European Journal of Agricultural and Rural Education (EJARE)
Available Online at: https://www.scholarzest.com
Vol. 3 No. 10, October 2022
ISSN: 2660-5643

ADVANTAGES OF ADJUSTABLE TECHNOLOGIES AND COTTON PRODUCTIVITY

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Article history:

Received: 4th August 2022
Accepted: 4th September 2022
Published: 14th October 2022

Abstract:

In the field experiment, three different thicknesses of cotton bushes (80; 100 and 120 thousand per hectare, as well as 7.2; 9.0 and 10.8 plants per 1 pogonometer, respectively), two different irrigations relative to the limited field moisture capacity of the soil (LFWC) regime (70-70-60 and 75-75-60%, as well as the irrigation regime 2-3-0 and 2-4-0, respectively) and the ratio of the two norms of fertilizer (NPK) (1:0.7:0,5 and 1:1:0.5) were studied. The annual norm of fertilizers was: N200 P140 and K100 and N200 R200 and K100 kg..

The annual fertilizer norm was N200 P140 and K100 kg; N200 R200 and K100 kg.

It was taken into account that the yield of cotton grown under conditions where the irrigation regime was 70-70-60% relative to the soil LFWC (limited field wet capacity) was higher in the years of experiments than the yield in the 75-75-60% regime irrigated variants.

In the 70-70-60% irrigation regime, the average yield was 35.7–40.9 ts/ha, depending on the thickness of the bush and the ratio of fertilizers, while in the 75-75-60% irrigation regime the yield was 33.2–36.4 on average. ts/ha.

The micronair index of fiber in cotton harvested from experimental variants was 4.3-4.5, and the micronair index of cotton fiber harvested from 70-70-60% of irrigated variants was slightly higher than the 75-75-60% irrigation regime.

Keywords: Fertilization ratio, watering regime, bush thickness, fertility, the quality, limited field moisture capacity, wet capacity, gross, general, mobile, nitrogen, phosphorus, potassium, humus, economic efficiency, profitability.

1. INTRODUCTION. Due to the growth of the population around the world, including in our country, their demands for food products and industrial raw materials are increasing, the large-scale development of the agrarian sector in our republic, where market relations are being formed, is considered one of the most important priority problems of our time. The productivity of cotton is directly related to the quality of many agro-technological activities in time and independently.

2. MATERIALS AND METHODS. Phenological observations, biometric measurements, analyzes and calculations in all conducted laboratory, field and production experiments were carried out on the basis of methods adopted by the Institute of Cotton Research of Uzbekistan.

"Chipoletti" devices were used to calculate the water consumption of the experimental field, and "Thomson" devices were used for waste water. The amount of total nitrogen and phosphorus was determined by the method of K.S. Ginzburg, E.I.shcheglova and S.V. Wilfius, the amount of mobile nitrogen was determined by the method of Granwald-Lyaju, phosphorus by the method of B.P.Machigin, and humus by the method of I.V. Tyurin.

The obtained results were analyzed by the method of B.A. Dospekhov. Fiber and seed quality analyzes Certification of the quality of cotton fiber of Uzbekistan was carried out in the laboratory of the Samarkand network of the "Sifat" Samarkand regional laboratory, the Cotton Research Institute of Uzbekistan.

3. RESULTS AND DISCUSSION. Field experiments were carried out in conditions of meadow-gray soils of the Samarkand branch of the Cotton Research Institute of Uzbekistan (2005-2007). According to the mechanical composition, the soil of the field where the experiments were conducted is medium sand, the level of underground water is 7-8 meters, and the area was planted with previous crops and cotton.

In the experimental field, the cotton variety Okdaryo-6 was planted in wide rows (90 cm wide).

In the experiment, three different bush thicknesses (80, 100, and 120 thousand plants/ha), two irrigation regimes (70-70-60 and 75-75-60% compared to ChDNS) and two different ratios of fertilizers (1:0, 7:0,.5 and 1:1:0.5, ie., N200 P140 K100 and N200 P200 K100) were studied.

Soil volume mass and field moisture capacity were determined before planting in the spring. The soil moisture before irrigation was determined according to the regimes in the 0-70 cm layer before the flowering phase of cotton, and in the 0-100 cm layer in each 10 cm layer interval in the flowering-harvest phase.

Phenological observations, biometric measurements, analyses, and calculations in all conducted laboratory, field, and production experiments were carried out based on the methods adopted at the Institute of Cotton Research of Uzbekistan. In the years of the experiment, in the irrigation regime of 70-70-60% compared to LFWC, the average pre-irrigation soil moisture of cotton was from 68.3% to 71.9% compared to LFWC, and in the planned irrigation regime of 75-75-60% it was determined to change by up to74.1-76.5%.

It was found that cotton irrigation periods and water consumption rates varied according to planned irrigation regimes. At the end of the growing period of cotton, the seasonal water consumption per hectare in the 70-70-60% irrigation regime changed from 5180 m^3 to 5280 m^3 during the years of the experiment, while in the 75-75-60% irrigation regime, the seasonal water consumption per hectare was 5360 m^3. It turned out to be up to 5555 m^3.

Analyzing the results of phenological observations, it was found that the watering regime, the thickness of the trunk, as well as the presence of fertilizers in different proportions, have a great effect on the growth and development of plants. On August 1 and September 1, the number of bolls and opened bolls per boll of cotton was taken into account, as the number of bolls changed from 80,000 to 120,000.

By increasing the element of phosphorus in the ratio of NPK or reducing the thickness of the trunk from 120,000 to 80,000 per hectare, the increase in the above indicators can be explained by the nutritional area of one plant and the optimization of nitrogen and potassium assimilation by the plant due to the increase in phosphorus and the speed of air exchange.

It turned out that increasing the phosphorus element in the ratio of fertilizers (1:1:0.5) has an effective effect on the flowering process of cotton.

However, with the increase of water consumption and the thickness of the stem, the reduction of the phosphorus element in the ratio of NPK showed that the flowering and ripening phase was slowed down.

With the increase of seedling thickness in both irrigation regimes and fertilizer background, it was observed that the height of the first sympodial branches and the joint intervals of the 1-10 crop branches were longer, but the length of the joint interval of the 11 and subsequent harvest branches and the daily cross section of the stems were taken into account.

It was observed that the height of the first sympodia branches was relatively short in both irrigation regimes studied in the experiment when compared to the cottons grown in the 1:1:0.5 ratio, that is, with the increase in the amount of the phosphorus nutrient in fertilization, compared to the cottons grown in the options given in the ratio of 1:0.7:0.5.

Compared to cotton LFWC, in the 75-75-60% irrigated variants and compared to the 70-70-60% irrigated variants, it was found that all shoots were up to 16 cm long and all crop branches were up to 18.1 cm long, depending on stem thickness and fertilizer ratio.

While the length of all plant branches and crop branches increased as the irrigation regime increased, the total length of plant branches and sympodial branches decreased as the NPK ratio and bush thickness increased from 80,000 to 120,000 per hectare.

In both the studied irrigation regimes and seedling thicknesses of the experiment, cotton was found to increase the number of leaves and their dry mass in the 1:1:0.5 ratio variant compared to the 1:0.7:0.5 ratio variant.

It was found that the number of cotton leaves and their dry mass increased in the irrigation regime maintained at 75-75-60% compared to the irrigation regime of 70-70-60% during the flowering and harvesting phase. However, in both studied irrigation regimes, the number of leaves and their dry mass were sharply reduced due to the reduction of the feeding area of one plant with the increase in the thickness of the bush from 80,000 to 120,000 per hectare.

It is known from the conducted experiments that during the cotton growing season, when the soil is irrigated in the regime of 70-70-60% in relation to LFWC, in both studied proportions of fertilizers, the productivity increases with an increase in seedling thickness from 80,000 to 100,000 on average, but a decrease in productivity was observed when the bush thickness increased to 120,000. However, when cotton is irrigated in the regime of 75-75-60%, it was found that cotton productivity decreases with an increase in the average number of seedlings from 80,000 to 120,000 per hectare in both proportions of mineral fertilizers (Table 1).

During the years of the experiment, the highest average yield (40.5 s) was obtained during the growing period of cotton in the regime of 70-70-60% relative to the limited field wet capacity of the soil, the mutual ratio of fertilizers was 1:1:0.5, and the thickness of seedlings was on average 97 thousand units/ha. It was determined that it was taken under the circumstances.

When fertilizers are applied in a ratio of 1:1:0.5, when cotton is irrigated in the 70-70-60% mode, in options with a bush thickness of 80-100 thousand per hectare, no changes in fiber output and fiber length were observed, however, with an increase in seedling thickness to 120 thousand bushes, these indicators decrease received.

Especially in both irrigation regimes, it was found that with the decrease of phosphorus in the NPK ratio and the increase of bush thickness from 80,000 to 120,000 per hectare, the breaking strength, microneural index, maturity coefficient, and 1000 seed mass decreased.

Table 1. Cotton yield, s/ha in different bush thickness, irrigation and nutrition regimes

Experiment options	Irrigation regime relative to limited field moisture capacity of the soil (LFMCS),%	Thickness before harvest, thousand pieces/ha	The ratio of NPK	Years of experience						Average	
				2005 y.		2006 y.		2007 y.		Total yield	in the form of cotton ball
				total yield	in the form of cotton ball	total yield	in the form of cotton ball	total yield	in the form of cotton ball		
1(c)	70-70-60	80,6	1:0,7:0,5	36,4	4,1	37,2	4,0	35,1	4,5	36,2	4,2
2		99,5		38,8	4,6	39,5	5,3	37,4	4,9	38,5	4,9
3		118,5		35,7	4,7	36,1	4,9	34,6	5,5	35,4	5,0
4		79,8	1:1:0,5	38,2	3,3	38,5	3,6	36,4	4,1	37,7	3,6
5		97,4		40,9	3,8	41,2	4,2	39,5	4,4	40,5	4,1
6		119,2		37,3	4,4	37,3	5,2	35,7	5,2	36,7	4,9
7	75-75-60	79,9	1:0,7:0,5	34,7	6,3	36,9	3,8	34,5	4,2	35,3	4,7
8		100,7		35,8	6,1	35,8	4,9	33,2	4,6	34,9	5,2
9		118,6		33,2	6,4	35,2	4,7	32,1	4,9	33,5	5,3
10		81,5	1:1:0,5	35,2	6,1	38,2	3,4	36,1	3,8	36,5	4,4
11		99,6		36,4	5,8	36,1	3,7	34,5	4,1	35,6	4,5
12		118,0		34,6	6,6	35,4	4,8	33,6	4,6	34,5	5,3
2005 y.:	**A(water).** $TSD_{0,5}$=1,22s/ha			**B(NPK).** $TSD_{0,5}$=1,22 s/ha				**C(thickness).** $TSD_{0,5}$=1,0 s/ha			
2006 y.:	**A(water).** $TSD_{0,5}$=1,59s/ha			**B(NPK).** $TSD_{0,5}$=1,59 s/ha				**C(thickness).** $TSD_{0,5}$=1,3 s/ha			
2007 y.:	**A(water).** $TSD_{0,5}$=1,25s/ha			**B(NPK).** $TSD_{0,5}$=1,25 s/ha				**C(thickness).** $TSD_{0,5}$=1,02 s/ha			

When irrigation is carried out in the 75-75-60% mode, the thickness of the bush is 80,000 to 100,000 per hectare and the fiber length is 33.5-33.6 mm. The weight of 1000 seeds is 120–121.1 g on average, but the thickness of the bush is up to 120,000 with the increase. It was found that the percentage of fiber output, fiber length, fiber maturation coefficient, as well as the mass of 1000 seeds compared to other investigated variants were significantly reduced. In the cotton crop harvested from the experimental variants, the fiber micronaire index was 4.3-4.5.

Analyzing the obtained data, it was found that the average highest economic efficiency (390,724 soums conditional net profit and profitability level of 34%) in the experimental field was irrigated with cotton in the 70-70-60% mode, the average bush thickness was 100,000 pieces per hectare, and the mutual ratio of fertilizers was it was obtained from a variant that was 1:1:0.5. Also, compared to the control option, a multi-conditional net profit of 76,503 soums/ha was obtained, and the level of profitability was higher by 4.3%.

4. CONCLUSION. It is known that excessive watering, waterlogging of the zone of distribution of the root system, leaching of nutrients from it and their entry into the lower layers, determining the thickness of the stem and the ratio of fertilizers without taking into account soil and climatic conditions, as well as a sharp decrease in cotton yields as a result of inefficient use of land happened. On the other hand, the combined, efficient and economical use of cotton will not only increase the yield of cotton, but also ensure a high level of agricultural culture. Inefficient use of these factors destroys the quality of the most fertile irrigated lands, which are the priceless wealth of our republic, and leads to their salinization and waterlogging.

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