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VARIETIES AND EARLY CULTURE OF CELERY IN UZBEKISTAN

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Abstract. The article presents the results of research on the cultivation of celery in the conditions of the Samarkand region. When growing different varietiesof celery, the highest plant height was observed in the Kartuli and Samurai varieties. According to the dynamics of biometric indicators - the largest number ofleaves, the size of the assimilation surface of leaves and the number of shoots, the varieties Kartuli (respectively, 84.7 pcs., 1330.6 cm2 and 5.9 pcs.) and Samurai (respectively, 83.9 pcs., 1318.4 cm2 and 5.8 pcs.). The highest indicators for the average weight of one plant (178.3 g), yield (28.7t/ha), profits (50.3 million soums)per hectare and profitability levels (197.7%) were obtained when growing Kartuli variety plants. The resulting yield for the Kartuli variety was 142.7% higher than that of the standard Serbarg variety (20.1 t/ha).

Key words: celery, seedlings, variety, leaf, dry matter, ascorbic acid, carotene, yield, cost, profit, profitability.

Introduction. In Uzbekistan, the task of ensuring food security of the population is urgent. The “Uzbekistan-2030” strategy, along with grain and livestock products, notes the relevance of year-round production of vitamin-rich vegetable products, expanding the range of crops grown, increasing the export potential, storage and processing of vegetables (Azimov et al. 2002)

Celery is a biennial plant from the celery family (Apiaciae). It is divided into root, petiole and leaf (Al-Jawazneh et al. 2004). Celery plants contain many fatty and essential oils, which provide a pleasant, specific smell (Aramov et al. 2018). It belongs to the aromatic spicy plants (Zuev et al. 2018). Which improve the taste of food. Celery is used as a spicy plant in cooking, canning and drying industries (Buriev et al. 2014)

Root vegetables and celery leaves are eaten. Petiole celery is consumed raw or boiled, adding it to salad, and leaf celery is used fresh or dried as a spicy herb (Makarov et al. 2019; Normuradov et al. 2023) Celery leaves contain 8-10 free amino acids; they are rich in vitamin C, B 1,B 2 and PP, as well as carotene, potassium, calcium and phosphorus salts (Osipova 2010). In Uzbekistan, only one celery variety (Serbarg) has been zoned, so researchto identify promising, high-yielding varieties with early production is of current importance for saturating the domestic market with fresh vitamin products and

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sending some of the products for export (Pivovarov et al. 2001).

Purpose and objectives of the research. The purpose of the research was to study the dynamics of changes in the biometric indicators of various varieties of celery when grown in early stages, to improve the technology of growing celery through seedlings, to identify promising varieties for the conditions of the Samarkand region of Uzbekistan.

The objectives of the research included:

- determine the main morphometric indicators of celery plants in the early stages of cultivation: number of leaves, number of shoots, plant height;

-calculate the area of the assimilation surface of celery leaves;

- to identify the dynamics of changes in the mass of celery plants;

- determine the yield and economic efficiency indicators of growing different varieties of celery.

Materials and methods. The research was carried out in the conditions of theTurob Bobo farm in the Tailyak district of the Samarkand region in 2021-2023. Five varieties of celery were used in the experiments: Serbarg, Bliskava (Countryof origin Ukraine), Parus, Samurai (Country of origin Russia), Kartuli (Country of
origin Georgia). Of these, the Serbarg variety is included in the State Register of Agricultural Crops recommended for sowing on the territory of the Republic of Uzbekistan (Dospehov 1985). *Variety Serbarg.* Included in the State Register of Agricultural Crops recommended for sowing on the territory of the Republic of Uzbekistan for open and protected conditions (Valiyev et al. 2023). Early-mid-ripening, the period from germination to the start of harvesting is 70 days. The height of the plants is 40-50 cm; a large number of medium-sized leaves are formed on the plant. The leaves are highly aromatic. The variety is high-yielding *Variety Bliskava*. Country of origin: Ukraine. An early variety of leaf celery. The plant is powerful, the rosette is slightly raised.

The leaves are large, dark green, shiny-glossy, with a strong aroma. A lot ofleaves are formed on the plant, and after cutting they quickly grow back. The leafpetiole is short and thin, without coarse venation. The leaves are used fresh asaromatic and vitamin-rich greens, and also for drying. The variety is high-yielding.*Variety Sail*. Country of origin Russia. The variety is high-yielding and resistant to flowering. Technical ripeness is achieved within 73-80 days. The leaf isgreen, hollow, slightly curved, the relief of the veins is weak. The taste and aroma

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are high.

Variety Samurai. Country of origin Russia. High-yielding and cold-resistant varieties of leaf celery with medium ripening periods. Harvesting can begin 72-82 days after germination of the first shoots. The plant forms large vertical rosettes.

Variety Cartuli. Country of origin Georgia. Mid-season variety. The period from germination to the start of harvesting is 65-70 days. The leaves are highly aromatic. The leaf rosette is erect, forms a large number of medium-sized leaves with hollow dark green petioles.

Research results. The seeds were sown annually in heated film greenhouses by the Turob Bobo farm in Tailyak district on December 25. The deadline for planting finished seedlings in open ground is February 25. The plot size is 36 m2, the repetition is 4 times, the total area under the experiment is 720 m2.

Immediately after planting the celery seedlings, the surface of the ridge was covered with temporary small-sized film structures. 2-3 weeks after the onset of warm days, the shelters were removed. When harvesting celery leaves, the following biometric indicators were determined: number of leaves, number of shoots, plant height, leaf assimilation surface area, average weight of one plant. For each plot, the average values calculated for one replicate plant were found using these biometric indicators. The area of the assimilation surface of leaves was calculated using the cutting method.

The research was carried out in accordance with the methodological instructions of the Research Institute of Vegetable Farming, methods under the guidance of V.F. Belik, G.L. Bondarenko (1979). Phenological and biometricobservations were carried out according to the method of Gossortseti and V.F. Belik (1992). The harvest data was subjected to mathematical processing accordingto B.A. Dospehov (1985) [7]. Research results. Celery is a spicy crop, the aromaticity of the plant is due to the content of celery essential oil, sedanolide. Themain purpose of celery cultivation is to produce green leaves. Celery seedlingsaged 60-65 days were planted in rows with a distance between them of 40 cm, in a row - 12-15 cm. Harvesting was carried out 25-30 days after planting the se edlings. Leaves were cut 4 times with an interval of 25-30 days (Fig 1).

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Figure 1. Seeds, seedlings and the process of growing celery in the conditions of the Samarkand region

Biometric indicators of various varieties of celery by year of research are given in. As can be seen from the data presented, the height of the plants was predominantly leveled and fluctuated within the data in 2021 from 51.1 to 55.8cm, in 2022 from 48.7 to 53.2 cm and in 2023 from 53.6 to 57.7 cm. At the same time, the highest plant height was noted for the varieties Kartuli and Samurai - in 2021, respectively, 55.8 and 53.7 cm, in 2022 - 53.2-52.6 cm, and also in 2023 -
57.7 and 52.6 cm (Table 1, Fig 2).

Table 1. Dynamics of biometric indicators of celery plants (Apium graveolens var.secalinum L.) in the conditions of the Samarkand region (2021-2023)

Variety	Number of leaves, pcs.			Number of shoots, pcs.			Plant height, cm.		
	15.03	30.03	15.04	15.03	30.03	15.04	15.03	30.03	15.04
2021 year									

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Serbarg (st)	8,6	26,7	80,1	1,9	4,0	5,1	22,8	30,6	51,1
Bliskava	8,6	28,9	82,2	2,2	4,2	5,3	24,2	31,3	52,2
Sail	8,6	28,8	81,5	2,0	4,1	5.3	23,3	30,8	51,8
Cartuli	8,7	29,7	84,7	2,3	4,4	5,7	26,9	34,8	55,8
Samurai	8,7	29,5	83,8	2,3	4,3	5,5	24,8	32,6	53,7
2022 year									
Serbarg (st)	7,5	25,2	78,3	1,8	3,8	4,6	20,2	28,4	48,7
Bliskava	7,8	26,7	79,6	2,0	4,0	4,9	22,8	29,4	50,3
Sail	7,9	26,4	79,0	1,9	3,9	4,7	20,7	28,8	49,4
Cartuli	7,9	27,3	80,2	2,1	4,2	5,3	24,3	32,1	53,2
Samurai	7,9	27,0	80,0	2,1	4,1	5,1	22,9	30,3	52,6
2023 year									
Serbarg (st)	8,7	27,5	82,4	2,2	4,4	5,5	23,9	32,5	53,6
Bliskava	8,8	29,5	83,6	2,6	4,7	5,8	25,6	33,7	55,5
Sail	8,7	29,8	82,9	2,5	4,6	5.6	24,9	32,6	54,9
Cartuli	8,9	30,3	84,6	2,7	4,9	5,9	27,8	36,9	57,7
Samurai	8,8	30,1	83,9	2,7	4,8	5,8	25,9	35,1	56,8

Figure 2. Celery plants ready for harvest and bunched products for sale

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In our studies, depending on the variety, the largest number of leaves of the celery plant was formed in 2023. The largest number of leaves in 2021 and 2023 was found in plants of the Kartuli varieties (84.7-84.6 pieces per year, respectively)and Samurai (83.8-83.9 pieces per year, respectively).

The plant formed the largest number of shoots in 2022; depending on the celery variety, the number of shoots on one plant was 5.5 (Serbarg) -5.9 (Kartuli).

Table 2 presents data on the size of the assimilation surface of the leaves, the average plant weight and the yield of various celery varieties by year of research. The maximum leaf area in 2021-2023 was found in the Kartuli and Samuraivarieties and, accordingly, averaged 1330 -1318 cm2 per plant. For the varieties Bliskava and Sail this figure was 1308.8 and 1298.1 cm2, and for the standard variety Serbarg -1283.2 cm2.

When growing celery, the highest average weight of one plant was found in the variety Kartuli and amounted to 178.3 g. In the varieties Samurai, Bliskava and
Sail, the average weight of one plant, respectively, was 177.1; 175.6 and 172.4 g. The standard variety Serbarg has the lowest average plant weight.

As a result of the research, it was revealed that by year the yield of various varieties of celery varied in 2021 from 19.8 to 29.1 t/ha, in 2022 from 19.3 to 26.5t/ha and in 2023 from 21 ,2 to 30.5 t/ha.

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The highest yields, profit per hectare and profitability levels were obtained when growing Kartuli variety plants, respectively 28.7 t/ha, 50.3 million soums and 197.7%. The resulting yield for the Kartuli variety was 142.7% higher than that of the standard Serbarg variety (20.1 t/ha) (Table 2).

Average plant weight and yield of celery (Apium graveolens var. secalinum L.) by year of research (2021-2023)

Variety	Square leaf surfaces,	Average plant weight, g	Productivity, t/ha				Profit per hectare, million soums	Level profitability, %
			2021	2022	2023	Average		
Serbarg (st)	1283,2	170,7	19.8	19.3	21,2	20,1	36,3	169,9
Bliskava	1308,8	175,6	25.5	24.1	26,6	25,4	45,1	187,2
Sail	1298,1	172,4	23.2	20.2	23,5	22.3	40,0	178,9
Cartuli	1330,6	178,3	29,1	26.5	30,5	28,7	50,3	197,7
Samurai	1318,4	177,1	27,3	24.9	27,6	26,6	47,6	192,8
HCP_{05}			2,04	2,12	1,98	1,92		
Sx%			4,01	4,38	4,29	4,23		

When growing celery in the conditions of the Samarkand region, the drymatter content in the leaves, depending on the variety, ranged from 11.4 to 11.8%, and the amount of sugars and crude protein, respectively, from 4.4 to 4.9% and from 1.5 up to 1.7%. There was more vitamin C and carotene in celery leaves ofthe Cartuli variety, respectively, 152.5 mg/% and 6.4 mg/% (Table 3).

Table 3. Biochemical composition of different varieties of celery

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Variety	Dry matter, %	Total sugars, %	Crude protein, %	Vitamin C, mg/%	Carotene, mg/%
Serbarg (st)	11,4	4,4	1,5	140,9	5,8
Bliskava	11,6	4,5	1,5	148,3	6,1
Sail	11,5	4,6	1,6	146,7	6,1
Cartuli	11,8	4,9	1,7	152,5	6,4
Samurai	11,7	4,8	1,6	150,4	6,2

The highest indicators for the average weight of one plant (178.3 g), yield (28.7 t/ha), profit (50.3 million soums) per hectare and profitability levels (197.7%) wereobtained when growing plants of the Kartuli variety. The resulting yield for the Kartuli variety was 142.7% higher than that of the standard Serbarg variety (20.1 t/ha).

Conclusions

When growing various varieties of celery, the highest plant height was noted for the Kartuli and Samurai varieties - in 2021, 55.8 and 53.7 cm, respectively, in 2022 53.2-52.6 cm, and also in 2023 year - 57.7 and 52.6 cm. According to the dynamics of biometric indicators - the largest number of leaves, the size of the assimilation surface of leaves and the number of shoots, the varieties Kartuli (respectively, 84.7 pcs., 1330.6 cm2 and 5.9 pcs.) and Samurai (respectively, 83.9 pcs.) stood out 1318.4 cm2 and 5.8 pcs.).

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