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TECHNOLOGY OF SEEDS RECEIVING FROM SAMPLES OF LEAVED LETTUCE VARIETIES

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

Key words. Lettuce, variety, area, quality, seed, high, sufficient, conditions, research, sample, technology.

Introduction. The breeding scheme and system are designed to ensure that the cultivars are able to maintain their best economic characteristics.

In our country, a certain system of seeding of vegetable crops has been established, but the seeding of leafy lettuce, which is considered a green vegetable, has not been studied in the soil and climate conditions of Andijan region.

In order to increase the productivity of leafy salad crops, it is necessary to provide high-quality and pure seeds of the best varieties adapted to local conditions to ITIs engaged in vegetable growing, homestead landowners, farmers, farmers and amateur vegetable growers.

During our research, we studied the phenological phases of the leafy lettuce plant intended for seed production. The observations revealed that the seeds of all the selected varieties were sown on March 5, 2021, and on March 7, 2022.

The earliest gross germination is in the control option in the cross-section of years (Kok-Shokh, 10 days) was observed. 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 Pomegranate garden 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 2021, the "planting-germination" phase of the Kholodok variety consisted of 11 days, the "germination-branching" phase consisted of 29 days, the "germination-full flowering" phase consisted of 60 days, and the "germination-seeding" phase consisted of 100 days in 2022. the following parameters were determined: "planting-germination" 9 days, "germination-branching" 27 days, "germination-full flowering" 62 days, "germination-seeding" phase 98 days.

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. The "germination-seed ripening" phase was 98 days in 2021, 96 days in 2022, and an average of 97 days, it was observed that it ripened 1 day later than our control variant, and 2 days earlier than our holodok 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).

Table 1

Phenological phases of the leaf lettuce plant intended for seed production, 2021-2022

Indicators	Varieties, cross-section of years								
	Cock-horn			Cold			Pomegranate garden		
	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 and germination	10	10	10	11	9	10	14	12	13
Germination is branching	28	24	26	29	27	28	23	21	22
Germination gross flowering	62	60	61	60	62	61	60	62	61
Germination and germination	96	96	96	100	98	99	98	96	97

In the course of our study, the biometric indicators of the samples of the seed leaf salad variety were analyzed, and accordingly, the Kok-Shokh variety, which was considered as a control option, had a plant height of 122 cm in 2021, the number of leaves per flowering plant was 17, and the second-order branching 18 pieces, third-order branching 182 pieces, inflorescence 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 was 138 cm, the number of leaves in one flower plant 13 pieces, second-order branching 16 pieces, third-order branching 184 pieces, inflorescence 2881 pieces, flowers 60300 pieces, the number of formed seeds 53810 pieces, the set seeds were found to be 89.2% (Table 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, that is, the plant height 136 cm, the number of

leaves in one flowering plant is 23 pieces, second-order branching is 21 pieces, third-order branching is 181 pieces, inflorescence is 2900 pieces, flowers are 61,200 pieces, the number of formed seeds is 55,800 pieces, the set seeds are 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 leafy salad 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 leafy lettuce varieties on the productivity, that is, on germination, is strong.

Table 2
Biometric indicators of seed lettuce varieties 2021-2022

Biometric indicators	Cock-horn			Cold			Pomegranate garden		
	2021 y	2022 y	averag e	2021 y	2022 y	averag e	2021 y	2022 y	averag e
Plant height, cm	122	138	130	132	136	134	115	125	120
The number of leaves on one flowering plant, pcs	17	13	15	21	23	22	14	10	12
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	5290 0	6030 0	56600	5320 0	6120 0	57200	5190 0	5930 0	55600
Number of seeds formed	4226 0	5381 0	48035	4546 0	5580 0	50630	4430 0	5281 0	48555
Ripe seeds, %	82,8	89,2	86	89,4	90,6	90	80,0	84,2	82,1

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 is 1.48 g in the control option, the germination energy is 70%, the germination rate is 92%, and the seed yield is 0.25 t/ha. In 2022, 1000 seeds it was determined that the mass was 1.60 g, the germination energy was 72%, the germination rate was 90%, and the seed yield was 0.23 t/ha.

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 0.32 t/ha, and in 2022, when the seed mass is 1.82 g, the germination energy is 73%. it was observed that the fertility was 93%, and the seed yield was 0.30 t/ha.

The quality indicators of the studied seeds of the Granatovy sad variety of leafy salad are 1.67 g of average mass of 1000 seeds, 69% germination energy, 90% germination, and 0.25 t/ha seed yield. It was proved that the seed yield was 4% higher compared to the control variant and 29% lower compared to the Kholodok variety.

In conclusion, the highest indicator of seed quality was observed in the Kholodok variety, and it was found that the seed yield was 24-29% higher than the Kok-shok and Granatovy varieties. So, it has been proven that the Kholodok variety that produces the highest yield when grown in the soil and climate conditions of Andijan region.

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, t/ha
Cock-horn	2021	1,48	70	92	0,25
	2022	1,60	72	90	0,23
	Average	1,54	71	91	0,24
Holodok	2021	1,58	71	95	0,32
	2022	1,82	73	93	0,30
	Average	1,70	72	94	0,31
pomegranate garden	2021	1,60	68	91	0,28
	2022	1,74	70	89	0,22
	Average	1,67	69	90	0,25

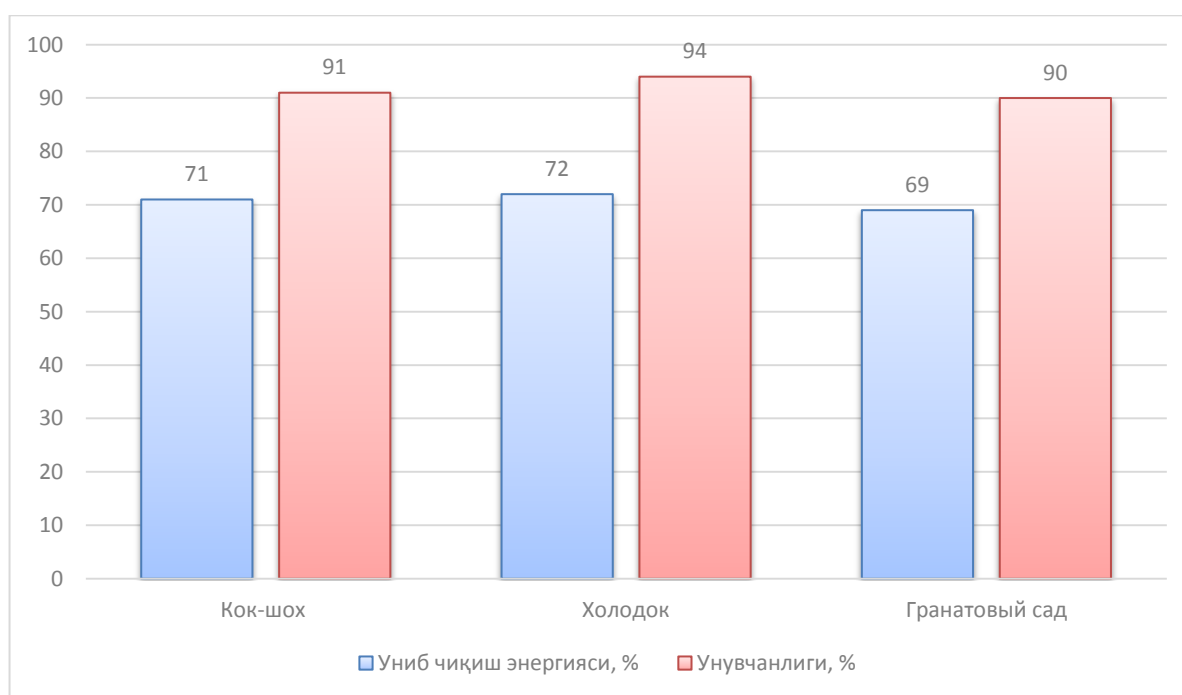


Figure 1. Quality indicators of seeds of leaf lettuce varieties 2021-2022.

Salad seeds to be planted must be clean, highly fertile, disease-free, whole. The seeds are cleaned from the seeds and impurities of other plants. The seed is thawed before sowing.

Lettuce thrives well in soil rich in a variety of nutrients. Leaf lettuce likes soils with organic and mineral fertilizers. Lettuce can be planted after potatoes, cucumbers, peas and tomatoes if enough manure is applied to the land area. If crops similar to radish and radish are planted in the ground, planting lettuce after them will not bring good results. The land area

prepared for planting lettuce must be well cultivated and fertilized. It is possible to obtain a high yield of lettuce even with the use of only mineral fertilizers in such land areas. But if the soil is weak and hardened, then, in addition to mineral fertilizers, it is necessary to apply the required amount of manure. The combined use of organic and mineral fertilizers helps to provide the lettuce plant with nutrients. But it is necessary to use organic and mineral fertilizers in half doses.

When applying mineral fertilizers, it is necessary to determine the quality of the soil, the amount of alkalinity in it, if the pH level increases, the lettuce plant will grow poorly. The acceptable amount of alkalinity is 6-7. Therefore, if mineral fertilizers have not been applied to such lands, this work should be done during spring mowing.

Before plowing in the fall, 10 tons of manure and phosphorous fertilizers, pure R_2O_5 - 75 kg/ha, K_2O 40 kg/ha are applied to the field. Then the main plowing is done at a depth of 28-30 cm.

Fields for sowing seeds are thoroughly cleaned of previous crop residues and weeds. 15.0–20.0 tons of rotted manure is applied to 1 hectare. The soil is softened to a depth of 20–25 cm. Large pieces are crushed, leveled well, and irrigation egates are removed.

Growing lettuce depends on market strategy and commercial requirements.

First, the period between harvesting and selling lettuce should not exceed 2 days.

Second, the duration of the growing season is short (50-120 days) and depends on a consistent production cycle in exactly one plot of land throughout the year.

Thirdly, the process of growing lettuce is extremely labor-intensive, as agrotechnical measures for harvesting are still carried out by hand.

Fourth, there are a large number of subspecies and varieties with their own somewhat unique ecophysiological classifications.

In the Mediterranean region, lettuce is grown outdoors or in greenhouses throughout the year. Lettuce is planted in a sheltered area from September to March. In this case, the cultivation cycle is shorter compared to the open field, about 40 days in autumn and 80 days in winter, which allows to cultivate up to three times a year. The air temperature for growing lettuce outdoors is 600 to 700°C, depending on factors such as harvest date, growth process, variety, and soil type.

Meanwhile, marketing content often calls for a minimum amount of each type of lettuce. Although the majority of Mediterranean farmers have large areas dedicated to this product and grow a significant number of leafy lettuce varieties

and species to reduce agricultural and financial risks, some are limited to conventional species (oily cabbage type, Batavia), their cultivation and easy too.

As for the harvest period, 84% of farmers grow lettuce for a period longer than 3 months, and 26% - for a period longer than 7 months.

Leafy salads (cabbage type with oily leaves, Batavia and oak leaves) are resistant to cold and wind. They are grown in sheltered, open soil only during favorable periods or in areas that do not get cold and are protected from the wind.

Red-leaf lettuces (Batavia, Oak-leaf and Lollo varieties) are somewhat resistant to wind and cold, but the color of their leaves changes dramatically when there is not enough light. Therefore, they are not grown in protected soil, except for the most unfavorable period (December-January).

Cultivation of different morphotypes and varieties of lettuce is a complex process, which includes the cultivation of the product both in space and time, since the validity of the new product depends on the time of harvesting.

In the absence of a specific biological indicator for technical maturity, the date of harvest is the day when the desired size is reached: in cabbage-like varieties, its head, and in leafy varieties - the ball of leaves should be fully formed.

From this moment, the grower has 7 to 10 days to harvest. When harvesting is delayed, the stem may be elongated, the bar ball may open, and necrosis may occur in the leaves.

In March-April, diseases and necroses of leaves develop rapidly due to increased air temperature in closed soil, under protective equipment. Due to the ban on the use of pesticides on green vegetables, scientifically based mulching is necessary. To avoid white rot or sclerotiniosis, it is recommended to return to the previous land area at least 5 years later.

The experience of "Cheerful agronomist" LLC can be cited as an example of the experience of growing lettuce in small commodity farms in the conditions of the Moscow region. Since 2012, this community has leased pastures in the village of Orudevo, Dmitrov district. Four types of salads are grown here: Iceberg, Frise, Radicheva Remen. Lettuce cultivation is carried out by planting seedlings in open ground using film greenhouses. Lettuce cultivation in open ground is carried out in several stages.

1. Preparation for planting and planting seedlings in film greenhouses.

Greenhouses are prepared for planting a week before planting. Pilomaterials of the two-layer coating, intended for placement of planted lettuce cassettes, the integrity of the bed, the functionality of heating and irrigation, lighting equipment are checked.

Peat soil is poured from containers, water is poured over it as necessary, and it is covered with an opaque film so that the soil does not dry out. After 2 days, the primer is thoroughly mixed and closed again. After another 2-3 days, the soil will be ready for placement. Plastic cassettes with 40 cm, 40 cm, 4.5 cm, 144 cells are used for growing seedlings.

Automated lines are used for filling with peat, planting and watering. Cassettes are filled with neutral acid ($pN \approx 7$), sieved peat mixed with agroperlite in a ratio of 8:2.

The content of trace elements in the received peat is checked in an agrochemical laboratory. In cassettes filled with substrate, a hole is made in the center of the cell with a marker and seeds are sown with a seeder. Then, on the inspection table, it is checked that there is one seed in the center of each cell, the cassettes are filled with agroperlite until the top of the seed and the barriers between the cassettes are completely covered. After that, water is sprinkled until the cassettes are completely wet.

In order to ensure that the product is delivered to the customer in a planned manner, sowing of seeds is carried out according to a special schedule. Planted cassettes are placed on top of each other at an angle of 35% (with the variety and date written) in the harvesting chamber, tightly wrapped with a light-transmitting film, and a thermometer is installed to determine the air temperature. The temperature in the chamber is kept within 16...18°C for 48 hours. During the ripening of the seeds, the deviation of the temperature in one direction or the other can drastically deteriorate the quality of the seedling or the plant. In cases where the air temperature is lower than 10°C, a lettuce crop with an elongated core can be formed. When the air temperature is higher than 18°C, uneven germination of seeds is observed. In cases where the temperature is higher than 24°C, some of the seeds "rest" and do not germinate at the right time. After that, the cassettes are placed in a greenhouse where the temperature of 15...25°C is maintained. In cases where the transfer of seedlings to the greenhouse is delayed, the sprouted crops are elongated and the quality of the planting material deteriorates. Cultivation of seedlings lasts from 3 to 9 weeks, depending on the duration of the sunny day, soil and air temperature, as well as the time of planting. When planted early in open ground, seedlings are grown for at least 7-9 weeks.

After 2 days, the cultivation cassettes taken from the chamber are transferred to the greenhouse, to their permanent place - a wooden bed covered with covering material, and warm water is poured as needed.

2. Growing lettuce seedlings in a film greenhouse.

Control of air and soil temperature in the greenhouse is carried out along with keeping a log. Depending on weather conditions, the temperature inside is regulated by turning on the heat guns or opening the doors and sides to ventilate the greenhouse and provide a comfortable temperature for the growth and development of seedlings (daytime - 21...22°C and night - 15...16°C).

Lettuce seedlings do not tolerate drying out of the soil. For this reason, they are watered with warm and clean water every day, not allowing them to dry out and at the same time not to overmoisten. The cells on the edge dry out faster than the cells in the center, so they need to be watered especially carefully. Watering rate is 6-12 l/m².

In order to avoid sunburn, seedling feeding is carried out in the evening or on cloudy days. Every week seedling cassettes are moved or turned 90°. This method allows you to cut off the roots protruding from the cells of the cassette. In this case, the main root system is formed inside the cells.

3. Preparing the soil for planting.

Soil preparation for planting begins as early as possible. The first processing is carried out with a Sipma cultivator at a depth of 8 cm, sideways to the future rows.

A day before planting or on the day of planting, the required number of rows are formed using a row forming device. Crops are planted in the prepared rows during the day. Depending on the weather conditions, the line forming device works with or without a marker. The marker is activated in rainy weather.

Preparation of the soil for planting lettuce is done step by step.

In the late period, it is necessary to plow to a depth of 23 cm with subsequent cultivation and application of fertilizers. The field intended for lettuce is cleared of weeds by cultivation or disc work.

4. Planting crops.

If mechanized planting is not possible due to weather conditions or other reasons, planting is done by hand. Cassettes are washed after use and placed in a 1% Virocid solution for 1-2 days, after which they are disinfected by washing with warm water. As necessary, after planting, the crops are

irrigated for good germination. Watering rate - 20-30 l/m².

5. Care of crops. The main thing in crop care is the daily monitoring of the condition of plants, soil, and weather conditions. One of the main elements of care is to keep lettuce plants free of weeds. Weeds should be fought at the "white thread" stage, when the seedlings have not yet sprouted. For this purpose, it is necessary to prevent the surface of the soil from becoming lumpy with the help of irrigation. The surface should always be moist and "soft". At this time, it is necessary to soften the surface of the rows by hand, not to push the soil towards the crops without creating conditions for the development of pathogens of salad diseases. Further work on weed control will consist of regular extermination.

The need for watering is determined based on the weather conditions and the condition of the plants. Total water consumption is 140 mm. The rate of watering can vary from 6 to 15 mm. Seedlings should be watered at night so that internal necrosis does not occur on hot days. As soon as the heads of lettuce begin to form, it is necessary to reduce the frequency of watering to prevent rotting.

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