



EFFICIENCY OF CO-PLANTING OF COTTON AND PEANUTS IN SANDY SOILS OF THE DESERT REGION

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Annotation

In the conditions of sandy soils of the desert region, the possibility of improving the moisture regime of the soil and reducing water consumption by co-planting crops is described in the article.

Keywords: Co-planting, soil moisture, irrigation rate, water consumption.

Introduction

Desert sand and sandy soils are the most common types of soils, the area of which is 64.7 million hectares in the CIS countries and 13.8 million hectares in Uzbekistan [1]. Out of this, only in the Republic of Uzbekistan, 1572 thousand hectares are irrigated [2].

The mechanical composition of sandy soils is light, the amount of sand particles (0.25-0.05 mm) in 1 m of soil layer is >75%, and the amount of physical clay is 10.4-21.3%. Also, the amount of humus is very low (0.2-0.5%), the volume weight is from 1.40-1.47 g/cm³, the specific gravity is from 2.64-2.68 g/cm³, the porosity is 45.1 consists of -47.0%.

Because of this, the water-physical properties of the soil are poor (water permeability 11758-15350 m³/ha, limited field moisture capacity 7.8-9.5%) [3] a large number of irrigations are necessary in the maintenance of agricultural crops. In this case, a part of the water is inefficiently lost due to seepage into the lower layers, which cannot be absorbed by the plants, up to seepage, and another part due to the high evaporation characteristic of this area.

Because in the conditions of the sandy soils of the desert region, achieving efficient use of water and saving water is of great scientific and practical importance.

The purpose of the study. It consists in achieving efficient use of water in irrigation and reducing water consumption by planting crops in sandy soils.

Research object and subject. The sandy soils of the desert region, cotton and peanut crops are the object of research. Soil moisture regime, crop water demand and water



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consumption were studied in the methods of planting cotton and peanut in sequence (mixed) in all rows and alternately in separate rows under sandy soil conditions.

Method of conducting research. Field experiments were carried out on the basis of methodological manuals "Методика полевых опытов с хлопчатником" [4], laboratory analyzes "Методы агрохимических, агрофизических, микробиологических исследований в поливных хлопковых районах" [5].

Crop water demand was determined by cell sap concentration using a hand-held reflectometer.

Research conditions. Field research was conducted in the conditions of sandy soils distributed in the Central Fergana desert region of Uzbekistan. The water level of Sizot is 2.2-2.4 meters.

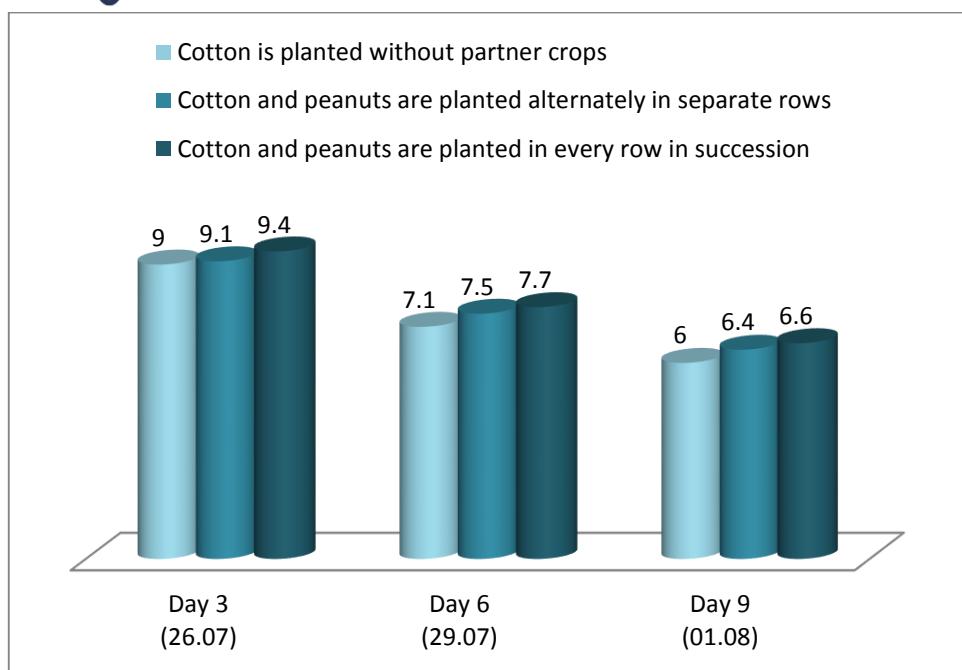
The mechanical composition of the soil of the experimental field is light (sand particles >75%, physical turbidity <10%), low productivity (humus content 0.467-0.553%, total nitrogen 0.048-0.056% and total phosphorus 0.040-0.046%), excellent water-physical properties. poor (limited field moisture capacity 7.8-9.6%, water permeability 11458-12350 m³/ha, capillarity 44-48 cm) and is extremely unfavorable for the maintenance of agricultural crops.

Research results. In our experiments, when cotton is planted together with peanuts, the soil surface is fully covered with plants and better shaded, and soil moisture is preserved more and longer due to the enrichment of the soil with plant residues.

This was especially evident after the 2nd irrigation, when the air temperature rose to a high level and the crops completely covered the soil surface.

In particular, when cotton was cultivated without partner crops, the average moisture content in the soil layer (0-30 cm) was 9.0 on the 3rd day of irrigation; It was 7.1% on the 6th day and 6.0% on the 9th day.

When cotton is planted together with peanuts, with better preservation of moisture, 9.4, 7.7 and 6.6% when the crops are planted in a row in a row, and 9.3 when they are planted in separate rows; It consisted of 7.5 and 6.4% (Figure 1).



Picture 1. Moisture dynamics in the 0-30 cm soil layer under co-planting conditions

These amounts of soil moisture are higher than in the 2019 research year, which is explained by the enrichment of the soil with plant residues.

In the conditions of co-planting of crops, more and longer preservation of moisture in the soil ensured that irrigation periods were extended from 12-14 days to 14-16 days. As a result, it was permissible to irrigate 6 times in the 1-4-1 system in the control variant where cotton was planted without partner crops, and 5 times in the 1-3-1 system when cotton was planted in partnership with peanuts.

When cotton was planted without companion crops, irrigation standards were 719-743 m³/ha, seasonal water consumption was 4370 m³/ha, while cotton was planted with peanuts, irrigation standards were 712-739, seasonal water consumption was 3624 m³/ha.

Conclusions. By co-planting crops in the sandy soils of the desert region:

- 1) Achieving preservation of soil moisture between irrigations by 0.4-0.6% relative to soil absolute weight, 5.1-7.7% relative to limited field moisture capacity;
- 2) Ensuring that the period of irrigation of crops is extended from 12-14 days to 14-16 days;
- 3) During the season, it will be possible to save 746 m³/ha or 17.1% of water per hectare.



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