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The Effect Of Biostimulants On Leaf Area Formation In Sesame Cultivars Sown As A Secondary Crop

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Abstract
In this article, 3 different rates of biostimulants were applied to the Qara Shahzoda and Sadaf varieties of sesame. Tandem 10% of the biostimulants used for the Qara Shahzoda variety was used at the rate of 0.5 l/t+0.8+1.0 l/ha, and Immunoactive biostimulants were used for the Sadaf variety at the rate of 35 ml/t+40+40 ml/ha. Leaf area of one plant was determined to be high and explained scientifically.
Keywords: sesame, cultivar, biostimulant, rate, leaf area, growth phases.

Introduction. In countries such as Sudan, India, Miami, Tanzania, Nigeria, and China, which are leading sesame producers in the world, each variety created by breeders has been thoroughly studied for its optimal planting dates, seedling thickness, mineral fertilizer application dates and rates, and irrigation requirements in each region, and today it produces 64.8 percent of the total seed yield produced in the world. In order to meet the world's demand for high-quality sesame oil at a constant rate throughout the ear, it is of great importance to create new generations of varieties and develop high-yield agricultural technologies in the context of global climate change.

Despite the fact that almost 7 million hectares of oilseeds are planted, the demand for vegetable oil is high. Because, according to the physiological diet, 13.5 kg of vegetable oil is needed per person per ear, in reality, only 9 kg of vegetable oil is produced per person [6].

The homeland of origin is Africa and Central Asia, which are short-day countries by their biological characteristics. Planting sesame in the north leads to flowering and unripe seeds. In China, India and African countries, sesame leaves are used as a food product. Sesame seeds are considered one of the main raw materials in food, baking, bread and confectionery products, in the production of printing inks, black paper, ink, and various halva [2].

Sesame kernels are rich in protein and are used in the preparation of protein-rich feeds for livestock. According to FAO reports, based on analyses conducted in Egypt, sesame can be grown in the newly developed sandy areas of the world at the right time to obtain high yields [1].

T.N. Narzuloev considers sesame to be an aboriginal oilseed crop that has been cultivated in the Zarafshan Valley since ancient times. He writes that there are several varieties of sesame in the Zarafshan Valley. He proves that Turkestan, Tajik, and Afghan ecotypes are common in this region. He notes that sesame was cultivated in Southern Ukraine due to the increased demand for oilseeds after World War II [4].

According to E.N. Ivanenko, the development period of the studied sesame varieties, plant characteristics, oil content, and yield differ from each other. While varieties imported from the northern regions ripen very early, sesame imported from Syria and Egypt have a longer growing season [3].

D.I. Obydalo and I.A. Ogarkova created a variety of sesame seeds that do not spill seeds from samples imported from Japan.

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This variety is high-yielding and suitable for mechanized harvesting [5].

Materials and Methods. The scientific research work was carried out in 2023 in the experimental scientific research and educational experimental farm of Tashkent State Agrarian University. In the field experiment, sesame varieties Qora Shaxzoda and Sadaf were planted in 16 variants, four replications, totaling 20 hectares. Before sowing sesame, Fitovak 20% (standard) immunostimulant was treated at a rate of 300 ml/t, and sprayed during the growth period at a rate of 300 and 400 ml/ha. Tandem 10% biostimulant was treated with seeds at a rate of 0.3, 0.4, 0.5 l/t, and sprayed during the growth period at a rate of 0.4+0.6, 0.6+0.8 and 0.8+1.0 l/ha. The immunoactive biostimulant was treated with seeds at a rate of 25, 30, 35 ml/t and sprayed during the growing season at a rate of 30+40, 35+40 and 40+40 l/ha. Based on the goals and objectives of the experiments, phenological observations and calculations were carried out on the Qora Shaxzodaand sesame varieties.

Results: In sesame varieties, leaf surface area increased with growth phases, with the largest leaf surface area being formed in the budding phase. When the immunostimulant Fitovak 20% (standard) was applied to the Qora Shaxzoda variety at a rate of 0.3 l/t+0.3+0.4 l/ha, it was found that leaf surface areas of 646.0 cm2, 875.3 cm^2, 1136.4 cm^2 and 415.3 cm^2 were formed more with the use of the immunostimulant in the growth phases compared to the control variant.

In the variant where the Tandem biostimulant was used at the rate of 0.5 l/t+0.8+1.0 l/ha, the leaf surface area of one plant was 1098.7 cm2 in the flowering phase, 68.1 cm2, 145.1 cm2 more, and 1544.8 cm^2 in the budding phase, 201.7 cm^2, it's been 42.6 cm^2 a lot. Fitovak 20% (standard) in the growing phase was less by 206.7 cm^2, 365.8 cm^2, 408.4 cm^2.

In the variant where the immunoactive biostimulant was applied at the rate of 35ml/t+40+40ml/ha, the leaf surface area of one plant was 1004.4 cm^2 in the flowering phase, 114.4 cm^2, 67.0 cm^2 more, and 1463.3 cm^2 in the budding phase, 189.9 cm2, 73.2 cm^2 more. Fitovak in the 20% (standard) option was 137.0 cm^2, 253.7 cm^2, 326.9 cm^2 less in the growing phase.

Table 1. Formation of leaf area by development phases of sesame cultivars planted as a repeated crop, 2023

No	Name of cultivars	Name of growth regulators	Rates of biostimulants, ml, l/t/ha	In one plant, cm^2			
				Developmental phases			
				branching	flowering	pod formation	ripening
1	Qora Shaxzoda	Control	-	383,9	646,7	801,9	384,6
2		Fitovak 20% (standard)	0.3+0.3+0.4	646.0	875.3	1136.4	415.3
3		Tandem 10%	0.3+0.4+0.6	660.2	953.6	1343.1	576.7
4		Tandem 10%	0.4+0.6+0.8	907.9	1030.6	1502.2	675.0
5		Tandem 10%	0.5+0.8+1.0	978.7	1098.7	1544.8	640.3
6		Immunoactive	25+30+40	566.4	890.0	1273.4	569.6
7		Immunoactive	30+35+40	643.6	937.4	1390.1	606.7
8		Immunoactive	35+40+40	779.7	1004.4	1463.3	586.5

9	Sadaf	Control	-	487.5	559.0	738.8	424.1
10		Fitovak 20% (standard)	0.3+0.3+0.4	651.8	869.9	1111.4	449.8
11		Tandem 10%	0.3+0.4+0.6	738.0	945.2	1218.4	567.4
12		Tandem 10%	0.4+0.6+0.8	964.1	1009.8	1332.7	789.0
13		Tandem 10%	0.5+0.8+1.0	1034.6	1064.3	1413.7	868.8
14		Immunoactive	25+30+40	949.6	1006.9	1273.4	611.5
15		Immunoactive	30+35+40	987.4	1037.8	1413.5	803.9
16		Immunoactive	35+40+40	1020.7	1119.2	1560.6	886.4

According to the norms of application of the Immunoactive biostimulant to the Qora Shaxzoda variety, it was determined that the formation of 69.7 cm^2, 112.1 cm^2, 81.5 cm^2 less was observed in the growth phase compared to the variants where the Tandem 10% biostimulant was used.

When the Fitovak 20% (standard) immunostimulant was applied to the Sadaf variety at the rate of 0.3 l/t+0.3+0.4 l/ha, it was determined that the leaf surface area was 164.3 cm^2, 310.9 cm2, 372.6 and 25.7 cm^2 more in the growth phases compared to the control variant.

In the variant where the Tandem biostimulant was applied at a rate of 0.5 l/t+0.8+1.0 l/ha, the leaf area of one plant increased by 119.1 cm^2, 54.5 cm^2 more in the flowering phase, and by 195.3 cm^2, 71.0 cm^2 more in the vegetative phase. In the variant with Fitovak 20% (standard), the leaf area of one plant increased by 86.2 cm^2, 312.3 cm^2, 382.8 cm^2 less in the vegetative phase.

In the variant where the Immunoactive biostimulant was applied at a rate of 35 ml/t+40+40 ml/ha, the leaf surface area of one plant increased by 112.3 cm^2, 81.4 cm^2 more in the flowering phase, and by 287.2 cm^2, 147.1 cm^2 more in the vegetative phase. In the Fitovak 20% (standard) variant, the leaf surface area was 162.0 cm2, 302.1 cm2, 449.2 cm2 less in the growth phase.

It was found that the leaf surface area of the variants in which the Immunoactive biostimulator was applied to the Sadaf variety was less in the variants in which the Tandem 10% biostimulator was applied compared to the variants in which the Immunoactive biostimulator was applied. According to the standards for the use of the Immunoactive biostimulator, it was found that the formation of 55.0 cm^2, 80.8 cm^2, 147.1 cm^2 less in the growth phase compared to the variants in which the Tandem 10% biostimulator was applied was found.

Conclusion. From the above results, it can be concluded: Of the biostimulants used for the Qora Shaxzoda variety, the Tandem 10% biostimulant had a positive effect, while the effect of the Immunoactive biostimulant was clearly felt for the Sadaf variety.

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