NOVATEUR PUBLICATIONS
JournalNX- A Multidisciplinary Peer Reviewed Journal
ISSN No: 2581 - 4230
VOLUME 8, ISSUE 12, Dec. -2022

EVALUATION OF VARIETIES AND HYBRIDS OF TABLE CARROT (DAUCUS CAROTA L.) GROWN IN CONDITIONS OF DESERT SOIL-CLIMATE ZONE OF SURKHANDARYA REGION

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ANNOTATION
This article presents the results of testing domestic and foreign varieties of table carrots in the desert soil-climatic zone of the Surkhandarya region. An assessment was given to 22 varieties of table carrots in terms of productivity and quality of the crop.
It has been established that the most productive varieties under the conditions of flight sowing in 2019-2021 were: Imperator, Mars F1 and Baraka.

Keywords: table carrots, varieties, productivity, root mass, marketability.

Carrot (Daucus carota L., vag. sativus Hoffmn.) is the main vegetable crop of the Umbelliferae family, widely cultivated throughout the world. Carrots are cultivated mainly for use as a fresh vegetable and in processed form, and also serve as a fodder plant for animals, birds and fur-bearing animals. Along with this, it is used for medicinal purposes and in the perfume industry. In the Republic of Uzbekistan, the table carrot culture occupies one of the leading places in the cultivation and production of root crops.
The special value of carrots lies in the fact that its varieties, which have an orange color of root crops, contain carotene (provitamin A), which in the human and animal body turns into vitamin A. It has a high sugar content and is a good source of essential mineral salts containing potassium, calcium , iron, phosphorus and other useful elements [1,2].
Carrot is a productive crop, the yield in some regions is 60-70 t/ha. Carrot root crops, subject to the necessary storage conditions, are well stored and retain their commercial and quality indicators throughout the entire storage period [1]. The irrigated regions of Uzbekistan are distinguished by a variety of soil and climatic conditions. The Republic of Uzbekistan is divided into two vast climatic zones: desert and semi-desert. The southern part of the Surkhandarya region is flat and located in the desert soil-climatic zone, which belongs to the zone of risky farming [3].

The Purpose of our Research

to characterize varieties of carrots according to economically valuable traits in the dry desert climate of the Surkhandarya region of the Republic of Uzbekistan.

In this regard, the objectives of the research included:

- determine the yield indicators of varieties and hybrids depending on the harvesting period;
- evaluate varieties and hybrids in terms of quality of root crops;

Material and Methods of Research

The studies were carried out in 2019-2021. at the Termez Institute of Agrotechnologies and Innovative Development, including field - at the experimental site of the Surkhandarya Scientific Experimental Station of the Research Institute of Vegetables, Melons and Potatoes, located in the southern part of the Surkhandarya region.

The soils of the experimental plot are gray-brown, ordinary, medium-thick, slightly loamy and slightly leached. Weather conditions in 2019-2021 were relatively unfavorable for the development and ripening of table carrots. The growing season of 2019 and 2021 was very hot and dry. In our studies, the laying of experiments, records and observations were carried out according to the methodological guidelines [4, 5].

For research, 22 varieties of table carrots were taken: 13 of them were domestic breeding (Farovon, Mshak 195, Mirzoi red 228, Nurli 70, Mirzoi mshak, Cylindrical red, Cylindrical yellow, Zarcha red, Zarcha yellow, Ziynatli, Baraka, Mshaki surkh, Mirzoi yellow 304) and 9 grades VNIISSOK (Russia) (Nadezhda F1, Minor, Marlinka, Margosha (Minsk), Moscow winter A-515, Nantskaya 4, Shantane 2461, Mars F1, Imperator)

Sowing seeds was done manually. The experiments were carried out without repetition. The area of the accounting plot is 2.8 sq.m. Arrangement of plots in two tiers. Phenological observations were carried out in one repetition. The date of beginning (10-15%) and full shoots (75%), as well as the beginning of full technical (commercial) ripeness, were noted.

Full technical ripeness was characterized by root crops formed and corresponding to GOST. Harvesting was started as the root crops of each variety reached technical maturity, when at least 75% of the root crops reached marketable sizes.

The entire crop was sorted into marketable and non-marketable (diseased, damaged, cracked, short-lived, 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

The weather conditions of 2019 and 2021 were unfavorable for the development of carrot plants. Not all varieties formed a high yield. However, the yield indicators of varieties varied significantly (Table 1). The values of yield indicators ranged from 27.5 t/ha for the Mars F1 variety to 92.5 t/ha for the Mshak 195 variety, the difference was 65.0 t/ha.

The marketability of root crops is an important indicator for producers and consumers. Fluctuations in marketability by variety ranged from 42.3% (Nantes 4 variety) to 81.7% (Imperator). The indicator of varieties Imperator and Mars F1 is higher than the level of the standard value - 79.3%. Root crops formed quite large. The maximum weight of the root crop is 190.1 g for the variety Mirzoi yellow, for the standard variety Farovon - 119.6 g.

Table 1.

Economic characteristics of table carrot varieties, 2019-2021

Variety	Commercial yield, t/ga	% k control role	Marketability, %	Under-rutting,%	Freak-livid,%	Cracked-shii,%
Farowon (standard)	62,3	100	79,3	10,3	5,0	5,4
Mshak 195	92,5	148,4	68,1	15,0	2,0	14,2
Mirzoi red 228	75,6	123,1	66,9	7,7	8,0	11,8
Nurli 70	84,6	135,8	73,9	11,6	3,4	11,0
Mirzoi Mshak	70,9	113,8	73,4	8,7	3,0	13,9
Cylindrical red	60,5	97,1	76,2	4,1	9,0	10,6
Cylindrical yellow	78,6	126,1	75,6	3,5	2,2	11,9
Zarcha red	72,2	115,9	73,5	12,0	3,8	7,1
Zarcha yellow	55,5	89,0	68,5	3,8	9,5	12,4
Ziynatli	59,7	95,8	71,2	6,2	17,7	-
baraka	51,4	82,5	76,3	5,4	5,9	6,3
Mshaki surkh	42,7	68,5	66,4	4,6	6,8	20,3
Hope F1	58,7	94,2	60,0	5,3	23,9	14,9
Minor	58,8	94,3	77,2	5,7	12,8	5,0
Marlinka	51,2	82,1	76,6	1,8	14,1	6,3
Margosha (Minsk citizen)	39,6	63,5	62,3	5,6	22,2	8,1
Moscow winter	35,9	57,6	58,4	13,5	21,5	6,6
A-515	33,6	53,9	42,3	4,8	52,9	-
Nantes 4	60,0	96,3	76,4	0,3	7,9	15,4
Shantane 2461	83,1	133,3	69,3	7,0	4,1	17,3
Mapc F_1	27,5	44,1	81,4	2,5	10,3	3,5
Emperor	52,3	83,9	81,7	3,3	9,8	5,2

Because temperature and soil moisture affect the shape, color, and quality of carrots, carrots of the highest quality are produced when weather conditions favor regular, uninterrupted growth. Plant growth is optimal between 15° and 20° C, and roots also develop the best color and flavor at these temperatures. At temperatures below or above optimal, a poorer color appears. Roots also tend to be shorter, often with poor taste, when high temperatures prevail. Insufficient soil moisture results in a longer and thinner root, while very wet conditions have the opposite effect and also produce a lighter color. Carrots have a rougher appearance when temperatures are quite high in summer and soil moisture conditions vary. Branched and cracked roots are more common in summer, and the central core tends to be thicker.

The dry and high-temperature summer growing season had a negative impact on the growth and development of plants. Fluctuations in the underage by varieties ranged from 0.3% (Chantane 2461 variety) to 15.0% (Mshak 195). The indicators of varieties Mshak 195, Nurli 70, Zarcha red, Moscow winter A-515 are higher than the standard value - 10.3%. The fluctuation in the ugliness of the root crop by variety ranged from 2.0% (variety Mshak 195) to 52.9% (Nanskaya 4). The worst values for this characteristic were shown by the varieties Minor, Marlinka, Ziynatli, Moscow winter A-515, Morgosha (Minsk), Nadezhda F1, Nantskaya 4.

Table 2. Qualitative characteristics of table carrot varieties, 2019-2021

Variety	Mass of marketable root crop, gr.	Root length, cm.	root diameter, cm.	Diameter root core, cm.
Farowon (standard)	119,6	14,3	3,6	1,5
Mshak 195	154,9	9,8	4,6	1,4
Mirzoi red 228	167,1	15,1	3,9	1,4
Nurli 70	129,3	13,7	3,7	1,2
Mirzoi Mshak	156,0	12,3	4,3	1,6
Cylindrical red	151,3	15,7	3,9	1,5
Cylindrical yellow	165,0	12,8	4,4	1,4
Zarcha red	119,0	10,4	4,1	1,5
Zarcha yellow	118,4	9,9	4,0	1,4
Ziynatli	177,3	16,0	4,0	1,6
baraka	127,2	14,6	3,6	1,5
Mshaki surkh	161,5	10,9	5,1	1,9
Hope F1	86,6	12,9	3,2	1,4
Minor	86,7	13,4	3,1	1,3
Marlinka	126,0	13,4	3,8	1,7
Margosha (Minsk citizen)	114,7	13,3	3,8	1,7
Moscow winter	119,0	13,7	4,2	1,8
A-515	110,0	13,7	3,2	1,5
Nantes 4	162	13,1	4,4	2,0
Shantane 2461	190,1	11,8	4,7	1,6
Mirzoi yellow 304	112,5	15,1	3,4	1,6
Mars F1	126,2	17,2	3,3	1,4

The fluctuation in cracked root crops by variety ranged from 3.5% (Mars F1 variety) to 20.3% (Mshaki surkh). The worst values for this characteristic were shown by the varieties Mshaki surkh, Marlinka, Ziynatli, Moscow winter A-515, Morgosha (Minsk), Shantane 2461, Mirzoi yellow 304, Nadezhda F1, Mshak 195, Mirzoi red 228. In the varieties Ziynatli, Nantskaya 4, this the deficiency was not observed, and also in the Minor variety, the indicator was below the standard.

CONCLUSION

Analyzing the obtained results, it should be noted that the yield of varieties of domestic breeding is much higher than the varieties of VNIISSOK. Consequently, in terms of productivity, domestic varieties Mshak 195, Mirzoi red 228, Nurli 70, Mirzoi mshak, Cylindrical yellow, Zarcha red, Mirzoi yellow 304 outweigh the standards and more resistant to the desert soil-climatic zone of the Surkhandarya region. But despite this, the varieties Mars F1 (81.4) and Imperator (81.7) outweigh the standard in terms of marketability, and among domestic varieties Baraka approached the standard indicator.

Therefore, the varieties Mars F1 and Imperator can be attributed to varieties of an extensive type, which fully realize their biological potential in the conditions of the desert soil-climatic zone of the Surkhandarya region

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