THE INFLUENCE OF GROWTH STIMULANTS ON GROWTH, DEVELOPMENT AND PRODUCTIVITY OF SOYBEANS DURING RE-SOWING IN SOUTHERN UZBEKISTAN

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Annotation

In the conditions of the Surkhandarya region, the use of growth stimulants Uzgumi and Massuda to obtain an early and high yield of repeated culture of soybean varieties Nafiswas studied. When using the Uzgumi growth stimulator, it is recommended (seed treatment at a rate of 0.6 l / t; spraying plants in a phase of 3-5 leaves 0.2 l / ha, budding 0.3 l / ha and flowering 0.4 l / ha) and the use of the Masuda stimulator, seed treatment at a rate of 3.0 l / t; and spraying plants in a phase of 3-5 leaves of 6.0 l / ha; during budding, 9.0 l / ha) had a positive effect on yield.

Key words:

Soybean, stimulant, Uzgumi, Masuda, seed and plant treatment, seedlings, growth and development, productivity.

Introduction

In Uzbekistan, the cultivation of legumes and other crops as a second crop is an important area that can be used in the rotation system of cotton and wheat. They serve, first of all, to maintain and improve soil fertility, and secondly, to provide the population with protein-rich food and valuable livestock feed. In Uzbekistan, legumes and soybeans can be sown in the second crop after harvesting winter wheat and produce 1.5–2 t / ha.

However, due to adverse weather conditions: a changing climate is characterized by an uneven rainfall, cold winters and dry summers, which negatively affects crop yields and it is not always possible to achieve the expected results from sowing wheat.

Therefore, obtaining early and high yields of second crops after winter wheat remains an urgent problem. To obtain an early and high yield of soybean crops, special agrotechnical measures must be used. To achieve positive results after winter wheat, it is important to use growth regulators in different crops.

However, the technology of using growth stimulants to obtain an early and high crop of soybean re-culture on takyr-meadow soils of the Surkhandarya region is not well understood.

However, the technology of using growth stimulants to obtain a high-quality crop of repeated soybean crops on the takyr-meadow soil of Surkhandarya is not well understood.

The development of scientific theories and theoretical foundations for the use of physiologically active growth regulators, before sowing and during the growing season, is important for creating a scientific basis for improving soybean cultivation after winter wheat.

However, the influence of enzymatic activity, the activity of phytohormones, physiological processes, biochemical reactions on the soybean crop after winter wheat has not been sufficiently studied.

The use of growth stimulants in soybeans as a re-crop is relevant for agricultural production in southern Uzbekistan. Soy is considered the best precursor to many crops and a source of vegetable oil.

Growth stimulators comprehensively affect the physiological and biochemical processes that occur in the plant. The manifestation of their action in extremely small concentrations allows them to be widely used in the practice of agricultural production, and now their use is of particular relevance [6].

The growth regulators of the new generation have a triple effect on plants: stimulation of physiological processes, increase of the plant's own resistance to the action of adverse factors and strengthening of non-specific immunity [3, 12, 7].

The use of stimulants for the development of crops makes it possible in some cases to reduce the amount of applied mineral fertilizers and pesticides, which affects the quality of products [2].

Growth regulators - organic compounds of a type other than nutrients, stimulate or inhibit plant growth. Growth regulators include both natural growth substances and chemical growth preparations used in the processing of crops [8, 4].

It has been established that the use of growth substances increases the activity of enzymes and the biosynthesis of nucleic acids and proteins, accelerates seed germination, and intensively develops the root system [1].

Research Methodology

The experiments were carried out on the takyr-meadow soil of the Surkhandarya experimental station Reserart institute of selection, seed production and agrotechnologies of cotton growing located in the southern zone of the Surkhandarya region of Termez district. The soil is non-saline, the content of humus at a depth of 0-30 cm in the soil was 0.669-0.597%, total nitrogen 0.059-0.054%, phosphorus 0.124-0.100%, exchange potassium 125-125 mg / kg, the occurrence of groundwater at a depth of 1.5-2 , 0 m, heavy loam in terms of mechanical composition (Tabl. 1).

Table. 1

Agrochemical properties of the soil after winter wheat

№	Soil layer, cm	Nutrients in general, %			Mobile nutrients, mg / kg		
		humus	Nitrogen	phosphorus	nitrate	phosphorus	potassium
1	0-30	0,669	0,059	0,124	1,925	13,8	125
2	30-50	0,597	0,054	0,100	1,55	12,0	125

The object of research is the mid-season soybean variety Nafis. The area of the accounting plot is 24 m^2, the repetition is fourfold. Sowing seeds was carried out to a depth of 3-4 cm, the seeding rate of 70.0 kg / ha Seed treatment with growth regulators was performed on the day of sowing. The plants were treated using an AIDA hand sprayer.

The experiments were laid according to the methodology of Uzbek Scientific Research Institute of Cotton (2007), “Methods of agrochemical, agrophysical and microbiological studies in irrigated cotton areas” (1963), using chemical preparations “Brief guidelines for conducting state tests of plant growth regulators” (1984), “Methodological guidelines for testing of insecticides, ascaricides, biologically active substances and fungicides ”(1994).

For the agrotechnical characteristics of the soil, the humus content was determined by the Tyurin method, total nitrogen, phosphorus in one sample by burning according to K.E. Ginzburg, M. Shcheglova and E.K. Wulfius, the content of nitrate nitrogen by the ionometric method, mobile phosphorus according to B.P. Machigin and exchange potassium according to Protasov on a flame photometer. Statistical processing of experimental data was carried out according to the method of B.A. Dospekhov (1985).

Research results and discussion

To obtain high yields of legumes, pre-sowing preparation of seed material is necessary in order to increase their germination and other sowing qualities, reduce seed infection, and accelerate growth.

One of the most promising methods for pre-sowing seed treatment is the treatment of seeds with various physiological active substances, growth regulators and other compounds that affect the growth of seedlings and increase its resistance to adverse environmental conditions and various pathogens.

In 2017-2019, field studies were conducted on the treatment of seeds of soybean varieties Nafis with Uzgumi and Massuda stimulators.

On the options with treatment with stimulants Uzgumi and Matsuda, seed germination increased.

Field germination of seeds in the control without chemical treatment was 60.7%.

Seedlings were higher in all variants treated with growth stimulants compared with the control. It was greatest in the variants when treated with the Uzgumi preparation in the norms of 0.6-0.7 l / t, where it was 67.5-66.8%, which is 6.8-6.1% higher than the control variant. When using the drug Matsuda in standards 2.0; 3.0; 4.0 l / t, seedlings were higher by 4.2; 5.2 and 3.8%, in comparison with the control.

A rather high result of 67.5% was observed in crops treated with Uzgumi stimulants at a rate of 0.6 l / t.

The seed dressing with a Uzgumi stimulator of 0.6 l / t ensures the emergence of friendly soybean seedlings 2-3 days earlier than in the control.

The formation of highly productive crops of crops and, in particular, soybeans, requires the regulation of numerous factors that determine the growth and differentiation of various vegetative and generative organs.

Plant growth and development is a physiological process that combines and reflects almost all aspects of the vital activity of a plant organism.

The growth and development of plants mainly depends on the characteristics of the variety and the soil and climatic conditions of cultivation.

In our studies, we observed the growth and development of plants on August 1, September 1, September 1, October: the height of the plants was measured, the number of branches, leaves and beans was calculated, and the influence of growth regulators on the value of these indicators was studied (Drawing-1).

The use of the studied drugs had a positive effect on the growth of soy plants.

On August 1, September 1 and October 1, on all variants with the use of drugs, soy plants were taller than on the variants without treatment. Moreover, the maximum values were noted on the variants with the treatment of Uzgumi growth regulators (seed treatment at a rate of 0.6 l / t; spraying the plant in a phase of 3-5 leaves 0.2 l / ha, in budding 0.3 l / ha, and in bloom 0.4 l / ha), and in the case of seed treatment with a Matsuda stimulator with a norm of 3.0 l / t and spraying in the phase of 3-5 leaves 6.0 l / ha, and in budding 9.0 l / ha.

On October 1, a positive trend was observed. All options with the use of growth stimulants Uzgumi showed a significant increase in growth. So, the maximum height of the soybean plant was achieved on the Uzgumi variants (seed treatment at a rate of 0.6 l / t; spraying the plant in a phase of 3-5 leaves 0.2 l / ha, in budding 0.3 l / ha, and in flowering 0, 4 l / ha), where it was 57.7 cm, respectively. Whereas, in the control the growth was 55.2 cm, which is 2.5 cm lower.

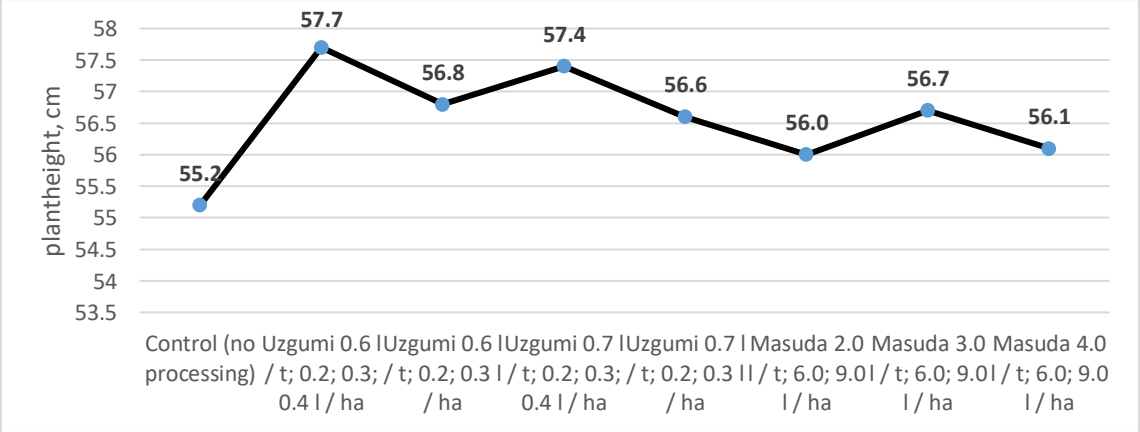
When using the Uzgumi stimulator (seed treatment at a rate of 0.6 l / t; spraying the plant in a phase of 3-5 leaves 0.2 l / ha, budding 0.3 l / ha), the height of soybean plants reached 56.8 cm, which is higher version without processing 1.6 cm.

When using the Uzgumi stimulator (seed treatment 0.7 l / t; spraying the plant in a phase of 3-5 leaves 0.2 l / ha, budding 0.3 l / ha, and flowering 0.4 l / ha) plant height soybean reached 57.4 cm, which is 2.2 cm higher than the version without processing.

When using the Uzgumi stimulator (seed treatment 0.7 l / t; spraying the plant in a phase of 3-5 leaves 0.2 l / ha, budding 0.3 l / ha), the height of soybean plants reached 56.6 cm, which is higher than the option 1.4 cm without treatment

Drawing-1

The influence of the growth stimulator Uzgumi and Matsuda on the growth and development of soy



When used with the drug Masuda (seed treatment with norms of 2.0; 3.0; 4.0 l / t; spraying the plant in the phase of 3-5 leaves 6.0 l / ha, budding 9.0 l / ha) plant height soybeans reached 56.0; 56.7; 56.1 cm, which is 0.8 higher than the untreated option; 1.5; 0.9 cm

Based on the data obtained, it can be concluded that the use of Uzgumi preparations (seed treatment at a rate of 0.6 l / t; spraying the plant in the phase of 3-5 leaves 0.2 l / ha, in budding 0.3 l / ha, and in bloom 0.4 l / ha) has a stimulating effect on the growth of soybean plants. Moreover, it is important to note that the effect was not only the use of drugs, but also the type of drug and its concentration.

Our studies have found that soybean seed treatment with growth regulators before sowing, in the phases of 3-5 leaves, in budding and flowering had a positive effect on growth, development and yield.

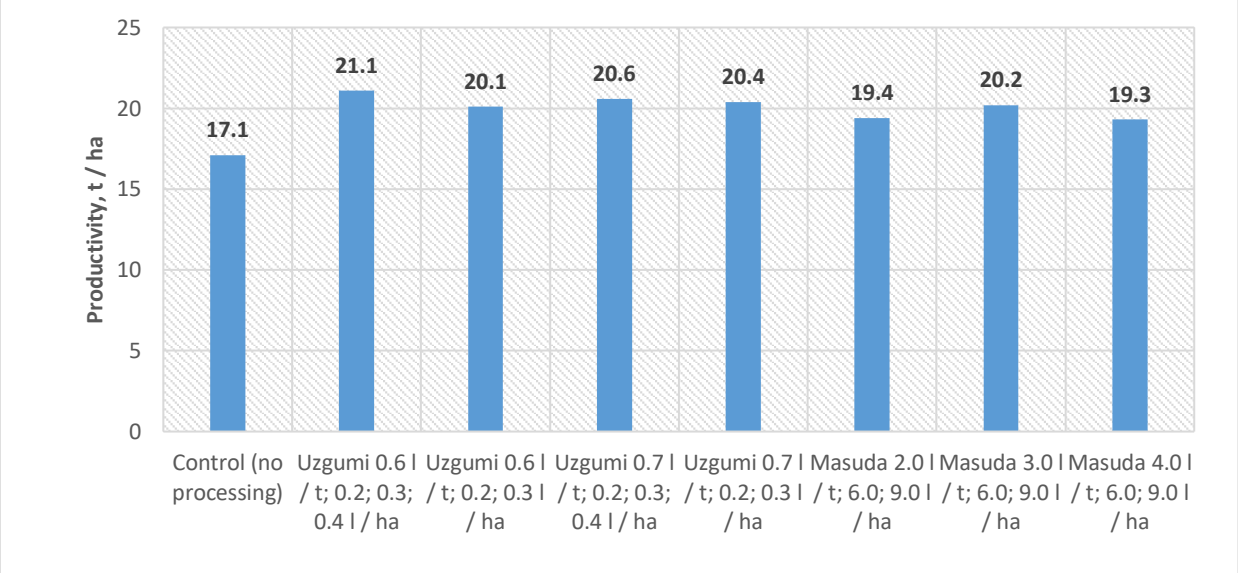
Currently, to increase productivity, great importance is attached to new methods of pre-sowing seed treatment with physiologically active substances, which contribute to increasing yield and seed quality, are distinguished by environmental safety, manufacturability and economy.

Presowing seed treatment and spraying of vegetative plants are the most promising methods of using growth regulators.

On average (for 3 years), soybean yield in the control variant without treatment was 17.1 c / ha. The maximum yield was observed on the options when used with the Uzgumi preparation (seed treatment at a rate of 0.6 l / t; spraying the plant in a phase of 3-5 leaves 0.2 l / ha, in budding 0.3 l / ha, and in flowering 0,4 l / ha) amounted to 21.1 kg / ha, which is 4.0 kg / ha higher than the control option (Drawing-2).

Drawing-2

The influence of the growth stimulator Uzgumi and Masuda on the productivity of soybean seeds



When using Uzgumi (seed treatment at a rate of 0.6 l / t; spraying the plant in a phase of 3-5 leaves 0.2 l / ha, budding 0.3 l / ha), the grain yield was 20.1 c / ha, which 2.9 kg / ha above the untreated option.

When using Uzgumi (seed treatment at a rate of 0.7 l / t; spraying a plant in a phase of 3-5 leaves 0.2 l / ha, budding 0.3 l / ha, and flowering 0.4 l / ha) was 20.6 t / ha, which is 3.5 t / ha higher than the control option.

With the use of Uzgumi (seed treatment at a rate of 0.7 l / t; spraying the plant in a phase of 3-5 leaves 0.2 l / ha, budding 0.3 l / ha), the grain yield was 20.4 c / ha, which 3.2 kg / ha above the untreated option.

When used with the drug Masuda (seed treatment before sowing with the norms of 2.0; 3.0; 4.0 l / t; spraying the plant in the phase of 3-5 leaves 6.0; 6.0; 6.0 l / ha, and in budding 9.0; 9.0; 9.0 l / ha) the grain yield was 19.4; 20.2 and 19.3 kg / ha, which is higher than the version without treatment, respectively, by 2.3; 3.1; 2.2 c / ha.

Conclusion

It should be noted that the treatment of soybean seeds with growth stimulants before sowing, in phases of 3-5 leaves, budding and flowering had a positive impact on the yield and quality of the grown products.

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