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EFFECT OF BIOSTIMULATOR NORMS ON GROWTH AND DEVELOPMENT OF “SADAF” VARIETY OF SESAME

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ABSTRACT

In this article, various measures of biostimulants Tandem, Immunoactive biostimulants were applied to increase the biomass of Sadaf variety of sesame, and Fitovak biostimulant was studied as a standard for these biostimulants. Application of Tandem biostimulator 0,3 l/ha, Immunoactive 35 ml/ha and Fitovak (standard) 300 ml/ha has been proven to increase plant biomass. Immunoactive biostimulant has been found to have a positive effect on the growth and development of sesame.

KEYWORDS

Sesame, biostimulant, norm, biomass, stem, leaf, bud, flower, standard, oil, crops.

INTRODUCTION

Sesame around the world today 3840 tons of products are grown annually on more than 78,5 million hectares of land in the world, and the average yield is 4,9 c/ha. Birma (4,9 c/ha), India (3,4 c/ha), China (10,2 c/ha), Burkina Faso (7,2 c/ha), Niger (5,0 c/ha) and Somalia (9,4 c/ha) took place are among the top 10 countries

that grow sesame in the world, and the highest yield was observed in China. In the last 5 years, the price of one ton of sesame seeds has risen sharply from 800 US dollars to 1800 US dollars in the world markets. The main reason for this is the prolonged drought in the



African sesame-growing countries for the last 5-7 years [5].

The extensive works carried out in the field of wheat and grain crops in our republic should also be reflected in oilseed crops. However, the role of oil crops in meeting the demand for quality vegetable oil of the population of the republic is incomparable. Until the years of independence, oilseeds were cultivated only in small areas and were mainly used for natural crops and partly for livestock fodder, but now oilseeds are included in the country's food program, and attention has been paid to them. The creation of new selective varieties of these crops that are productive, quick-ripening, high-quality, resistant to various abiotic and biotic factors and adapted to the different soil and climate conditions of our republic, mechanization and automation of their processing, and carrying out in-depth research, taking into account the achievements of modern science, is one of the urgent issues [6].

Increasing the yield of food crops by 1,5-2,0 times to provide the population with food, clothing and health, using radically new methods of technical crop care, and introducing technologies that keep the environment clean are the one of the urgent tasks of among it today.

According to information, sesame fields have a significant place among oil crops and are mainly cultivated in India, China, Burma, Pakistan, African countries, southern regions of Europe and Mexico. Cultivated area of this plant is 7 mln.hectares, occupying 4% of the area of oil crops and 2,5 mln.tons of sesame seeds are harvested, the average yield is 0,4 c/ha. The value of sesame oil is that it contains 35-39% of the most useful oleic acid and up to 47% of unsaturated linoleic acid. Due to these substances, sesame oil is one of the most preferred raw materials in the confectionery industry and perfumery [7].

Solutions for injection and ointments used in application are obtained from high-quality sesame oils. Sesame oil, after pressing, contains 116 nutritional units of one of the protein feeds for livestock. The demand for sesame seeds is increasing worldwide, and India (46,4% of the total volume) and Myanmar (21,4%) are among the countries that export it. The amount of sesame seeds exported annually in the USA is 1,1 billion dollars or 605,4 thousand tons [1].

Uzbekistan occupies 19th place in the world in the export of sesame seeds, 3,5 thousand tons of seeds are sold annually to 2,8 million. Sells for US dollars, our sesame is grown mainly in dry areas. Sesame has been cultivated in the countries of Central Asia for a long time, and its oil is appreciated and consumed by ordinary people. In recent years, due to the lack of water, sesame fields have been expanded and planted as a main and repeated crop. According to the information of the Republic Oil Industry Association, sesame fields in farmers' fields are increasing year by year [2].

According to the latest information, due to the improvement of people's living conditions, the demand for sesame seeds and oil is also increasing, because now people are accustomed to a healthy lifestyle and a healthy diet. Depending on the color of sesame seeds, the market price is different, the purchase price of black seeds is more expensive, and white sesame seeds are sold cheaply because they are used only as a spice in the confectionery industry. Due to the fact that quality oil and raw materials for medicine are obtained from black sesame seeds, this seed is expensive in the market [3].

In particular, Ethiopian farmers managed to expand the sesame fields in recent years and are selling 370,000 tons of sesame seeds to the world market in

2022. In 2021, they produced 320,000 tons of seeds throughout the country [4].

METHODS

Scientific research work was conducted in 2023 in the fields of experimental scientific research and educational experimental farm of Tashkent State Agrarian University.

The soil of the experimental farm is a typical sierozem that has been irrigated for a long time. This soil contains about 0,715-0,920% humus, about 0,065-0,083% nitrogen, about 0,134-0,152% phosphorus and about 0,148-0,154% potassium. The mobile forms of nutrients in the experimental field are N-NO₃ 3,1-4,7 mg/kg, P₂O₅ 40,3-41,7 mg/kg and K₂O 140,0-180,7 mg/kg constitutes. The soil is not saline, and this soil differs in water permeability, softening complexity.

In the field experiment, the Sadaf variety of sesame was planted in 8 variants, four repetition. The area occupied by each option was 28 m², of which 14 m² was taken into account, and the total area occupied by the experiment was 0,10 ha. Fitovak (standard) 300 ml/t, Tandem 0,3, 0,4, 0,5 l/t, Immunoactive 25, 30, 35 ml/t on the seed before planting sesame and Fitovak (standard) 300, 400 ml/ha, Tandem 0,3, 0,5 l/ha, Immunoactive 30 and 40 ml/ha were used.

Based on the purposes and objectives of the experiments, phenological observations and calculations were made in the Sadaf variety of sesame.

RESULTS AND DISCUSSION

The effect of the rate of biostimulants on the increase of the biomass of the Sadaf variety of sesame was studied in each phase, and the following were determined. An increase in biomass was observed in

the variants treated with biostimulants compared to the control variant. In the second option, where Fitovak (standard) was used, the plant grew to a height of 80,1 cm, and the number of leaves was 40,5. Compared to the control option, the plant was 2,6 cm higher and the number of leaves was 2,3 more.

In the third variant, where Tandem biostimulator was used at 0,3 l/ha per hectare, it was observed that the plant height and the number of leaves were less compared to the control and Fitovak (standard) biostimulator, and it was found to be less than 3,9 units. It was found that the height of the plant and the number of leaves formed in the fourth and fifth options, where Tandem biostimulant was applied at 0,4 and 0,5 l/ha per hectare, were higher compared to the control and Fitovak (standard) biostimulant options. In these variants, the height of the plant was 81,4 and 81,7 cm, and the number of leaves was 42,6 and 41,7 pieces.

The application of immunoactive biostimulant was observed to have a positive effect on the development of sesame, and it was distinguished from other options studied in the experiment by having a high stem and a large number of leaves. When 25 ml/ha per hectare was applied in the budding phase, the height of the plant was 78,8 cm and the number of leaves was 42,7 pcs. Compared to the control, in the first option, where the Immunoactive biostimulator was used, the height of the plant increased by 1,3 cm and the number of leaves increased by 4,5 pieces, in the second option, where the rate of biostimulant was increased, it increased by 3,8 cm and 6,0 pieces, and in the third option, it increased by 5,2 cm and 9,3 pieces. Using immunoactive biostimulant Fitovak standard biostimulant was found to increase plant height by 1,2-2,6 cm and the number of leaves by 3,7-7,0 cm.

Table 1

The effect of different norms of biostimulants on the biomass growth of the Sadaf variety of sesame

Options	The name of biostimulants	Biostimulant spending norm, ml./ ha	Growth phases							
			budding		flowering		boll formation		ripening	
			plant height, cm	number of leaves, pcs	plant height, cm	number of leaves, pcs	plant height, cm	number of leaves, pcs	plant height, cm	number of leaves, pcs
1	Control	-	77,5	38,2	89,5	64,2	120,4	78,8	138,2	78
2	Fitovak (standard)	300,0	80,1	40,5	107,4	72,1	140,5	115,5	144,7	114
3	Tandem	0,3	74,9	36,6	109,6	60,6	145,4	102,8	161,9	100
4		0,4	81,4	42,6	113,9	73,9	146,8	98,7	163,7	97
5		0,5	81,7	41,7	109,4	72,4	147,8	100,1	169,4	100
6	Immunoactive	25,0	78,8	42,7	117,7	77,5	142,8	113,9	153,2	112
7		30,0	81,3	44,2	113,3	75,8	137,5	98,1	160,1	97
8		35,0	82,7	47,5	113,0	81,2	143,9	102,5	163,0	102

During the flowering and boll forming phase of sesame, the stems grew and the number of leaves increased accordingly. In the flowering phase, the control variant grew 89,5 cm, and the number of leaves was 64,2 pieces. In the second option, where the biostimulant Fitovak (standard) was used, the height of the plant was 107,4 cm, and the number of leaves

was 72,1 pieces. Compared to the control option, in the second option, where the Fitovak biostimulator was used, it was found that the plant stem grew 17,9 cm higher and the number of leaves was 7,9 more.

It was found that the height of the plant and the number of leaves in it were higher and more than the

other options in the experiment in the variant where the immunoactive biostimulant was applied at the norm of 35 ml/ha per hectare. The stem was 23,5 and 5,6 cm, and the number of leaves was 17,0 and 9,1 more than the control and standard variant.

It was observed that the height of the plants increased by 3,4-23,5 cm and the number of leaves increased by 23,7 pcs. In this phase, it was evident that the biostimulants used in the experiment had a positive effect on the increase of plant biomass, and Tandem biostimulant was applied at the norm of 0,5 l per hectare, it was determined that the height of the plant was 147,8 cm and the number of leaves were 100,1 more and compared to the control, the height of the plant was 27,4 cm and the number of leaves were 21,3 more.

At the end of the growing season, the stem growth of the sesame plant reached a high level, while the height of the sesame stem in the control variant was 132,8 cm, and the number of leaves in it was on average 78,0 pieces. The application of Fitovak (standard) biostimulant had a positive effect on the growth of the stem of the plant, which was 144,7 cm, and compared to the control option, the stem was 6,5 cm higher and 36,0 more leaves were formed. At the norm of 0,5 l/ha per hectare of Tandem biostimulant, the stem was 169,4 cm and the number of leaves on it was 100,0 pieces.

Increasing the application rate of Tandem biostimulant ensured the growth of sesame stem, but did not have a positive effect on the increase in the number of leaves. It was determined that Fitavak (standard) formed 4,0 units less than the variant.

The application of immunoactive biostimulant to sesame had a positive effect on the increase of stem height and number of leaves compared to control,

Fitavak (standard) and Tandem biostimulant variants. In the first and third options, where the immunoactive biostimulator was used, compared to the control, the height of the plant increased from 15,0 cm to 24,8 cm. It was found that the number of sesame leaves was 24,0 and 34,0 more than Fitavak (standard).

CONCLUSION

It was determined that the use of biostimulants has a positive effect on the increase of the biomass of the “Sadaf” variety of sesame, and it was observed that the Immunoactive biostimulant showed a higher rate than the Fitovak biostimulant, which was taken as a reference for biostimulants. The height of the stem and the number of leaves formed in each phase of sesame compared to control, Fitovak (standard) and all norms of Tandem biostimulators, a positive result was achieved in the option of using 35,0 liters of Immunoactive biostimulator per hectare.

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