

Effect of Weeding on Cotton Weight Per Boll and Cotton Yield Depending on Seedling Thickness of Medium Fiber Cotton Varieties

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Abstract. This article presents information on the effect of seedling thickness and weeding on cotton weight per bag and cotton yield. The research was conducted in cotton varieties S-6524, S-6560, UzPITI-202 in the conditions of typical gray soils of Tashkent region, and in each selected variety 80-90; 100-110 and 120-130 thousand bushes/ha were planted. The thickness of each seedling is 11-12 in the background; 13-14; On 15-16 harvest branches, manual pruning and no pruning were placed. By the end of the growing season, the cotton yield and cotton weight per boll of each option were determined. The highest results were obtained from the options where the cotton variety S-6560 was planted at 80-90 and 100-110 thousand bushes/ha, at 13-14 harvest branches, according to the seedling thickness. According to this, the weight of cotton in one sack is 0.57-0.41 g compared to unspun cotton. ha, 1st harvest weight increased by 6.5-3.1%, yield increased by 3.7-2.6 tons/ha. Also, when the UzPITI-202 cotton variety was maintained at different seedling thicknesses and weeding was carried out in it, the highest values were obtained from the variant where cotton was maintained at a seedling thickness of 80-90 and 100-110 thousand bushes/ha, weeding was carried out at 13-14 harvest branches, and cotton per boll it was noted that the weight of the 1st harvest increased by 4.5%, the yield increased by 3.5-2.7 t/h compared to the non-chilled one. However, it was observed that the seedling thickness in non-chilled options is lower in the background with 80-90 thousand leaves than in the background with 100-110 thousand bush/ha.

Key words. Typical gray soils, S-6524, S-6560, UzPITI-202 cotton varieties, seedling thickness, chilpish, weight of cotton in 1 boll, productivity.

1 Introduction

It is known that improving land reclamation, maintaining and increasing soil fertility, using advanced innovative technologies, and timely and quality implementation of agrotechnical measures are of great importance in obtaining a high and quality cotton harvest [1]. Therefore, comprehensive attention was paid to the development of cotton cultivation, and the complete modernization of the industry was started [2, 3]. It should be noted that now the

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main fields are planted with cotton varieties created by our breeder scientists, whose fibers are popular in the world market, fast ripening, resistant to various diseases and unfavorable extreme conditions of nature. However, based on the biological characteristics of these cultivated cotton varieties, the development of agrotechnics suitable for different soil and climatic conditions has not been fully resolved. For this, development of optimal cotton watering procedure, weeding periods, seedling thickness is an important agrotechnological activity [4-6].

It has been found in many scientific studies that newly created cotton varieties have a negative effect on expected yield regardless of seedling thickness and tillering period. Therefore, it is necessary to develop a system of maintenance agro-measures, taking into account the soil and climatic conditions of the area where any new cotton varieties are recommended for production [7].

When leaving the number of seedlings, it is necessary to pay attention to the types of branching of cotton, the degree of wilt disease of the field [8, 9].

Seedling thickness is one of the factors that have a decisive influence on the conditions of cotton growth and development, and consequently on productivity. It is known that when seedlings are sparse, some cotton bushes develop vigorously and each of them collects a lot of crops, but the total yield per hectare is low. On the contrary, if the seedling is thick, the growth of cotton slows down to a certain extent, and this has a slightly negative effect on productivity. However, the gross yield per hectare will increase. However, if the seedling is too thick, the productivity will decrease sharply [10].

In the scientific research conducted by Y.Muhammadov, Sh.Mamanazarov and others, it was found that the thickness of seedlings of medium-fiber "Porloq-1" and "Porloq-2" cotton varieties per hectare is around 110-120 thousand bushels per hectare in low-fertility lands, and around 75-85 thousand bushes in high-fertility lands. determined its feasibility [11].

According to observations, up to 15% of cotton plants did not produce bolls at all when cotton plants were overplanted in the field. Unproductive cotton is like a weed, because weeds do the same damage to normally growing cotton. In the experiment, with the same fertilizer and water regime, cotton was left in two thicknesses - 90,000 and 160,000 bushels, and when the ratio of their vegetative and generative masses was studied, this ratio was 56:44 when 90,000 bushels/ha were left and 74:74 when 160,000 bushels were left. It was observed that it was equal to 26. The vegetative mass formed during the cultivation of the total crop was 50.4 centners in the first option, 118.0 centners in the second option, or 67.7 centners of excess vegetative mass was created when the seedlings were left thick for the same level of yield [12].

In addition to the thickness of the cotton seedlings, it is necessary to pay attention to the cultivation of chilpish. It is necessary to avoid delaying tillering, because if cotton is waiting for 18-19 branches to emerge, the process of photosynthesis and the supply of nutrients will be disturbed. In this case, even when the buds on the upper branches are fully preserved, they do not ripen together [13].

Chilpish agro-management is of great importance in the normal development of cotton and in reducing the spillage of crop elements. Because it has been determined that the amount of carbohydrates in cotton fruits is higher when chilpish is carried out in its term than when chilpish is not carried out. As a result, it is possible to preserve the elements of the crop. As a result of this agrotechnical measure, it is possible to speed up the sowing of pods by 3-8 days, and increase the total productivity by 5-8 tons/ha [14].

Also, in case of delaying cotton ginning, poor quality and incomplete ginning, or no ginning at all, the yield will decrease, ripening will be delayed by 7-10 days, the bolls will be smaller and the weight will decrease. Cotton is a cypress, and the husk of the bolls thickens and attracts insects more [15].

When the cotton is picked in time, the number of bolls on the plant increases to 2-3, and the quality of the cotton improves. If this event is carried out early, the cotton will shrivel and shed the fruit elements near the main stem. Even if weeding is delayed, the cotton will grow, the number of formed bolls will decrease. Weeding a thirsty cotton plant does not work [16].

It is known in R. Nazarov's research that it is necessary to carry out the weeding twice if the soil and climatic conditions of the cotton plant are based on the characteristics of the plant variety and the development of the sprouts is different. First, the main growth point is cut, and after 7-10 days, the tips of the side branches are cut off. Our cotton growers do the ginning mostly by hand. Then, along with the growth points of the main and side branches, the branches are also pruned. In most foreign countries, chilpish is done chemically [17].

2 Materials and methods

During 2018-2020, scientific research was conducted at the central experimental site of the Scientific-Research Institute of Cotton Breeding and Cultivation Agrotechnologies, located in Qibray district of Tashkent region. The soil of the Central Experimental Fields of PSUEAITI is typical gray, and the mechanical composition is average. Sizot are automorphic soils located at a depth of 18-20 meters.

In the first year (2018), the amount of humus in soil layers 0-30 and 30-50 in the experimental area was 0.704-0.651%, nitrogen 0.064-0.055%, and phosphorus 0.156-0.133%, respectively. 3,147-2,287 mg/kg, mobile phosphorus 40,8-30,4 mg/kg, exchangeable potassium 271-185 mg/kg.

All agrochemical analyzes of the soil composition were carried out in the last year of research based on the methods. Soil samples (2020) were taken at the end of the cotton growing season, and the average humus content in the 0-30 and 30-50 soil layers was 0.873-0.780%, nitrogen 0.078-0.068%, phosphorus 0.1538-0.1364%, respectively. It was observed that in these layers nitrate nitrogen was 9.56-5.49 mg/kg, mobile phosphorus was 20.04-16.40 mg/kg, exchangeable potassium was 228-212 mg/kg.

Field experiments were conducted on the basis of the manuals "Metodokiya proveniya polevyx opytov s xlopchatnikom" (SoyuzNIXI, 1981) [18], "Metodika polevyx opytov s xlopchatnikom" (SoyuzNIXI, 1979), "Methods of conducting field experiments" (2007) [19] adopted at the institute.

The experiment consisted of 36 variants and was planted in cotton varieties S-6524, S-6560, UzPITI-202 in 3 returns. In each variety, 80-90, 100-110, 120-130 thousand bushes/ha were planted and in the background of seedling thickness, there were 11-12, 13-14, 15-16 harvest branches, with and without pruning.

In the field of agriculture, the weather conditions of the research areas are of great importance for the growth and development of plants, in general scientific research [20-22]. If the research was carried out during the years 2018-2020, it was found that the air temperatures in these years were close to each other, but the amount of precipitation was different from each other (Fig. 1).

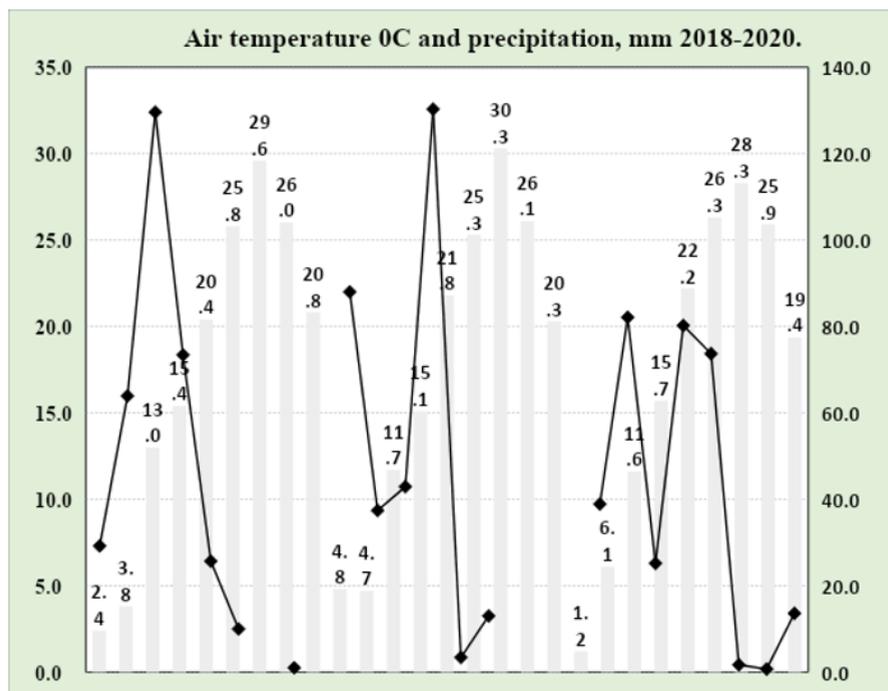


Fig. 1. Air temperature (0C) and precipitation (mm) Tashkent 2018-2020. (Information of Aqqavoq agrometeorological station)

Before each harvest, 50 bolls of cotton were picked in I and III harvests, and the average weight of 1 boll of cotton was determined. In each variant, the cotton crop was picked by hand and weighed on an electronic scale. The obtained yield was converted into hectares based on the area of the options.

3 Results and discussion

Cotton productivity is directly affected by the number of seedlings produced and the weight of cotton per boll, in addition to feeding and irrigation. It is known that in our researches, it is precisely the thickness of seedlings and pruning measures that affect the number of pods. Therefore, scientific researches were conducted in all cotton varieties studied in our research, depending on the thickness of the seedling and agro-measures of chilpish [23-25].

According to a number of scientists, the weight of a piece of cotton in the case of the cotton thread is 0.2 g when the threading is not performed. from 0.5 g. it was determined to increase up to Since the increase in the weight of pods during the Chilpish event was small, if we calculate it per bush and per hectare, it was determined that it would not be less than 1.0-1.5 ts/ha per hectare [26].

Due to the fact that the legality of the obtained results of all the years of the research was carried out, we will limit ourselves to the results of the research obtained in 2020.

As we mentioned, according to the results of the research carried out in Tashkent region, in the 1st background of cotton variety S-6524, i.e., in the option where 80-90 thousand bushels/ha were planted and 11-12 crops were harvested, the average weight of cotton in one boll was 5.58 g. was 5.72-5.56 g, respectively, in the options where chilpish was carried out on the 13-14 and 15-16 harvest branches. was found to be The weight of cotton in one bag is 5.46 g. it turned out to be equal to (Fig. 2).

In cotton, in the field where 100-110 thousand bushels/ha of seedlings were left, in the variant where chilpish was carried out when 11-12 harvest branches appeared, the average weight of cotton in one boll was 5.57 g. 13-14 and 15-16 branches of the harvest, in the options where pruning was carried out, proportionally 5.56-5.39 g. it became known that he organized The weight of cotton in one bag is 5.15 g. was observed to be equal to

In this S-6524 cotton variety, 120-130 bushels are left per hectare and the cotton is shorn at 11-12 harvest branches, the weight of one boll is 5.50 g. , which is 0.07 g compared to the variant in background 2 (100-110 thousand bushes/ha) where 11-12 harvests were carried out. was distinguished by the fact that it decreased to At the expense of the first and second terms, the lowest value is obtained from the non-chilling option, which is proportionally 4.88 g. established.

Also, it was found that the above-mentioned laws were preserved in the S-6560 cotton variety, 11-12 of the background where the seedling thickness was left at 80-90 thousand bushels/ha; The weight of cotton in one boll is 5.59-5.92-5.55 g on average in the options where sleeving is carried out in 13-14 and 15-16 harvest branches. was 0.2-0.6 g in the 11-12 and 13-14 crop branches in the non-chilpish variant compared to the chilpish variants. was observed to be less than In this type of cotton, in the case of planting 100-110 and 120-130 thousand bushels/ha, the weight of cotton in one boll is 5.32-5.34 g respectively. ni, 5.70-5.27 g in the variant where chilpish was carried out on 13-14 harvest branches. ni, 5.52-5.07 g in 15-16 harvest branches in the variants where chilpish was carried out. was 5.29-4.98 g in the non-chilpish options. was equal to

Cotton variety UzPITI-202 was distinguished by the fact that the weight of cotton in 1 boll was higher compared to other varieties when the seedling thickness was kept at 80-90 thousand bushels/ha. 11-12 of this background; The weight of cotton in one boll is 5.57-5.87-5.70 g on average in the options where sleeving is carried out in 13-14 and 15-16 harvest branches. was 5.33 g in the non-chilpish version. was found to be In the UzPITI-202 cotton variety, 100-110 and 120-130 thousand bushels/ha were left and weeded on 11-12 harvest branches, respectively, the average weight of one boll is 5.51-5.43 g. ni, 5.63-5.36 g in the case of the 13-14 harvest branches. ni, 5.46-5.17 g in the variants where chilpish was carried out on 15-16 harvest branches. was 5.25-4.86 g proportionally in non-chilpish options. was equal to

In the conditions of the Tashkent region, the S-6524 cotton variety was cultivated and the seedlings were planted at 80-90 thousand bushels/ha in the 13-14 harvest branches of the background, in which 39.7 t/ha were harvested, and 3.7 t/ha additional yield was obtained compared to the un-tipped option. In the case where the seedlings were left at 100-110,000 bushels/ha, in the 13-14 harvest branches, the yield was 40.0 t/ha, and it was found to be 3.3 t/ha higher than the control. It was observed that 37.2 t/ha was obtained and 2.8 t/ha higher than the control in the variant where the planting thickness was 120-130 thousand bush/ha in the 11-12 harvest branches.

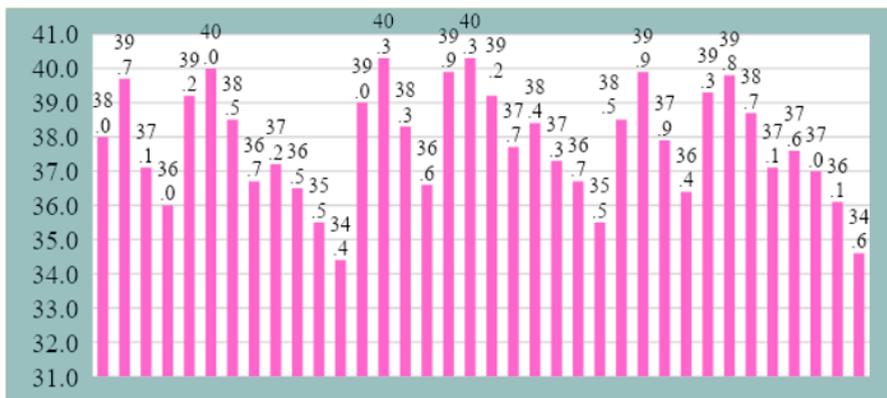


Fig. 2. Effect of seedling thickness and tillage on cotton yield, ts/ha.

In cotton variety S-6560, in the background where the seedling was left at 80-90 thousand bushels/ha, the highest yield was obtained from the option with 13-14 harvest branches, and it was 3.7 ts/ha more than the control. It was found that in the background where the seedlings were left at 100-110 thousand bushels/ha, a higher yield was obtained in the 13-14 harvest branches than in the option with no pruning, and an additional yield of 2.6 tons/ha was obtained compared to the option without pruning. It was observed that 38.4 t/ha was obtained in the variant where the thickness of the seedling was left at 120-130 thousand bush/ha, and this was 2.9 t/ha more than the control.

Also, the medium-fiber cotton variety UzPITI-202 was planted at 80-90,000 bushels/ha, and the highest yield was obtained from the variant with 13-14 harvests in the treated background, and 13-14 harvests in the background where the seedlings were left at 100-110,000 bushels/ha. it was obtained from the option where chilpish was performed on the horn and was equal to 39.9-39.8 ts/, respectively. The thickness of the seedling was left at 120-130 thousand bush/ha, and in the option where pruning was carried out on the 11-12 harvest branch, the yield was 37.6 t/ha and 3.0 t/ha increased compared to the control.

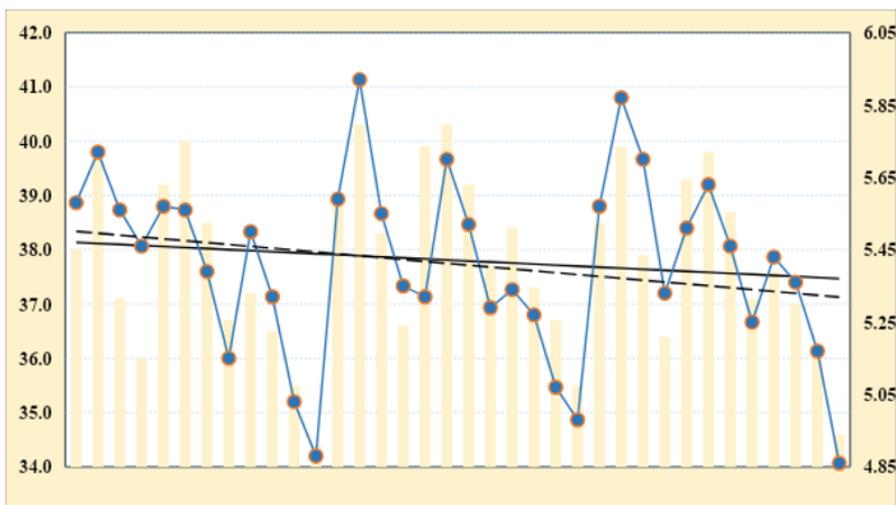


Fig. 3. Correlation between boll weight and cotton yield in relation to seedling thickness in different cultivars, 2020

In our research, we observed the effect of different weeding periods depending on the thickness of the seedlings on the change of the weight of cotton in one boll and the increase

of the total yield of cotton. Mathematical correlation between these two indicators was calculated according to the method of Dospikhov (1979) [27]. According to mathematical calculations, it was observed that the results of dispersion analysis have a high degree of correlation between these indicators. In particular, the correlation coefficient between the two indicators is equal to $r=0.827$ ($R^2=0.6836$), and it was found that there is a high positive correlation (Figure 3).

4 Conclusions

In order to obtain a high yield from the medium fiber cotton varieties studied in the research, leaving 80-90 and 100-110 thousand bushels/ha and weeding at the 13-14 harvest branch, in the fields where 120-130 thousand bushels/ha were planted, weeding at the 11-12 harvest branch is highly effective. determined. The highest yield was obtained from the S-6560 cotton variety, with 100-110,000 seedling thickness in the 13-14 harvest branches, and the S-6524 and UzPITI-202 cotton varieties were maintained at 100-110,000 bushels/ha in the 13-14 harvest branches. it was found to be higher by 0.3-0.5 ts/ha compared to the option of chilpish.

In the conditions of the central regions of the republic, it is recommended to maintain the S-6560 cotton variety at a thickness of 100-110 thousand seedlings and to prune at 13-14 harvest branches.

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