, budding 0.3 l/ga-1, flowering 0.4 l/ga-1 .

The yield of soybeans in the control variant - without treatment - was 1.71 t/ha-1. The maximum yield was noted in the variants with treatment with the growth stimulator Uzgumi (seed treatment at a rate of 0.6 l/t-1; spraying of plants in the phase of 3-5 leaves 0.2 l/ha-1, budding 0.3 l/ha-1, flowering 0.4 l/ha) and amounted to 2.11 t/ha-1, respectively, which is 0.40 t/ha-1 higher than the control variant.

Keywords: soybeans, processing, application, 3-5 leaves, Uzgumi, stimulator, germination, growth, development, yield.

In Uzbekistan, soybean and other crops as secondary crops are an important area that can be used in the rotation system of cotton and wheat. In Uzbekistan, soybeans can be sown as a second crop after harvesting winter wheat and will yield 2.0-3.0 t/ha^{-1}. However, due to unfavorable weather conditions, the changing climate is characterized by uneven rainfall, cold winters and dry summers, which negatively affects the yield, it is not always possible to achieve the expected results from sowing wheat.

The refore, obtaining an early and high yield of repeated crops after winter wheat remains an urgent problem. To obtain an early and high yield from repeated sunflower crops, it is necessary to use special agrotechnical measures. To achieve positive results after winter wheat It is important to use growth regulators in different crops.

Research by Sh.Kh. Abdualimova and K.M. Tadjiev showed that the use of stimulants Uzgumi and Masuda increases the yield of soybean seeds by 3.1-4.0 t/ha^{-1} compared to the control [1].

K.M.Tadjiev [7. –P.35-38] Processing of sunflower seeds and subsequent spraying during vegetation of plants with a growth regulator Humimax has a stimulating effect on plant growth, and the effect on yield showed a positive effect compared to the control.

The aim of the research: To study the effectiveness of the stimulant Uzgumi on soybean crops in the southern zone of the Surkhandarya region.

Research methodology. The experiments were conducted on takyr-meadow soil of the Surkhandarya scientific experimental station located in the southern zone of the Surkhandarya region of the Termez district.

The object of the research is the mid-early soybean variety Nafis. The area of the plot is 24 m^2. heat. repeated four times. Seeds were sown to a depth of 3-4 cm, seeding rate 70.0 kg/ha^{-1}. Seeds were treated with growth regulators on the day of sowing. Plants were treated using a manual sprayer AIDA.

The experiments were carried out in accordance with the recommendations of “Dala tazribalari utkazish uslublari” (UzPITI Tashkent, 2007) [2], “Methodology of field experiments with cotton” (1981) [5]. treated with the growth stimulator Uzgumi. Treatment of soybean seeds with the growth stimulator Uzgumi had a significant effect on their germination. Methods of agrochemical, agrophysical and microbiological research in irrigated cotton regions (2005) [6], when using chemicals “Brief methodological guidelines for conducting state tests of plant growth regulators” (1984) [4], “Methodological guidelines for testing insecticides, ascaricides, biologically active substances and fungicides” [7].

For the agrotechnical characteristics of the soil, the humus content was determined by the Tyurin method, total nitrogen, phosphorus in one sample by combustion according to K.E. Ginzburg, M. Shcheglova and E.K. Vulfius, the nitrate nitrogen content by the ionometric method, mobile phosphorus according to B.P.Machigin and exchangeable potassium according to Protasov on a flame photometer. Statistical processing of experimental data was carried out according to the method of B.A. Dospekhov [3].

Research results. Experimental studies were conducted on experimental plots on takyr-meadow soil of the Surkhandarya scientific experimental station located in the southern zone of the Surkhandarya region of the Termez district.

The aim of the research: To study the effectiveness of the stimulant Uzgumi on soybean crops in the southern zone of the Surkhandarya region. The main climatic factors determining the possibility of re-seeding are the duration of the warm period, the amount of precipitation, temperature, and illumination after harvesting grain crops. These factors are closely related to the maturity, yield, and quality of the above crops.

In the southern regions of the country, after harvesting grain, there will be 130-140 frost-free days. The sum of positive temperatures for plants during this period is 2400-3200°C, which is even more than half of the annual reserves heat

In our field studies, soybean seeds treated with the growth stimulator Uzgumi. Treatment of soybean seeds with the growth stimulator Uzgumi had a significant effect on their germination.

Field germination is the percentage ratio of the amount full germination to the number of seeds sown in the field.

In 2017-2019, field studies were conducted on treatment of seeds of the Nafis soybean variety with the growth stimulator Uzgumi.

Field germination of seeds under control without chemical treatment amounted to 60.7%.

The seedlings were higher in all variants with treatment with growth stimulants compared to the control. It was the highest in variants with treatment with the growth stimulant Uzgumi at rates of 0.6-0.7 l/t^{-1} where it was 66.8-67.5%, which is 6.1-6.8% higher than the control variant.

A fairly high result of 67.5% was noted in crops treated with growth stimulator Uzgumi at a rate of 0.6 l/t^{-1}.

Seed treatment with the growth stimulator Uzgumi 0.6 l/t^{-1} provides the emergence of friendly soybean shoots 2-3 days earlier than in the control.

In our research, observations of plant growth and development were carried out on August 1, September 1, and October 1: the height of the plants was measured, the number of leaves was counted, and the effect of growth regulators on the magnitude of these indicators was studied.

The use of the studied preparations had a positive effect on the growth of soyaben plants (Table 1).

On August 1, September 1 and October 1, in all variants with the use of preparations, soybean plants were taller than in variants without treatment. Moreover, the maximum values were noted in variants with treatment with growth stimulants Uzgumi seed treatment at a rate of 0.6 l/t^{-1}; spraying of plants in the phase of 3-5 leaves 0.2 l/ha^{-1}, budding 0.3 l/ha^{-1}, flowering 0.4 l/ha^{-1}.

As of October 1, a positive trend was observed. All variants with the use of Uzgumi growth stimulants showed a significant increase in growth. Thus, the maximum height of soybean plants was achieved in the Uzgumi variants The seedlings were higher in all variants with treatment with growth stimulants compared to the control. It was the highest in variants with treatment with the growth stimulant Uzgumi at rates of 0.6-0.7 l/t^{-1} where it was 66.8-67.5%, which is 6.1-6.8% higher than the control variant. (seed treatment at a rate of 0.6 l/t^{-1}; spraying plants in the phase of 3-5 leaves 0.2 l/ha, budding 0.3 l/ha^{-1}, flowering 0.4 l/ha^{-1}), where it was 57.7 cm, respectively. Whereas, in the control, the growth was 53.2 cm, which is 4.5 cm below.

When using the Uzgumi stimulant (seed treatment at a rate of 0.7 l/t^{-1}; spraying plants in the 3-5 leaf phase at 0.2 l/ha^{-1}, budding at 0.3 l/ha^{-1}, flowering at 0.4 l/ha^{-1}), the height of soybean plants reached 57.4 cm, which is 4.2 cm higher than the untreated variant. In 2017-2019, field studies were conducted on the emergence of friendly soybean shoots 2-3 days earlier than in the control.

When using the Uzgumi stimulant (seed treatment at a rate of 0.6-0.7 l/t^{-1}) spraying plants in the phase of 3-5 leaves 0.2 l/ha^{-1}, budding 0.3 l/ha^{-1}) the height of soybean plants reached 56.6-56.8 cm, which is 3.4-3.6 cm higher than the variant without treatment.

Based on the data obtained, it can be concluded that the use of Uzgumi growth stimulants (seed treatment at a rate of 0.6 l/t^{-1}; spraying plants in the phase of 3-5 leaves 0.2 l/ha^{-1}, budding 0.3 l/ha^{-1}, flowering 0.4 l/ha^{-1}) has a stimulating effect on the growth of soybean plants.

It is important to note that it was not only the use of drugs that had an impact, but also the type of drug itself and its concentration.

Based on the results of our research, it was established that the treatment of sunflower seeds and plants with growth stimulants led to a significant activation of growth and reproductive processes, resulting in a significant increase in yield compared to the control variant.

On average, over the years of research (2017-2019), the highest yield of soybean seeds was formed in variants with pre-sowing seed treatment and treatment of both seeds and vegetative plants with the Uzgumi stimulant.

The soybean yield in the control variant without treatment was 1.71 t/ha^{-1}.

The maximum yield was noted in the variants with the use of the growth stimulator Uzgumi seed treatment at a rate of 0.6 l/t^{-1}; spraying of plants in the phase of 3-5 leaves 0.2 l/ha^{-1}, budding 0.3

l/ha^{-1}, flowering 0.4 l/ha^{-1}, where it amounted to 2.11 t/ha^{-1}, higher than the control variant (1.71 t/ha^{-1}), which is 0.40 t/ha^{-1}.

Application of the growth stimulator Uzgumi, seed treatment at a rate of 0.7 l/t^{-1}; spraying of plants in the phase of 3-5 leaves 0.2 l/ha^{-1}, budding 0.3 l/ha^{-1}, flowering 0.4 l/ha^{-1}, where they amounted to 2.06 t/ha^{-1}, higher than the control variant by 0.34 t/ha^{-1}.

Table. Soybean harvest

№	Options	Seed treatment, l/t	Application in vegetation, l/ha^{-1}			grain yield, t/ ha^{-1}
			3-5 leaves	budding	flowering	
1	Control	-	-	-	-	1,71
2	Uzgumi	0,6	0,2	0,3	0,4	2,11
3	Uzgumi	0,6	0,2	0,3	-	2,01
4	Uzgumi	0,7	0,2	0,3	0,4	2,06
5	Uzgumi	0,7	0,2	0,3	-	2,04

Application of growth stimulator Uzgumi seed treatment at a rate of 0.6-0.7 l/t^{-1}; spraying of plants in the phase of 3-5 leaves 0.2 l/ha^{-1}, budding 0.3 l/ha^{-1}, where they amounted to 2.01-2.04 t/ha^{-1}, respectively, higher than the control variant by 0.30-0.33 t/ha^{-1}.

The use of plant growth stimulating agents had a positive effect on the yield of soybean plants.

Conclusions. Treatment of soybean seeds and subsequent spraying during the growing season of plants with the growth regulator Uzgumi has a stimulating effect effect on plant growth and the impact on yield showed a positive effect compared to the control.

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