Distribution of primary sources for melon selection

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Abstract. The aim of the research was to select early maturing melon varieties of high quality and resistant to powdery mildew. In the nursery of the main resource for melon breeding for maturity, fruit weight, soluble dry matter content and resistance to powdery mildew, 28 cultivars of Russian, Italian, Dutch, Japanese and Chinese selections were isolated. The area of each sample in the nursery for the study of varietal samples is 10 m2, irretrievably. According to the early ripening of fruits stood out samples Holland №101, №102, Japan Earls verda Natsu, Yellow King, Russia №1 and were 72-77 days. According to allocation by the content of soluble solids in fruits of samples Russia № 02, Holland № 101, China ECO-117, № 01, № 02, Japan Festa, Earls verda Natsu had an average content of soluble solids - 14.3-16.3%, the highest reached 18%. These samples are recommended for selection of varieties with high sugar content. The studied melon samples were 100% resistant to powdery mildew, and they can be used as donors in the selection of varieties resistant to the disease.

1 Introduction

The soil and climate conditions of Uzbekistan are suitable for growing high-quality products from rice crops. The length of sunny days and high temperature in our country increases the amount of biologically active substances and vitamins in the products of polys crops. This increases the demand for our products abroad.

Melons of Uzbekistan are distinguished by their quality indicators, high sugar content, aroma, variety. There are early, medium and late ripening varieties of melon. These varieties are in great demand in the domestic and foreign markets. Most varieties of melons are large, transportable and do not meet the requirements of the foreign market. At the same time, the sugar content of the fruits is decreasing as a result of the resistance of local melon varieties to diseases. Therefore, it is necessary to create varieties of melon with small fruits of 1-1.5 kg, transportable, resistant to diseases [1, 2].

Melon fruit has a wonderful taste and many useful properties. It contains 85-92% water, 8-15% dry matter, 0.8% protein, 1.8% fiber, 6.2% other carbohydrates, 0.9% fat, 20-30 mg/% ascorbic acid, iron , there are trace elements such as calcium, magnesium, potassium,

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organic and mineral salts. The amount of sugar in the fruits of Uzbek melon varieties reaches 14-16%. A large amount of fructose in the composition gives the flesh of the melon a sweet taste, and when there is more glucose, it has a sweet taste. Melon also contains vitamin C, P, PP, provitamin A, folic acid, pectin and other elements. In addition, due to the presence of superoxide dismutase and antioxidant enzymes in melon, it relieves stress in the human brain.

Melon seed tinctures are used to treat cough, skin and stone diseases. The seeds contain compounds of high functional and nutritional potential. Biologically active compounds such as tocopherols, phospholipids and sterols are present in large amounts in melon seeds, which have beneficial effects on humans [3, 4].

Melon is a very common fruit consumed all over the world and is an excellent source of biologically active compounds for humans due to its good taste and rich chemical composition. Melon contains glucose, fructose, vitamins A, D, C, K, E and some vitamins of group B [3].

Also, melon is characterized by the presence of large amounts of carotene, vitamins V1, V2, RR, A, C, V9, R, provitamin A, folic acid and iron (mainly due to the healing effect of this product), pectin substances, fats, salts, as well as a special enzyme that prevents damage to body tissues. For example, the amount of iron in melon is 17 times higher than in dairy products. Beta-carotene helps the immune system as a powerful antioxidant associated with cancer, heart attack, stroke, cardiovascular disease, chronic fatigue syndrome, lupus, and is essential in the fight against night blindness and cataracts. Ascorbic acid helps maintain a healthy immune system, reduce the severity of colds, is a powerful antioxidant, and helps prevent cardiovascular disease (Lester, 2006).

Folic acid controls amino acids in building protein chains, reduces homocysteine, which is associated with cardiovascular disease, participates in cell division, regulates the central nervous system, mood, sleep, and appetite, and plays an important role in preventing spina bifida in newborns.

Varieties have their own requirements for the use of agricultural products in each direction. Therefore, it is necessary to create varieties suitable for use in each direction. Farmers and peasant farms need high-yielding, high-fruit and technological quality, disease-resistant varieties. At the same time, varieties lose quality indicators as a result of long-term cultivation, changes in environmental conditions, hybridization of varieties with each other, mutations and mechanical interference reduce the purity of varieties, and it is necessary to replace them with new varieties [5-7].

It has been proven by scientists and growers to create locally created varieties suitable for every soil-climate condition. Varieties and hybrids of cultivated crops imported from foreign countries do not give high yields in our conditions and are inferior to local varieties in terms of quality indicators. Due to the high quality indicators of varieties created in local conditions, it satisfies the demand of consumers.

In the cultivation of a high and stable yield of melons, along with the creation and introduction of new productive and high-quality varieties into production, varieties are required to be resistant to disease and complex stress conditions of the region [8].

As a result of the study of the genetic collection of polys crops, it is possible to isolate the initial source for selection work in different directions [9]. Based on the goal set in the selection, the necessary primary resources are selected in the nursery of the collection [10].

The main purpose of selection work is to create varieties and hybrids of melon with high yield, good quality indicators, resistance to diseases and competitive with foreign varieties and hybrids.

In Uzbekistan, field crops are cultivated from March to October. Therefore, according to the types of polyz crops, early, mid- and late-ripening varieties are required. Varieties should be fruitful, resistant to various environmental conditions and diseases, high fruit

quality, transportable and exportable. Breeders are required to create new varieties that embody all these characteristics [1,2,6,11].

Creating new varieties is a long process and consists of several stages. A model of the type to be created is created. First, a collection of varieties is studied, parental forms are distinguished, and cross-breeding is carried out. Hybrids of the first and second generation are tested and a selection of promising forms is held in order to create a new variety. Lines from the third and next generation hybrids are isolated on the basis of individual selection. The promising lines are tested with the standard variety and the promising ones are separated for the new variety. Then, the small and large varieties are tested with the zoned variety in trial nurseries. At the same time, primary seeding of promising lines is organized. Based on the selection and production results, promising ones are submitted to the State Variety Testing Commission.

Our selection work in the creation of new varieties of melons is moving to the next stages. The main method of our selection work is to select parental forms from the collection and carry out cross-breeding. Generations of hybrids are tested and promising forms are selected based on selection. The promising lines are tested with the standard variety and the promising ones are separated for the new variety. Then, the small and large variety are tested with the zoned variety in the trial nurseries. At the same time, primary seeding of promising lines is organized. Based on the selection and production results, promising ones are submitted to the State Variety Testing Center. Based on this method, selection works are being carried out. With this method, a number of varieties of rice crops were created at the institute [2,12].

Uzbek melons have a sweet taste, a pleasant smell, and various shapes that are unmatched in the world. Varieties fairy tale, comrade and evening, as well as long-term winter storage qualities. They have many domestic and foreign market buyers. Most of the local varieties have large fruits, and there is a great demand for small-sized ones abroad. To create varieties with an average weight of 1.0-1.5 kg that are resistant to transport in transport for export. At the same time, many local varieties are resistant to diseases, especially powdery mildew. The development of high quality, disease resistant local varieties is a hot topic.

2 Material and methods

Research materials. In the research, 28 samples of varieties belonging to the selection of Russia, Italy, the Netherlands, Japan and China were tested. As a standard variety, the Obi novvot variety included in the State Register was taken.

Research methods. Selection works "Method of conducting experiments in vegetable growing, rice growing and potato growing" (2023), "Metodika polevogo opyta" (1985g), "Metodicheskie ukazaniya po selektsiya bakchevyx kultur" (1988), "Metodika otsenki ustoychivosti tykvennyx kultur k muchnistoy rose" (1975) , was conducted on the basis of methodological manuals.

Each sample area in the study nursery of variety samples is 10 m2, non-refundable.

The following observations and measurements were made during the growth period:

the main stages of the growth period: germination, opening of paternal and maternal flowers, fruit ripening were observed;

biometric measurements of plant leaves (length of main and side branches, number of side branches) were carried out on every 10 plants;

plants were evaluated according to morphobiological and cultivar characteristics (palm development, leaf shape, fruit shape, color, flower, web);

the level of damage by flour dew disease was determined;

the crop was harvested and the yield was determined. The harvest was divided into high-quality (goods) and low-quality;

the weight of 5 fruits (kg) and dry matter content (in refractometer) % were determined in each sample. Method of conducting experiments in vegetable, potato and potato crops. Tashkent, 2023.

Soil-climatic conditions of the research site. Experiments were conducted in the fields of the Tashkent experimental site of the Scientific-Research Institute of Vegetables, Rice Crops and Potatoes. The experimental farm is located in the territory of Kok Saray village, Tashkent district, Tashkent region.

In the experimental land plots, the average PH-7.1%, humus content 0.965%, N-0.147%, R-0.168%, K-2.198%, mobile P2O5-31.2 mg/kg and N-NO3- 18.2 mg/kg.

The temperature of the climatic region of Tashkent region changes dramatically. The zones of the climate region are characterized by heat and light and dry temperatures.

A characteristic feature of the region's weather is that there is sufficient light and heat, and continental variability, and the air is dry. The duration of sunlight is 2,700–3,000 hours per year, with 360–400 hours of sunlight per month in summer and 90–130 hours in winter.

The winter is characterized by a rapid transition from cold to a warm rainy spring, and a warm spring to a hot dry summer. The transition from autumn to winter is also sharp. It is noted that the daily temperature changes with a large difference in the continentality of the climate (7-9 0C in winter and 10-15 0C in summer), and the daily temperature in January and July varies with a large amplitude (up to 27-30 °C).

3 Experimental results

In 2022-2023, 28 varieties and G'1 hybrids selected from Italy (1), the Netherlands (3), Japan (8), China (13), and Russia (3) were tested at the Scientific Research Institute of Vegetables, Fruit Crops and Potatoes in 2022-2023 . As a result of phenological observations, the seeds germinated on the 5th-6th day and 75% of the sprouts on the 7th-8th day. Early flowering of paternal flowers was 27-28 days and mass flowering was 33-35 days in Dutch samples №101, №102, №104. Late paternity flower opening was observed in Italy 7V0020, Russia №1, №2, №3, China IVF-117, KR-1222, KR-1800, №01 and 10% opening took 38-41 days and 75% opening took 41-47 days. organized. In the standard Obi novvot variety, this indicator was equal to 36-41 days. (Table 1)

The early opening of the maternal flowers determines the early ripening character of the variety. Early opening of maternal flowers (10%) 37-40 days in samples of Holland №101, Japan Earls verda Natsu, NAM-1, China IVF-05, Russia №3, Holland №102, Japan Early Arena Natsu, Yellow King, Festa, China №05, №198, №02, Paradist 686 samples made 41-43 days. The late opening of maternal flowers was equal to 43-47 days in samples KR-1230, KR-1345, №03, 7V0020, №1, №2, №104 and Early Venus Akihuyn. In the standard Obi novvot variety, the opening of the first flowers (10%) took 44 days and the mass (75%) took 53 days.

Early ripening of fruits was 72-77 days in samples of Holland No. 101, No. 102, Japanese Earls verda Natsu, Yellow King, Russian No. 1. In Japanese NAM-5, NAM-6, Chinese №01, №04, №05, №198, Paradist 686 samples 85-88 days, in KR-1222, KR-1230, KR-1345 samples this indicator was 90-98 days . In the remaining samples, this indicator was 80-88 days, and in the standard Obi novvot variety, it was 88 days.

For the selection of early varieties, samples №101, №102, Earls verda Natsu, Yellow King, №1 are recommended. Japanese NAM-1, Chinese KR-1800, No. 02 samples are recommended for the selection of early-mid-ripe varieties, and NAM-5, NAM-6, Chinese No. 01, No. 04, No. 05, No. 198, Paradist 686 samples are recommended for the selection of mid-ripe varieties.

Table 1. Phenological monitoring indicators of melon variety samples (2022-2023 year)

Varieties and hybrids	Origin	Seed germination, day		Flower opening, day				Fruit ripening period, days
				fatherhood		motherhood		
		10%	75%	10%	75%	10 %	75 %	
Obi Novvot, st	Uzbekistan	6	8	36	41	44	53	88
7B0020	Italy	6	8	39	42	45	55	82
№1	Russia	6	8	38	41	44	53	77
№2	Russia	6	8	40	43	44	53	81
№3	Russia	6	8	31	38	41	46	84
№101	Netherlands	6	8	28	35	37	43	72
№102	Netherlands	6	8	27	33	43	48	77
№104	Netherlands	6	8	28	35	45	52	80
Early Venus	Japan	6	8	32	36	45	49	83
Early Arena	Japan	6	8	29	32	43	48	81
Yellow King	Japan	6	8	30	32	43	45	76
Earls verda Natsu	Japan	6	8	30	32	38	44	74
Festa	Japan	6	8	32	35	43	46	83
HAM-1	Japan	5	7	34	38	38	45	80
HAM-5	Japan	5	7	34	39	45	50	85
HAM-6	Japan	5	7	34	38	45	50	85
IVF-05	China	6	8	38	40	44	52	90
IVF-117	China	6	8	40	42	44	52	90
KR-1222	China	6	8	40	42	44	53	98
KR-1230	China	6	8	36	39	47	55	96
KR-1345	China	6	8	36	39	47	55	92
KR-1800	China	6	8	40	46	45	50	80
№01	China	6	8	41	47	46	51	85
№02	China	6	8	38	43	43	47	83
№03	China	6	8	38	43	49	53	90
№04	China	6	8	38	43	46	50	85
№05	China	6	8	38	43	43	50	87
№198	China	6	8	38	43	42	47	86
Paradist 686	China	6	8	38	43	42	47	88

In the results of biometric measurement of the plants of the melon variety, all the samples showed a low index in terms of the length of the main stem and side branches compared to the standard Obi novvot variety. The length of the main stem in samples 7V0020, №1, №2, №3, №102, №104 was 120-132 cm, and the length of side branches was 300-398 cm. The number of lateral branches is 2.8-3.5 pieces.

Table 2. Economic characteristics and disease resistance indicators of melon variety samples (2022-2023 year)

Varieties and hybrids	Resistance to powdery mildew,%	Fruit average weight, kg	Fruit index	Soluble dry matter content, %		The thickness of the meat sm
				average	the most	
Obi Novvot, st	0	1,9	0,94	12,3	14,0	4,1
7B0020	100	1,6	1,3	13,0	14,2	3,2
№1	100	1,8	1,6	7,5	8	3,5
№2	100	2,5	1,6	8	9	4
№3	100	1,5	1,2	14,3	15	3,7
№101	100	1,5	1,1	14,5	16	4,6
№102	100	1,8	1,3	10,8	13	3,7
№104	100	1,6	1,2	9	10	3,5
Early Venus Akihuyn	100	0,75	0,9	9,2	12,0	3,5
Early Arena Natsu	100	0,6	1,0	12,0	14,0	3,0
Yellow King	100	0,4	1,0	13,0	14,0	3,0
Earls verda Natsu	100	1,4	1,0	16,3	18,0	3,6
Festa	100	0,7	0,9	14,0	16,0	3,0
HAM-1	100	1,5	1,2	12,5	13,5	3,0
HAM-5	100	2,1	1,5	11,5	13,0	3,5
HAM-6	100	1,4	1,3	12,0	14,0	3,0
IVF-05	100	0,8	1,4	12,0	14,0	2,0
IVF-117	100	1,0	1,2	14,5	15,0	2,3
KR-1222	100	1,5	2,2	12,0	13,5	2,5
KR-1230	100	1,3	2,0	10,2	12,5	2,7
KR-1345	100	1,3	0,9	11,0	13,0	2,0
KR-1800	100	0,8	3,2	13,1	14,0	1,5
№01	100	1,4	1,1	14,2	16,3	4,0
№02	100	1,4	1,3	15,0	16,0	3,3
№03	100	0,9	1,4	11,0	13,0	2,0
№04	100	1,7	1,4	12,0	13,5	3,5
№05	74	0,9	1,2	13,0	14,0	2,5
№198	100	1,3	0,9	11,5	13,5	3,0
Paradist 686	87	1,4	1,2	12,7	16,0	4,0

The development of stem was low in Japanese Early Venus Akihuyn, Early Arena Natsu, Yellow King, Earls verda Natsu, Festa hybrids. The length of the main stem was 63-93 cm, and the length of the side branches was 136-186 cm. The number of lateral branches is 2.2-3.0. In the standard Obi novvot variety, the length of the main stem is 155 cm, the length of the side branches is 425 cm, and the number of side branches is 3.5.

The fruits of the studied samples were small in size and averaged 0.4-2.5 kg. Japan's Yellow King, Early Arena Natsu, Festa, Early Venus Akihuyn, China's IVF-05, KR-1800, №03, №05, IVF-117 with very small fruit, 0.4-1.0 kg, medium weight Italian 7V0020 , Russia's №1, №3, №101, Holland's №102, 104, Japan's Earls verda Natsu, NAM-1, NAM-6, China's KR-1222, KR-1230, KR-1345, №01, №02, №198, Paradist 686 in samples 1.3-1.8 kg and only in Japanese NAM-5 and Russian sample №2 2.1-2.5 kg (Table 2).

The index of the fruit, that is, its shape, was different. Japan's Yellow King, Early Arena Natsu, Festa, Early Venus Akihuyn, Earls verda Natsu, China's KR-1345, №01, №198 samples are spherical 0.9-1.1 equal, KR-1222, KR-1230 samples are elongated oval is, the index is 2-2.2, that of the KR-1800 sample is higher, the index is equal to 3.2. In the remaining hybrids, this indicator was 1.2-1.6.

The amount of soluble dry matter in the fruit has a high correlation with the sugar content and is equal to r-85. The average amount of soluble dry matter in the samples №3, №101, Earls verda Natsu, Festa, IVF-117, №01, №02 with high sugar content in the fruit was 14.2-16.3%, the highest was 15-18%. The average sugar content in hybrids No. 1, No. 2, No. 104, Early Venus Akihuyn was 7.5-9.2%. It was 10.2-13.1% in the remaining hybrids. The average sugar content of the standard Obi novvot variety was 12.3%, and the highest was 14%.

The thickness of the meat was 3.5-4 cm in samples №1, №2, №3, №101, №102, NAM-5, №01, №04, Paradist 686. The thickness of the meat is IVF-05, KR-1345, KR-1800, №03 samples, the thickness is 1.5-2 cm. The thickness of the flesh of the standard Obi novvot variety was equal to 4.1 cm.

Among the samples studied in 2022-2023, in terms of total productivity, sample No. 2 of Russia was 117% higher than the standard Obi novvot variety per hectare or 22.7 t/ha. Productivity of Russian №1, №3, Dutch №102, Japanese NAM-1, NAM-5 samples was 16.6-18.9 t/ha or 85.5-97.4% compared to the standard. The lowest yield was 8.3-9.8 t/s in samples of China №05, №03, IVF-05, Japan's Yellow King, Early Arena Natsu. (Table 3)

Tovarbop yield is the highest in relation to the total yield of Italian 7V0020, Russian No. 1, No. 2, No. 3, Dutch No. 101, No. 102, No. 104, Japanese NAM-1, NAM-5, NAM-6, Chinese No. 01, №04, №198, Paradist 686 samples made 88.5-94.3%. In the standard Obi novvot variety, this indicator was 90.2%. In the rest of the samples, this indicator was lower than the standard variety and made 82.1-87.8%.

The variety hybrids are 100% resistant to powdery mildew and have high resistance to the necrotic form of fusarium.

For selection of early varieties №101, №102, Earls verda Natsu, Yellow King, samples №1, for selection of early-mid varieties Japan NAM-1, Early Venus, Early Arena, Festa, samples of China KR-1800, No. 02, mid-season NAM-5, NAM-6, Chinese №01, №04, №05, №198, Paradist 686 samples are recommended for variety selection.

1. Among the studied samples, the fruit is very small in Chinese IVF-05, KR-1800, №03, №05, IVF-117, Japanese Early Venus Akihuyn, Early Arena Natsu, Yellow King, Festa, 0.4-1.0 kg, in medium weight Italian 7B0020, Russian №3, Dutch №101, №104, Japanese NAM-1, NAM-6, Chinese KR-1222, KR-1230, KR-1345, №01, №02, №198, Paradist 686 samples It was 1.3-1.6 kg, 1.7-1.8 kg in sample No. 04 of China, No. 102 of Holland, No. 1 of Russia, and 2.1-2.5 kg in sample No. 2 of Russia and NAM-5 of Japan.

Chinese IVF-05, KR-1800, №03, №05, IVF-117, Japan's Early Venus Akihuyn, Early Arena Natsu, Yellow King, Festa for selection of small-fruited varieties of melon under local conditions, Italy's 7V0020, Russia's for selection of medium-fruited varieties №1, №3, Dutch №101, №102, №104, Japanese NAM-1, NAM-6, Chinese KR-1222, KR-1230, KR-1345, №01, №02, №04 №198, Paradist 686 samples were extracted.

2. The sugar content of the fruit is high. Russian No. 02, Netherlands No. 101, China IVF-117, No. 01, No. 02, Japan Festa, Earls verda Natsu samples have an average soluble dry matter content of 14.3-16.3%, the highest went up to 18%. It is recommended to use these samples for selection of varieties with high sugar content.

3. In terms of total productivity, not a single sample of the variety showed a higher index than the standard Obi novvot variety (18.9 t/ha). Only the sample of Russia No. 2 made 22.7 t/ha per hectare and was 117% higher than the standard variety.

4. The variety samples are 100% resistant to powdery mildew, and they can be used as donors in the selection of disease-resistant varieties.

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