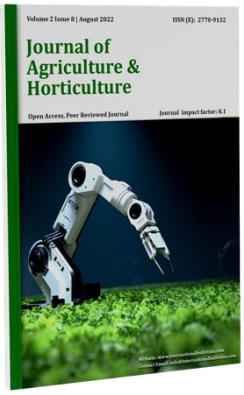

INFLUENCE OF GROWTH-REGULATING SUBSTANCES ON SEED CUCUMBER CULTIVATION

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Abstract: The study investigates the influence of various growth-regulating substances on the cultivation of seed cucumbers (Cucumis sativus L.). The research aimed to determine how biostimulants and phytohormones such as auxins, gibberellins, and cytokinins affect germination rate, plant growth dynamics, flowering period, and seed productivity. Experimental data revealed that the application of growth regulators in optimal concentrations significantly enhanced the physiological and morphological development of cucumber plants, improved fruit set, and increased seed quality indicators such as viability and germination energy. The results suggest that the balanced use of growth-regulating substances can be an effective agronomic strategy to improve the efficiency and sustainability of seed cucumber cultivation under controlled and open-field conditions.

Keywords: growth regulators, seed cucumber, auxins, gibberellins, cytokinins, plant growth, germination rate, productivity, seed quality, agricultural biotechnology

Currently, new types of growth-regulating substances are being used in our Republic for the cultivation of vegetable crops. The use of these substances in agriculture helps to improve seed germination, accelerate plant growth and development, increase productivity, and create the basis for producing high-quality seeds. In our experiments, we used preparations that are widely applied today and serve as key factors in enhancing the germination and quality of seeds of various agricultural crops.

The experiment was conducted during the 2021–2022 growing seasons to investigate the seed production of cucumber (*Cucumis sativus L.*) varieties *Marg'ilon 822* and *Ranniy 645*. Cucumber seeds were predominantly sown directly into open-field conditions, either in a dry state or following pre-soaking in plain water. Observations indicated that seeds soaked in water for a specific duration prior to sowing exhibited different germination rates compared to unsoaked seeds, as also documented in relevant scientific literature.

Accordingly, the present study examined the effects of several growth stimulants on enhancing seed germination, early plant development, and overall yield performance in cucumber. The results demonstrated that the application of these stimulants positively influenced seed vigor and productivity, confirming their potential utility in improving cucumber cultivation efficiency.

In the experiment, seed treatment was carried out by soaking cucumber seeds prior to sowing using the preparations **Plantastim (10 g/L)**, **Zerebra-Agro (100 mg/L)**, and **Ifo Seed (2 g/L)**. Seeds soaked in plain water were used as the **control** for comparison with the treated variants.

Prior to sowing, the cucumber seeds were soaked for 5 hours in clean water as well as in solutions of **Plantastim**, **Zerebra-Agro**, and **Ifo Seed**. After soaking, the seeds were spread on

gauze or cotton fabric and kept in a warm, humid environment for 24 hours to maintain moisture. Careful observation of the treated seeds revealed that the tips had reached a stage of readiness for germination. Germination was observed two days after sowing. Once uniform emergence was achieved, thinning was performed, leaving two plants per hill. When the plants developed 2–3 true leaves, a suspension of the growth-regulating substances was prepared and applied once as a foliar spray to provide additional nutrients.

The effects of the applied preparations on cucumber seed germination were determined in the experiment. It was found that, compared to seeds soaked in plain water, seeds treated with certain stimulants exhibited a significantly higher germination rate. Furthermore, after germination, a more intensive development of the root system, stem, and leaves was observed in the treated plants.

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The Effect of Different Growth Regulators on Cucumber Seed Germination (2021–2022).

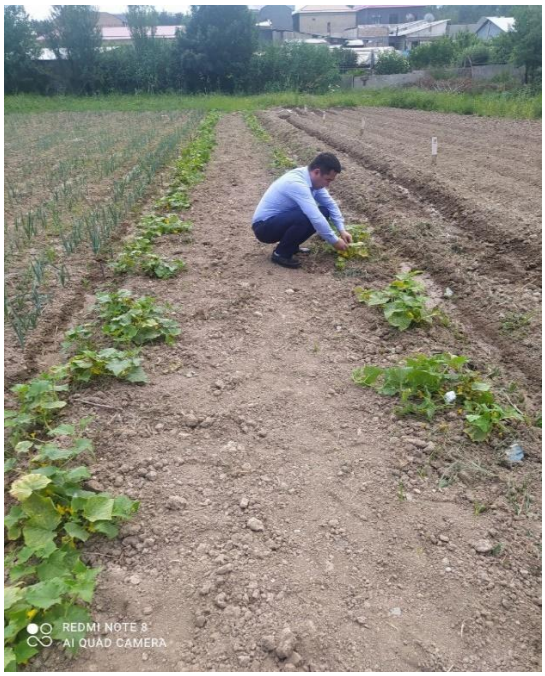
Tested Varieties	Growth Stimulants	From seed sowing until ...		
		Seed Germination (days)	Seedling Emergence (days)	True Leaf Formation (days) (kun)
Marg'ilon 822	Soaking in Water (Control)	4	6	10
	Zerebra Agro-100 mg/L	3	5	9
	Plantastim-10 gr/L	2	4	8
	Ifo Seed-2 gr/L	2	4	8
Ranniy 645	Soaking in Water (Control)	4	6	10
	Zerebra Agro-100 mg/L	3	5	9
	Plantastim-10 gr/L	2	4	8
	Ifo Seed-2 gr/L	2	4	8

The experimental variants differed in terms of cucumber seed germination, seedling emergence, and the formation of true leaves. In the control variant, seed germination began on the 4th day, seedling emergence occurred on the 6th day, and true leaves appeared on the 10th day. These indicators were consistent across all control samples. In the experiment, the highest results for seed germination, emergence, and true leaf formation in both varieties were observed in the variant treated with Plantastim at a concentration of 10 g/L. In this treatment, seed germination occurred on the 2nd day, emergence on the 3rd day, and true leaf formation on the 7th day—indicating that these stages occurred 2 to 3 days earlier compared to the control.

In the variants treated with the stimulants Zerebra-Agro and Ifo Seed, seed germination occurred 1 day earlier, while seedling emergence and true leaf formation occurred 2 days earlier than in the control treatment.

In the experiment, all treatments in which cucumber seeds of both varieties were soaked in growth stimulants for 5 hours demonstrated better results compared to seeds soaked in

plain water. This improvement is evidently associated with the active compounds contained in the growth regulators, which enhanced seed germination and emergence, increased resistance to certain fungal diseases, and contributed to the acceleration of the photosynthetic process in the plants.



In the experiment, the effects of growth regulators on the above-ground parts of the plants were also determined. During the growing period, biometric measurements were conducted twice. Based on these measurements, the main stem length, the number of lateral branches, and the number of leaves per plant were recorded.

Conclusion

In terms of main stem length, the *Marg'ilon 822* variety reached 165.3 cm in the control treatment, while in the variants treated with stimulants, the stem length ranged from 177.3 to 188.7 cm. For the *Ranniy 645* variety, the main stem length in the control was 161.5 cm, whereas in the treated variants it ranged from 152.5 to 186.3 cm.

Earlier flowering was also observed in the variants treated with Plantastim and Ifo Seed, where 10% flowering occurred 5 days earlier (on day 27) and 75% flowering occurred 8 days earlier (on day 28) compared to the control. In the variant treated with Zerebra-Agro, 10% flowering occurred on day 28 and 75% on day 29, which was 7 days earlier than in the control treatment.

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