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## INFLUENCE OF SOME ELEMENTS OF THE CULTIVATION TECHNOLOGY ON THE YIELD OF MELON VARIETY SAMPLES

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### Abstract

In early sowing, the highest total and commodity yield among melon variety samples was observed in the varieties “Gurbek mestny” (72.6 and 71.4 t/ha), “Kichkintoy” (41.2 and 40.6 t/ha), “Rokhat” (53.6 and 52.9 t/ha), and the hybrid “Dakaro F1” (81.2 and 79.3 t/ha) when planting 25-day-old seedlings under polyethylene film on April 10.

**Keywords:** Melon, main stem length, number and length of side branches, total stem length, number of leaves, width, length and surface, number of fruits, width, length, flesh thickness and weight, yield per bush, total and commodity yield.

### Introduction

Melon growing is a very profitable branch of agriculture in the commercial zones where it is produced. Melon (*Melo Adans L.*) is a melon crop widely grown throughout the world. The nutritional value of melon fruits lies in the high content of carbohydrates, mainly sugars, well-absorbed by the human body [2]; [3]; [5]. According to FAO data, 28.6 mln tons of melons were produced worldwide from an area of 1077.4 mln hectares, with Asia in first place (22.1 mln tons; 77%), the



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second – America (3.3 mln tons; 11%), third – Europe (1.96 mln tons; 7%), fourth – Africa (1.11 mln tons; 4%) and the fifth – Oceania (207.8 thousand tons; 1%), leading melon producers are China (14.1 mln tons), Turkey (1.64 mln tons), India (1.48 mln tons), and Kazakhstan (1.39 mln tons).

Uzbekistan has natural and climatic opportunities for its high-level development and obtaining high-quality products. Opportunities for this exist, especially in connection with the fact that the republic has a number of advantages over the CIS countries, especially in growing early-season melon products using the seedling method. In 2024, 24.3 thousand tons of melon products were exported to the republic.

In conditions where the main limiting factor for the growth and development of melon is heat and a short growing season, agrotechnical methods that allow for the rational use of the heat resources of the short summer, optimizing plant growth conditions, play a special role [7]. When developing agricultural techniques for growing melons, it is necessary to consider the peculiarities of melons. Melon has significant differences in biological characteristics: root system, stem structure, flower type, fertilization methods, and fruit formation. The earliest and highest yields of melons and gourds are obtained using the seedling method of growing with the use of temporary film coverings [8]; [9].

Currently, a strategic approach is being taken in Uzbekistan to fully meet the needs of industry and the population for melons, and a number of plans are being implemented, including the cultivation of early and export-oriented products. However, in recent years, insufficient scientific research has been conducted on the selection of varieties and hybrids of melon suitable for the soil and climatic conditions of Karakalpakstan and the improvement of their cultivation technology. In this regard, conducting scientific research within the framework of this dissertation topic is considered relevant.

### **Methodology of research**

In the studies, the influence of different seedling ages, planting dates, and methods on the biometric and yield indicators of the “Gurbek mahalliy”,



“Kichkintoy”, “Rokhat” melon varieties, and the “Dakaro F1” hybrid under early cultivation was studied. Variety samples of melon were taken with 4 dexterities, from the calculated area of 40 m<sup>2</sup>, each sample contained 40 pieces, and the calculation work was carried out on 10 plants. In the studies, melon variety samples were sown according to the 210+70/2×70 cm scheme, seeds were sown in the first ten days of April.

Field experiments were conducted based on the methodological manuals “Methodology for Conducting Experiments in Vegetable, Melon, and Potato Growing” [1], “Methodology of Field Experiments in Vegetable and Melon Growing” [4], statistical analysis of research results was carried out using the “Excel 2010” and “Statistica 7.0 for Windows” computer programs, with a confidence interval of 0.95% using the variance method “Methodology of Field Experiments” [6].

### **Research Results**

When determining the optimal age of seedlings for growing melon products in the early crop, when planting 25-day-old seedlings, the longest main stems were formed in the varieties “Gurbek mestny” (177.1 cm), “Kichkintoy” (168.5 cm), “Rokhat” (155.7 cm), as well as in the “Dakaro F1” hybrid (159.9 cm), on the contrary, 35 days (respectively: 43.9; 27.1; 33.3 and 28.2 cm) and 45-day-old (60.4; 46.9; 39.0 and 37.3 cm), short main stem length was determined. Also, when planting 25-day-old seedlings, the longest side branches were observed in the varieties “Gurbek mestny” (690.2 cm), “Kichkintoy” (512.2 cm), “Rokhat” (534.4 cm) and the “Dakaro F1” hybrid (685.5 cm), while, conversely, the short side branches were 35 days long (respectively: 434.8; 332.6; 317.3 and 412.4 cm) and 45-day-old (354.5; 220.2; 248.0 and 336.3 cm) when planting seedlings.

When planting 25-day-old saplings of melon variety samples in early sowing, the longest total stems were formed in the varieties “Gurbek mestny” (867.3 cm), “Kichkintoy” (680.7 cm), “Rokhat” (690.1 cm) and the hybrid “Dakaro F1” (845.3 cm), and conversely, 35 days (respectively: 434.8; 332.6; 317.3 and 412.4 cm) and 45-day-old (354.5; 220.2; 248.0 and 336.3 cm), the length of short lateral branches was determined.

When planting 25-day-old melon seedlings in the early sowing period, the

number of leaves per bush, the width of the leaf surface, the leaf surface per bush and per unit area of area of “Gurbek mestny” (respectively: 306.4 pieces; 161.0 cm<sup>2</sup>; 3.84 m<sup>2</sup> and 50.6 thousand m<sup>2</sup>), “Kichkintoy” (241.8 pieces; 76.4 cm<sup>2</sup>; 1.36 m<sup>2</sup> and 19.0 thousand m<sup>2</sup>), “Rokhat” (244.4 units; 87.6 cm<sup>2</sup>; 1.63 m<sup>2</sup> and 22.0 thousand m<sup>2</sup>) and the “Dakaro F1” hybrid (317.2 pcs.; 74.1 cm<sup>2</sup>; 1.82 m<sup>2</sup> and 24.1 thousand m<sup>2</sup>), on the contrary, a small number of leaves and a single leaf, smaller than a bush and a unit area, were formed at 35 days of age (respectively: 211.1; 178.4; 162.8 and 211.8 units; 147.6; 70.1; 80.0 and 67.8 cm<sup>2</sup>; 2.43; 0.92; 1.01 and 1.12 m<sup>2</sup> and 31.9; 12.8; 13.4 and 14.7 thousand m<sup>2</sup>) and 45 days (175.7; 129.2; 135.6 and 182.2 units; 141.5; 67.3; 76.6 and 65.1 cm<sup>2</sup>; 1.90; 0.62; 0.79 and 0.89 m<sup>2</sup> and 25.5; 8.9; 10.6 and 12.2 thousand m<sup>2</sup>), respectively.

When planting 25-day-old melon seedlings in early sowing, the greatest number of fruits was observed in the varieties “Gurbek mestny” (2.4 pcs.), “Kichkintoy” (3.5 pcs.), “Rokhat” (3.4 pcs.) and the hybrid “Dakaro F1” (2.9 pcs.), on the contrary, in the 35-day-old variety (respectively: 1.8; 2.9; 2.9 and 2.4 units) and 45-day (1.6; 2.6; 2.5 and 2.2 units) a small number of fruits were found. Also, when planting 25-day-old seedlings with heavy fruit weight, the varieties “Gurbek mestny” (2702 g), “Kichkintoy” (981 g), “Rokhat” (1235 g) and the hybrid “Dakaro F1” (2310 g), on the contrary, light-weight fruits were planted at 35 days (respectively: 2568; 894; 1150 and 2184 g) and 45-day (2388; 823; 1069 and 2119 g) (Fig. 1).

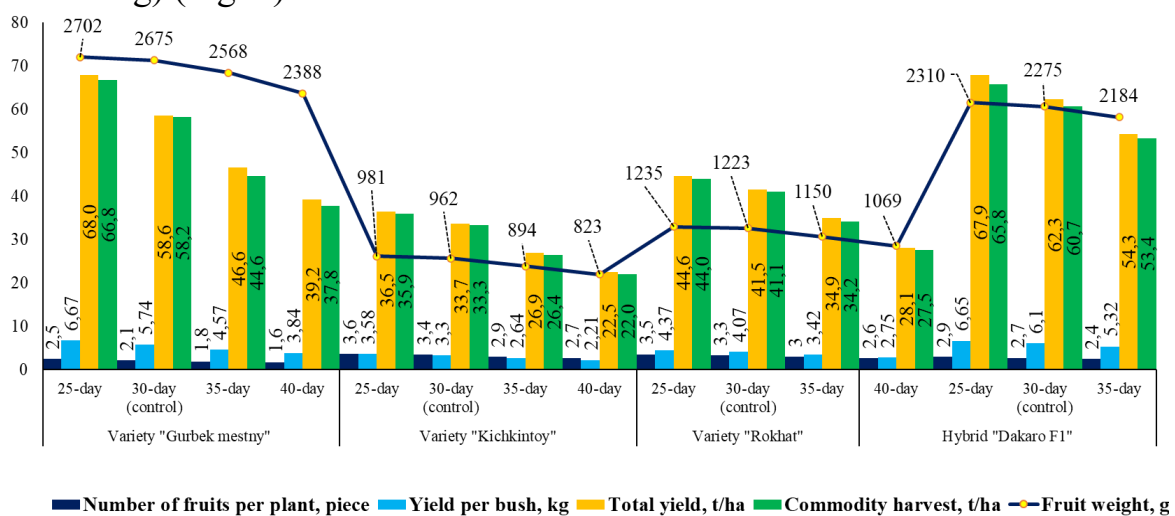


Fig. 1. Number of fruits, weight, yield per plant and per unit area of melon variety samples grown on seedlings of different ages in early crops (2022-2024 years)



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Also, the highest fruit yield from one bush was observed in the varieties “Gurbek mestny” (6.67 kg), “Kichkintoy” (3.58 kg), “Rokhat” (4.37 kg) and the hybrid “Dakaro F1” (6.65 kg) when planted on the basis of 25-day-old melon seedlings, and, conversely, less than one bush yield was observed at 35 days (respectively: 4.57; 2.64; 3.42 v 5.32 kg) and 45 days (3.84; 2.21; 2.75 and 4.77 kg) when planting seedlings.

In early sowing, when sowing melon variety samples based on 25-day-old seedlings, the highest total yield was observed in the varieties “Gurbek mestny” (68.0 t/ha), “Kichkintoy” (36.5 t/ha), “Rokhat” (44.6 t/ha) and the hybrid “Dakaro F1” (67.9 t/ha), on the contrary, the lowest total yield was observed at 35 days (respectively: 46.6; 26.9; 34.9 and 54.3 t/ha) and 45-day (39.2; 22.5; 28.1 and 48.7 t/ha), respectively.

In early sowing, when sowing melon variety samples based on 25-day-old seedlings, the highest commodity harvest was obtained in the varieties “Gurbek mestny” (66.8 t/ha), “Kichkintoy” (35.9 t/ha), “Rokhat” (44.0 t/ha) and the hybrid “Dakaro F1” (65.8 t/ha), on the contrary, the lowest commodity harvest was obtained at 35 days (respectively: 44.6; 26.4; 34.2 and 53.4 t/ha) and 45-day (37.8; 22.0; 27.5 and 48.2 t/ha), respectively.

When determining the optimal planting dates for melon crops in the early sowing period, the longest main stem, lateral branches, and common stems were planted on April 10 at the “Gurbek mestny” plant (respectively; 154.8; 625.4 and 780.2 cm), “Kichkintoy” (170.6; 456.3 and 626.9 cm), “Rokhat” (135.4; 585.5 and 720.9 cm) and the “Dakaro F1” hybrid (149.4; 611.5 and 760.9 cm), on the contrary, the length of the main stem, lateral branches, and total stems was short when sown on April 30 (respectively: 126.6; 468.4 and 595.0 cm; 143.9; 352.8 and 496.7 cm; 119.5; 471.7 and 591.2 cm and 126.1; 535.8 and 661.9 cm).

In early sowing, the highest number of leaves per bush, a wide leaf surface area, and a leaf surface per bush and per unit area were observed in melon variety samples “Gurbek mestny” (306.4 pieces; 186.4 cm<sup>2</sup>; 5.62 m<sup>2</sup> and 57.3 thousand m<sup>2</sup>), “Kichkintoy” (241.8 pieces; 95.5 cm<sup>2</sup>; 2.67 m<sup>2</sup> and 27.3 thousand m<sup>2</sup>), “Rokhat” (244.4 units; 107.7 cm<sup>2</sup>; 3.17 m<sup>2</sup> and 32.3 thousand m<sup>2</sup>) and the “Dakaro

F1” hybrid (317.2 pcs.; 89.7 cm<sup>2</sup>; 2.49 m<sup>2</sup> and 25.4 thousand m<sup>2</sup>), on the contrary, when sowing on April 30 (respectively: 211.1 units; 144.4 cm<sup>2</sup>; 3.15 m<sup>2</sup> and 32.1 thousand m<sup>2</sup>; 178.4 units; 64.2 cm<sup>2</sup>; 1.16 m<sup>2</sup> and 11.8 thousand m<sup>2</sup>; 162.8 units; 77.3 cm<sup>2</sup>; 1.67 m<sup>2</sup> and 17.1 thousand m<sup>2</sup> and 211.8 units; 60.5 cm<sup>2</sup>; 1.29 m<sup>2</sup> and 13.2 thousand m<sup>2</sup>), less than one bush, one bush, and a leaf surface area less than a unit area were formed.

In the early sowing of melon variety samples on April 10, the highest number of fruits was observed in the varieties “Gurbek mestny” (2.3 pcs.), “Kichkintoy” (3.5 pcs.), “Rokhat” (3.4 pcs.) and the hybrid “Dakaro F1” (2.5 pcs.), and on April 30 (respectively: 1.7; 3.1; 2.9 and 2.2 pieces) a small number of fruits were formed (Fig. 2).

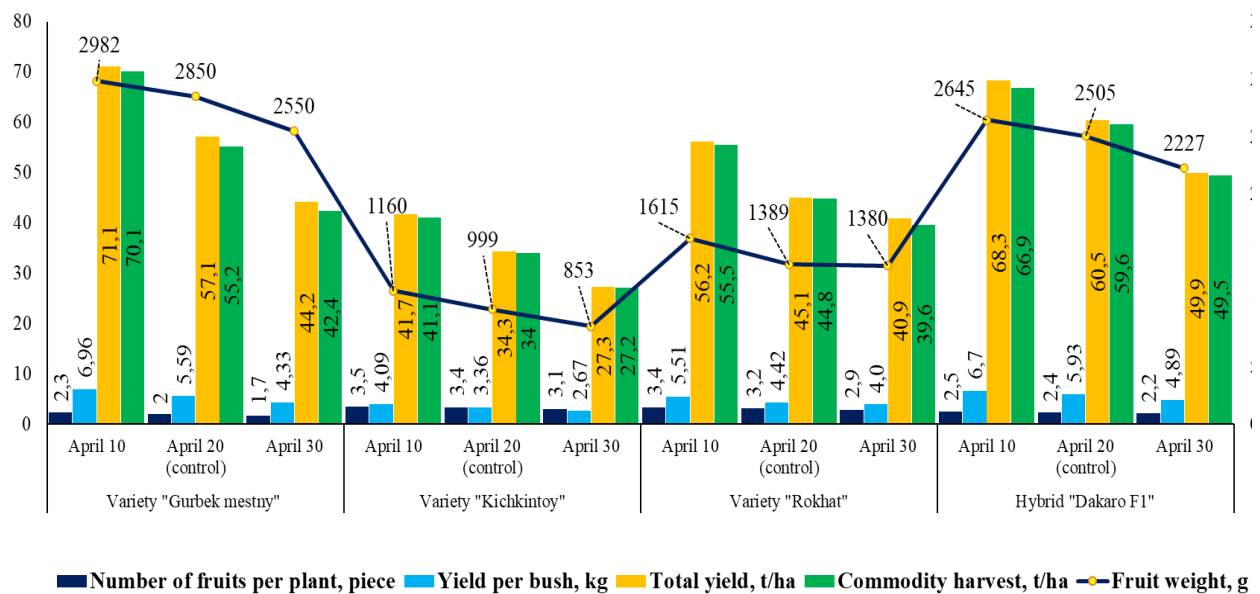


Figure 2. Number of fruits, weight, yield per plant and per unit area of melon variety samples grown at different planting dates of 30-day-old seedlings in early sowing (2022-2024 years)

In early sowing, heavy fruit weight was observed in the melon varieties “Gurbek mestny” (2982 g), “Kichkintoy” (1160 g), “Rokhat” (1615 g) and the “Dakaro F1” hybrid (2645 g) at the sowing date of April 10, and, conversely, light fruits were obtained at the sowing date of April 30 (respectively: 2550; 853; 1380 and



2227 g). Also, when sowing melon variety samples on April 10, the highest yield from one bush was obtained in the varieties “Gurbek mestny” (6.96 kg, 71.1 and 70.1 t/ha), “Kichkintoy” (4.09 kg, 41.7 and 41.1 t/ha), “Rokhat” (5.51 kg, 56.2 and 55.5 t/ha) and the “Dakaro F1” hybrid (6.7 kg, 68.3 and 66.9 t/ha), and, conversely, the lowest yield was obtained on April 30 (respectively: 4.33 kg, 44.2 and 42.4 t/ha; 2.67 kg, 27.3 and 27.2 t/ha; 4.0 kg, 40.9 and 39.6 t/ha and 4.89 kg, 49.9 and 49.5 t/ha).

When determining the method of sowing seeds and seedlings in early melon cultivation under polyethylene film, the longest main stems were formed in the varieties “Gurbek mestny” (154.5 cm), “Kichkintoy” (172.0 cm), “Rokhat” (145.1 cm), as well as in the “Dakaro F1” hybrid (149.3 cm). Also, the largest number of lateral branches in early sowing was found in the varieties “Gurbek mestny” (4.7 pcs.), “Kichkintoy” (4.5 pcs.), “Rokhat” (4.8 pcs.) and the hybrid “Dakaro F1” (4.8 pcs.) when planting seedlings under polyethylene film.

When planting melon seedlings under polyethylene film in early sowing, the longest side branches were formed in the varieties “Gurbek mestny” (638.3 cm), “Kichkintoy” (467.9 cm), “Rokhat” (638.6 cm), as well as in the “Dakaro F1” hybrid (622.4 cm), and the longest total stems were formed in the varieties “Gurbek mestny” (647.7 cm), “Kichkintoy” (525.1 cm), “Rokhat” (671.1 cm), as well as in the “Dakaro F1” hybrid (688.7 cm).

Among the melon variety samples, the largest number of leaves per bush in the early crop was observed in the varieties “Gurbek mestny” (302.4 pcs.), “Kichkintoy” (244.1 pcs.), “Rokhat” (298.9 pcs.) and the hybrid “Dakaro F1” (306.2 pcs.), the widest leaf area was observed in the varieties “Gurbek mestny” (216.3 cm<sup>2</sup>), “Kichkintoy” (109.6 cm<sup>2</sup>), “Rokhat” (124.4 cm<sup>2</sup>) and the hybrid “Dakaro F1” (103.0 cm<sup>2</sup>), It was established that the most leafy area per bush was formed when planting seedlings of the varieties “Gurbek mestny” (6.57 m<sup>2</sup>), “Kichkintoy” (2.69 m<sup>2</sup>), “Rokhat” (3.74 m<sup>2</sup>) and the hybrid “Dakaro F1” (3.17 m<sup>2</sup>), as well as the varieties "Gurbek mestny" (67.1 thousand m<sup>2</sup>), “Kichkintoy” (27.4 thousand m<sup>2</sup>), “Rokhat” (38.1 thousand m<sup>2</sup>) and the hybrid “Dakaro F1” (32.3 thousand m<sup>2</sup>) under polyethylene film.

In early sowing, the largest number of fruits of melon variety samples was found in the varieties “Gurbek mestny” (2.4 pcs.), “Kichkintoy” (3.6 pcs.), “Rokhat” (3.4 pcs.) and the hybrid “Dakaro F1” (3.7 pcs.), as well as in the varieties “Gurbek mestny” (3199 g.), “Kichkintoy” (1246 g.), “Rokhat” (1733 g.) and the hybrid “Dakaro F1” (2836 g.) when planting seedlings under polyethylene film. When sowing the seeds of melon variety samples in the open field in the early crop, the yield of fruit from one bush was 4.89 kg for the “Gurbek mestny” variety, 2.68 kg for the “Kichkintoy” variety, 4.13 kg for the “Rokhat” variety, and 7.44 kg for the “Dakaro F1” hybrid. 4.46; 5.89 and 10.52 kg) under polyethylene film.

When sowing seeds in open fields in early sowing of melon variety samples, the total yield was 49.9 t/ha for the “Gurbek mestny” variety, 27.3 t/ha for the “Kichkintoy” variety, 42.2 t/ha for the “Rokhat” variety, and 75.9 t/ha for the “Dakaro F1” hybrid. 45.5; 60.1 and 107.3 t/ha) and seeds (66.0; 34.5; 47.2 and 92.2 t/ha) when sown under polyethylene film (Fig. 3).

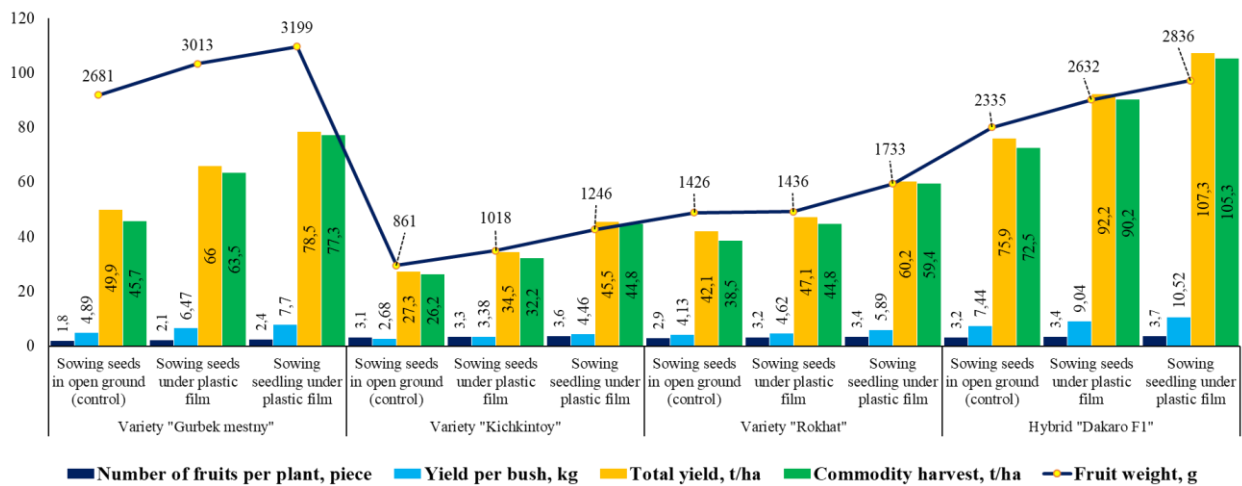


Fig. 3. Number of fruits, weight, yield per bush and per unit area of melon variety samples grown by different sowing methods in early crops (2022-2024 years)

When sowing melon variety samples in open fields in early sowing, the commodity harvest was 45.7 t/ha for the “Gurbek mestny” variety, 26.2 t/ha for



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the “Kichkintoy” variety, 38.5 t/ha for the “Rokhat” variety, and 72.5 t/ha for the “Dakaro F1” hybrid. 44.8; 59.4 and 105.3 t/ha) and seeds (63.5; 32.2; 44.8 and 90.2 t/ha) when sown under polyethylene film.

The economic efficiency of growing melon in early sowing with different planting ages, planting dates, and methods was as follows: when growing 25-day-old seedlings on April 10 under polyethylene film, the highest net profit and profitability were observed in the “Gurbek mestny” variety – 127.7 mln soums and 306.6%, in the “Kichkintoy” variety – 107.8 mln soums and 288.2%, in the “Rokhat” variety – 170.4 mln soums and 451.0%, and in the “Dakaro F1” hybrid – 262.7 mln soums and 651.2%. On the contrary, in melon variety samples, low net profit and profitability were observed at 35 days (respectively: 54.7; 71.8; 102.7 and 178.2 mln soums; 158.4; 212.4; 301.1 and 502.8%) and 40 days (41.3; 54.4; 76.2 and 157.6 mln soums; 120.7; 161.7; 225.0 and 447.3%) and on April 30 (29.2; 20.6; 84.5 and 113.2 mln soums; 84.7; 60.8; 246.1 and 321.0%), as well as in the open field (59.7; 21.5; 45.6 and 111.7 mln soums; 188.3; 69.4; 145.1 and 335.1%), respectively.

### **Conclusion**

1. In the early sowing of melon variety samples, the longest main stem, lateral branches, and common stems were obtained when planting 25-day-old seedlings on April 10 under polyethylene film “Gurbek mestny” (respectively: 162.1; 651.3; and 765.1 cm), “Kichkintoy” (170.4; 478.8 and 610.9 cm), “Rokhat” (145.4; 586.2 and 694.0 cm) and the “Dakaro F1” hybrid (152.9; 639.8 and 764.9 cm).
2. In early sowing, the highest number of lateral branches and leaves in melon variety samples was observed when sowing 25-day-old seedlings on April 10 under polyethylene film “Gurbek mestny” (respectively: 4.7; 305.1 and 2.4 units), “Kichkintoy” (4.6; 242.6 and 3.5 units), “Rokhat” (4.6; 517.7 and 3.4 pcs.) and the “Dakaro F1” hybrid (4.7; 313.5 and 3.0 units).
3. In early sowing, the largest leaf area of melon variety samples, the largest leaf area per bush and per unit area, was obtained when sowing 25-day-old seedlings



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on April 10 under polyethylene film “Gurbek mestny” (respectively: 187.9 cm<sup>2</sup>; 5.34 m<sup>2</sup> and 58.3 thousand m<sup>2</sup>), “Kichkintoy” (93.8 cm<sup>2</sup>; 2.24 m<sup>2</sup> and 24.6 thousand m<sup>2</sup>), “Rokhat” (109.9 cm<sup>2</sup>; 2.85 m<sup>2</sup> and 30.8 thousand m<sup>2</sup>) and the “Dakaro F1” hybrid (88.9 cm<sup>2</sup>; 2.49 m<sup>2</sup> and 27.3 thousand m<sup>2</sup>).

4. In early sowing, the thickest fleshy fruits of melon variety samples were obtained when planting 25-day-old seedlings on April 10 under polyethylene film “Gurbek mestny” (5,8; 6.4 and 6.4 cm), “Kichkintoy” (4.7; 4.1 and 4.1 cm), “Rokhat” (4.3; 3.7 and 3.8 cm) and the “Dakaro F1” hybrid (4.8; 4.8 and 4.9 cm).

5. When sowing 25-day-old saplings under polyethylene film on April 10, the weight of heavy fruits and high yield per bush were determined in the varieties “Gurbek mestny” (2961 g and 7.11 kg), “Kichkintoy” (1129 g and 4.04 kg), “Rokhat” (1528 g and 5.26 kg), and the hybrid “Dakaro F1” (2597 g and 7.96 kg).

6. In early sowing, the highest total and commodity yield among melon variety samples was observed in the varieties “Gurbek mestny” (72.6 and 71.4 t/ha), “Kichkintoy” (41.2 and 40.6 t/ha), “Rokhat” (53.6 and 52.9 t/ha), and the hybrid “Dakaro F1” (81.2 and 79.3 t/ha) when planting 25-day-old seedlings under polyethylene film on April 10.

7. The highest net profit and profitability in the cultivation of melon variety samples in early sowing was observed in the varieties “Gurbek mestny” (127.7 million soums and 306.6%), “Kichkintoy” (107.8 million soums and 288.2%), “Rokhat” (170.4 million soums and 451.0%) and the hybrid “Dakaro F1” (262.7 million soums and 651.2%) when planting 25-day-old seedlings under polyethylene film on April 10.

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