

Improvement of seed yield of leaf Lettuce (*Lactuca sativa* L. var. *crispa*) varieties in the soil and climate conditions of Andijan region

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Abstract: The results of the research carried out in the framework of improvement of seed yield of leaf lettuce (*Lactuca sativa* L. var. *crispa*) variety samples in the soil-climatic conditions of Andijan region are presented with an in-depth scientific analysis. Also, the article describes the phenological phases and biometric indicators of leaf lettuce varieties intended for seed production.

Key words: inflorescence, germination, total flowering, inflorescence, variety samples.

Introduction

In order to increase the productivity of lettuce crops, it is necessary to provide scientific research institutes engaged in vegetable growing, landowners, farmers and amateur vegetable growers with high-quality and pure seeds of the best varieties adapted to local conditions [4,5].

Taking into account that in all areas where leaf lettuce products are grown, there will be sufficient conditions to ensure the seeding of seeds with high yield qualities, we have developed the technology of obtaining seeds from samples of lettuce varieties in our research [3].

Research object and methodology

The researches were mainly conducted in the experimental farm of the Andijan Institute of Agriculture and Agro-Technology and in the farms of Andijan Region districts during 2018-2019 (partially 2017). In the course of our research, we studied the phenological phases of leaf lettuce varieties intended for seed production (Kok-shokh, Kholodok and Granatovy sad). The seeds of all the selected varieties were sown on March 5, 2021, on March 7, 2022. Planting period during the vegetation period, plant germination period, planting seedlings in the ground, formation of leaf band, harvesting; the beginning of the period, the beginning of the formation of the stem; the beginning of the formation of gulpoya, the formation of mass gulpoya; the beginning of flowering, mass flowering; initiation of seed formation, mass seed formation; ripening of seeds; phenological observations such as seed collection were carried out. When studying the seed yield, the height of the seed bush, the number of lateral shoots of the II and III levels, the number of inflorescences, the number of flowers and seeds in one inflorescence were determined.

Researches in field and laboratory conditions "Guidelines for the ecological testing of vegetable crops in the open field", "Guidelines for the selection of green, spicy-flavoring and perennial crops", "Guidelines for the study of the collection of cabbage and leaf green crops (lettuce, spinach, dill)", "Methodology of the State variety testing of agricultural crops", "Methodology of experimental work in vegetable growing and melon growing" [1] was conducted on the basis of methodological manuals.

The statistical analysis of the data was carried out using the Microsoft Excel program based on the dispersion method (B.A. Dospekhov) [2].

Research results

The results of the research showed that the earliest gross germination was observed in the control variant (Kok-shokh, 10 days) in the cross-section of years. In 2021, the Kholodok variety germinated in 11 days, and in 2022, this indicator was found to be 9 days. It was observed that the overall germination of the pomegranate cultivar was delayed by 2-4 days compared to the control variant.

As can be seen from the above, the longest period for seed germination was observed in the

Granatovy sad variety, the shortest period was observed in the Kok-shokh variety, and stable germination was observed in the Kholodok variety. Also, in the course of our research, the phenological phases of the lettuce plant intended for seed production, such as "sprouting-branching", "sprouting-full flowering", "sprouting-seeding", were also studied. The "germination-branching" phase was 28 days, "germination-total flowering" 62 days, and "germination-seeding" 96 days in the Kok-shokh variety, which was considered as the control variant, while in the 2022 version of the same variety, "germination-branching" It was observed that it was 24 days in the "germination-general flowering" phase, 60 days in the "germination-seeding" phase, and 96 days in the "germination-seeding" phase.

In the Kholodok variety, in 2021, the "planting-germination" phase consisted of 11 days, "germination-branching" 29 days, "germination-full flowering" 60 days, "germination-seeding" phase consisted of 100 days, in 2022 these phases the following parameters were determined: "planting-germination" 9 days, "germination-branching" 27 days, "germination-full flowering" 62 days, "germination-seeding" phase 98 days.

Table 1
Phenological phases of leaf lettuce for seed, 2021-2022

Phenological phases	Varieties, cross-section of years								
	Kok-shokh			Kholodok			Granatovy sad		
	2021	2022	average	2021	2022	average	2021	2022	average
Planting period	5.03	7.03	6.03	5.03	7.03	6.03	5.03	7.03	6.03
Gross germination	15.03	17.03	16.03	16.03	16.03	16.03	19.03	19.03	19.03
Branching	12.04	10.04	11.04	14.04	12.04	13.04	11.04	09.04	10.04
Gross bloom	18.05	16.05	17.05	15.05	17.05	16.05	18.05	20.05	19.05
Seed germination	19.06	21.06	20.06	22.06	24.06	23.06	25.06	23.06	24.06
Planting-sprouting	10	10	10	11	9	10	14	12	13
Germination-branching	28	24	26	29	27	28	23	21	22
Germination-gross flowering	62	60	61	60	62	61	60	62	61
Germination - germination	96	96	96	100	98	99	98	96	97

It was found that the average "planting-germination" phase of the Pomegranate variety was 3-4 days later than our two varieties, and the "germination-branching" phase was 4-6 days earlier. There was no significant difference between varieties in the "germination-full flowering" phase, that is, it was 61 days on average. "It was observed that the "germination-seed ripening" phase was 98 days in 2021, 96 days in 2022, and 97 days on average, which was 1 day later compared to our control variant, and 2 days earlier compared to our Kholodok variety. It was proved that this situation was caused by the biological characteristics of each of our selected varieties and external environmental factors by year (Table 1).

In the course of our study, the biometric indicators of the samples of the seed leaf lettuce variety were analyzed, and accordingly, in the Kok-shokh variety, which was considered as a control option, in 2021, the plant height was 122 cm, the number of leaves in one flowering plant was 17 pieces, the second-order branching was 18 pieces, the third-order branching was 182 pieces. 2301 pieces, flowers 52900 pieces, the number of formed seeds 42260 pieces, it was observed that the set seeds were 82.8%, and in the observations of 2022, the height of the plant is 138 cm, the number of leaves in one flowering plant is 13 pieces, the second-order branching is 16 pieces, the third it was found that branching in the order was 184 pieces, inflorescence 2881 pieces, flowers 60300 pieces, the number of formed seeds 53810 pieces, the set seeds were 89.2% (Table 2).

Table 2
Biometric indicators of seed lettuce varieties, 2021-2022

Biometric indicators	Kok-shokh			Kholodok			Granatovy sad		
	2021	2022	average	2021	2022	average	2021	2022	average
Plant height, cm	122	138	130	132	136	134	115	125	120
The number of leaves on one	17	13	15	21	23	22	14	10	12

flowering plant, pcs									
Second-order branching, piece	18	16	17	19	21	20	14	18	16
Branching of the third order, piece	182	184	183	195	181	188	175	171	173
Inflorescence, piece	2301	2881	2591	2402	2900	2651	2203	2755	2479
Flowers, pcs	52900	60300	56600	53200	61200	57200	51900	59300	55600
Number of seeds formed	42260	53810	48035	45460	55800	50630	44300	52810	48555
Ripe seeds, %	82,8	89,2	86	89,4	90,6	90	80,0	84,2	82,1

In the course of observations, the height of the plant in 2021 of the Kholodok variety is 132 cm, the number of leaves in one flowering plant is 21, the second-order branching is 19, the third-order branching is 195, the inflorescence is 2,402, the flowers are 53,200, the number of formed seeds is 45,460, and the set seeds are 89.4%, and in the observations of 2022, it was observed that these indicators were slightly higher, i.e., the plant height was 136 cm, the number of leaves in one flowering plant was 23 pieces, the second-order branching was 21 pieces, the third-order branching was 181 pieces, the inflorescence was 2900 pieces, and the flowers were 61,200 pieces, the number of formed seeds is 55,800, the number of seeds is 90.6%. Compared to the control option, all biometric indicators were proven to be 4-6% higher.

In our research, in 2021, in the Granatovy sad variety, the height of the plant is 115 cm, the number of leaves in one flowering plant is 14 pieces, the second-order branching is 14 pieces, the third-order branching is 175 pieces, the inflorescence is 2203 pieces, the flowers are 51900 pieces, the number of formed seeds is 44300 pieces, the seeds 80.0%, and in the observations of 2022, the height of the plant is 125 cm, the number of leaves in one flowering plant is 10 pieces, the second-order branching is 18 pieces, the third-order branching is 171 pieces, the inflorescence is 2755 pieces, the flowers are 59300 pieces, the number of formed seeds is 52810 pieces. It was found that the number of seeds produced was 84.4%, and compared to the control, it was 4.5-5% lower than the control.

When analyzing the biometric parameters of leaf lettuce samples by year, the highest average indicator was observed in the Kholodok variety, while the Kok-shokh and Granatovy varieties did not differ significantly. From this it can be concluded that the effect of the biometric parameters of the samples of leaf lettuce varieties on the productivity, that is, on germination, is strong.

The quality indicators of the seeds of lettuce varieties are closely related to its yield. From this point of view, in the course of research, the quality indicators of the seeds of leaf lettuce varieties were analyzed and some valuable information was obtained.

In particular, during the 2021 research, when the mass of 1000 seeds in the control variant (Kok-shox) was 1.48 g, the germination energy was 70%, the germination rate was 92%, and the seed yield was 2.5 c/ha. In 2022, 1000 seeds mass was 1.60 g, germination energy was 72%, germination was 90%, seed yield was 2.3 c/ha. (Table 3).

Table 3
Quality indicators and yield of seeds of leaf lettuce varieties, 2021-2022

Varieties	Years	Mass of 1000 g of seed, gr	Germination energy, %	Fertility, %	Seed yield, c/ha
Kok-shox	2021	1,48	70	92	2,5
	2022	1,60	72	90	2,3
	average	1,54	71	91	2,4
Kholodok	2021	1,58	71	95	3,2
	2022	1,82	73	93	3,0
	average	1,70	72	94	3,1
Granatovy sad	2021	1,60	68	91	2,8
	2022	1,74	70	89	2,2

	average	1,67	69	90	2,5
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In 2021, the mass of 1,000 seeds of the Kholodok variety under observation is 1.58 g, germination energy is 71%, germination is 95%, seed yield is 3.2 c/ha, and in 2022, when the seed mass is 1.82 g, the germination energy is 73%. it was observed that the germination rate was 93%, and the seed yield was 3.0 c/ha. The quality indicators of the studied seeds of the Granatovy sad variety of leaf lettuce are 1.67 g of the average mass of 1000 seeds, 69% germination energy, 90% germination, and 2.5 c/ha seed yield, which is 4% higher in terms of seed yield compared to the control variant. and it was proven that it was 29% lower than the Kholodok variety.

Conclusion

Analyzing the results of the conducted research, we conclude that the cultivation of leaf lettuce (*Lactuca sativa* L. var. *crispa*) cultivars in the soil and climate conditions of Andijan region gave good results and the improvement of leaf lettuce seed production was achieved.

Literature

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