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RESULTS OF TESTING TOMATO VARIETIES AND HYBRIDS UNDER THE CONDITIONS OF SALTED SOILS OF THE ARAL REGION

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ABSTARCT:

The article describes the results of tomato cultivar testing in open ground in saline soils of the Republic of Karakalpakstan. It is noted that tomato varieties and hybrids behave differently in different conditions, therefore, for each zone they should be selected experimentally.

The biometric counts carried out showed that the plants of all accessions had a longer stem and fewer side shoots. However, varietal differences in these traits remained. It has been established that the earlier ripening begins, the higher the value of the early harvest; the longer the main stem, the more side shoots on it and the less the early harvest.

KEYWORDS: tomato, varieties, hybrids, variety testing, climatic zones, type of plants, marketability, yield.

INTRODUCTION:

To improve the situation in the vegetable growing industry, an important place is currently given to issues of sustainable development, which includes modern zonal technologies for the cultivation of food crops. The development of zonal cultivation technologies will make it possible to grow quality products in various soil and climatic conditions of the republic.

The common tomato, Lycopersicon esculentum Mill. Is the most common tomato species in the genus Lycopersicon Tourn. Family Solanovykh (Solanaceae Juss.). The nutritional value of tomatoes is great: its fruits are of great value due to their high taste and the content of substances important for human health in them, such as vitamins, sugars, organic acids, minerals, etc. [5].

Among the vegetable crops grown in the Aral Sea region (Republic of Karakalpakstan), tomato occupies a leading place in terms of area, gross yield and consumption. Tomato production is mainly concentrated in small farms and private household plots.

It is known that the size and quality of the yield obtained largely depends on the variety used. A correctly selected variety adapted to local soil and climatic conditions is the basis for obtaining high yields [3, 4].

Salt tolerance (halotolerance) is the resistance of plants to an increased concentration of salts in soil or water. With long-term cultivation under salinization conditions, a significant increase in their salt tolerance was found in tomatoes without a decrease in yield. Salt tolerance depends on the phase of plant development. Seedlings suffer more than adult plants; seed germination is delayed, since the activity of hydrolytic enzymes in the endosperm decreases. The climate also affects salt tolerance. In colder climates, plants are more resistant to salts (https:// studme.org /292737 / ekologiya/soleustoychivost).

RESEARCH METHODOLOGY AND CONDITIONS:

The soil and climatic conditions of the Aral Sea region (the Republic of

Karakalpakstan) differ significantly from other zones of Central Asia. The soils of the Republic of Karakalpakstan are very specific. The soils of the experimental site of the experimental base of the Karakalpak Scientific Experimental Station are of meadow-takyr type. In terms of texture, medium loamy. According to the availability of nutrients to low-income groups: humus they contain 0.7-0.9%, total nitrogen - 0.06% phosphorus - 0.19% and gross potassium - 1.48%. In terms of chemical composition, they are considered moderately saline. The dense remainder of the arable soil layer is 0.72-0.95%, the level of occurrence of groundwater before water flow and the irrigation network is 2-3 m.

The article presents the results of a study in 2019-2020 of 10 varieties of tomato of various ecological and geographical origin: Uzbek, Russian and foreign selection. The plants were planted by the seedling method in four repetitions. Sowing of seeds to obtain seedlings was carried out on March 1-2 in an unheated film greenhouse, followed by planting in open ground. Plants grown in this way in greenhouse conditions are less injured when planted in open ground. During the growing season of plants, the studies were accompanied by observations, counts and measurements, which were carried out in accordance with the requirements of existing techniques for tomato culture [1, 2]. The growing season was determined from the appearance of full seedlings.

AIM:

The research is to study the tomato gene pool to create new varieties that are highly productive and resistant to environmental stress factors. The promising tomato varieties have been identified for economically valuable traits, which can be used in further breeding work to create new varieties for the conditions of saline soils of the Republic of Karakalpakstan.

RESEARCH RESULTS:

The experiments were carried out in conditions of moderately saline soils in 2019-2020. In the variety trial, 8 samples were tested in comparison with the standards: variety Volgogradskiy 5/95 and hybrid Sultan F_1. For the test, 2 large-fruited (Prednekrovskiy rojeviy, Yubileyniy Tarasenko) and medium-sized hybrids (Tristar F_1, Solerosso F_1) and 3 small-fruited varieties (Rio grande, UzMASH, Novichok, TMK-22) were included.

Determination of the early maturity of the tested varieties showed that all small-fruited varieties began to ripen several days earlier than large-fruited ones. Of the medium-fruited, the Solerosso F_1 hybrid began to mature later than others (Table 1).

Table 1. The duration of the growing season, yield and the value of the early harvest of tomato in competitive variety testing (2019-2020 years)

Variety samples	Duration of the growing season, days	Total yield, t/ha	Early harvest, t/ha	% To standard	% Of the total harvest
variety					
Volgogradskiy 5/95 (st)	112	26,5	0,8	100,0	2,8
TMK – 22	108	21,7	1,2	150,0	4,1
Rio grande	109	28,8	1,7	212,5	4,8
Prednekrovskiy rojeviy	112	24,3	1,2	150,0	5,5
Yubileyniy Tarasenko	113	27,0	1,1	137,5	5,9
Novichok	100	26,8	1,6	200,0	5,2
UzMASH	103	25,0	1,2	150,0	9,6
hybrid					
Sultan F_1 (st)	102	29,8	1,2	100,0	4,1
Solerosso F_1	110	30,8	1,4	116,6	4,5
Tristar F_1	108	31,3	1,5	125,0	3,8
LSD_{05}		1,55	0,2		

The highest early harvest in the first 20 days of fruiting (1,4-1,7 times higher than the standard) was formed by small-fruited varieties UzMASH, Novichok. The large-fruited hybrids F_1 Solerosso and the small-fruited

variety Rio Grande were generally close to the standard in terms of size and proportion of early harvest. The Solerosso F_1 hybrid was inferior to the standard in terms of size and proportion of the injured crop.

It was revealed that the Tristar F_1 hybrid was characterized by the most powerfully developed aerial part. The hybrid Solerosso F_1 and the UzMASH variety also had a highly developed bush. The rest of the varieties were close to the TMK-22 standard in terms of bush development. An average positive correlation was noted between the length of the main stem and the number of lateral shoots ($r=0,57\pm0.20$, $t_{05}=2,10$), that is, the longer the stem was, the more lateral shoots it had.

In these years, the Tristar F_1, Solerosso F_1 hybrids and the Rio Grande variety formed a significantly higher total and especially marketable yield, compared to the Volgogradskiy 5/95 standard.

All other tested varieties gave practically the same yield as the standard. The difference in yield between them and the standard did not exceed the smallest significant difference.

The yield counts carried out in both years showed that all varieties left in the variety trials significantly exceed the standard variety Volgogradskiy 5/95, both in total and marketable yield. The difference in yield between the tested varieties and the standard was significantly higher than the LSD, i.e. was significant and reliable (Fig.1.,Fig.2).

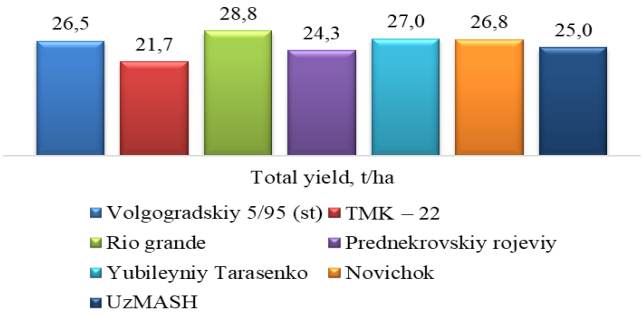

Figure: 1. Marketable yield of tomato varieties in variety testing, t/ha (2019-2020)

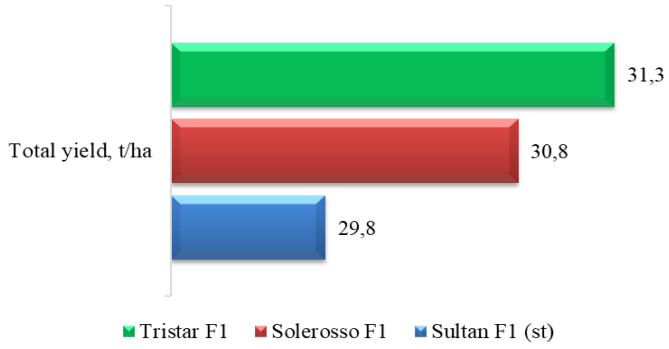

Figure: 2. Marketable yield of tomato hybrids in variety testing (2019-2020)

The most productive hybrids were Tristar F_1 and Solerosso F_1. The difference in yield between them and all other samples tested was significant (above the LSD).

The difference in yield between Solerosso F_1, Rio Grande, Newbie did not go beyond the limits of experience, i.e. did not exceed the LSD. Therefore, we can assume that their yield was the same and significantly higher than the standard.

CONCLUSION:

The Tristar F_1 and Solerosso F_1 hybrids exceeded the standard in average fruit weight and tasting score. Small-fruited varieties Rio grande, Novichok, UzMASH, in comparison with the standard, formed smaller fruits, were suitable for whole-fruited canning, but when fresh, they were somewhat inferior in taste to the standard.

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