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ECONOMIC AND BIOLOGICAL CHARACTERISTICS OF LOCAL GREENHOUSE VARIETIES OF MELON

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Abstract:

In the first in the republic, varietal samples of greenhouse melons were created, characterized by high yields, high taste qualities, resistant to major diseases common in protected ground. The average weight of melon fruits in all varieties ranged from 0.550 - 0.895 kg. Hybrid F_1 Zarkhal was transferred to the inspectorate for variety testing, and promising hybrids F_1 L-160 x L-179 and F_1 L - 161 x L-179 are undergoing production tests in greenhouse farms of the republic.

Keywords: Melon, Varietals, Hybrids, Sowing, Growth, Development, Yield, Taste, Resistance To Diseases, Protected Soil.

INTRODUCTION

Currently, melon is widely distributed in protected ground in France, Italy, Spain, Hungary, Bulgaria, usa, Japan, the Netherlands and even in such warm countries as Israel, Egypt and Morocco where melons are grown in winter in greenhouses. The creation of heterosis hybrids is a promising direction in the selection of melon culture in closed ground [16, 23, 25, 27].

Varieties of melon for greenhouses of Uzbekistan should combine precociousness, yield and good taste of fruits, as well as have resistance to adverse environmental conditions in the greenhouse. It is necessary that greenhouse varieties have a pulp no thinner than 3 cm with a sugar content of at least 7-8% sugars. Therefore, in the winter-spring turnover, medium-ripe varieties with very high taste qualities of fruits are usually grown [1, 7, 12].

The creation of high-yielding varieties and heterosis hybrids of melon has been and remains one of the main directions of breeding. Yield is a complex feature, since it depends on many factors: the length of the growing season, plant habitus, resistance to diseases and pests, endurance to adverse abiotic environmental factors, etc. The yield is based on the productivity of the plant, the components of which are the number and average weight of the fruit [10, 13, 17, 30].

The precociousness of the variety is associated with its resistance to temperature drops, i.e. with plasticity in relation to the temperature factor. Varieties that can develop in a larger temperature range and at lower minimum temperatures, as a rule, are more precocious, are promising for the northern regions of melon growing and for growing in film greenhouses of the northern zone [2, 34, 35].

The first reports of heterosis in melons referred to a sign of early ripeness. Precociousness is the main advantage of heterosis hybrids of melon, as it is a dominant trait and is controlled by three groups of genes. In this regard, the use of heterosis hybrids of melon is also of particular interest for selection for precociousness [3, 15, 18, 28].

The high taste of melon fruits is very closely correlated with the content of soluble solids in them, especially sugars. Along with sugars, ascorbic acid and carotene are important in assessing the quality of the fruits of melon crops, which increase the body's resistance to adverse conditions [6, 8, 21].

In this regard, the selection of varieties with orange pulp rich in carotene is of interest. Such varieties are cantaloupe melons, many samples of which are also well adapted to the conditions of protected ground [5, 22, 26].

The more the parents differ among themselves in the ecological conditions of cultivation, precociousness, origin, morphological and other signs, the more heterosis manifests itself [4, 19, 24].

However, in our republic to date, melon hybrids suitable for growing in protected ground have not been zoned. In this connection, in the first created hybrids of melon F1 Zarkhal, as well as hybrid combinations F1 L-160 × L-179 and F1 L - 161 × L-179 allocated in terms of yield, taste, as well as resistance to diseases is very promising and relevant for greenhouses in Uzbekistan [11, 13].

RESEARCH METHOD

One of the most promising methods of creating varieties is the method of heterosis selection. So, as hybrid varieties, they have increased viability, which provides a sharp increase in yield [9, 29].

The main directions of obtaining hybrid seeds by natural repollination of the original parent forms are: use as one of the parent forms of plants with signs of male sterility, the use of forms with signal signs, the effect on maternal forms of physiologically active substances in order to strengthen the female sex, as well as the use of female (genocidal) forms [19, 31, 33].

The technique of intervarietal hybridization in melon has been studied by many researchers. It is established that the best time for crossing is the morning hours (from 7 to 10 h). It is proved that the best knotting of hybrid fruits occurs when pollination of freshly harvested male flowers is pollinated. According to the generally accepted method of crossing, used for breeding purposes, in melons on the eve of the opening of female flowers, their castration is carried out, and in the morning only pollination and isolation are carried out [14, 20, 32].

In the experiments of 2020-2022, the following hybrid combinations obtained in previous years were planted below in spring greenhouses in comparison with the Kichkinta standard, as well as with parent forms: Zarhal (L - 131×Kichkintoy), F_1 L-160×L-179, F_1 L-161×L-179, L-160, L-161, L-179.

The accounting area of the plot is 30m^2, planting scheme is $\frac{120 + 80}{2}$ × 50cm,

the culture was conducted in a single stem.

RESEARCH RESULTS

Phenological observations of hybrid combinations of melon are given in Table 1. Sowing of seeds was carried out in cassettes with a soil mixture on February 1, mass shoots were noted on day 7-8. Planting of melon seedlings in a permanent place in the greenhouse was carried out on March 1.

After planting after 7-8 days, the plants were tied with twine to a trellis. As can be seen from Table 1, the flowering of male flowers was noted on the 26-30th day from mass shoots, a little later on the 29-35th day the flowering of female flowers was noted, the ripening of fruits was noted on the 85-95 day [11].

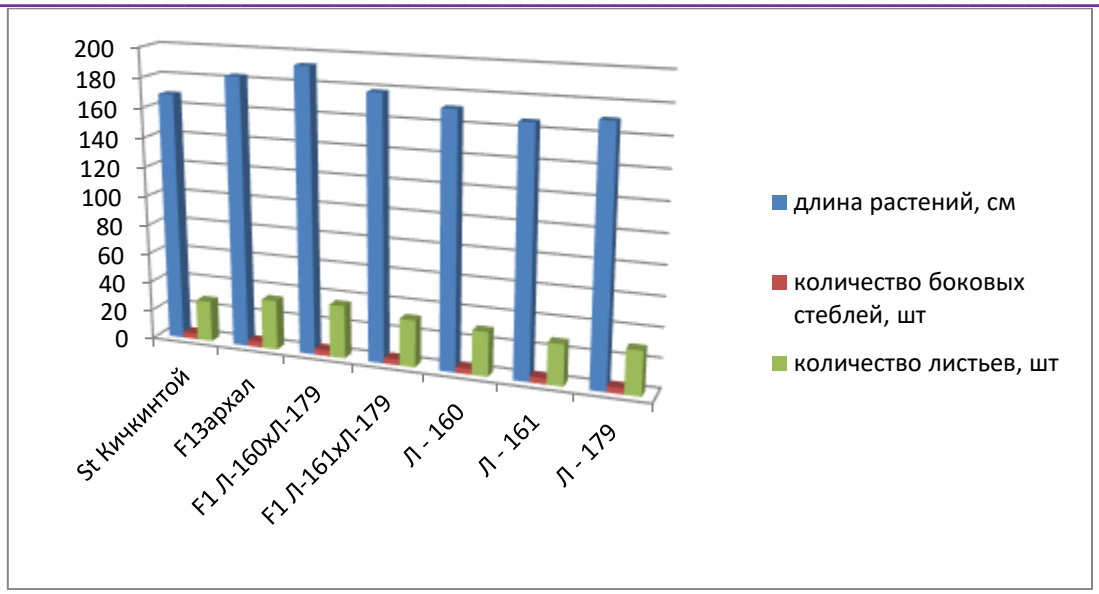
To trace how the growth and development of vegetative organs occur in various varieties of melon, we carried out biometric measurements of plants.

Table 1.
Phenological observations of varietal specimens of greenhouse melons

№	Varieties	Sowing data	Number of days from mass shoots		
			before flowering:		Fruit ripening
			male flowers	female flowers	
St.	Kichkintoy	1.03	30	35	95
1	F_1Zarhal (Л-131×Kichkintoy)	1.03	26	29	85
2	F_1 L-160×L-179	1.03	27	30	88
3	F_1L-161×L-179	1.03	28	31	87
4	L - 160	1.03	29	33	91
5	L - 161	1.03	29	32	89
6	L - 179	1.03	30	34	90

The power of plant development was characterized by the following indicators: the length of the main stem, the number of shoots, the number of leaves on one plant (Table 2)

Table 2.
Biometric measurements in hybrid combinations of melon in greenhouses



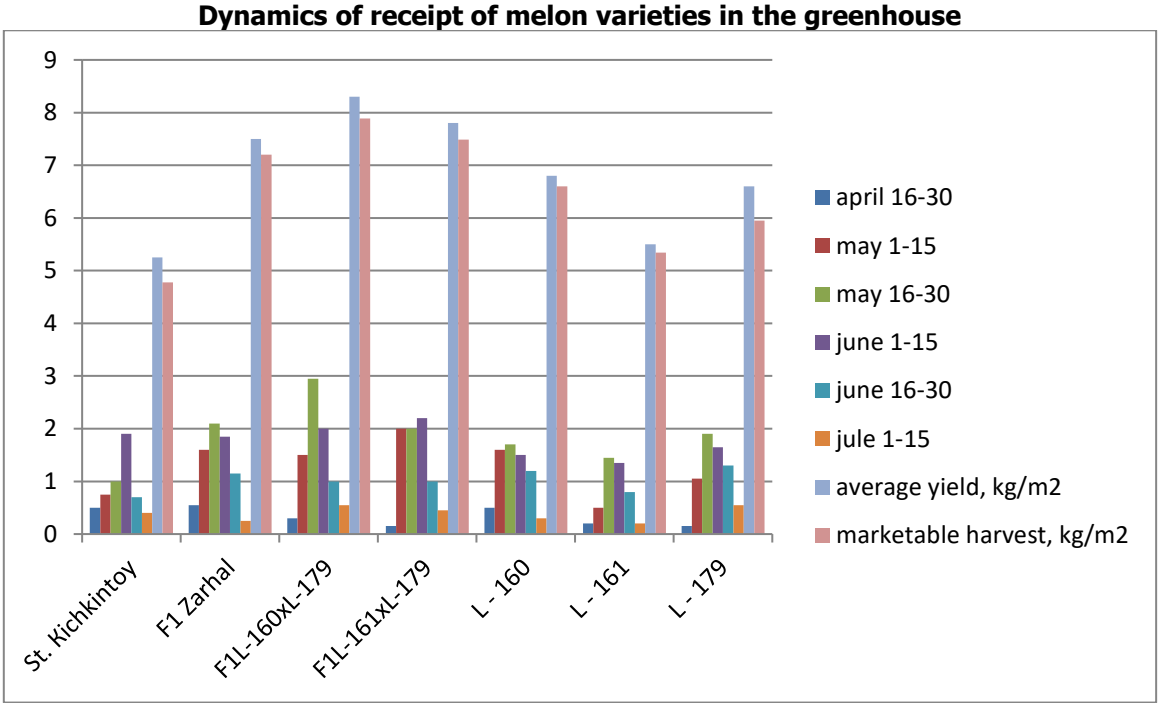
When measuring the vegetative organs in melon plants, F1L-160×L-179-192.6 cm, 4 side shoots and 36 leaves were distinguished, the smallest was noted in L-161-166.2 cm, 4 and 28 pieces, in the Kichkintoy standard, respectively, 168.6 cm, 4 and 28 pieces.

A large number of melon leaves is a positive sign, they contribute to the improvement of the carbon nutrition of plants. The latter contributes to a better fruiting process and increases plant productivity (Table 3).

Table 3 shows the dynamics of fruiting of hybrid combinations. It is very important in the protected ground to get not only a high yield of melon, but also an earlier harvest before the onset of summer-June 1, which predetermined a higher economic efficiency.

Table 3

Dynamics of receipt of melon varieties in the greenhouse



As can be seen from Table 3, the highest total yield was obtained in hybrid combinations F_1 L-160×L-179-8.3 kg/m^2, F_1L-161×L-179-7.8 kg/m^2 and F_1Zarchal -7.5 kg/m2 in comparison with the Kichkinta standard -5.25 kg/m^2 and parent forms L-160-6.8 kg/m^2, L-161-5.5 kg/m^2 and L-179-6.6 kg/m^2. According to preliminary data, these new hybrids of local selection are very promising in terms of productivity [11].

It is important in the selection of melon to get not only a high yield, but also a high-quality one. Thus, an important indicator determining the prospects of the variety is its quality of fruits, the data of which are given in Table 4.

Table 4
Harvest and its quality in varieties of melons in greenhouses

Variety	Yield, kg/m^2			early harvest to the commodity	average fruit weight kg	DSS %	Degustation. grade, score
	marketability	early before 1.06	% commodity				
StKichkintoy	4,78	2,25	91	47	0,612	12,4	4,0
F_1Zarhal	8,20	5,25	96	64	0,895	14,3	5,0
F_1L-160×L-179	7,89	4,75	93	60	0,850	13,8	5,0
F_1L-161×L-179	7,49	4,15	96	55	0,815	13,6	4,8
L - 160	6,60	3,80	97	58	0,670	13,1	4,5
L - 161	5,34	2,15	97	40	0,550	13,4	4,5
L - 179	5,95	3,25	90	52	0,705	12,7	4,2

According to the output of early products taken in the protected ground of the harvest before the onset of summer, i.e. up to 1.06, hybrid combinations of F_1 L-160×L-179 - 4.75 kg/m^2 (60% of the commodity harvest), F_1 Zarhal - 5.25 kg/m^2 (64% of the commodity), F_1 L-161×L-179 - 4.15 kg/m^2 (55% of the commodity) standard Kichkintoy - 2.25 kg/m^2 (47% of the commodity harvest) were distinguished.

The average weight of melon fruits in all varieties ranged from 0.550 - 0.895 kg. In terms of the content of soluble dry substances, F_1 Zarhal was distinguished - 14.3%, F_1 L-160×L-179 - 13.8%, F_1 L-161×L-179 -13.6% the lowest was noted for the standard by Kichkintoy - 12.4%, for L-160, L-161 and L-179, respectively - 12.7%, 13.1% and 13.4%.

During the period of mass gatherings, we conducted a tasting of melon varieties. The tasting was conducted on a 5-point system. In terms of taste, in appearance, all three new varieties of melons stood out: F_1 Zarkhal, F_1 L-160×L-179, F_1 L-161×L-179 - the tasting score of which was from 4.8-5.0 points, the Kichkintoy standard - 4.0 points, the parent forms L-160, L-161 and L-179 from 4.2 - 4.5 points.

CONCLUSIONS

1. When measuring the vegetative organs in melon plants, F_1 L-160×L-179-192.6 cm, 4 side shoots and 36 leaves were released, the smallest was noted in L-161-166.2 cm, 4 and 28 pieces, in the Kichkintoy standard, respectively, -168.6 cm, 4 and 28 pieces.

2. The highest total yield was obtained in hybrid combinations F_1 L-160×L-179-8.3 kg/m^2, F_1L-161×L-179-7.8 kg/m^2 and F_1 Zarhal-7.5 kg/m^2 in comparison with the Kichkintoy standard -5.25 kg/m^2 and parent forms L-160-6.8 kg/m^2, L-161-5.5 kg / m^2 and L-179-6.6 kg/m^2.

3. According to the output of early products adopted in the protected ground of the harvest before the onset of summer, i.e. up to 1.06, hybrid combinations F_1 L-160×L-179 - 4.75 kg/m^2 (60% of the commodity crop), F_1 Zarhal - 5.25 kg/m^2 (64% of the commodity), F_1 L-161×L-179 - 4.15 kg/m^2 (55% of the commodity) standard Kichkintoy - 2.25 kg/m^2 (47% of the commodity harvest) were distinguished. The average mass of melon fruits in all varieties ranged from 0.550 - 0.895 kg.

4. In terms of the content of dry soluble substances, F_1 Zarhal was released - 14.3%, F_1 L-160×L-179 - 13.8%, F_1 L-161×L-179 -13.6% the lowest was noted in the Kichkintoy standard - 12.4%, in L-160, L-161 and L-179, respectively - 12.7%, 13.1% and 13.4%.

5. Tasting was conducted on a 5-point system. In terms of taste, in appearance, all three new varieties of melons stood out: F1 Zarkhal, F1 L-160×L-179, F1 L-161×L-179 - the tasting score of which was from 4.8-5.0 points, the Kichkintoy standard - 4.0 points, the parent forms L-160, L-161 and L-179 from 4.2 - 4.5 points.

LITERATURE

1. Akhmedova M., Lyan E. The sammet mater collection of cup-network science in the Republic to beat the impact of fire samples on their cassettes in greenhouse conditions. Tashkent. 2021. 161 - 166 p.
2. Akhmadov M. Kh. Biological features of growing melon in greenhouses. Report. TAI. 1978. (1979). - V. 246. - 12-16.
3. Akhmadov M. Kh. Ecological features and formation of the harvest of varieties and heterosis hybrids of melon in the greenhouse culture : Dis. . . . cand. s.-kh. nauk : 06. 01. 06. - M., 1979. - 245 p.

4. Bamburova A. S. Methods of obtaining early melon products (foreign experience) // Agroprom. production: experience, problems and development trends. - 1990. - № 5. - S. 49-59.
5. Belik V. F. Melon crop. - 2nd ed., pererab. i dop. - M.: Kolos, 1975. - 271 p.
6. Bryzgalov V.A., Sovetkina V.E., Savinova N.I. and others. Protected ground vegetable growing / Ed. V. A. Bryzgalova. - 2nd ed., revised. and additional - M. : Kolos, 1995. - 325 p.
7. Davydov VD Handbook of vegetable and melon growing / Comp. V. D. Davydov; Ed. V. P. Yanatiev. - Donetsk: Donbass, 1981. - 287 p.
8. Dreval F. V., Didenko V. P., Lysenko V. P. New melon varieties for protected ground. - 1985. - Issue. 58. - S.
9. Dyutin K. E. Selection of melons for resistance to LMR / Problems of irrigated vegetable and melon growing. - 1990. - p. 27-34.
10. Ivanova A. E. Promising samples of melon for various areas of breeding / Use of world collections for breeding vegetable and fruit crops in Uzbekistan. - 1984 (1988).
11. Lyan E.E. Annual report on the project FZ-201802940 "'Creation of new productive and exportable varieties of melon grown in greenhouses in 2021".
12. Lyan E. Assessment of the melon collection with the purpose of identification of prospective lines for selective use in conditions of closed ground. Middle european scientific 413 bulletin issn 2694-9970. P. 413-418.
13. Lyan E. Selection of varieties and hybrids of melon resistant to diseases for protected soil of Uzbekistan. Asian Journal of Multidimensional Research.
14. Guidelines for the selection of maternal forms of heterotic melon hybrids / VASKhNIL, Department of Plant Growing and Breeding, All-Russian Research Institute of Irrigated Vegetable Growing and Melon Growing / Comp. K. E. Dyutin. - M, VASKHNIL, 1981. - 12 p.
15. Nehorosheva T. I. Technology of growing melons in film heated greenhouses in Western Siberia // Agrotechnics and selection of vegetable crops. - 1992. - S. 177-180.
16. Pyzhenkov V. I., Malinina M. I. Cultural flora, volume XXI. Pumpkin (cucumber, melon). - M. : Kolos, 1994.
17. Senchak I. S., Kirillov M. I. Influence of seedling age on melon yield // Vegetable and melon growing. - 1990. - No. 35. - p. 21-24.
18. Tarakanov G. I., Akhmadov M. Kh. Melon heterosis in greenhouse culture // Potatoes and vegetables. - 1978. - No. 5. - S. 34-35.
19. Tekhanovich G. A., Azarov A. A. Heterotic melon hybrids based on female forms. bul. VIR. - 1989. - T. 189. - S. 36-38.
20. Fursa T. B., Malinina M. I., Yuldasheva L. M. et al. Selection of gourds (Guidelines) / Ed. T. B. Fursa. - L. : VIR, 1988. - 78 p.
21. Shamuradova, R.V., Varieties and hybrids of melon, promising for growing film greenhouses in the north-west of the Non-Chernozem zone of the RSFSR, Nauch.-tekh. bul. VIR. - 1990. - Issue. 199. - S. 53-56.
22. Abd-El-Gavad M. M. A comparative study for some Cantaloupe hybrids in winter season under north Sinai conditions / Annals of Agricultural Science, Moshtohor. - 1994. - V. 32. - №1. - P. 469-477.
23. Berton F. Melone: alkune indicazioni di tecnica colturale // Colture Protette. - 1991. - V. 20. - № 3. - P. 36-37.
24. Effect of fruiting number, fruiting position and training methods on fruit characteristics and quality in melon (cv. Sul Hyang melon) / Lim J. W., Rhee H., Yu C. J., Kwon K. C. Yoon H. M. // RDA Journal of Agricultural Science, Horticulture. - 1994. - V. 36. - № 2. - P. 413-417.
25. Fraguas A., Frezza D. Determinacion comparativa del tenor de solidos sulubles en cultivares de melon bajo invernandero / Horticultura Argentina. - 1995. - V. 14. - № 36. - P. 78-82.
26. Guler H. G., Olympios C., Gerasopoulos D. The effect of the substrate on the fruit quality of hydroponically grown melons (Cucumis melo L.) // Acta Horticultuare. - 1995. - № 379. - P. 261-265.
27. Ikeda H., Tagami K., Fukuda N. A study on a simple passive hydroponic system for melon production / Journal of the Japanese Society for Horticultural Science. - 1996. - V. 64. - № 4. - P. 839-844.
28. Korsenievska A., Galecka T., Niemirowich-Szczytt K. Effect of ethephon (2-chlorethylphosphonic acid) on monoecious muskmelon (Cucumis melo L.) F_1 hybrid seed production / Folia Horticultuare. - 1995. - V. 7. - № 2. - P. 25-34.
29. Molfino M. La coltivazione del melone in Francia // Colture Protette. - 1991. - V. 20. - № 3. - P. 32-25.
30. Murakami H., Akiyoshi H. Hydroponic culture of melon (Cucumis melo L.) // Bulletin of the Experimental Farm College of Agriculture, Ehime University. 1995. - №16. - P. 35-40.
31. Pan R. S., More T. A. Screening of melon (Cucumis melo L.) germaplasm for multiple disease resistance // Euphytica. - 1996. - V. 88. - № 2. - P. 125-128.
32. Petsas S., Lulakis M. Asporazione di elementi nutritivi nel melone in serra fredda // Colture protette. - 1995. - V. 24. - № 10. - P. 83-85.
33. Sheen TzayFa, Hsu Miao Miao Studies on nutrient uptake of muskmelon grown in different seasons // Journal Research of China. - 1994. - V. 43. - № 2. - P. 182-194.
34. Tan Zue Wen, Li Zeng Xin A study on the technology and production costs of substrate culture of muskmelon / Beijing Agricultural Sciences. - 1995. - V. 13. - № 4. - P. 29-30.
35. Winter grown muskmelons: a breeding programme for adaptation is necessary / Nerson H., Burger Y., Fahima S., Rood Z. // Hassaden. - 1994. - V. 74. - № 4. - P. 398-400.