

# The effect of different feeding methods on the growth of melon varieties

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**Abstract.** Experimental cultivation of medium-sized varieties of melon with strong growth of the aboveground part by adding a gidrogel substance to the soil and achieving high results. It should be noted that in the experiment, the effect of various soil mixtures and standards on the yield index was determined in the cultivation of medium-ripe varieties of melon. In the experiment was determined, that the yield level was 108.9-132.0% in the Kokcha variety, 102.2-136.8% in the Gurvak variety, and 200.2-210.1% in the Qari-qiz variety and the profitability of all varieties was strongly affected in the variant with the background and gidrogel substance applied at 12 kg/ha, and a high result was observed. The best result were 13% in the varieties of Kokcha (20.2 t/ha), 21% in Gurvak (20.8 t/ha) and Qari-qiz variety (30.3 t/ha). ga) It was found that 9 percent higher yield was obtained than the control option. Use of sedating substances in the planting of melon seeds in the conditions of Khorezm region.

## 1 Introduction

This experiment investigated in 2022-2023, the effectiveness of using gidrogel polymer together with mineral fertilizers for the growth and development of mid-ripe gurvak, kari-kiz, kokcha varieties of melon. for the first time, in order to increase the drought resistance of melon, the options of mineral fertilizers fed according to the standards of nitrogen-210 kg, phosphorus-140 kg and potassium-50 kg per hectare were compared and tested.

In the experiment, there were 4 options, and as a comparison with the options of using mineral fertilizers  $N_{210}P_{140}K_{50}$  gidrogel on the background of 5 kg, 10 kg and 16 kg per hectare, simple planting without fertilizers was controlled. Melon seeds were sown on May 18-20 in the double row method and the experiment has 4 rows, the field is 2 rows, its feeding area is 11.4 m<sup>2</sup>, each field is 5 m long and 2.8 m wide and there are 14 plants on the site.

And the method of using gidrogel with mineral fertilizers was carried out before sowing seeds, i.e. together with sowing seeds. in this case, the gidrogel was placed in containers, 1.5 liters of clean water was poured per 1 gram, and it was cooled in water for 3-4 hours. The recommended amount of mineral fertilizer and gidrogel were mixed with the soil in each hole where melon seeds were planted, then the seeds were placed with 2-3 cm of soil, and the seeds were covered with 3-5 cm of soil.

In the experiment, phenological observations were done after sowing the seeds of mid-season melon varieties, in which the seed germination (10 and 80 %), flowering of paternal and maternal flowers, and ripening of fruits were determined (see Table 1).

**Table 1.** Effect of nutrient parameters on seed germination, flowering and fruit ripening of mid-ripe melon varieties (2022-2023 yy)

Varieties	Gidrogel rate, kg/ha	Day of seed germination	Flower opening, day		Day of fruition
			fatherhood	motherhood	
Ko'kcha	Without fertilizer - control	11	34	44	80
	n210p140k50+gidrogel-6 kg/ga	8	35	43	75
	n210p140k50+gidrogel-12 kg/ga	8	30	40	71
	n210p140k50+gidrogel-18 kg/ga	10	34	44	79
Kurvak	Without fertilizer - control	9	35	42	79
	n210p140k50+gidrogel-6 kg/ga	8	34	42	74
	n210p140k50+gidrogel-12 kg/ga	7	31	38	70
	n210p140k50+gidrogel-18 kg/ga	8	34	43	75
Qari-qiz	Without fertilizer - control	9	34	44	80
	n210p140k50+gidrogel-6 kg/ga	8	35	42	76
	n210p140k50+gidrogel-12 kg/ga	7	30	38	71
	n210p140k50+gidrogel-18 kg/ga	8	35	44	78

According to the results of phenological observation, full (75%) germination of seeds of mid-season varieties of melon was 8-11 days between variants. In the experiment, it was observed that the earliest seeds germinated in the option where 12 kg per hectare of gidrogel material was used with background, and this indicator was 8 days, and in the option where 6 kg of gidrogel was used per hectare with background and it was consisted 8 days. With the background, germination was observed in 10 days, although it was insignificant compared to the control (2 days difference), and this option took an intermediate place between the control and the options where the gidrogel drug was used.

Gurvak and Qari-qiz varieties also germinated in 7-8 days in the variants with gidrogel, and it was found that the earliest in the variant with 12 kg/ha of gidrogel germinated in 7 days and in control variants it was 9 days. It was observed that the gidrogel substance keeps the soil moisture for quick germination of melon seeds and accelerates the process of seed germination. As a result, it was found that the seeds will germinate completely and uniformly in the nests where they were planted.

It was observed that the appearance of paternal and maternal flowers of medium-early Kokcha gurvak and qari-qiz varieties of melon is earlier in early-germinated variants. This is definitely related to the development of seedlings and soil moisture, favorable conditions. In the experiment, in all varieties, the earliest version of the father's flowers appeared was the

version with 12 gidrogel application per hectare, and it was 30-31 days. In addition, in the control variant, male flowers appeared in 34-35 days.

In the appearance of maternal flowers, the earliest blooming gidrogel among varieties was the variant that used 12 kg of gidrogel per hectare, and it was 38-40 days and in the control option, this indicator was 42-44 days.

In the case of using 18 kg of gidrogel per hectare, the period of appearance of male and female flowers was significantly accelerated compared to the control. In this case, the emergence of male flowers was recorded 2 days earlier in the Kokcha variety, 1 day in the Gurvak variety and 1 day earlier in the Karigiz variety. Maternal flowers bloomed one day earlier, depending on the variety. This experimental variety had an intermediate expression between the control and gidrogel-treated variants in terms of both paternal and maternal flower emergence, demonstrating that it has a distinct favorable effect on melon output.

The investigation also revealed that using different soil combinations in the cultivation of mid-ripe melon types improved fruit ripening. In this situation, the experimental choices employing 6 and 12 kg of gidrogel preparation per acre can be shown in the shortest length of time, 70-80 days. In this scenario, the fruits of the Kokchaberry variety ripened 5 and 9 days (75 and 71 days) faster than the control (80 days). In Gurvak and Kariqiz varieties, it was discovered that the application of the drug hydrogel at the rate of 6 and 12 kg increased the ripening of fruits by 5 and 9 and 4 and 9 days, compared to the control.

The analysis of experimental options for accelerating the ripening of fruits showed that in the option of using 18 kg of gidrogel when planting melon seeds, an acceleration of this physiological process was noted, even though it was not noticeable, compared to the control. In this variant, the ripening of melon fruits faster than the control was 2, 4 and 2 days in Kokcha, Gurvak and Kari-qiz varieties, respectively, and took an intermediate place between the control and the above-mentioned experimental variant.

Based on the general analysis, it can be concluded that the application of gidrogel preparation at 12 kg per hectare during the planting of melon seeds resulted in early seed germination (2-3 days), early flowering of paternal and maternal flowers (4-5 days) and fruit ripening compared to the control ensures early ripening (9-10 days).

In the conducted experiment, the influence of different gidrogel preparations on the growth and development of the above-ground part of plants was determined.

Biometric measurements and calculations were carried out in the experiment. The length of the main stem of the plant, the number of side branches and the length of the side branches were determined (Table 2).

**Table 2.** Development of mid-season melon varieties by growing above ground (2022-2023 yy)

Varieties	Gidrogel rate, kg/ha,	Main stem length, cm	Number of side branches, pcs	Length of side branches, cm	Powdery mildew%
Ko'kcha	Without fertilizer - control	133	3,0	418	5,0
	n210p140k50+gidrogel -6 kg/ga	140	3,2	467	0
	n210p140k50+gidrogel -12 kg/ga	162	3,4	575	0
	n210p140k50+gidrogel -18 kg/ga	145	3,1	510	2,5
Gurvak	Without fertilizer - control	142	3,5	551	2,5
	n210p140k50+gidrogel -6 kg/ga	165	3,7	668	0
	n210p140k50+gidrogel	171	3,7	739	0

	-12 kg/ga				
	n210p140k50+gidrogel -18 kg/ga	150	3,6	611	5,0
Qari-qiz	Without fertilizer - control	139	3,6	493	15,0
	n210p140k50+gidrogel -6 kg/ga	157	3,7	503	2,5
	n210p140k50+gidrogel -12 kg/ga	162	3,8	708	0
	n210p140k50+gidrogel -18 kg/ga	145	3,6	540	2,5

According to the results of biometric measurements, the length of the main stem of all medium-sized melon plants was 133-171 cm. the highest indicator was in the variants of all varieties where 12 kg of gidrogel per hectare was used, and it was determined to be 162-171 cm. It was found that the length of the main stem increased by 23-31 cm compared to the control variant. And in the version where 18 kg of gidrogel was used, this indicator was low.

When the number of lateral branches of plants was calculated, it was 3.0-3.4 pieces in the medium-sized Kokcha variety, and a relatively high index of 3.4 pieces was observed in the variants with 12 kg of gidrogel per hectare.

The Gurvak and Kari-Kiz types were discovered to have 3.7-3.8 lateral branches. The control variety exhibited substantially less branching.

According to the results of the calculation of the total length of the side branches, it was 418-575 cm in the Kokcha variety, 551-739 cm in the Gurvak variety, and 493-708 cm in the Qari-qiz varieties. Among the medium-sized varieties, the total length of side branches is relatively high, that is, the strongly grown variant is 575 cm in the Kokcha variety, 739 cm in the gurvak variety, and 739 cm in the qari-qiz variety when applying gidrogel at 12 kg per hectare. It was 708 cm and it has grown 157-217 cm higher than the control.

In the experiment, for the strong growth of the above-ground part of the plant of medium-sized melon varieties, the cultivation of the gidrogel substance in the soil, especially in the version with 12 kg per hectare, the highest result, that is, the length of the main stem compared to the control by 12 cm, the number of side branches by 0, For 4 pieces, the length of the total side branches is higher than 157-217 cm.

The effect of several gidrogel preparations on production was investigated in the cultivation of medium-sized melon types in the Khorezm oasis. To determine yield, each harvest was weighed separately, and the fruits were classified as commercial or non-commercial based on external quality parameters.

The amount of dry matter, sugar, ascorbic acid and nitrates and the tasting value of the melon varieties were determined according to their biochemical composition.

According to the research results, the amount of dry matter in the fruit of melon varieties is 10.8-11.4%, sugar content is 10.0-11.0%, ascorbic acid is 12.4-13, It was noted that 5%, and the amount of nitrates was 22.2-28.1 mg/kg.

## 2 Analysis of economic indicators

It is known that the application of any agrotechnical development to production is directly determined by its economic efficiency. from an economic point of view, the developed agrotechnical elements must include criteria such as resource-saving, energy-saving, convenient, low-cost, local and easy to find.

Based on the above information, when determining the economic effectiveness of the experiment, the option of using the gidrogel substance at 12 kg/ha with the control (without fertilizer) and the background was taken for the comparison of soil mixtures and all types of

costs spent on crop production and the price of the crop were compared and yield estimates are based on 2019 estimates.

Calculations showed that the total costs were higher when gidrogel was used compared to the control. costs in cultivation, i.e. seeds, fertilizers, fuel lubricants, gidrogel, biohumus, maintenance and other costs were differentiated between options and in this case, it was equal to 5025 thousand soums in control options without fertilizers of all melon varieties. This indicator was 5,040,000 soums for Kokcha and Gurvak varieties and 5,045,000 soums for Kari-kiz variety (see Table 3).

**Table 3.** Economic efficiency of production, thousand/soum

Indicators	Kokcha		Gurvak		Qari-qiz	
	control without fertilizer	Fon+gidro gel-12 kg/ga	control without fertilizer	fon+gidro gel-12 kg/ga	control without fertilizer	Fon+gidro gel-12 kg/ga
Seed, fertilizer, yam, care and other expenses	5025	5040	5025	5040	5025	5045
Harvesting and transportation costs	850	965	842	1018	1361	1483
Total costs	5875	5005	5867	5058	6386	6528
Overhead costs 25%	1468.7	1401.2	1466.7	1514.5	1596.5	1622
Unexpected expenses, 20%	1175	1201	1173.4	1211.6	1277.2	1305.6
All expenses	8518.7	8707.2	8507.1	8784.1	9259.7	9465.6
Yield, t/ha	17.8	20.2	17.2	20.8	27.8	30.3
Crop price, (1000 so*m)	17800	20200	17200	20800	27800	30300
Net income	9281.3	11492.8	8692.9	12015.9	18540.3	20834.4
Cost of 1 ton of product	478.5	431.0	494.6	422.3	333.0	312.4
Rate of return,%	108.9	132.0	102.2	136.8	200.2	210.1
Profit from production	-	2211.5	-	3323.0	-	2294.1

The indicators of the economic analysis presented in the table show that in the experiment, the costs of harvesting and transportation were related to the productivity indicators of the options, and as the productivity increased, the costs due to the collection and transportation of additional crops increased.

The use of soil mixtures, in particular, the gidrogel preparation (6, 12 kg and 18 kg standards) led to an increase in productivity and an increase in the total value of the grown product. The higher the yield, the higher the cost of production.

The amount of all expenses compared to the control options, in the options where the gidrogel drug was used at 12 kg per hectare during the planting of melon seeds, including the kokcha variety (8707.2) was 188.5 thousand soums, and the gurvak variety (8784.1) was 277, 0 thousand soums and 205.9 thousand soums higher in the qari-qiz variety (9465.6).

For economic analysis, in the experiment, the price of 1 kg of the crop was taken as 1000 soums on average in 2019 in sales outlets, and the difference in this indicator by varieties,

i.e., in the Kokcha variety - 17,800-20,200 thousand soums, Gurvak variety - 17,200-20,800 thousand soums and Qari-qiz variety - 27,800-30,300 thousand soums.

As we mentioned above, the increase in productivity due to the use of soil mixtures, although it led to an increase in total costs, but under the influence of the use of the gidrogel preparation (in 6, 12 kg and 18 kg standards), the overall yield the increase in yield resulted in a significant increase in the value of the net income received. Therefore, the net income is higher in the variants using 12 kg of gidrogel preparation per hectare compared to the control variants, 11492.8 thousand soums in the Kokcha variety, 12015.9 thousand soums in the Gurvak variety, and 20834,4 soums in the Qari-qiz variety.

The use of soil mixtures and the increase in productivity caused the increase in production efficiency and the decrease in the cost of production. The price of 1 ton of products also varies between varieties and variants, ranging from 312.3 thousand to 494.6 thousand soums. It was observed in the version where the gidrogel material, which had a strong effect on the reduction of the product cost, was used.

In the experiment was determined, that the yield level was 108.9-132.0% in the Kokcha variety, 102.2-136.8% in the Gurvak variety, and 200.2-210.1% in the Qari-qiz variety and the profitability of all varieties was strongly affected in the variant with the background and gidrogel substance applied at 12 kg/ha, and a high result was observed.

When sowing melon seeds, when the gidrogel substance is mixed with the soil, the profit from production is 2211.5 thousand soums in the Kokcha variety, 3323.0 thousand soums in the Gurvak variety, and 2294.1 thousand soums in the Kari-kiz variety and it was found that the use of this polymeric substance as a soil mixture in melon cultivation has a high economic effect.

### 3 Conclusion

In the case of using 12 kg of gidrogel per hectare, early germination of melon seeds (2-3 days), early flowering of male and female flowers (4-5 days) and early ripening of fruits (9-10 days) were found. In the experiment, for the strong growth of the above-ground part of the plant of medium-sized melon varieties, the cultivation of the gidrogel substance in the soil, especially in the version with 12 kg per hectare, the highest result, that is, the length of the main stem compared to the control by 12 cm, the number of side branches by 0. It was proved that 4 pieces, the length of the total side branches is higher than 157-217 cm.

In the experiment, the average fruit weight in all varieties was the highest in the variants with gidrogel applied at 12 kg per hectare, and it was 2.6 kg in the Kokcha variety, 2.1 kg in the Gurvak variety, and 3.7 kg in the Qari-qiz variety. It was found that the number and weight of fruits per plant in the variants using 18 kg of gidrogel per hectare were higher compared to the control variant.

In the experiment, the effect of various soil mixtures and standards on the yield index was determined in the cultivation of medium-ripe varieties of melon. The best result were 13% in the varieties of Kokcha (20.2 t/ha), 21% in Gurvak (20.8 t/ha) and Qari-qiz variety (30.3 t/ha). It was found that 9 percent higher yield was obtained than the control option.

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