Assessment of the melon collection with the purpose of identification of prospective lines for selective use in conditions of closed ground

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Abstract. *In recent years, portioned early ripening sample-varieties of melons with an average weight of 0.6 - 2.5 kilograms grown in greenhouses have been in great demand abroad. Unfortunately, until recently, having a wide sample-variety of local melons, which are the best in the world, capable of satisfying the most refined tastes, nevertheless, work on creating sample-varieties of melons for protected ground has not been carried out. Breeding for the creation of sample-varieties and hybrids of melons for protected ground in Uzbekistan is a new and promising direction.*

Keywords: *sample-varieties, hybrids, protected soil, melons, fruit weight, quality, disease resistance.*

Introduction

Gourds in greenhouses are widespread in China, Turkey, Spain, the Netherlands, Japan, Israel. In Japan, melons and gourds occupy about 17-18% (20-30 thousand hectares) of greenhouses. In the Netherlands, melons occupy 40-60 thousand hectares of greenhouses, in Israel more than 200 thousand hectares of plastic greenhouses: FAOSTAT.

In 2012-2016. world melon production increased by 9% to 31.2 million tons amid an increase in cultivated area by 9 thousand hectares and an increase in yield from 24.6 t / ha to 25 t / ha: FAOSTAT.

The leaders of the world production of watermelons and melons are China (68%), Turkey and Iran (3% each). The global export of melon increased by 6% to 2.3 million tons, the leaders are Guatemala and Spain (20% each), Brazil (10%). In 2016, the global volume of melon exports was estimated at more than $ 1.6 billion. In 2016, the USA (25%) and the Netherlands (10%) were the leaders in the import of melons in the world: FAOSTAT.

Central Asia, including Uzbekistan, has long been the center of melon cultivation. Melons in Uzbekistan are among the best in the world, capable of satisfying the most sophisticated tastes of consumers [6].

Melon is not only tasty, but also healthy. Traditional medicine has long recommended the melon to emaciated patients, especially after undergoing operations. Previously, a decoction of seeds was used to treat gonorrhea, and a decoction of the peel and roots was used to cleanse the stomach [5].

The high iron content makes melon useful for anemia, atherosclerosis and cardiovascular diseases. Like watermelon, melon is effective in treating kidney stones (Avicenna wrote about this).

Of paramount importance is their taste, which mainly depends on the sugar content of the pulp. The fruits contain such essential substances for the body as vitamin C, provitamin A (carotene) and pectins. Melon seeds contain up to 23–35% fat [1,3, 12].

Currently, in the Republic of Uzbekistan, the area for melon cultivation occupies over 25,000

hectares, for watermelons, 25569 hectares, about 60 sample-varieties have been zoned, of which over 40 sample-varieties of local selection [13].

However, until recently, selection work has not been carried out to create early ripening, highly productive, with high taste, resistant to powdery mildew, fusarium wilt with a fruit weight of 0.8 - 2.5 kg suitable for growing in greenhouses local sample-varieties.

Materials and Methods

In the first Scientific-Research Institute of Vegetables Crops, Melons and Potatoes in the greenhouse economy, since 2018, work has begun on breeding to create sample-varieties and hybrids of melons.

In our experiments for 2020, the temperature on sunny days was 25-320C in March, 8-150C at night, 17-250C on cloudy days, 30-350C in the daytime in April, 20-250C at night, in May and June the temperature reached on some days up to 550C without shading, after shading the temperature in greenhouses dropped to 350C, at night it was at the level of 22-260C (Fig. 1).

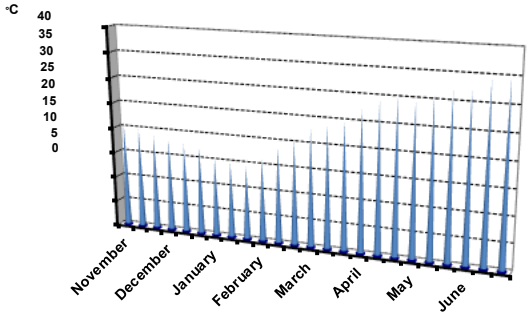

Fig. 1. Average daily air temperature in heated film greenhouses in 2020.

According to our observations, the air humidity inside the film greenhouse was at the level of 80-90%, on rainy days it reached up to 95%. With good ventilation, this indicator was at the level of 75-85% (Fig. 2).

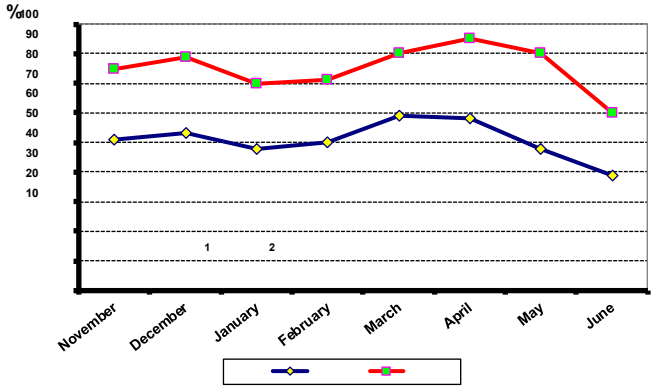

Fig. 2. Relative air humidity in open ground (1) and plastic greenhouses (2) in 2020

One of the most promising cultivars is the heterotic breeding method. So, as hybrid sample-varieties, they have increased viability, which provides a sharp increase in yield [9].

The main directions for obtaining hybrid seeds by natural cross-pollination of the original parental forms are: use as one of the parental forms of plants with signs of male sterility, the use of forms with signaling signs, the effect on the maternal forms of physiologically active substances in order to enhance the female sex, and the use of female (genocidal) forms [4, 7, 11, 14].

The technique of inter-varietal hybridization in melon has been studied by many researchers. It was found that the best time for crossing is morning hours (from 7 to 10 hours). It has been proven that the best set of hybrid fruits occurs when freshly harvested male flowers are pollinated with pollen. According to the generally accepted method of crossing, used for breeding purposes, the melon on the eve of the disclosure of female flowers is castrated, and in the morning only pollination and isolation [2, 8, 10].

Research Analysis

In our experiments, a collection of 41 sample-varieties of melons of foreign and local selection for open ground was studied. The zoned local melon sample-variety Kichkintoy (means "Baby") for open ground was taken as the standard, since in the Republic not a single melon sample-variety has been zoned in greenhouses yet, the Kichkintoy sample-variety - medium-early-ripe, the growing season is 75-80 days.

Fruits are spherical, fruit weight 0.8-1.2 kg, surface is smooth, background color is yellow, mesh is partial, coarse-meshed, bark hardness is average. The pulp is white, tender, dense, aromatic, tastes like honey. The sugar content is 8.3-11.8%. Productivity is 20-26 t / ha.

Of the studied melon cultivars, 19 cultivars were early ripening, 73-84 days, 10 mid-ripening cultivars - 86-93 days, 12 late-ripening cultivars - 104-123 days from mass shoots.

Table 1 and Figure 3 show the economically valuable characteristics of the isolated melon sample-varieties in the experiments in 2020.

Table 1. Economic evaluation of the separated sample-varieties of melon when grown in film greenhouses Scientific-Research Institute of Vegetables Crops, Melons and Potatoes (2020)

№	Variety samples	Fruit weigh, kg	PCB %	Description of fruits				Tasting assessment, Score (grade)
				Height, length, cm	Flesh thickness cm	Flesh color	Fruit flesh	
ст	Kichkintoy ("Baby")	0,6	11,9	11x9	2,5	Light green	soft	5
1	L-1	1,4	12,5	15,2x12	3,3	white	soft	4
2	L-2	1,8	12,5	23,3x13	3,5	white	soft	4
3	L-3	1,2	10,5	17x11,2	2,8	white	soft	4
4	L-6	1,2	11,3	14x12	3,9	white	soft	5
5	L-161	0,8	15,2	12x9	2,6	white	soft	5
6	Rohat ("Pleasure")	1,0	10,6	14x12	2,8	white	soft	5
7	L-15	1,2	15,0	14x12	3,0	white	soft	5
8	L-160	1,0	12,8	14x11	2,7	white	soft	5
9	F_1 -179	0,7	12,8	13x9	2,4	white	soft	5
10	L-161a	0,8	14,3	13x10	2,6	white	soft	5
11	L-1a	1,4	12,9	7x15	3,4	Light white	soft	5
12	F_1 -Dave	1,0	11,1	13x12	3,4	white	soft	5
13	F_1Galimax	1,3	13,6	10x14	3,3	Light	soft	5

						white		
14	NS-168	1,3	9,2	22x12	3,4	white	soft	4
15	Company	1,5	9,7	21x12	3,0	white	soft	4
16	REM	1,7	9,6	18x14	3,5	white	soft	4
17	MEL-004	0,9	10,2	14x13	2,9	Light white	soft	5

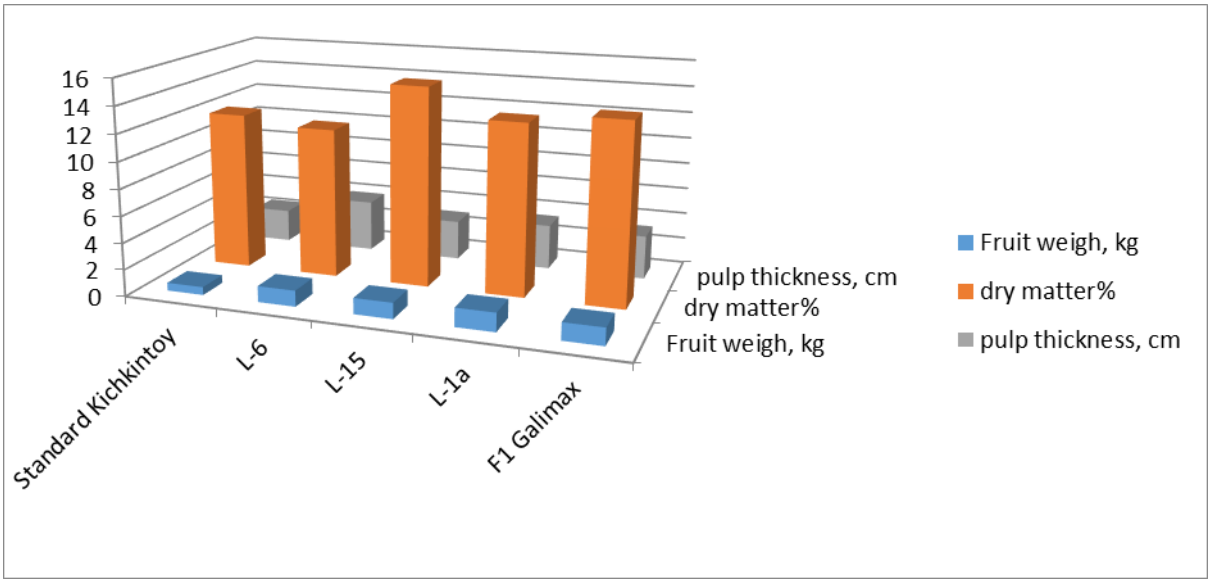

Fig. 3. Sample-variety of melon distinguished by fruit weight, dry matter and tasting assessment

As can be seen from Table 1, the separated sample-varieties of melon had an average fruit weight of 0.6-1.8 kilograms, RSV (soluble dry matter) of 9.2-15.2%.

However, under greenhouse conditions, not all cultivars were resistant to powdery mildew (Pseudoperonospora cubensis), fusarium wilt (Fusarium oxysporum f. Sp. Melonis), and root rot (Rhizoctonia solani).

F1 -179, REM, Kichkintoy, NS-168, F1 - Dave were relatively resistant to root rot and fusarium wilt. The rest of the sample-varieties were affected by fusarium wilting from 10-20%, Fig. 4.

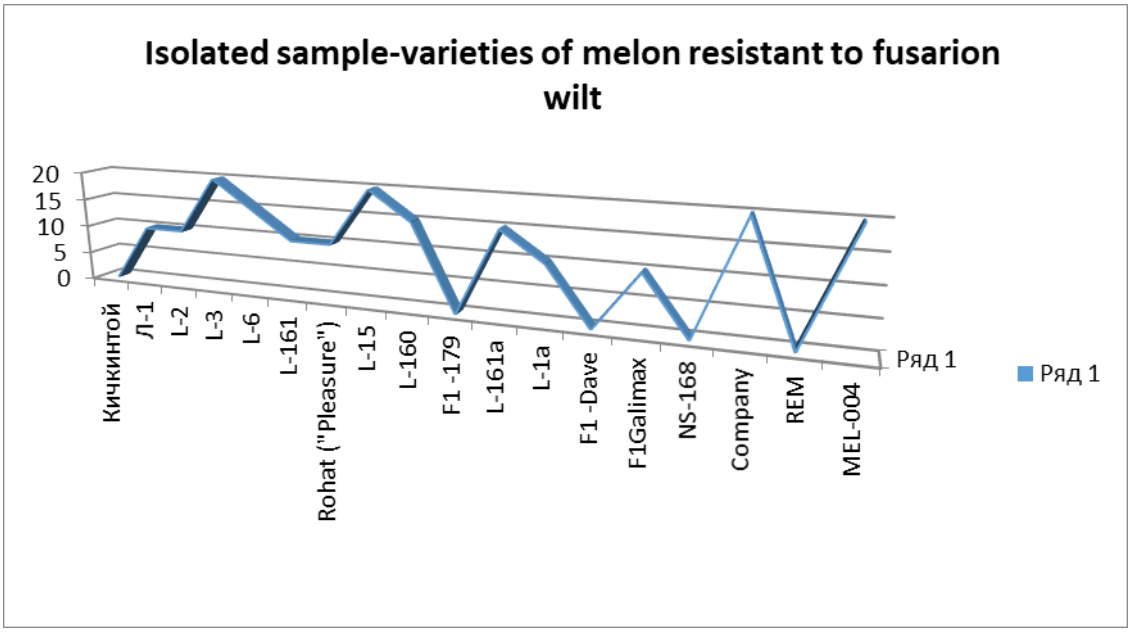

Fig. 4. Isolated sample-varieties of melon resistant to fusarium wilt

Thus, we can make a preliminary conclusion that in the collection nursery out of 41 sample-varieties of foreign and local selection, 18 sample-varieties were identified as the most interesting for selection, including the Kichkintoy ("Baby") standard. These sample-varieties had high taste, appearance, relative resistance to powdery mildew, fusarium wilting.

Conclusion

Samples L-161, L-15, L-161a, L-160, F_1 -179, L-1, L-2, L-1a, F_1Galimax, Kichkintoy ("Baby"), were distinguished by high taste, the melon fruit pulp was soft, sweet, aromatic. The tasting score ranged from 4-5 points. These sample-varieties were selected and will subsequently be used for breeding purposes.

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