ISSN: 2775-5118 VOL.4 NO.2 (2025) I.F. 9.1

IMPACT OF SOWING DATES ON THE YIELD AND BIOCHEMICAL COMPOSITION OF LEAF TURNIP

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Аннотация: Ушбу мақолада Қорақалпоғистон Республикасида тупроқ иқлим шароитида барг шолғом экинининг етиштиришда ҳосилдорлик кўрсаткичлари ва биокимёвий таркибига ёзги экиш муддатларини таъсири ўрганиш бўйича маълумотлар келтирилган.

Калит сўзлар: барг, илдизмева вазни, муддат, шолғом, кун, барг эни, барг узунлиги, барг сони, вариантлар, ҳосилдорлик.

Аннотация: В статье приведены данные по изучению влияния сроков летнего сева на показатели урожайности и биохимический состав посевов лестовая репа в почвенно-климатических условиях Республики Каракалпакстан.

Ключевые слова: вес листа, срок, лестовой репы, день, ширина листа, длина листа, количество листьев, варианты, урожайность.

Annotation: The article presents data on the study of the influence of summer sowing dates on the yield indicators and biochemical composition of turnip crops in the soil and climatic conditions of the Republic of Karakalpakstan.

Key words: leaf weight, root mass, timing, turnip, day, leaf width, leaf length, number of leaves, variants, yield.

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INTRODUCTION

The unique climatic conditions of the Republic of Karakalpakstan and its variably saline soils necessitate careful consideration of multiple factors when cultivating agricultural crops, including valuable food vegetables for the local population. Since leaf turnip is relatively new to Karakalpakstan, determining the optimal sowing dates for its cultivation as a secondary crop is crucial for maximizing yield. For this study, Darmon variety leaf turnip seeds were sown during four summer periods: July 20, August 1 (control), August 10, and August 20. The sowing was conducted in open fields using a (50+20)/2 × 10 cm planting scheme.

RESULTS AND DISCUSSION

The control variant was the August 1 sowing date. In this case, the seeds germinated uniformly within 3-5 days, and the plants became edible within 25 days.

The duration of phenological phases increased progressively from the first sowing date to the fourth. For example, in the fourth sowing period (August 20), it took 15 days for 4-5 true leaves to appear and 30 days for the plants to become edible—5 days longer than in the first sowing period. This indicates that the leaf turnip's growth phases were extended over time, likely due to its long-day plant characteristics, whereas later sowing dates coincided with shorter daylight hours. Sowing dates also significantly influenced the morphological characteristics of leaf turnip. The highest values for leaf length (31.2 cm), width (14.5 cm), and number of leaves per plant (9.1) were observed in the first sowing period (August 1). In subsequent sowing dates, leaf length progressively decreased by 0.5 cm, 1.8 cm, and 3.5 cm, respectively. A similar trend was observed for leaf width and the number of leaves per plant. Observations showed a strong correlation between leaf number and leaf width, regardless of sowing date. The correlation coefficient varied but remained strong, indicating a consistent relationship between these traits. The connection between leaf number and leaf length was also moderate to high.

The yield of leaf turnip varied depending on sowing dates. The control variant (August 1) produced a yield of 18.0 t/ha. Yield decreased progressively from the first to the fourth sowing date. The lowest total yield was observed in the fourth sowing period (August 20) at 14.7 t/ha, which is 3.3 t/ha (81.9%) lower than the control. The highest yield was recorded in the first sowing period (July 20) at 18.8 t/ha, which is 0.8 t/ha (104.4%) higher than the control. However, marketability was not significantly affected by sowing dates, with marketable yield ranging from 96.1% to 99.1% of total yield. These results suggest that the high marketability of the Darmon variety is due to its strong varietal characteristics and the optimal sowing scheme used in the study. The experimental error margin in the study was 0.31 t/ha, and the variation between sowing dates

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was 0.60%, confirming that the experiments were conducted accurately. Sowing dates significantly influenced plant weight and yield outcomes.

Table 1

Effect of Different Summer Sowing Dates on the Yield of Darmon Variety Leaf Turnip (2021-2023)

Variants	Dates	Yield, t/ha				Relative to Control, %	Marketable Yield, %	Average Weigh of one Plant	
		2021	2022	2023	Average			g	%
1	July 20	18,9	19,1	18,4	18,8	104,4	99,1	60,7	105,9
2	August 1 (control)	17,2	18,1	18,7	18,0	100,0	99,4	57,3	100,0
3	August 10	16,5	16,8	15,9	16,4	91,1	96,3	51,1	89,2
4	August 20	15,2	14,7	14,3	14,7	81,7	96,1	49,1	85,7
Average		**17,0**	**17,0**	**17,2**	**16,8**	**17,0**		**54,6**	
$LSD_{0.05}$ (t/ha)		**0,45**	**0,51**	**0,51**	**0,31**				
Sx,%		**0,23**	**0,26**	**0,27**	**0,60**				

The best result was observed in the first sowing period**.** At the time of harvest, the average weight of one plant was 60.7 g**.** Similar to the trend observed in yield, the average weight of a single plant decreased progressively from the first to the fourth sowing period**.** In the fourth sowing period**,** the average weight of one plant was 49.1 g**,** which is 10.2 g (4.3%) less than the control period and 11.6 g (20.2%) less than the first sowing period**.** The biochemical composition of leaf turnip grown in different summer sowing periods is presented in Table 2**.** The data in the table show that the dry matter, sugar content, vitamin C, and nitrate levels in leaf turnip varied across different sowing periods. In particular, the dry matter content in the control period (August 1) was 14.5%**.** The highest value was recorded in the third sowing period (August 10) at 15.7%**,** which is 1.2% higher than the control period. In the first and fourth sowing periods**,** the dry matter content ranged between 11.2% and 12.1%, which is 77.2–83.4% of the control variant.

Table 2

Biochemical Quality Indicators of Leaf Turnip Grown in Different Summer Sowing Periods (2021-2023)

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Variants	Dry Matter, %	Relative to Control, %	Sugar Content, %	Relative to Control, %нисбатан, %	Vitamin C, mg/%	Relative to Control, %	Nitrate, mg/%	Relative to Control, %
I	11,2	77,2	7,5	84,3	13,0	78,8	89,1	97,7
II	14,5	100,0	8,9	100,0	16,5	100,0	91,2	100,0
III	15,7	108,3	9,1	102,2	16,9	102,4	100,7	110,4
IV	12,1	83,4	7,2	80,9	12,2	73,9	110,2	120,8

Such a trend was also observed in the other biochemical quality indicators of the plant across the different variants.

In our opinion, the variation in the biochemical composition of leaf turnip leaves across different sowing dates is related to the fact that, during the second and third sowing periods, the plant's growth and development occurred under relatively more favorable conditions. This, in turn, contributed to the improvement of the biochemical composition of the leaves in the second and third sowing periods.

CONCLUSIONS:

1. The yield of leaf turnip varied depending on the sowing dates. The highest yield was observed in the first sowing period (July 20), reaching 18.8 t/ha. Yield gradually decreased from the first to the fourth sowing period.
2. The highest values for leaf length (31.2 cm), width (14.5 cm), and number of leaves per plant (9.1) were recorded in the first sowing period. These indicators declined progressively from the first to the fourth sowing period.
3. Sowing dates significantly affected the average weight of a single plant. The best result was observed in the first sowing period, where the average plant weight was 60.7 g. In the fourth sowing period, the average plant weight decreased to 49.1 g, which is 10.2 g (4.3%) lower than the control period and 11.6 g (20.2%) lower than the first sowing period.
4. Summer sowing periods significantly influenced the biochemical composition of leaf turnip leaves and root crops. The variation in biochemical composition observed across different sowing dates, in our opinion, is associated with the fact that growth and development conditions were slightly more favorable in the second and third sowing periods.

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