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METHODS OF IRRIGATION OF THIN AND MEDIUM FIBER COTTON VARIETIES IN SALINE AREAS

Raxmonov Raxmatillo Umaralievich

Doctor of Philosophy in Agricultural Sciences (PhD)

Avezov Shohmirjon Mavlonjonovich

PhD student

Abstract: The following article deals with the data obtained as a result of studying the productivity of cotton varieties in conditions of soil salinity and water scarcity. During experiments the results have shown that in the soil-climatic and salinity conditions of the Bukhara oasis, the growth of the Bukhara-8 cotton variety, the expansion of the leaf surfaces are higher than that of the Omad and C-4727 cotton varieties. According to the results of the research, it was recommended to use Bukhara-8 and C-4727 varieties, which had high adaptability in grassland-alluvial, red-brown and desert-sandy saline soils of the Bukhara oasis, as a starting material in selection processes and to plant in areas with unfavorable abiotic factors.

Key words: Soil salinity, water scarcity, adaptation, leaf level, cotton varieties, soil types, drought, growth, hardiness, moisture levels productivity.

Introduction. The strongest negative impact of unfavorable environmental factors such as soil salinity and water scarcity falls on the water demanding critical period of cotton, for example, in the flowering stage. At the same time, due to the lack of water in the soil and high air temperatures together adversely affect the physiological and biochemical processes that take place in the cotton, the yield and its quality decreases. Therefore, it is important to zoning cotton varieties that are resistant to such adverse factors based on specific soil and climatic conditions. The effect of irrigation work on the normal development of plants can be as follows: the first is to supply the nutrients and moisture needed for plants; and the second is to accelerate biological and physicochemical processes in soils through exposure to the microclimate and finally to increase soil temperature. The conclusion to be drawn from this is that normal plant growth and high yields are essential for these plants to be supplied with the moisture, nutrients, heat, light and air they need for all phases at the same time.

Therefore, high yields in agriculture are determined not only by watering, but also by taking into account all the conditions necessary for this plant. For example, if a plant is only supplied with water to get a high yield, first of all the plant grows well and then it feels that it lacks its body and the elements it needs to produce the crop, and the yield decreases. In addition, the most dangerous for agriculture is soil degradation can lead to rising groundwater, salinization or swamping of soils. In addition, under the influence of irrigation water, fine-grained soil structure can be formed, particles with a diameter of 2.5 mm are formed about 1 mm in solution, and soil colloids are weakened and viscosity is reduced, this phenomenon occurs in more thin layers of soil and affects the air regime of soils.

Soil salinization and water shortage are two major factors restricting the agricultural productivity in arid and semi-arid areas. More than 412 million hectares of farmland worldwide are reported to be affected by soil salinization, accounting for about 20% of available cropland, but it is estimated that this figure can increase by 50% in 2050. With the rapid population growth, limited fresh water supply and inadequate irrigation, the agricultural sustainability in semi-arid regions is facing increasing global challenges. Therefore, it is of great importance to improve the efficiency of irrigation water, balance soil salinity and put forward a scientific and effective irrigation management system while ensuring sufficient crop yields.

Irrigation is an essential factor in guaranteeing crop production in arid and semi-arid regions. Appropriate irrigation can not only increase seed cotton yield, strengthen cotton carbon assimilation, but also avoid excessive energy consumption of cotton leaf and branch growth redundancy, thereby promoting the increase of population yield, effectively avoiding the machine harvest leaves greedy and reducing the amount of defoliant and fiber damage.

As mentioned above, the irrigated meadows in the Bukhara oasis - alluvial, arable and newly developed desert-sandy soils have different levels of salinity, which greatly impairs the normal growth and yield of cotton. Therefore, in order to combat saline soils, saline soils were washed on irrigated lands, including the Bukhara oasis. As the groundwater level approaches the surface, the cotton root is damaged in a highly moist and saline layer. Subsequently, the groundwater level rises further closer to the soil surface layer, increasing evaporation processes. This situation, in addition to increasing salinization processes in soils, leads to a violation of their water-salt and nutrient regimes, as well as the destruction of cotton plants. In such saline soils, not only the yield of cotton is reduced, but also the quality of he fiber is finally reduced.

Bukhara-8, Omad and C-4727 medium-fiber cotton varieties, as well as alluvial, red-brown and desert-sandy soil types with different levels of salinity were used as a subject of the research.

The experiments were carried out in the scientific laboratory and experimental field of Bukhara State University, as well as in the fields of farms of Karakul and Jondor districts. The experiments were carried out in meadowalluvial, red-brown and desert-sandy fields. The depth of groundwater was 2-3 meters. Based on the pre-irrigation soil moisture, volumetric weight, and moisture capacity, the degree of moisture depletion in the soil was determined and irrigation standards were set.

In all field experiments, soil water deficit was studied and irrigation was carried out by determining soil moisture before irrigation, its volumetric weight and field moisture capacity. In some experiments, soil moisture was kept at 70-75-70, 65-70-65, 60-65-60 percent of the total moisture capacity. Seeds were planted in rows at 60 cm intervals. During the experiments, the agrochemical, agrophysical properties and other indicators of the grassland-alluvial, gray-brown and desert-sand soils, which are widespread in the Bukhara oasis, were determined. Soil salinity levels were also taken into account during field experiments.

Some physiological indicators of cotton varieties, the impact of agroecological factors on the growth and development, phenological observations, calculations and research on the growth and development of plants were carried out in accordance with the methods of UzPITI.

During the study, it was also noted that one of the indicators characterizing the productivity of plants is the change of leaf surfaces depending on the moisture level. In general, the expansion of the leaf surface is also one of the indicators directly related to the overall photosynthetic productivity of plants. This is because the intensity of photosynthesis in the leaves and the amount of organic matter that accumulates as a result are also important in the formation of biological and economic yields in plants. Unfavorable factors of the external environment also affect the formation of leaf surface in plants. The small size of the leaf surface led to a decrease in the pure productivity of photosynthesis.

Soil salinity, depending on moisture levels and soil types, had a negative effect on the expansion of leaf surfaces of all cotton varieties studied. The response of varieties to such a negative impact force varied depending on their biological characteristics. For example, in cotton varieties grown in meadow-alluvial soils with 70-75-70% humidity, the leaf level was as follows: Bukhara-8 variety at the stage of mowing - 1096.9, flowering stage-2015.7, Omad variety at the stage of mowing -980.0, at the flowering stage it was - 1897.2, at the C-4727 cultivar it was 998.9 cm2, at the flowering stage it was 1911.5 cm2. Leaf level in cotton varieties grown in meadowalluvial soils at 65-70-65% humidity was as follows: Bukhara-8 variety at the stage of mowing - 899.5, flowering stage -1806.9, Omad variety at the stage of mowing -879.9, flowering stage -1739, 0, C-4727 cultivar reached -880.3 cm2 during the mating stage and -1774.7 cm2 during the flowering stage. Leaf levels in cotton varieties grown in meadow-alluvial soils with humidity of 60-65- 60% percent were as follows: in Bukhara-8 variety at the stage of mowing - 860.5; during the experiments, it was found that in the flowering stage -1766.0, in the flowering stage of Omad -761.4, in the flowering stage -1722.1, in the flowering stage C-4727 -840.0, in the flowering stage -1745.5. According to the data obtained, the expansion of leaf surfaces of cotton varieties varies depending on the stages of growth and development, moisture levels and salinity, which may be due to the individual characteristics of varieties, as well as their adaptability to adverse factors.

Conclusion. In the irrigated meadow-alluvial, red-brown and desert-sand moderately saline fields of the Bukhara oasis, Bukhara-8, Omad and C-4727 cotton varieties were found to grow taller in different humidity conditions, and the leaf level increased in the variety. As the salinity levels in the environment increased, the growth rate of cotton varieties decreased. In experiments, it was found that in the soilclimatic and saline conditions of Bukhara, the growth of Bukhara-8 cotton varieties, the expansion of the leaf surface is higher than that of Omad and C-4727 cotton varieties. According to the results of the research, Bukhara-8 and C-4727 cultivars with high adaptability to meadow-alluvial, red-brown and desert-sandy saline soils of Bukhara oasis can be recommended for use as a starting material in selection processes and for planting in areas with unfavorable abiotic factors

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