THE EFFECT OF PRE-SOWING SEED TREATMENT WITH GROWTH SUBSTANCES AND SOWING DATES ON THE YIELD AND QUALITY OF MELON FRUITS

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Abstract
Under the conditions of newly irrigated light gray-earth soils of the Zarafshan Valley, the influence of pre-sowing seed treatment with growth substances and various sowing dates on the growth, development of plants, the formation of tops and roots, fruit elements, yield and quality of fruits of summer varieties of melon is studied. Technologies have been developed that provide a high and high-quality crop of summer varieties of melon Kuk kalla push, Obi Novvot Samarkand local and Kukcha-588.
Keywords: Melon varieties, succinic acid, vitriol, physiological active extract of germinated wheat grains, leaf surface area, quality of dried produce.

Introduction
Melons contain the largest amount of sugars among gourds. In some summer varieties of melons with hard flesh, the sugar content reaches 18%, they are mainly presented in the form of sucrose. And from the fruits of the melon, honey, dried products are prepared.
Obtaining a stable, plentiful and high-quality melon crop in various soil and climatic conditions, largely depends on the choice of varieties adapted for a given locality, pre-sowing preparation of their seeds for sowing and determination of optimal sowing dates. In this direction, in the conditions of the Zarafshan valley, scientific research has not been conducted enough.
Under conditions of newly irrigated light gray-earth soils, the cultivation of melon varieties during seed treatment with various growth substances and sowing dates, and an assessment of their influence on plant formation, yield quantity and quality, yield of dried products, as well as yield, its quality indicators from scientific and practical points of view is very relevant.
Research on the study of pre-sowing seed preparation and melon cultivation technology was carried out abroad by A.I.Filov [1969], V.F.Belik [1975], V.V.Korenets, T.A.Sannikova, V. M. Samodurov [2006;2009], T. G. Gutsalyuk [1973], S. G. Allakhyarov [1975], J. A. Tolikhov, T. A. Akhmedov, Z. Imamkulova [2018], and in Uzbekistan N. N. Balashev [1975], A. S. Khakimov [2018], Kh. Ch. Buriev, O. A. Ashurmetov [2000], R. T. Makhamadjanov [1990], V. I. Zuev [1971; 1991], R. F. Mavlyanova, A. Rustamov, R. A. Khakimov and others [2005]. However, in the conditions of newly irrigated light gray-earth soils, research on the development of agricultural technology that provides a cheap, high and high-quality crop based on the study of the effect of pre-sowing seed treatment and different sowing dates on the growth, development, yield and quality of the early, mid-early, and mid-season summer crops is mild - and hard-melon varieties of melon were not carried out.

The aim of the research is to determine in conditions of newly irrigated light gray soils of the Zarafshan valley the influence of pre-sowing seed preparation and various sowing dates on the growth, plant development, yield, and fruit quality when growing summer early, mid-early and mid-ripening melon varieties, development of an improved technology to ensure high , high-quality and cheap crop.

Materials and methods

The objects of study were widespread varieties of melon Kuk kalla push, Obi Novvot Samarkand local and Kukcha-588, pure water control and growth substances in 10 l of water (0.2 g of succinic acid + 2.0 g of copper sulfate), as well as 0.2 kg of physiologically active extract of germinated wheat grains, 4 sowing dates (April 1st, April 10th, 20th and 30th).

Field experiments were conducted under conditions of newly irrigated (last 17–20 years) light gray-earth soils of "Ishonch" farms in the Nurabad district of the Samarkand region in 2016–2019. The mechanical composition of the soil is medium loamy, the depth of groundwater is 18-20 meters and deeper, not saline.

Agrochemical analyzes of the soils of arable (0-30 cm) and subsurface (31-50 cm) horizons showed that the humus content in the horizons, respectively, was 1.13-1.15 and 0.83-0.89%, total nitrogen 0.12-0.15 and 0.09-0.11%; total phosphorus 0.24-0.27 and 0.17-0.20%; total potassium 2.05-2.16 and 1.84-1.95%, and their mobile forms were: phosphorus – 20.1-21.3 and 15.2-17.8; potassium exchange - 206-212 and 185-190 mg/kg. The reaction of the soil solution is neutral or slightly alkaline and amounted to pH = 7.1-7.2. It was revealed that the soils of the experimental plot were poorly provided with humus and mobile forms of phosphorus, with moderate exchange potassium.

The climate of the region is sharply continental, characterized by very high temperature and dry air, sharp changes in temperature during the seasons and days [2002].

The absolute height is 600 m above sea level, the average annual rainfall is 320 mm and mainly falls on winter and spring periods. According to long-term data, the average air temperature is 15.7 °C. The lowest temperature in the year (-8 ^{0}C) falls in January, and the highest (+ 48 ^{0}C) in July. During the years of research, the annual rainfall rate was 362-391 mm, which is 10-39 mm more than the average long-term data, and in 2018, 290 mm or 62 mm less than the long-term data fell. Relative humidity according to long-term data was 56-62%, the data of 2018 correspond to long-term indicators, in other years these indicators were higher. During the years of research, the air temperature was 1.3-2.1 °C higher than the long-term average data and amounted to 14.7-15.5 °C.

All censuses, observations, analyzes were carried out according to generally accepted methods and recommendations [1992; 2003; 1985; 1987; 2011].

Results and discussion

According to research, when sowing seeds of summer soft and hard-fleshed melon varieties, pre-treated before sowing for 12 hours with solutions of growth stimulants and microelements (per 10 l of water, 0.2 g of succinic acid + 2.0 g of copper sulfate) was detected that the highest germination rate, that is, on day 5, was 76.8-81.0; on day 7th, 86.1-90.2; on day 9th, 96.0-98.7 and on day 11th, 96.4-99.2%, or by 13.4-14.4; 7.8-7.9; 4.5-6.9 and 3.5-6.2% more in relation to the control.

According to the length of the growing season, it was found that the Kuk kalla push variety is early (73-75 days), Obi Novvot Samarkand local is medium early (84-87 days), and the Kukcha-588 variety is mid-ripening (91-93 days).

When pre-sowing seed treatment of the tested melon varieties with growth substances, along with increasing field germination to 96.4-99.2%, 1-3 days earlier, friendly, full-fledged and healthy seedlings were obtained, and the growing season was extended by 2-5 days.

According to biometric measurements, it was found that the pre-sowing treatment of seeds of the tested melon varieties with solutions of growth stimulants and microelements already at the beginning of plant vegetation (May 28-30) had a significant effect on plant growth if the length of the main stem was 58.3 -67.5 cm, the number of lateral shoots on one plant is 2.7-3.4, the main shoots are 3.4-4.1 pieces, then when treated with solutions of growth stimulants and trace elements, these indicators, respectively, amounted to 71.0-76.2 cm, 3.3-3.9 and 3.9-4.8 pieces, which is relative resolution to control is 7.8-12.7 cm, 0.5-0.6 and 0.5-0.7 more. This advantage was preserved until the end of the plant vegetation, as a result with the longest stems (239.5-244.1 cm), the largest number of stems (4.6-4.9 pieces), side shoots (12.7-14.0 pieces), leaf surface area (2734-2844 dm^2), powerful shrubs (1999-2073 g) and root system mass (145.0-153.6 g) melon varieties Obi Novvot Samarkand local and Kukcha-588 were identified, the seeds of which were sown before were treated with a solution of 10 g of water, 0.2 g of succinic acid + 2.0 g of copper sulfate.

The yield of melon varieties by varieties and varieties on average varied from 21.7 to 30.0 tons per hectare **(Table 1).**

When processing seeds of the early-ripening melon variety Kuk kalla push with clean water (control), the yield was 21.7 t/ha, including 20.5 t/ha or 94.3% marketable crop. When seeds were soaked before sowing for 12 hours in a solution of 10 g of water, 0.2 g of succinic acid + 2.0 g of copper sulfate, the highest yield of 25.6 t/ha was obtained, including 24.5 t/ha or 95.8% of the commodity crop, while the yield increase amounted to 3.9 t/ha (118.0%). And when treating seeds before sowing for 12 hours in a solution of 10 l of water, 0.2 kg of physiologically active extract of germinated wheat grains, the yield was 24.2 t/ha, marketable crop – 23.0 t/ha or 95.1%, while the yield increase is 2.5 t/ha (111.5%).

When pre-sowing seed treatment of medium early melon varieties Obi Novvot Samarkand local and mid-season Kukcha-588 for 12 hours with clean water, the yield was 23.5-25.7 t/ha, including marketable crop – 22.1-24.4 t/ha or 94.1-95.0%, and when sowing seeds soaked for 12 hours in a solution of 10 g of water, 0.2 g of succinic acid + 2.0 g of copper sulfate, the highest yield of 28.4-30.0 t/ha, including marketable crop – 27.3-29.2 t/ha or 96.3-97.4%, while the increase in yield per hectare was 4.3-4.9 tons (116.7-120.9%). When pre-sowing seed treatment of these melon varieties for 12 hours

Table 1. The effect of pre-sowing treatment of seeds of melon varieties with solutions of growth stimulants and microelements on the quality of fruits and the yield of dried produce (2016-2018 y)

№	Pre-sowing seed treatment	Productivity, t/ha	The biochemical composition of the fruit				During heli-drying, the yield of dried products in relation to the flesh of a melon		The quality of dried products, in points
			dry matter,%	sugar, %	vitamin C, mg/%	nitrates, mg/kg	t/ha	%	
	Variety Kuk kalla push								
1	Water-12 hours (control)	21.7	11.2	8.6	13.84	64.1	2.15	10.5	8.3
2	10 g of water 0,2 g succinic acid + 2,0 g $CuSO_4$ treatment 12 hours	25.6	11.9	9.2	15.72	70.8	2.64	10.8	8.5
3	For 10 l of water, 0,2 kg of wheat grain extract, processing 12 hours	24.2	11.5	8.8	15.40	66.5	2.43	10.6	8.5
	Variety Obi Novvot Samarkand Local								
4	Water-12 hours (control)	25.7	12.8	8.7	17.31	51.4	2.66	10.9	9.0
5	10 g of water 0,2 g succinic acid + 2,0 g $CuSO_4$ treatment 12 hours	30.0	13.4	9.6	20.24	58.3	3.33	11.4	9.4
6	For 10 l of water, 0,2 kg of wheat grain extract, processing 12 hours	28.1	13.0	9.2	19.62	52.7	3.00	11.1	9.3
	Variety Kukcha-588								
7	Water-12 hours (control)	23.5	12.2	8.5	15.68	78.2	2.56	11.6	9.0
8	10 g of water 0,2 g succinic acid + 2,0 g $CuSO_4$ treatment 12 hours	28.4	12.5	9.4	19.14	80.5	3.24	12.0	9.2
9	For 10 l of water, 0,2 kg of wheat grain extract, processing 12 hours	26.8	12.5	9.2	17.80	79.1	3.02	11.8	9.0

With a solution of physiologically active extract of germinated wheat grains, a relatively high yield was obtained (26.8-28.1 t/ha, including marketable yield of 25.6-27.0 t/ha or 95.4-96.1% of the commodity crop), the additional yield per hectare obtained was 2.4-3.3 tons.

Analysis of the research results showed that pre-sowing seed treatment with solutions of growth stimulants and microelements, as well as a physiologically active extract of germinated wheat grains, had a positive effect on the quality of the yield of melon varieties, the dry matter content increased by 0.3-0.7%, sugars by 0.3-0.7%, vitamin "C" at 1.56-3.46 mg/%. The highest dry matter content by melon varieties (11.9–13.4%), total sugar (9.2–9.6%), and vitamin C (15.72–20.24 mg/%) was noted when treating seeds before sowing for 12 hours in a solution of 10 l of water, 0.2 g of succinic acid + 2.0 g of copper sulfate. It was noted that the nitrate content in the composition of the fruits according to the options was 51.4-80.5 mg/kg, this does not exceed the maximum permissible norms (90 mg/kg).

It was revealed that the sowing of summer varieties of melon with different periods had an impact on the onset and passage of development phases, with early sowing (01.04) seedlings of melon varieties appeared on days 8-9, and in late sowing (30.04) on 6-7 days after sowing, the duration of the "emergence-first true leaf" period for early sowing was 16-17 days, for late sowing 12-13 days, the "first true leaf-budding" period, respectively, was 13-14 and 11-12 days, and the period "Budding-flowering" - 7-8 and 5 days, with early sowing, elongation of vegetation was observed The period of 2-5 days, the formation of aboveground and underground parts had a significant difference, the longest stems (300.8-324.7 cm), the largest number of stems (4.9-5.1 pieces), the most leafy (310.1-341.1 units), large bushes (2102-2198 g) and a lot of roots (119.6-150.2 g), melon varieties with a sowing date of April

20th, large leaf surface area (2604-2790 dm^2), powerful bushes Relatively high indicators of the mass of tops and roots had plants when sown on April 10th.

At different sowing dates, the formation of fruit elements differed significantly in melon varieties, the largest number of male (139-149) and female (19-23 pieces) flowers were formed at a sowing date of April 20th. At the same time, the highest productivity indices of melon varieties were revealed (on one bush, the fruit yield is 9.8-10.2 kg, their number is 3.3-3.5 pieces). Early sowing or delayed sowing leads to a decrease in productivity of up to 8.6 kg.

As can be seen from the data in **Table 2**, the highest yield (29.0-32.8 t/ha), including marketable crop (27.6-31.9 t/ha or 95.0-97.3%), were obtained by sowing the tested varieties on April 20th, while the yield increase per hectare was 5.4-7.9 t/ha (119.7-137.4%). Relatively high (26.7-29.2 t/ha) and marketable crops (25.3-27.9 t/ha 94.7-96.6%) were obtained with a sowing date of April 10th.

In order to identify the influence of different periods of sowing and pre-sowing seed treatment of the studied melon varieties with solutions of growth stimulants and microelements, as well as a physiologically active extract of germinated wheat grains on the yield and quality of dried products during solar drying, 10 pieces of ripe fruits were

Table 2. Harvest, fruit quality and yield of dried produce of melon varieties at different sowing dates (2016-2018)

№	Sowing dates	Productivity, t/ha	The biochemical composition of the fruit				During solar-drying, the yield of dried products in relation to the flesh of a melon		The quality of dried products, in points
			dry matter,%	sugar, %	vitamin C, mg/%	nitrates, mg/kg	t/ha	%	
	Variety Kuk kalla push								
1	April 1st	22.0	11.2	8.0	12.70	36.6	2.10	10.2	8.1
2	April 10th	26.7	11.6	8.3	14.94	40.0	2.66	10.5	8.4
3	April 20th	29.0	12.0	8.6	15.20	42.5	2.95	10.7	8.6
4	April 30th (control)	21.1	11.8	8.5	15.05	41.8	2.04	10.4	8.4
	Variety Obi Novvot Samarkand Local								
5	April 1st	25.8	11.8	8.6	16.80	28.4	2.62	10.8	8.8
6	April 10th	29.2	12.4	8.8	20.40	33.7	3.13	11.2	9.2
7	April 20th	30.7	12.6	9.0	22.65	36.2	3.39	11.4	9.5
8	April 30th (control)	24.3	12.2	8.8	20.36	32.8	2.51	11.0	9.4
	Variety Kukcha-588								
9	April 1st	25.1	12.3	9.0	14.40	46.7	2.87	12.0	8.6
10	April 10th	28.6	13.0	9.2	18.96	50.6	3.37	12.2	8.8
11	April 20th	32.8	13.4	9.5	22.20	55.1	3.99	12.5	9.0
12	April 30th (control)	27.4	13.1	9.3	20.84	52.8	3.24	12.3	9.0

Selected from each experimental version. Preparation of ripe melon fruits for drying consists in washing the melon, drying it, weighing it and cutting it in half along with a knife. Seeds and placenta (core) are removed from the inside, immediately weighed. Then each half is divided across into slices in the form of segments with an equal thickness of 2-3 cm and at the same time the peel (peel) of the melon is removed and weighed. In this case, the yield of

pulp and the proportion of core and crust are determined according to the experimental variants and grades. After that, slices of melon pulp are placed evenly in one layer on a stainless steel or aluminum wall. When solar drying in a grid with slices is placed on the rack in 4-5 layers, the height between the layers is 50-70 cm covered (closed) with a transparent film. The drying time is 7-12 days. The readiness of the product is determined organoleptically, the prepared melon slices have a light-yellow color, a well-dried crust and a soft consistency inside.

We found that of the mass of ripe fruit, 82.6% is pulp, 13.2% of the crust and 4.2% of the seeds and placenta. According to the variants of the experiment, these indicators changed insignificantly. However, there was a tendency (up to 0.8%) in the increase in pulp with pre-sowing treatment of seeds with growth substances.

An analysis of the research results showed that studying the effect of pre-sowing seed treatment of the tested melon varieties with solutions of growth stimulants and trace elements, as well as physiologically active with an extract of germinated wheat grains to yield dried products (coca) during the drying process, it was found that the highest yield of dried products (11.4-12.0%), yield (3.24-3.33 t/ha), with good quality (9.0-9.4 points) were obtained from Obi Novvot Samarkand local varieties and Kukcha-588 when treating seeds for 12 hours with growth substances and microelements.

When studying the quality and yield of dried products of melon varieties, depending on the sowing dates, in the early ripening varieties Kuk kalla push showed that the dry matter content was 11.2-12.0%, sugars 8.0-8.6%, ascorbic acid 12.70-15.20 mg/%. The highest dry matter content (12.0%), sugars (8.6%), ascorbic acid (15.20 mg/%) were obtained by sowing on 04/20. It was found that the nitrate content was 36.6-42.5 mg/kg, which is 2.0 times lower than the maximum permissible norms. The composition of mid-season melon varieties Obi Novvot Samarkand local depending on the sowing period, the dry matter content was 11.8-12.6%, sugars 8.6-9.0%, ascorbic acid 16.80-22.65 mg/% and the highest quality fruit yield was obtained at sowing dates of April 20 and 10. In this variety, the lowest amount of nitrates was also noted (28.4-36.2 mg/kg). And in the composition of the fruits of the Kukcha-588 melon variety, the largest amount of dry matter (12.3-13.4%), sugars (9.0-9.5%), ascorbic acid was found (14.40-22.20 mg/%) and the nitrate content was the highest (46.7-55.1 mg/kg), the largest amount of dry matter, sugars, ascorbic acid and nitrates was noted when sowing on April 20th.

When studying the effect of different periods of sowing of melon varieties on the yield of dried products, it was noted that the highest yield (3.39-3.99 t/ha) of dried products, yield (11.4-12.5%) and quality (9.0-9.5 points) were obtained from Obi Novvot varieties and Kukcha-588 with a sowing date of April 20th.

Conclusions

1. The productivity of the studied melon varieties according to the experimental options varied from 21.7 to 30.0 tons per hectare. The highest yield (25.6-30.0 t/ha), including 24.5-29.2 t/ha or 95.8-97.4% marketable crop, was obtained by soaking seeds before sowing during 12 hours in a solution per 10 l of water, 0.2 g of succinic acid + 2.0 g of copper sulphate, while the yield increase per hectare was 3.9-4.9 tons. At the same time, a positive effect on the quality of fruits of melon varieties was noted, the dry matter content increased

by 0.3-0.7%, sugars by 0.3-0.7%, vitamin "C" by 1.56-3.46 mg/%, nitrate content did not exceed the maximum permissible norms (90 mg/kg), the highest yield of dried products (11.4-12.0%), with a high yield (3.24-3.33 t/ha) was ensured and good quality (9.0-9.4 points).

2. The highest yield (29.0-32.8 t/ha), including marketable crop (27.6-31.9 t/ha or 95.0-97.3%), were obtained by sowing the subject's varieties on April 20th, while the yield increase per hectare amounted to 5.4-7.9 t/ha. Relatively high (26.7-29.2 t/ha) and marketable crops (25.3-27.9 t/ha, 94.7-96.6%) were obtained with a sowing date of April 10th. Crops on April 10th and 20th contributed to the improvement of the biochemical composition, resulting in the highest yield (3.39-3.99 t/ha) of dried products, yield (11.4-12.5%) and quality (9.0-9.5 points) were obtained from Obi Novvot Samarkand Local varieties and Kukcha-588.

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