

Effect of water and resource saving technologies of cotton growing on cotton yield

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Abstract: In this article, in the conditions of light gray soils of Andijan-37 and Sultan varieties of cotton, before additional application of mineral fertilizers (every 3 years) 6,000 kg of bentonite per hectare is cultivated with Andijan-37 variety of 1,000 seeds weighing 2-3 g/ha, fiber yield 0,7%, increase in cotton yield by 3.0-3.5 q/ha, in the Sultan variety of cotton the weight of 1000 seeds by 5 g, fiber yield by 1.4%, cotton yield by 4.1-4.5 q/ha observed an increase in Due to the early ripening of the cotton crop 7-10 days and its 90-100% compliance with the requirements of the first industrial variety, saving 20-25% of available resources, the net profit per hectare is 150-105-75 kg/ha of mineral fertilizers used in the Sultan variety of cotton. There is information that in comparison with the usual technology fed on norms increased by 192,197 and 553,113 UZS, cotton of Andijan-37 variety increased by 468,048 and 553,148 UZS.

1 Introduction

Today, the world's irrigated land is 299,488 million hectares. e. World agriculture uses 2.8 thousand km³ of fresh water per year. It accounts for 70% of the world's freshwater consumption, 7 times more than the water used by world industry [1, 2, 10-13]. Almost all of this water is used to irrigate crops. Globally, 40% of food and 60% of cereals come from irrigated land. In many parts of the world, water supply to agricultural crops is becoming increasingly difficult due to climate change, global warming and declining rainfall. In addition, research that serves the scientific use of existing agrominerals in nature is a topical issue [2, 4-6].

Proper use of available internal resources in raising the level of crops in the republic's agriculture to the required level, increasing soil fertility, scientifically studying the terms and standards of effective use of water-bearing agro-fields to meet the water needs of plants, local application, abundant and high-quality, cheap cotton, the development of new

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resource-efficient agro-technologies that ensure the cultivation of competitive, world-class cotton, is one of the pressing issues [1-3].

Taking into account the soil and climatic conditions of the republic, many scientists, including K. Mirzajonov, A. Avliyokulov, N. Ibragimov, tested the newly created cotton varieties in each soil and climatic conditions and developed agrotechnics for growing more and better cotton. A. Urazmatov, Sh. Nurmatov, M. Khamidov, G. Bezborodov, S. Buriev, M. Tojiev, L. Slesareva, R. Nazarov, A. Isashov, A. Shamsiev, S. Isaev, D. Tungushova and other scientists comprehensive scientific research has been conducted [7-14]. However, in the conditions of light gray soils of Andijan province, insufficient research has been conducted to create a scientific and practical basis for the use of non-traditional agro-ores (bentonite) in the cultivation of early, high-quality cotton from Andijan-37 and Sultan varieties of medium-fiber cotton [15-17].

Therefore, the main purpose of the study is to develop technologies for the use of non-traditional bentonite to save water consumption and mineral fertilizers in the cultivation of new medium-fiber cotton Andijan-37 and Sultan varieties of cotton, depending on the irrigation regime in light gray soils of Andijan province.

2 Materials and methods

The object of research is light gray soils of Altinkul administrative district in Andijan province (Uzbekistan), norms of mineral fertilizers, bentonite, irrigation regimes, Andijan-37 and Sultan varieties of cotton (see red province in Figure 1).

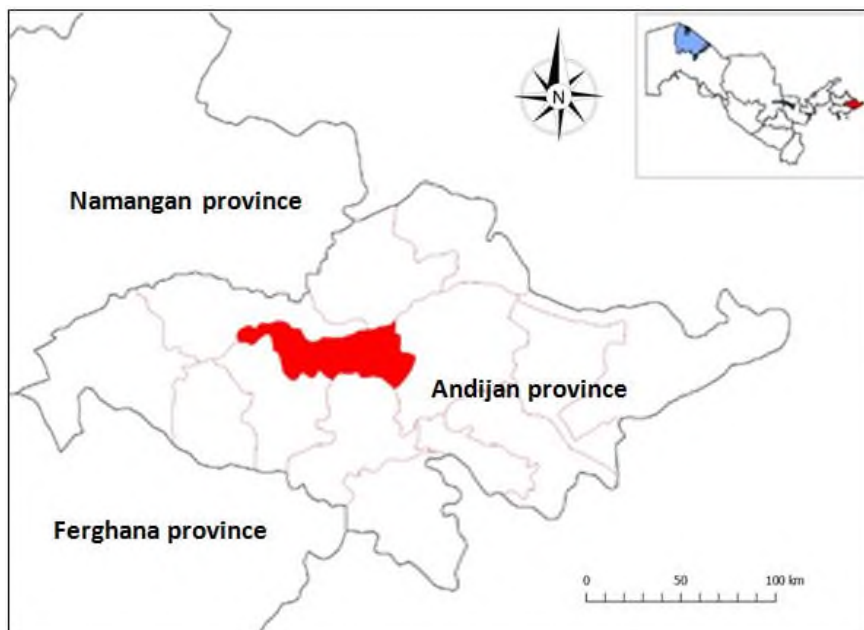


Fig. 1. Map of the study area

The subject of research is the rate of mineral fertilizers, non-traditional bentonite efficiency, irrigation methods, agrophysical properties of soil, agrochemical properties and plant growth, development, yield, fiber quality indicators and economic efficiency.

Field and laboratory researches “Methods of conducting experiments in cotton growing” [4], “Analysis of agrochemical properties of soil and plants” [5], “Analysis of agrophysical properties of soil” [5, 6], “Methods of conducting field experiments” [7], based on the manuals. During the agrochemical analysis, envelope-shaped soil sections of 1–1.5 m were dug in the experimental field. the amount of mobile phosphorus was determined by the BP Machigin method, the bulk mass of the soil (SN Rijov) was determined by the cylindrical method, the structure was determined by the IV Savvinov method [8-13].

3 Results and discussion

The soil-climatic conditions of the study area and research methods are given. The experimental field soils have long been irrigated, light gray soil, medium sand mechanical composition, ancient irrigated, non-saline, groundwater level is 4-5 meters above the ground, annual precipitation is 225 mm, the air temperature is in the Fergana Valley. The beginning of the period is the end of March, when the average daily temperature above 10⁰C is 202-222 days, the sum of effective temperatures is 1,962-2,555⁰C, and the average daily temperature in the desert zone during the period of operation is 23.5⁰C light gray soils 21.6-22,6 and 20.4-21.6⁰C in typical gray soils, frost-free days lasting from 194-214 days, effective temperature sum from April 1 to October 1 to 2,027-2,620⁰C, average annual rainfall is typical gray 350 mm in soils, 240 mm in light gray soils and up to 100 mm in desert areas [18-22].

Prior to the experiment in light gray soils, the initial agrochemical properties were described: 0.790% in 0-30 cm layer with humus, total nitrogen 0.084%, total phosphorus 0.142%, N-NO₃ in mobile form 18.8 mg/kg, mobile phosphorus 28.1 mg/kg and exchangeable potassium 200 mg/kg were found to be low in nutrients.

In the experimental years, Andijan-37 and Sultan varieties of cotton were fed with mineral fertilizers at the rate of NPK-150-125-75 kg/ha, 750 kg of bentonite was applied during the cotton mowing period, and 70-70-60% of cotton varieties were irrigated with the limited field moisture capacity (LFMC). As a result of the positive properties of bentonite, the amount of nutrients in the general form in the 0-30 cm layer of soil increased by 8-10% compared to control options, the amount of mobile nutrients by 10-15%, mineral fertilizers by 25% less than 6,000 kg/ha bentonite In the case of irrigated varieties with additional irrigation and cotton varieties 70-70-60% of the soil LFMC, the amount of nutrients in the general form in the 0-30 cm layer of soil is 12-15% compared to the control options, the amount of mobile nutrients is 32-40% increase was detected.

In experiments on light gray soils of Andijan province, the soil mass was reduced with mineral fertilizers and 6,000 kg of bentonite per hectare was applied before plowing (every 3 years), although the soil layer was compacted to 0.08 g/cm³ per head during the application period, a decrease of 0.12–0.13 g/cm³ was observed in a relatively average 3 years (Figure 2).

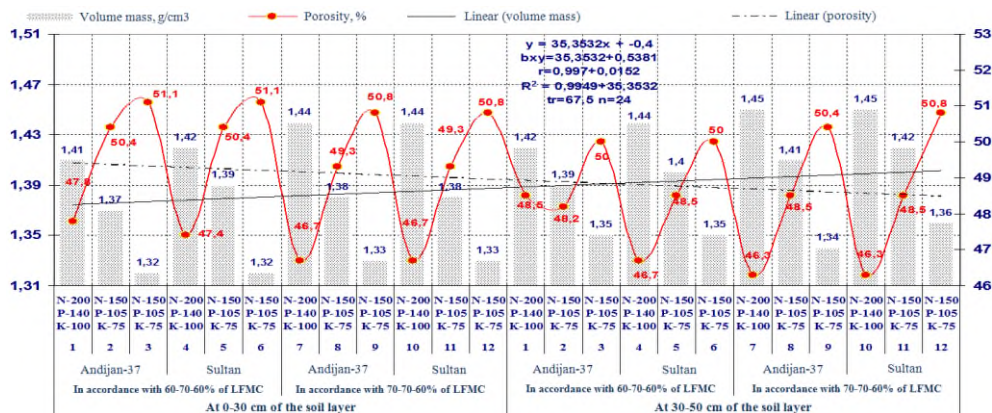


Fig. 2. Changes in soil volume, mass and porosity of the experimental field, 2015

Note: 6.0 tons per hectare (once in 3 years) was fed to 3, 6, 9 and 12 options before cultivation, and 750 kg/ha of bentonite was fed to 2, 5, 8 and 11 options annually during mowing.

Similar patterns were observed in the variants of both cotton varieties with 6,000 kg of bentonite per hectare before plowing (once in 3 years) with an average porosity of 52.2 and 53.3% at the beginning of the application period, and by the end of the application period the soil porosity was positive. Decreased by 2.5% (50.8%). In the control variants, it was observed that the soil porosity decreased by 4.8% compared to the bentonite variants.

Soil water permeability In light gray soils, cotton varieties were fed at the rate of mineral fertilizers NPK-150-105-75 kg/ha during the period of cotton weeding with the addition of 750 kg of bentonite per hectare and 6,000 kg per hectare (once in 3 years), soil LFMC 70-70-60 % were observed to be good in these options, with an average of 691.9 and 674.9 per hectare for three hours at the beginning of the application period, respectively; Although the water absorption was accounted for 681.1 and 677.9 m³/ha in the beginning, the water absorption at the end of the application period was 15.6 m³ per minute, with low rates of mineral fertilizers applied and results close to those of the additional 6,000 kg bentonite variants. In the control variants, the water permeability of the soil decreased by the end of the application period, and in the variants fed mineral fertilizers NPK-200-140-100 kg/ha of cotton varieties, the water permeability of the soil for 6 hours compared to the beginning of the application period was 184.3-221.4 m³/ha. decreased to 442.9-464.9 m³/ha. It was found that the water permeability of these variants decreased by 70-100 m³/ha compared to the bentonite variants.

In the experiments, irrigation procedures and mineral fertilizers NPK-150-105-75 kg/ha, fertilization of Andijan-37 and Sultan cotton varieties, application of 750 kg of bentonite per hectare between rows in the cotton mowing phase and an additional 6000 kg of phosphorus and potassium fertilizers before driving In the bentonite-laden variants, cotton played an important role in the longer retention of soil moisture between rows, in the growth and development of cotton.

6,000 kg of bentonite per hectare was applied before driving to a reduced rate of 25% of mineral fertilizers, and cotton varieties irrigated in the order of 70-70-60% of the soil relative to LFMC showed that the most effective measure of long-term retention of soil moisture. Evaporation of soil moisture due to a significant improvement in soil density and porosity, as well as water permeability properties of 6,000 kg of bentonite per hectare planted before the autumn plowing, 2.0-2.5 times compared to control options NPK 200-140-100 kg/ha per hectare of mineral fertilizers decreased. As a result, this option also

extended irrigation periods due to longer soil moisture retention. Cotton varieties were fertilized with NPK 150-105-75 kg/ha at the rate of NPK 150-105-75 kg/ha and 6,000 kg/ha bentonite before plowing and irrigated at 70-70-60% soil moisture relative to LFMC. was higher than the options under normal fertilized soil conditions and was an important factor in the long retention of soil moisture and a significant reduction in the number of irrigations during the application period.

Soil moisture and irrigation standards differ from other options in the case of bentonite application at the rate of 6000 kg per hectare before driving using mineral fertilizers (in 2015 conditions) NPK-150-105-75 kg/ha, the effect of bentonite in the soil composition at 0-100 cm layer is long continued, the humidity was at its highest level compared to other options. As a result, it was possible to drastically reduce water consumption in both irrigation regimes during irrigation of cotton varieties during the growing season.

60-70-60% of the soil was irrigated in the order of 60-70-60% between 27 and 28 days, with an average water consumption of 771 m³/ha and a total of 2,312 m³/ha 3 times during the season. This means that the number of irrigations of cotton varieties has been reduced by two, saving 2,051 m³/ha of water consumption compared to the control option in this irrigation scheme. Also, in the order of irrigation of 70-70-60% of the soil relative to LFMC, cotton was irrigated 4 times between 26 and 28 days, at an average irrigation rate of 707 m³/ha. A total of 2,827 m³/ha of water was supplied during the season. This means that even in this irrigation mode, water consumption is reduced or saved by 2,060 m³/ha compared to the control option. In short, even in this irrigation scheme, the number of irrigations of cotton varieties has halved.

As a result of the positive effect of 6,000 kg of bentonite applied to the soil during the entire application period, the irrigation interval was extended to 10-13 days, and cotton varieties were watered for 26-28 days. Considering the differences in the methods of interaction of bentonite variants, the evaporation of soil moisture in 60-70-60% of irrigated variants compared to LFMC is 0.96-1.0% per day, in 70-70-60% of irrigated variants evaporation was 0.40-0.44%, and 60-70-60% of the soil was observed to evaporate under the positive effect of bentonite compared to 60-70-60% irrigation regime options.

According to the calculation of the amount of water consumed in the experimental variants, in the variants irrigated at a soil moisture content of 60-70-60% relative to the soil LFMC, the combined control of common mineral fertilizers NPK 200-140-100 kg/ha for a total of 3 years in total combined with reserve water and rainwater 4,972 m³/ha in the variants, the amount of water consumed in the variants irrigated in the order of 70-70-60% of the soil relative to the LFMC was 5,677 m³/ha.

Mineral fertilizers NPK 150-105-75 kg/ha were fertilized with 750 kg/ha of bentonite between rows during the cotton mowing period, and 60-70-60% of the irrigated variants were combined with reserve water and rainwater for a total of 3,653 m³/ha, the amount of water consumed in the irrigated variants at 70-70-60% soil moisture compared to LFMC was 4,950 m³/ha. Before driving, mineral fertilizers NPK 150-105-75 kg/ha with an additional 6,000 kg of bentonite and 60-70-60% of the variants irrigated in the order of 60-70-60%, combined with reserve water and rainwater, a total of 3,473 m³/ha, compared to LFMC. The amount of water consumed in the irrigated variants at 70-70-60% soil moisture was 3,911 m³/ha (Figure 3).

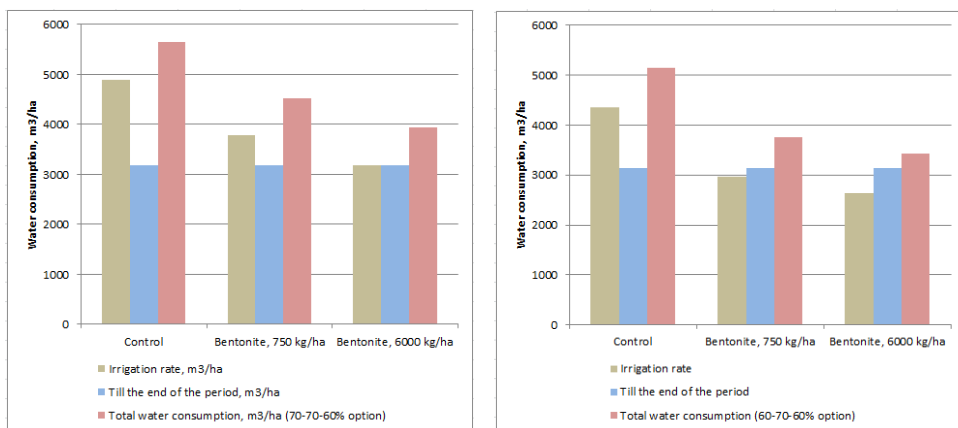


Fig. 3. Average water consumption by experimental field options, 2015

According to the results of the study, mineral fertilizers NPK 150-105-75 kg/ha were fed by adding 750 kg/ha of bentonite between rows during the cotton ginning period and 1,319 m³ compared to the control variant due to the effect of bentonite in 60-70-60% irrigation mode compared to LFMC, and in the order of 70-70-60% irrigation compared to LFMC, 727 m³/ha of water was saved in irrigated variants.

Due to the effect of bentonite in the variants reduced by 25% of mineral fertilizers and added an additional 6,000 kg/ha of bentonite before irrigation and irrigated in the order of 60-70-60% in relation to LFMC, 1499 m³/ha, in the variants irrigated in the order of 70-70-60% in relation to LFMC 1,776 m³/ha of water savings.

When calculating the saved water according to the consumption of cotton varieties, it was found that the mineral fertilizers of Andijan-37 variety of cotton irrigated at 60-70-60% soil moisture relative to LFMC NPK 150-105-75 kg/ha at the rate of 750 kg/ha between cotton rows When fertilized with bentonite and added 2.4 quintals of cotton compared to the control option, the water consumption for 1 quintal of cotton was 99.5 m³/ha, and the water consumption was 45.9 m³, although the yield of cotton increased compared to the control option. / was found to decrease. In the Sultan variety of cotton, a total of 3,653 m³ of water was used to grow 37.1 t/ha of cotton, 98.5 m³/ha of water was used for 1 quintal of cotton, or 47.7 m³/ha less than in the control option.

In addition, 6,000 kg of bentonite was applied before additional driving using NPK 150-105-75 kg/ha norms of mineral fertilizers and 3 quintals of additional yield was harvested compared to the control option when irrigated in 60-70-60% irrigation mode compared to LFMC.

In the experiment, the water consumption for the production of 1 ton of cotton in Andijan-37 variety of cotton in the order of irrigation of 70-70-60% of the soil relative to LFMC was 93.1 m³/ha, although the cotton yield increased compared to the control option, water consumption was 52.3 m³ was found to decrease. In the Sultan variety of cotton, 37.4 q/ha of cotton was grown, 92.9 m³/ha of water was used for 1 quintal of harvest, which is 53.3 m³/ha less than in the control variant (Figure 4).

According to the results of a three-year study, in addition to the reduced standards of mineral fertilizers before driving in the agro-techniques of Andijan-37 and Sultan varieties of cotton 6-7 kg/ha of bentonite soil is suitable for irrigation in the order of 70-70-60% or 1-2-1 irrigation system was found to be a mineral fertilizer and water-saving agronomic measure.

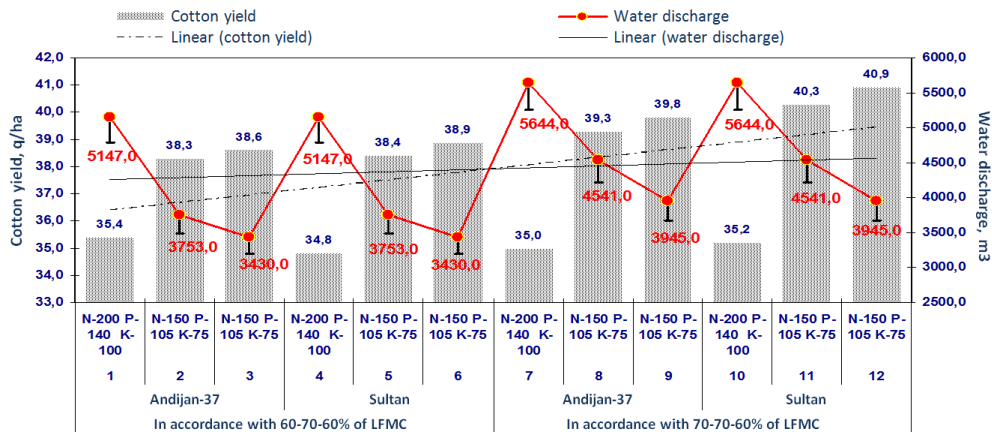


Fig. 4. Amount of water used for cotton yield obtained by experimental options

Before driving, the annual norms of mineral fertilizers were reduced by 25% and 6,000 kg of bentonite per hectare was applied before the autumn plowing, 7 and 14.5 units of yield elements, 6.8 and 8.3 units of stalks were formed, and in comparison with its control variant, the yield of Andijan-37 variety increased by 1.9 units, yield elements and stalks increased by 2.0 units. It was observed an increase of 2.3 units, yield elements and pods by 2.2 units.

For the first time in the experiment, cotton was fed with NPK 150-105-75 kg/ha fertilizer at the rate of 750 kg of bentonite per hectare and 6,000 kg of bentonite per hectare at the pre-driving mineral fertilizer rate. enriched with substances, creating optimal soil conditions with high fertility. Also, agro-measures fed with the addition of 750 kg of bentonite per hectare at the rate of NPK 150-105-75 kg/ha during the period of cotton weeding showed that it is possible to grow high cotton yields, increasing the efficiency of mineral fertilizers by 50-60%.

According to the results of the experiment, under the influence of agronomic measures applied to cotton varieties and irrigation regimes of 70-70-60% of the soil LFCM, Andijan-37 and Sultan cotton varieties yielded 5.6-5.7 cotton varieties per irrigation and irrigation regimes, respectively. At the same time, regardless of the norms of bentonite and the duration of application, almost no difference was observed, or in both varieties of cotton formed a single cocoon weighing 0.2-0.3 g more than the control options.

Cotton yield of cotton varieties studied in the experiment was 38.4 kg of Andijan-37 cotton and 39.4 t/ha of Sultan cotton in the variants with bentonite at the rate of 6,000 kg per hectare before application with mineral fertilizers NPK 150-105-75 kg/ha. Conventional mineral fertilizers NPK 200-140-100 kg/ha yielded 4.0 and 4.6 q/ha, respectively, compared to the control options fed at the rates. The same patterns were observed in all variants of cotton varieties irrigated in the order of 60-70-60% of the soil relative to the LFCM, and the yield of cotton decreased by 1.1-2.0 q/ha compared to the variants of the soil in the order of 70-70-60% of the LFCM (Table 1).

Table 1. Cotton yield, q/ha

Options	Cotton varieties	Annual application of mineral fertilizer, kg/ha			Cotton yield, q/ha				Additional yield, q/ha	
		N	P ₂ O ₅	K ₂ O	2013	2014	2015	Average	In accordance with the control	In accordance with 60-70-60 % of LFMC
1	Andijan-37	200	140	100	33.9	33.5	35.4	34.3	-	-
2	Andijan -37	150	105	75	36.1	36.2	38.3	36.7	2.4	-
3	Andijan -37	150	105	75	36.8	36.5	38.6	37.3	3.0	-
4	Sultan	200	140	100	34.8	32.5	34.8	34.0	-	-
5	Sultan	150	105	75	37.7	35.3	38.4	37.1	3.1	-
6	Sultan	150	105	75	37.9	35.4	38.9	37.4	3.4	-
7	Andijan-37	200	140	100	34.0	34.1	35.0	34.4	-	0.1
8	Andijan -37	150	105	75	37.3	36.9	39.3	37.8	3.4	1.1
9	Andijan -37	150	105	75	38.0	37.5	39.8	38.4	3.0	1.1
10	Sultan	200	140	100	34.8	34.3	35.2	34.8	-	0.8
11	Sultan	150	105	75	38.5	37.8	40.3	38.9	4.1	1.8
12	Sultan	150	105	75	39.0	38.3	40.9	39.4	4.6	2.0

Note: Mineral fertilizers were fed at the rate of NPK-150-105-75 kg/ha between the rows during the mowing (annually) 750 kg/ha and before the autumn plowing (once in 3 years) by adding bentonite 6,000 kg/ha. Seedling thickness was studied in the range of 90-100 thousand/bush. Options 1-6 are irrigated at a soil moisture content of 60-70-60% relative to LFMC, options 7-12 are irrigated at 70-70-60% relative to LFMC.

This is because, as mentioned above, in the options of this irrigation regime, in the early stages of cotton, a decrease in nutrients was observed due to incomplete decomposition of minerals in the soil at 60% soil moisture relative to LFMC. As a result, the growth and development of plants of these variants lagged behind, and the yield of cotton was relatively reduced. The yield of cotton by varieties was irrigated in the order of 70-70-60% of the soil relative to LFMC, in both variants with bentonite the cotton yield of Sultan cotton was 1.0-1.1 q/ha higher than that of Andijan-37 cotton. At the same time, it had a positive effect on its quality indicators. Although a decrease in cotton yield was observed in all variants irrigated in the order of 60-70-60% of the soil relative to LFMC, there were no significant differences in the yield of cotton grown by varieties.

It was found that using the elements of agro-technologies used in the experiment, ie bentonite agro-ore, which saves water and mineral fertilizers in the cultivation of cotton, it is possible to grow high-quality cotton from Andijan-37 and Sultan varieties of cotton.

While under the influence of different agro-measures in the experiments, each variant formed a specific cotton yield, according to them, the economic efficiency of each variant also had a certain degree of economic performance. Irrigation of 70-70-60% of the soil in relation to LFMC consumed an average of 2827 m³/ha of water in 3 years, fertilized with mineral fertilizers NPK 150-105-75 kg/ha at the rate of 750 kg/ha bentonite or 6,000 kg per

hectare before driving with mineral fertilizers In the bentonite variants, the yield of cotton of the Sultan variety of cotton is 38.9-39.4 q/ha, compared to the control variant fed with conventional mineral fertilizers NPK 200-140-100 kg/ha at the rate of 4.1 and 4.6 q/ha. the highest economic return was obtained in the option where additional crops were grown. The gross income from these options amounted to 5,517,304 and 5,588,220 UZS, respectively, with a net profit of 1,176,624 and 1,537,540 UZS per hectare. The profitability rates were 27.1% and 37.9%, respectively, and agro-measures proved to be the most cost-effective measures. The current mineral fertilizers received 192,197 and 553,113 UZS/ha more, respectively, compared to the control option fed at the rate of NPK 200-140-100 kg/ha. The profitability of the control option was also 24.9%. The cotton yield of Andijan-37 in these variants was 37.8 and 38.4 q/ha, while the gross economic income averaged 5,361,287 and 5,446,387 UZS per hectare for 3 years, respectively. The net profit was 1,633,224 and 1,718,324 UZS, which is 468,048 and 553,148 UZS/ha more than the control option, where the current mineral fertilizers were fed at NPK 200-140-100 kg/ha. Profitability rates were 29.2 and 36.1%, respectively, with a decrease of 3.0 and 2.8% compared to Sultan. At the same time, the profitability of the control option was 23.2%. It was found that the use of bentonite agro-ore, which saves water and mineral fertilizers in the cultivation of cotton, is an agro-measure with high economic efficiency in the production of high quality cotton from Andijan-37 and Sultan varieties.

4 Conclusion

In the conditions of light gray soils of Andijan province, bentonite from agroma was applied to the cotton row spacing or before plowing.

In Andijan-37 and Sultan varieties of cotton, the annual norms of mineral fertilizers are applied at NPK-150-105-75 kg/ha between 750 kg per hectare between rows (annually) or 6,000 kg/ha during autumn plowing (once in 3 years). when fed with the addition of bentonite, when irrigated in the order of 70-70-60% relative to LFMC in the soil layer of 0-30 and 30-50 cm is compacted to 0.06-0.05 g/cm³ and 0.08 g/cm³ compared to the beginning of the application period, Under the positive effect of bentonite, the soil density decreased by 0.06-0.08 g/cm³ compared to the control option, creating favorable soil conditions for rapid growth and development of plants during the application period.

Cotton varieties are applied in the order of irrigation in the order of 60-70-60 and 70-70-60% relative to LFMC, mineral fertilizers NPK-150-105-75 kg/ha in the variants of 6,000 kg/ha bentonite (3 and 6; 9 and 12) at the beginning of the period, the water permeability of the soil was the highest compared to the other options, averaging 709.8 and 697.7 per hectare for 6 hours per three years; Absorption of water in the soil in the amount of 71.3.3 and 694.8 m³/ha, 19.3-19.7 m³ per minute, with the positive effect of bentonite mobile nitrogen 42.12-44.36 mg/kg, mobile phosphorus 43.44 -46.41 mg/kg, an increase in exchangeable potassium was observed to 200-240 mg/kg.

Mineral fertilizers of Andijan-37 and Sultan varieties of cotton are fed at the rate of NPK-150-105-75 kg/ha (annually) with the addition of 750 kg of bentonite per hectare and irrigated in the order of 70-70-60% relative to the LFMC. Although reduced by%, during the mowing and flowering periods of cotton varieties, an increase in mobile nitrogen of 14.22 and 29.99, mobile phosphorus by 12.65 and 30.18 mg, and potassium by 80 and 100 mg, respectively, was observed compared to the leaf period.

NPK 200-140-100 kg/ha of conventional mineral fertilizers irrigated in the order of 70-70-60% relative to LFMC, evaporation of soil moisture in the control variants per day averaged 0.76-0.82% for 3 years, while mineral fertilizers NPK at the rate of 6,000 kg/ha before driving (once in 3 years) applied at the rate of 150-105-75 kg/ha, the evaporation of soil moisture decreased by an average of 0.44% per day.

In all variants of cotton varieties irrigated in the order of 60-70-60% relative to the LFMC, the cotton yield decreased by 1.5-2.0 q/ha due to water (soil moisture) compared to the variants in the order of 70-70-60% irrigation compared to the LFMC. In the variants with 6,000 kg/ha of bentonite per hectare (once in 3 years) before additional application of mineral fertilizers to the norm of NPK-150-105-75 kg/ha, the highest yield of cotton from Andijan-37 and Sultan varieties is 38.4 and 39.4 q/ha. The crop is grown.

Irrigation in the order of 70-70-60% in relation to LFMC consumed an average of 2,827 m³/ha of water per hectare for 3 years, fertilized by adding 750 kg/ha of bentonite between rows (annually) or before driving when mowing mineral fertilizers NPK 150-105-75 kg/ha (Once in 3 years) with bentonite variants at the rate of 6,000 kg/ha, the highest economic income was obtained from the Sultan variety of cotton with 192,197 and 553,113 UZS / ha more than the control variant fed with mineral fertilizers NPK 200-140-100 kg/ha.

Andijan-37 variety of cotton averaged 5,361,287 and 5,446,387 UZS per hectare for 3 years. The net profit was 1,633,224 and 1,718,324 UZS, which is 468,048 and 553,148 UZS more, respectively, compared to the control option of cotton fed with mineral fertilizers NPK 200-140-100 kg/ha. Profitability rates were 29.2 and 36.1%, respectively, with a decrease of 3.0 and 2.8% compared to Sultan. At the same time, the profitability of the control option was 23.2%.

In the care of Andijan-37 and Sultan varieties of cotton in light gray soils of Andijan province, the annual rate of mineral fertilizers is set at NPK-150-105-75 kg/ha, taking into account the consumption of bentonite from agroma, between rows during the mating season (annually). It is recommended to add 750 kg/ha or 6000 kg/ha of bentonite (once in 3 years) to the mineral fertilizers before the autumn drive, and to irrigate at 70-70-60% relative to LFMC in a 1-2-1 system with a seasonal irrigation rate of m³/ha.

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