The Effect of the Application of Biodux Stimulator in Growing High and Quality Cotton From Cotton

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Abstract. In the article, the scientific basis of the new stimulators on enzyme activity, biosynthesis of amino acids and proteins, and the physiological processes that occur during cotton development, the effect of new stimulators on seed and cotton during its growth period, on seed germination, cotton growth and development, and resistance to gommosis and wilt diseases, were determined. . Biodux stimulator provides 8.5-12.1% higher field fertility of seed, and the highest result was achieved at the rate of 3.0 ml/t. Also, when cotton was treated with Biodux at the rate of 2.0 ml/ha during the flowering period, the plant height was 7.7 cm higher, the yield branches were 1.3 pieces and the number of bolls was 1.8 more, and the degree of opening of bolls was 7.7-13.7 % has been found to be accelerated.
Key words: typical gray soil, Biodux stimulator, laboratory and field seed germination, plant growth and development, yield elements, cotton yield, fiber and technological quality indicators of seed.

1 Introduction

By the 30s and 40s of the last century in world agriculture, the demand for growth regulators increased in countries such as the USA, the Russian Federation, China, Japan, India and Australia, and now the world market demand is 2241 mln. is equal to the US dollar [1]. This means that growth regulators are widely used in the cultivation of products in the world's agriculture [2, 3] . Growth regulators not only control plant growth, but also accelerate and improve agrochemical processes involved in maintaining and increasing soil fertility.

Global climate change and the use of plant growth regulators in extreme climatic conditions are showing positive results [4-6]. In this case, as a result of the scientific justification of the treatment with growth regulators in the season when there is an increase in weather, water shortage, pests and various diseases, the physiological processes in the germination and growth development of seedlings are accelerated, the photosynthesis productivity of plants increases, and the tolerance to external stress factors, diseases and pests increases. , a fairy tale, due to the high and quality harvest, the volume of agricultural

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production is increasing, which makes it possible to ensure food security [7-9].

The creation and application of various digital technologies will significantly enhance the effectiveness of this activity [10-15], and the solution of legal issues will allow solving the tasks at a high level [16-23].

2 Materials and methods

Yu.Merzhinisky, F.Kalinin, Yu.Rakitin, K.Ovcharov, M. Chailakhyan, A.A. Dunlap, P.E. Schott, A. Imomaliev, U. Madraimov, Sh. Abdualimov, K. Tadjiev, U. Niyazmetov, F. Mustaev, Q. Davronov have conducted many scientific studies.

Sh. Abdualimov, DAhmedova, S. Rashidova [24; 30-31 p.], when the seed of the Okdaryo-5 variety of cotton was treated with stimulants T-86, Nitrolin, Tj-85 and XS-2, the field fertility of the seed increased, the growth and development of cotton accelerated, and the leaf surface, it is written that cotton yield and fiber quality have increased.

G. Nurmakhanbetov and B. Bekbaev [25; 18-19 p.] In the conditions of the Republic of Karakalpakstan, in order to increase the yield of cotton and improve the quality of fiber, when the seeds of Chimboy-3010 cotton variety were treated with A-1 before planting, compared to the control variant, the field fertility of the seed, the growth, development and yield of cotton improved, and cotton economic efficiency was achieved with an increase in yield of 3.5-4.2 tons/ha.

F.Shamsiddinov, Sh.Abdualimov's [26; 338-341 p.] In the research carried out in the conditions of the pale gray stony soils of Namangan region, the growth and development accelerated when the seed was treated with Unum stimulator at the rate of 2.0 ml/t before planting and 20 ml/ha during the ginning period of cotton, and the plant height was 8.6 cm high, and the yield was observed to be 2.9 ts/ha.

Sh. Nurmatov, R. Nazarov, S. Alimuhammedov [27; 11-p.] states that in the conditions of Kashkadarya region, when cotton is treated with biologically active growth agents Oxyhumate, Sodium humate, Silk and Bionitrogen before sowing and during the growth period of cotton at different rates, the yield is 2-3 tons/ha increased.

When treated with various new growth regulators, many scientists have identified a positive effect not only on seed germination, but also on the growth and development of cotton, the formation of leaf surface, photosynthetic efficiency, yield and technological quality of cotton. In particular, G. Gubanov [28; p. 115-169], A. Joraev, A. Yangiboev, M. Tojiev [29; p. 38-39], Sh. Kodirov, A. Yakubov [30; p. 13-14], Sh. Koziboev, R. Isaev, S. Zokirov [31; 15-16 p.], J. Sattorov [32; 2 p.] stated that various physiologically active substances improved the growth and development of plants, as a result of rapid formation of crop elements, optimal distribution of nutrients, opening of pods was accelerated and quality was improved.

Z.I. Mamedov [33; 12 p.], G.P. Gamzakov [34; 10 p.] noted that when various seeds were treated with a complex of cobalt microelement compounds before planting, it had a positive effect on the growth and development of cotton, increased the yield of cotton from one plant to 9.4-17.9 g and improved the quality of cotton fiber. .

The purpose of the study. In order to increase the tolerance of cotton seedlings to various external factors in the conditions of typical gray soils of the Tashkent region, it is necessary to develop the optimal period and norms of using the Biodux stimulator in order to obtain a high and high-quality cotton crop from them.

Research methods. Researches were conducted on the basis of the following system in the conditions of typical gray soils of the Tashkent region (Table 1).

Table 1. Experience system

№	Experience options	Pre-sowing treatment rate	Processing rate of cotton during the flowering period
1	Control	No processing	
2	Gumimaks	0.8 l/t	0.3 l/ha
3	Biodux	2.0 ml/t	2.0 ml/ha
4	Biodux	3.0 ml/t	2.0 ml/ha
5	Biodux	4.0 ml/t	2.0 ml/ha

Researches in field and laboratory conditions were carried out in accordance with the methodological guide "Methods of conducting field experiments" adopted by UzPITI. Also, "Brief methodological guidelines for state testing of growth regulators" and "Methodological guidelines for testing insecticides, acaricides, biologically active substances and fungicides" were used. The net productivity of photosynthesis was determined according to the method of N.N. Tretyakov. Mathematical-statistical processing of the data obtained from the experiments was carried out using the Microsoft Excel program (B.A. Dospekhov) on the basis of methodological manuals.

3 Research results

In the experiment, when the seed was treated with Biodux stimulator before planting, the field germination of the seed showed different indicators depending on the biological characteristics of the cotton variety and weather conditions. In the first observation of seed fertility in field conditions, the level of fertility in the control variant was 45.4%, while it was observed that this indicator was 48.2-50.2% in the variants treated with Biodux.

It should be noted that in the first observation, the fertility rate of the options treated with Biodux stimulator was significantly higher compared to the control option.

At the same time, in the options treated with the Biodux stimulator, high indicators of seed germination were found in the observations conducted in the following periods (6-8.05).

In the last period of observation, carried out on May 9-10, the rate of seed germination was 72.8% in the control, and in the variants treated with Biodux at the rate of 2.0-4.0 ml/t, the control was 81.3-84.9%. It was noted that it was 8.5-12.1% higher than the variant. Also, this indicator was slightly higher than the indicator of Gumimax stimulant (81.6%), which was used as a standard. The best results were obtained in the version of Biodux treated at the rate of 3.0 ml/t of seed (Table 2).

Table 2. Effect of biodux stimulator on seed germination

№	Experience options	Field germination of seed, %				Difference from control, %
		Observation 1 (4-5.05)	Observation 2 (6.05)	Observation 3 (7-8.05)	Observation 4 (9-10.05)	
1	Control	45,4	61,0	67,5	72,8	-
2	Gumimaks 0.8 l/t	43,0	61,2	71,2	81,6	8,8
3	Biodux 2.0 ml/t	50,2	69,6	74,9	81,3	8,5

4	Biodux 3.0 ml/t	48,2	69,8	76,8	84,9	12,1
5	Biodux 4.0 ml/t	48,4	67,4	75,4	83,9	11,1

Therefore, the Biodux stimulator ensured that the field fertility of the seed was 8.5-12.1% higher, and high results were achieved at the rate of 3.0 ml/t of the seed.

In the experiment, in order to determine the effect of the Biodux stimulator on the growth and development of cotton, the state of the plant was periodically studied through biometric observations. In this case, we believe that its positive effect was manifested due to the creation of favorable conditions for the growth of the plant in the variants treated with the Biodux stimulator during the development of the seed and cotton.

It should be noted that the positive effect of Biodux on the growth and development of cotton was determined during the 3-4 ginseng, tillering, flowering and ripening periods. For example, in the variants treated with the Biodux stimulator, on June 1, the height of the main stem is 9.2-9.5 cm, the number of leaves is 3.1-3.3, and on July 2, the plant height is 28.8-29.9 cm, the yield branches 5.1-5.6 units, the number of combs was 5.2-5.3 units, slightly superior to the control option.

During the observations made during the flowering and fruiting periods of cotton, it was found that the plant height and the accumulation of yield elements were optimized and higher values were obtained when the seeds were treated with Biodux and cotton at different rates during the growth period.

At the end of the cotton growth period on September 2, the plant height was 96.2 cm, the yield branches were 16.0 pieces, and the number of bolls was 11.6 in the option treated with Biodux stimulator at the rate of 3.0 ml/t per seed and 2.0 ml/ha during the flowering period. in terms of units, these indicators are 88.5 cm, 14.7 and 9.8 units, respectively, in the control variant, the height of the cotton under the influence of Biodux is 7.7 cm, the number of harvested branches is 1.3 units and the number of bolls is 1.8 units more observed (Table 3).

The degree of opening of the bolls was determined during the pre-harvest observation. In this case, the number of open cysts in the control variant was 3.5 units or 35.4%, while in the variants treated with Biodux stimulator at different rates, it was equal to 4.7-5.5 units or 43.1-49.1%, and the control It was observed that the rate of opening of blisters increased by 7.7-13.7% compared to the variant.

Thus, it was found that when treated with the Biodux stimulator before planting and during the flowering period of cotton, it has a positive effect on its growth and development, as well as acceleration of harvest, and the ground is created for the cultivation of high and quality crops.

Table 3. Effect of seed treatment with Biodux stimulator and its growth development during the period of application of cotton

№	Experience options	Plant height, cm	number of harvested branches, pcs	Number of Shona, pieces	Number of pods, pcs	From this the opened cup	
						Piece	%
1	Control	88,5	14,7	4,8	9,9	3,5	35,4
2	Gumimaks 0.8 l/t+ 0.3 l/ha	88,3	14,8	5,2	10,8	4,9	45,4
3	Biodux 2.0 ml/t+ 2.0 ml/ha	90,6	15,0	5,2	11,0	5,4	49,1
4	Biodux 3.0 ml/t+ 2.0 ml/ha	96,2	16,0	5,2	11,7	5,5	47,0

5	Biodux 4.0 ml/t+ 2.0 ml/ha	94,5	15,7	5,3	10,9	4,7	43,1

It is known that the productivity of cotton varies depending not only on the number of bolls and the process of its formation, but also on the main growth periods of cotton. In our studies, the development processes of cotton treated with Biodux were optimized, the crop was more formed, and later it showed a positive effect on the cotton yield indicators. For example, in the control variant of the experiment (seed and cotton were treated without stimulants), it was found that the average cotton yield was 37.2 t/ha.

In the version of the experiment treated with Gumimax stimulator, which was used as a standard, 40.1 ts/ha, 2.0 ml/t of Biodux per seed, 39.9 ts/ha of Biodux per seed, 39.9 ts/ha during the flowering period of cotton. 0 ml/t, 41.0 t/ha at the rate of 2.0 ml/ha for cotton and 39.7 t/ha when treated with Biodux at the rate of 4.0 ml/t for seed and 2.0 ml/ha for cotton, compared to the control compared to 2.9 t/ha in Gumimax and 2.5-3.8 t/ha in Bioduks different rates, additional yield was achieved.

In these variants, it was found that the weight of the first harvest was 3.3-4.7 ts/ha more than the control variant.

It should be noted that in the experiment, the weight of one bag of cotton was 5.8-6.0 g, and the thickness of seedlings was 82.0-82.8 thousand bushels per hectare. Thus, in the experiment, the highest result in terms of cotton yield was observed in the variant treated with the Biodux stimulator at the rate of 3.0 ml/t before sowing and 2.0 ml/ha during the flowering period of cotton, and an additional yield of 3.8 t/ha was achieved (1- picture).

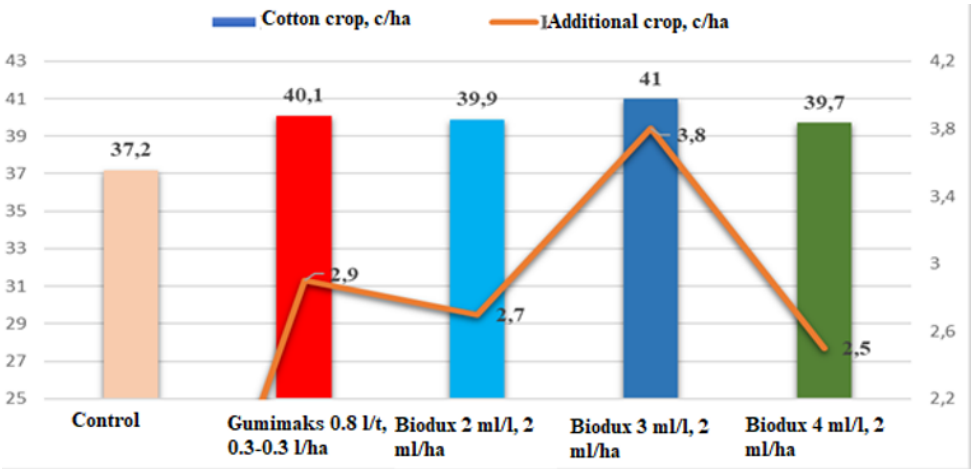

Fig. 1. Effect of biodux stimulator on cotton yield when applied to seed and cotton at different rates and periods, ts/ha.

In the experiment, the effect of Biodux stimulator on cotton seed and cotton fiber quality during leaf treatment at different rates during the flowering period was studied.

Table 4. Effect of Biodux stimulator on quality indicators of cotton fiber and thousand seed weight

№	Experience options	Fiber yield, %	1000 seed weight, g	Type of industry	Tensile strength, gk	Linear density, m/tex	Maturity coefficient	Relative tensile strength, gk/tex
1	Control	42,0	108,0	I	4,6	181	2,0	25,4
2	Gumimaks 0.8 l/t+0.3 l/ha	42,2	107,0	I	4,6	182	2,0	25,3

3	Biodux 2.0 ml/t+2 ml/ha	42,5	109,5	I	4,7	184	2,0	25,5
4	Biodux 3.0 ml/t+2 ml/ha	42,5	108,0	I	4,8	185	2,1	25,9
5	Biodux 4.0 ml/t+2 ml/ha	42,2	108,5	I	4,5	180	2,0	25,0

According to the obtained results, in the version of the experiment treated with the Gumimax stimulator, the yield of fiber was 42.2%, the weight of 1000 seeds was 107.0 g, the breaking strength was 4.6 gk, the maturity coefficient was 2.0, the linear density was 182 m/tex, the relative breaking strength If it was 25.3 gk/tex, in the variants treated with the Biodux stimulator, the yield of fiber was 42.2-42.5%, the weight of 1000 seeds was 108.0-109.5 g, the breaking strength was 4.7-4.8 gk , maturity coefficient 2.0-2.1, linear density 184-185 m/tex, relative breaking strength 25.5-25.9 gk/tex, and in the control option, these indicators are correspondingly fiber output 42.0%, 1000 pieces seed weight was 108.0 g, tensile strength was 4.6 gk, maturity coefficient was 2.0, linear density was 181 m/tex, relative tensile strength was 25.4 gk/tex. That is, in the options where the Biodux stimulator was used, a high-quality cotton crop was grown, the fiber yield was 0.5%, the weight of 1000 seeds was 1.5 g, the linear density was 4 m/tex, and the relative breaking strength was improved by 0.5 gk/tex (table 4). . So, it was found that when seed and cotton are treated with Biodux stimulator at different rates, it has a positive effect on the technological quality indicators of cotton fiber.

4 Conclusion

Biodux stimulator provides 8.5-12.1% higher field fertility of seed, and the highest result was achieved at the rate of 3.0 ml/t. Also, when cotton was treated with Biodux at the rate of 2.0 ml/ha during the flowering period, the plant height was 7.7 cm higher, the yield branches were 1.3 pieces and the number of bolls was 1.8 more, and the degree of opening of bolls was 7.7-13.7 % was found to be accelerated.
When treated with the Biodux stimulator at the rate of 3.0 ml/t before planting and 2.0 ml/ha during the flowering period of cotton, as a result of the growth and development of cotton, a higher yield than cotton was achieved by 3.8 t/ha, and the fiber yield from fiber quality indicators was 0, 5%, linear density of 4 m/tex, relative tensile strength of 0.5 gk/tex was found to be improved.

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