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THE EFFECT OF GROWTH-REGULATING SUBSTANCES ON THE GERMINATION OF CHICKPEA SEEDS

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Abstract: This article presents data on the effect of growth-regulating substances on the germination performance of chickpea seeds under the conditions of meadow–gray soils of the Andijan region. In the control variant, the germination rate was 90.3%, while in the second variant treated with the fungicide Daltebu FS 6%, germination reached 91.1%, which is 0.8% higher than the control. In the third variant, treated with the stimulant GSN 2004, germination increased to 92.5%, exceeding the control by 2.2%. In the fourth variant, treated with Daltebu FS 6% + GSN 2004, the germination rate reached 92.9%, which is 2.6% higher compared to the control.

Keywords: plant, variety, chickpea, preparation, growth, development, germination, germination rate.

Introduction

In 2024, a total of 33.4 thousand tons of edible chickpea grain was produced in the Republic. The major share of this output was contributed by farms, which achieved a production volume of 24.0 thousand tons. In dehqon (smallholder) and household plots, 6.9 thousand tons were produced, while agricultural enterprises specializing in crop production yielded 2.5 thousand tons of chickpea grain¹.

Meeting the growing demand of the population and the food industry for chickpea grain requires agricultural specialists to develop high-yielding, disease- and pest-resistant new-generation varieties, as well as to design modern, resource-efficient agronomic technologies that ensure stable production of high-quality grain from regionally zoned cultivars. These tasks represent some of the most pressing priorities of the present day.

In agriculturally developed countries, under current global climate change conditions, meeting the population's and the food industry's demand for high-quality, protein-rich chickpea grain is of paramount importance. Achieving this requires the development of high-yielding, drought-tolerant, and environmentally stress-resistant new-generation chickpea varieties, as well as the enhancement of seed germination uniformity through the individual and combined application of biologically active substances during cultivation. These measures play a crucial role in ensuring high productivity.

Chickpea is highly valued as a food crop due to its grain being rich in essential amino acids, lysine, pigments, and proteins necessary for the human body.

A.Muminov and Sh. Rakhmonov (2021–2022) studied the duration of the vegetation period of the Zumrad chickpea variety. The results showed that in the first sowing period (November 10), the vegetation lasted 113–117 days; in the second sowing period (February 10), 107–111 days; and in the third sowing period (March 10), 102–106 days [1, pp. 16–19].

According to M. G'aybullaev, although the duration of the developmental stages of the Zumrad and Polvon chickpea varieties was initially similar, an increase in sowing density led to a gradual shortening of their growth period [2, pp. 94–100].

¹ <https://www.uzdaily.uz/ru/v-uzbekistane-v-2024-godu-proizvedeno-bolee-33-tys-tonn-nuta>



According to researchers M. Jo‘rayev and M. Jo‘rayeva [3, pp. 416–420], the vegetation period of the Marjon chickpea variety varied depending on the sowing date. When sown early, on February 15, the vegetation lasted 78 days; when sown on March 1, it lasted 74 days; and when sown on March 15, it lasted 67 days.

According to Sh. Musurmanov, the growth period of chickpea varies depending on the variety and growth conditions. Typically, its vegetative period lasts 80–110 days, and in most varieties, the seeds mature 70–80 days after germination [4, pp. 295–297].

Materials and Methods

During the growth period of the Marjon chickpea variety, phenological observations, biometric measurements, and analytical assessments were conducted in accordance with the methodological guidelines outlined in “Methods for Conducting Field Experiments” (2017) [5, p. 175].

Results

The Marjon chickpea variety was sown on February 18 using a 60×5×1 sowing scheme at a depth of 5 cm. With a calculated theoretical seedling density of 333,300 plants per hectare, the seeds were planted in the field.

According to the results of the study, in the control variant, the Marjon chickpea variety germinated on March 14, requiring 24 days for complete emergence. In the second variant, treated with the fungicide Daltebu FS 6%, germination occurred on March 13, emerging 1 day earlier than the control. In the third variant, treated with the stimulant GSN 2004, full emergence was observed on March 12, 2 days earlier than the control. In the fourth variant, treated with Daltebu FS 6% + GSN 2004, germination occurred on March 10, 4 days earlier than the control, 2 days earlier than the variant treated with GSN 2004 alone, and 3 days earlier than the variant treated with Daltebu FS 6% alone.

Table 1
Effect of Treatments on Seed Germination

№	Variety	Treatment	Seed Germination Dynamics, %				Days to Germination	Germination Rate, %
			10%	25%	50%	75%		
1	Marjon 18.02.2025	Control (untreated)	10.03	12.03	13.03	14.03	24	90,3
2		Daltebu FS 6% (Fungicide)	09.03	10.03	12.03	13.03	23	91,1
3		GSN 2004 (Stimulant)	08.03	09.03	11.03	12.03	22	92,5
4		Daltebu FS 6% + GSN 2004	07.03	08.03	09.03	10.03	20	92,9

The germination rate of chickpea seeds in the control variant was 90.3%. In the second variant, treated with the fungicide Daltebu FS 6%, germination reached 91.1%, which is 0.8% higher than the control. In the third variant, treated with the stimulant GSN 2004, germination was



92.5%, exceeding the control by 2.2%. In the fourth variant, treated with Daltebu FS 6% + GSN 2004, germination also reached 92.5%, which is 2.6% higher compared to the control.

Conclusion

In conclusion, it was observed that growth-regulating substances had a significant effect on the germination rate and emergence speed of chickpea seeds. The fourth variant, treated with Daltebu FS 6% + GSN 2004, showed a 2.6% higher germination rate and seedlings emerged 4 days earlier compared to the control.

References

1. Muminov A., Rakhmonov Sh. Effect of sowing dates and norms on the vegetation period duration of the Zumrad chickpea variety // Uzbekistan Journal of Agriculture and Irrigation. Tashkent, 2024. Special Issue (1). – P. 16–19.
2. G'aybullaeva M. Effect of sowing dates and mineral fertilization norms on the development of chickpea varieties // Innovation in the Modern Education System. Washington, 2023. – P. 94–100.
3. Jo'rayev M., Jo'rayeva M. Effect of sowing dates on the duration of developmental phases of spring chickpea varieties Polvon and Marjon // Collection of scientific-practical conference papers on “Scientific foundations and prospects of applying modern innovative technologies in the cultivation of new varieties of cereals and legumes”. Andijan, 2023. – P. 416–420.
4. Musurmanov Sh. Cultivation of chickpea crops in arable lands // Collection of scientific-practical conference papers on “Prospects of cultivating cereals, unconventional, oilseed, and fodder crops in Uzbekistan using innovative technologies”. Andijan, 2020. – P. 295–297.
5. Methods for Conducting Field Experiments. UzPTI, Tashkent, 2017. – P. 175.

