

INFLUENCE OF CLIMATIC FACTORS ON AGROBIOLOGICAL PARAMETERS OF  
CARROTS

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**Annotation:** This article presents the results of tests of domestic and foreign varieties of table carrots in the desert soil – climatic zone of Surkhandarya region. The assessment of 22 varieties of table carrots on productivity and quality of the harvest is given.

**Keywords:** table carrots, temperature, bolstering, root crop diameter, root crop length.

**Introduction.** The most important climatic factor affecting carrot cultivation is temperature. In addition to plant growth, temperature also affects the shape of the roots, their color, and the growth of the green parts of the shoots. Carrots are mainly a temperate climate crop grown from spring to autumn in temperate countries and in winter in tropical and subtropical countries of the world, especially because they are resistant to frost at the germination stage and in the early growing period. The optimal temperature for growing carrots is between 15.6 and 21.1°C. Higher and lower temperatures negatively affect growth and reduce root quality. The date of sowing has an important impact on the growth, development and yield of carrots due to environmental factors such as temperature and light intensity. Therefore, factors affecting carrot yield also include the date of sowing, and this can play a crucial role in increasing carrot availability on the market at the beginning and end of the season [1].

**Materials and methods of research.** Field experiments were conducted at the experimental site of the Surkhandarya Scientific Experimental Station of the Research Institute of Vegetable and Melon Potato Crops, located in the southern part of the Surkhandarya region (37°13' North latitude; 67°16' East longitude, 320 m above sea level) in the spring of 2022.

During the period of the experiments, the average temperature was 18.5±0.5°C, and the total precipitation was 73 mm. The climate of the Termez district is subtropical inland, with sultry and hot dry summers and cold winters. The soils of the experimental site are gray–brown, ordinary medium-sized slightly loamy and slightly leached. In our research, experiments were initiated, records and observations were carried out according to the methodological guidelines [4, 5].

22 varieties of table carrots were taken for research: 13 of them were domestically selected (Farovon, Mshak 195, Mirzo red 228, Nurli 70, Mirzo mshak, Cylindrical red, Cylindrical yellow, Zarcha red, Zarcha yellow, Ziynatli, Baraka, Mshaki surkh, Mirzo yellow 304) and 9 varieties of VNISSOK (Russia) (Nadezhda F1, Minor, Marlinka, Margosha (Minchanka), Moscow Winter A-515, Nantskaya 4, Shantane 2461, Mars F1, Emperor).

The seeds were sown manually on February 20, 2022. The experiment was carried out without repetition. The area of the registered plot is 2.8 sq.m. The plots are arranged in two tiers. The phenological observations were carried out one at a time. The date of the beginning (10-15%) and full shoots (75%) were marked, as well as the beginning of full technical (commercial) ripeness.

Full technical ripeness was characterized by fully formed and GOST-compliant root crops. Harvesting began as the root crops of each variety reached technical maturity, when at least 75% of the root crops reached the size of commercial crops.

The entire crop was sorted into marketable and non-marketable (sick, damaged, cracked, incomplete, ugly and branched). Each fraction was weighed and the proportion of its content in the total yield of root crops from the plot was calculated.

**Research results and their discussion.** Carrots are a biennial plant of the celery family. It can be divided into two subspecies: eastern and western. The eastern subspecies has a purple or yellow root crop, pubescent leaves, a gray-green hue and a tendency to early flowering. In the western subspecies, the root crop has orange, yellow, red and white coloration, green leaves without pubescence, and their ability to bloom appears only after undergoing the process of vernalization [3].

The optimal temperature for carrot growth in the phases of development looks like this: during germination – 9-15 ° C, during leaf formation – 15-20 ° C, during the period of intensive root crop growth – 13-18 ° C. At spring sowing dates, the optimal sum of effective temperatures (above 10°C) leaves 2000-2100°C, and the minimum is 1500°C. At a temperature of 31-33 ° C, the growth rate of root crops decreases by 3-6 times. At the same time, growth processes are inhibited, and the root crop ripens prematurely and ages. When the soil temperature drops to 10°C, growth is delayed, root crops have a less intense color, and their branching is observed [2].

The optimal temperature for carrot growth in the phases of development (shoots, leaf formation and during the period of intensive root crop growth) was below the permissible temperature (11.4 degrees Celsius in February, 13.8 degrees Celsius in March, 18.5 degrees Celsius in April and 25.0 degrees Celsius in May). In this regard, the yields of all varieties were low. Of the 13 domestic varieties, 9 (Farovon, Mshak 195, Mirzoi krasnaya, Nurli 70, Mirzoi mshak, Cylindrical yellow, Zarcha krasnaya, Zarcha yellow, Mshaki surkh) were shot.

However, the yield indicators of other varieties varied significantly (Table 1). The yield values ranged from 3.2 t/ha for the Baraka variety to 1.5 t/ha for the Ziynatli and Cylindrical Red varieties.

**Economic characteristics of canteen carrot varieties**

Variety	Yield, t/ha	Marketability, %	Mass of commercial root crop, g.	The length of the root crop, cm.	The diameter of the root crop, cm.	The diameter of the root crop core, cm.
Cylindrical red	1,5	88,5	48,2	10,9	2,5	1,1
Ziynatli	1,5	88,8	40,6	11,0	2,5	1,1
Baraka	3,2	90,7	38,2	11,4	2,4	1,0
Imperator	1,6	90,7	29,4	13,5	2,0	1,0
Minor	2,0	89,0	24,4	10,3	2,0	1,0
Moscow Winter A 515	1,9	90,0	40,5	10,5	2,7	1,7
Marlinka	2,0	87,0	34,2	9,2	2,6	1,4
Shantane 2461	2,3	92,5	39,8	9,6	2,9	1,7
Mars F1	1,5	84,5	28,6	11,2	2,2	1,2
Nadejda F1	1,9	92,8	27,6	12,0	2,1	1,0
Margosha	2,1	90,8	35,0	10,7	2,4	1,4

**THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY****VOLUME-5, ISSUE-5**

Nantskaya 4	1,8	89,0	27,2	11,0	2,2	1,0
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The marketability of root crops is an important indicator for producers and consumers. Fluctuations in marketability by grades ranged from 84.5% (Mars F1 grade) to 92.8% (Nadezhda F1). The root crops are not large enough. The minimum weight of the root crop is 24.4 g for the Minor variety, the maximum is 48.2 g for the Cylindrical red variety. The minimum length of the root crop is 9.2 cm for the Marlinka variety, the maximum is 13.5 cm for the Emperor variety.

The quality of carrots intended for consumption must comply with the requirements and standards of GOST 32284-2013 "Fresh table carrots sold in a retail chain." According to the requirements of GOST, the size of root crops by the largest transverse diameter (or by weight) It should correspond to: for early and small carrots – 1.0 – 4.0 cm (8.0-150.0 g); harvested before September 1 – 2.0 – 4.0 cm (20.0-150.0 g); after September 1 – 2.0 – 7.0 cm (50.0-310.0 g). The length of the root crop should be at least 10.0 cm.

The low-temperature spring growing season had a negative impact on plant growth and development. In addition, some domestic varieties were prone to shooting due to prolonged low temperatures and insufficient day length during the growing season.

**Conclusion.** Analyzing the results obtained, it should be noted that the yield of carrots in spring sowing is the least than in summer and late autumn ("tucsonbosti") sowing. VNISSOK varieties turned out to be more resistant to blooming. However, according to their biometric indicators, carrots grown in spring can be used for consumer purposes.

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