Effect of Plant Thickness and Cotton Row Spacing on Dry Mass Accumulation

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Abstract. In thi article, the medium-fiber cotton variety "Ravnaq-1" was processed at different 60 cm (control), 70 cm, and 76 cm row spacings in a cultivator adopted (in Uzbekistan) and a milling cultivator with a 76 cm row spacing, along with the theoretical seedling thickness. The analysis results of the scientific research on dry mass accumulation of cotton leaving 90-100 thousand bushels/ha and 120-130 thousand bushels/ha are presented. In the conducted research, the dry mass of one cotton bush in 2020 was 118.1-97.6 grams, in 2021 it was 131. It was 2-107.5 grams. That is, when the number of saplings is large, the dry mass of one plant decreases, when analyzed per hectare, it was found that higher dry mass was accumulated in all variants when the theoretical thickness of seedlings was 90-100 thousand bush/ha, when it was 120-130 thousand bush/ha. The highest rate of dry mass accumulation per bush in different row spacings was observed in both years of the study in the case of milling cultivator with a row spacing of 76 cm and theoretical seedling thickness of 90-100 thousand bush/ha, proportionally 138.9-151 It was .5 grams. It was found that this indicator accumulated more dry mass by 20.8-41.3 grams in the first year of the study than the control variants, and by 20.3-44 grams in the second year.
Key words: Dry mass, plant weight per bush, cotton row spacing, different cultivator, tillage, seedling thickness, growth and development.

1 Introduction

It is known that if favorable conditions are created for the good growth and development of cotton, the formation of vegetative and generative organs is improved and high results are achieved. The accumulation of dry mass of cotton directly depends on its morphobiological characteristics, agrotechnics of care, optimal row spacing and seedling thickness [1-3]. Optimal growth and development of cotton at all developmental stages is essential. Because of the formation of vegetative and generative organs, a high quality cotton crop is grown [4-6].

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2 Materials and methods

The researches were conducted in the field of the "Meros" farm, located in the Ahmad Yassavi neighborhood of the Upper Chirchik district of the Tashkent region. The soil of this experimental field is a typical gray, medium loam type, and the seepage water level is at a depth of 3-4 m. Researches were carried out in field conditions and were carried out on the basis of such a methodological manual as "Methods of Conducting Field Experiments" (Tashkent-2007) [7].

According to U.Z. Abdurakhmanov, in experiments on dry matter accumulation of cotton, "S-6524" cotton variety accumulated more dry matter in the early stages than "Andijan-36" cotton variety, while during harvest and ripening period, "Andijan-36" cotton variety accumulated more dry matter. it was mentioned that more dry matter was accumulated due to the high formation potential of crop elements [8].

Karimov Sh. was found to be high [9]. A.Iminov, E.Alikulov conducted a high rate of dry mass accumulation of cotton when 1:1, winter wheat + mixed siderate crops (perko, oat, blue pea):cotton system was used. This, in turn, is 9.4 g of the total dry weight of cotton at the end of the period of cotton compared to the control option, where cotton was cultivated without any repeated cropping after winter wheat. per hectare, 7.7 g in the "Omad" variety [10].

In the research conducted by M.L.Ikramova and others, in the field of average weight in terms of mechanical structure, meadow-alluvial, salinity level and fertility, at the beginning of the period of growth and development of cotton, in the first treatment, the depth of cultivation was 12-14 cm, and the depth before unification The highest quality yield is 48.2 t/ha when cultivation is carried out through a softener at 22-25 cm, the next one at a depth of 16-18 cm, and the last cultivation is carried out to a depth of 18-20 cm during the period when the cotton root system and its vegetative, generative organs are at their peak. , an additional cotton yield of +10.4 t/ha was grown compared to the cultivation depth of 5-6 cm [11].

W.Michael, Ahmad Khalilian conducted experiments in the south of the United States to study the optimal processing and planting methods for cotton using the traditional method of 76 cm narrow row spacing and 97 cm wide row spacing. In this case, it was mentioned that deep tillage between 76 cm narrow rows and traditional 97 cm wide rows with deep tillage on the eve of planting gave 23% more yield than cotton grown in 76 cm narrow row spacing compared to traditional 97 cm wide row spacing [12].

In experiments carried out by S.T. Negmatova and others, in the cultivation of cotton on irrigated lands in the southern regions of the Republic of Uzbekistan, when loosening at a depth of 30-32 cm between the rows, the volume mass of the soil in the mobile and underground layers is 0.02-0.03 g/cm3, the porosity is 2-2, 1%, water permeability increased by 100-120 m3/ha, humus content increased by 0.004%, nitrogen content by 0.007%, phosphorus content by 0.006%. It was mentioned that -5 tons/ha of cotton was obtained [13].

According to F.M. Hasanova, planting seeds with a wide-ranging seeder and a cultivator, and using agrotechnology of combined processing between rows of cotton can increase labor productivity by 30-35%, the number of passes of the unit by 30-33%, fuel consumption by 20-22%, labor 25-30% saving of consumption, reduction of soil compaction, improvement of agrophysical properties of the soil, and additional 5-6 t/ha of harvest were mentioned [14; 15].

3 Results and discussion

In the conducted studies, observations were made on the influence of different types of cotton between the rows on dry mass accumulation by cultivating them in different cultivators, leaving seedlings with a theoretical planting thickness of 90-100 thousand bushels/ha and 120-130 thousand bushels/ha. Data on the effect of inter-row tillage on different cultivators and cotton care at different plant thicknesses on dry mass accumulation are presented in Figure 1.

In the observations conducted in the first year of our research (2020), the total number of plants per plant was proportionally reduced in the control options with a 60 cm row spacing and a theoretical seedling thickness of 90-100,000 bushes/ha and 120-130,000 bushes/ha. weight is 118.1-97.6 grams, of which leaf weight is 32.3-25.5 grams, stem weight is 27.5-24.9 grams, boll weight is 21.9-20.5 grams, cotton weight was equal to 36.4-26.7 grams.

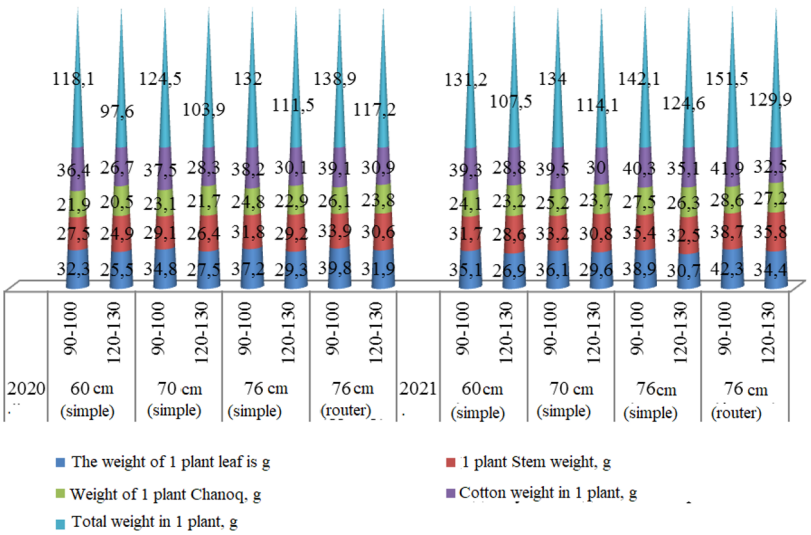

Fig. 1. Effect of inter-row tillage and seedling thickness on dry mass accumulation in grams in different cultivators. (2020-2021)

In scientific research, when 76 cm between rows were cultivated with a milling cultivator and the theoretical planting thickness was 90-100 thousand plants/ha, the dry mass of one plant was equal to 138.9 grams, of which the leaf weight was 39.8 grams, the stem weight was 33.9 grams, the weight of cotton was 26.1 grams, and the weight of cotton was 39.1 grams. In general, due to the widening of cotton row intervals (60 cm, 70 cm and 76 cm) and the number of seedlings, it was noted in the analyzes that the dry mass of one bush of cotton increased in all options, 76 cm between the rows was processed with a milling cultivator, and the theoretical thickness of seedlings was 90-100 thousand bushes It was observed that the dry mass of a boll of cotton was higher when compared to other options. This situation is explained by the fact that favorable conditions are created for the growth and development of the plant when the cotton is treated with a milling cultivator at 76 cm row intervals, and the physiological processes of the plant are improved in this way.

Among the options, the highest rate of dry mass accumulation per plant was observed in the option with a row spacing of 76 cm and a theoretical seedling thickness of 90-100 thousand/bush, and the total weight of one plant was 138.9 grams. In this version, 60 cm between the rows were processed in the cultivator and the theoretical seedling thickness

was 90-100 thousand/bush and 120-130 thousand/bush according to the total weight of one plant proportionally 20.8-41, 3 grams per hectare, 70 cm between rows, 14.4-35 grams per hectare, 76 cm rows proportionally from the options with a theoretical planting thickness of 90-100 thousand bushes/ha and 120-130 thousand bushes/ha 6.9-27.4 grams per ha and 76 cm between rows were processed in a miller cultivator in proportion to the options with a theoretical planting thickness of 90-100 thousand bushes/ha and 120-130 thousand bushes/ha. and it was found that the theoretical seedling thickness of 120-130 thousand bush/ha accumulated 21.7 grams more dry mass.

In the second year of our research (2021), although there was almost no significant difference in the results of the analysis of the dry mass accumulation of one bush, the data obtained from our research over the years remained close to regularity. In general, the highest indicator of dry mass accumulation of one bush is equal to 151.5 grams in the version with a 76 cm row spacing and a theoretical seedling thickness of 90-100 thousand bush/ha, of which leaf weight is 42.3 grams, stem weight is It was 38.7 grams, the weight of the groin was 28.6 grams, and the weight of the cotton was 41.9 grams.

The total weight of a cotton bush is proportional to 131.2-107.5 grams in the control options with a theoretical planting thickness of 90-100,000 bushels/ha and 120-130,000 bushels/ha. according to the method, cotton was 134-114.1 grams in the variants treated between 70 cm rows, proportionally 142.1-124.6 grams in the variants treated between 76 cm rows, and treated with a milling cultivator between 76 cm rows, the theoretical seedling thickness was 120-130 in the option of 1000 plants/ha, the total weight of one plant was 129.9 grams.

In this case, 20.3-44 grams from the control options maintained at 60 cm row intervals, 17.5-37.4 grams from options maintained at 70 cm row intervals, 9.4-26.9 grams from options maintained at 76 cm row intervals, and between 76 cm rows It was revealed from the results of the analysis that the variant treated with a milling cultivator and with a theoretical seedling thickness of 120-130 thousand bush/ha collected 21.6 grams more dry mass.

In our scientific researches, the highest rate of dry mass accumulation per bush was observed in the version with a theoretical seedling thickness of 90-100 thousand bush/ha, processed in a milling cultivator with a spacing of 76 cm between rows, but the highest rate of dry mass accumulation per hectare was 76 cm between rows. It was observed in the analyzes that high results were obtained due to the large number of seedlings in the variant processed by a milling cultivator and with a theoretical seedling thickness of 120-130 thousand bushes/ha. This, in turn, created an opportunity to increase the yield of cotton, it was determined in the results of the analysis.

4 Conclusion

From the results of the research, it can be said that in the care of cotton between the rows of 76 cm, it is cultivated in a milling cultivator between the rows, and when the theoretical seedling thickness is 90-100 thousand bushels/ha, favorable conditions are created for the plant to grow and develop, and high results were achieved in terms of dry mass accumulation of one bushel of cotton. in terms of accumulation of dry mass per hectare, 76 cm between rows were cultivated with a milling cultivator and the theoretical planting thickness was 120-130 thousand bush/ha.

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