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THE IMPACT OF THE APPLICATION OF WATER-SAVING IRRIGATION METHODS ON THE GROWTH, DEVELOPMENT AND YIELD OF COTTON

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Abstract: This article discusses the impact of water-saving irrigation methods on the growth, development and yield of cotton, their application in irrigation systems and the role of these technologies in the effective management of water resources in agriculture. The article highlights the introduction of irrigation systems into agriculture, as well as the study of the influence of important factors on plant irrigation, the usefulness of these technologies in optimizing the irrigation schedule based on meteorological data, soil conditions, plant needs and other important indicators.
Keywords: irrigation systems, agriculture, cotton, water resources management, irrigation optimization, technologies, soil monitoring, drainage, sprinkler irrigation, drip irrigation, flood irrigation, central circulation irrigation.

In the system of agrotechnologies of cotton care, feeding with mineral fertilizers at the appropriate time and rates and properly organizing irrigation leads to a lag in cotton growth and development, and ultimately a decrease in cotton yield. Studying the impact of different methods of irrigation of cotton on the growth and development of the plant and cotton yield is of great scientific and practical importance. In conditions of shortage of irrigation water, rational use of existing water sources and introduction of technologies that improve the quality of crop irrigation are becoming a requirement of the time.

In the conditions of Tashkent region, where the groundwater table is deep, the mechanical composition is heavy loam, and typical gray soils, the growth and development of cotton, the accumulation of crop elements, and the weight of cotton crop are studied by irrigating cotton through a simple furrow and between rows with black polyethylene film and winter wheat straw in layers along the furrow. The studies were conducted in the cotton fields of the Akqovok experimental plot of the PSUEAITI during 2012-2014. The experimental system is presented in Table 1. In the field experiment, each plot area was 240 m2, arranged in three rotations, in one layer. The cotton variety "Navruz" was planted in the experiment. Irrigation was carried out with a soil moisture content of 70-70-60% relative to the ChDNS. In the research, all observations, measurements and analyses were carried out on the basis of the methodological manual “Methodology of field experiments with cotton in irrigation conditions” adopted by PSUEAITI (Former UzPITI), agrotechnical measures were carried out in the manner adopted on the farm. In the experiment, in order to study the effect of different irrigation methods, namely, black polyethylene film and winter wheat straw mulching at different distances between rows and irrigation efficiency on the growth and development of cotton, phenological observations were carried out on 50 plants in each variant and replicate at the beginning of June, July, August and September.

As can be seen from the results of the data obtained during the years of experimentation, during the observations conducted in June, there was almost no difference between the experimental variants in terms of plant height and number of leaflets, and the average plant height was 10.2-

15.1 cm, and the number of leaflets was 4.3-5.4.
By August, in the control variant 1, which was irrigated through a regular trench and in the variant 2, which was irrigated alternately with the regular trench, the average plant height was 77.8-82.1 cm, the yield was 12.5-14.4 grains per stalk, 4.7-7.0 grains per node, and 6.4-8.2 grains per cob. In the variants 3-4, which were irrigated alternately with the regular trench and in the variants 3-4, which were irrigated alternately with the row-to-row and alternately with the row-to-row, the plant height was 82.5-89.2 cm, the yield was 14.0-15.8 grains per stalk, 5.3-7.5 grains per node, and 7.5-8.5 grains per cob. The first two-thirds of the field was covered with black polyethylene film and the last third was covered with winter wheat straw. In variants 5-6, which were irrigated with winter wheat straw inter-row and alternately alternating rows, this indicator was 85.7-97.2; cm; 13.8-15.7 grains; 6.4-8.7 grains and 7.9-9.2 grains, respectively.
Cotton yield was calculated for each harvest according to the experimental variants, the data obtained are presented in Table 3. According to the results obtained, in the 1st variant, which was irrigated with inter-row irrigation through a simple furrow and the 2nd control variant, which was irrigated with alternating rows from a simple furrow, the average annual yield was 27.1-29.8; 29.3-31.2; 30.6-30.9 centners, in variants 3-4, where the upper two-thirds of the plot was covered with ordinary straw and the last third with winter wheat straw, inter-row

Cotton yield index in the experimental field, c/ha (Shamsiev A.S.2015).

№	2012 year		2013 year		2014 year	
	Cotton yield, c/ga	Additional cotton harvest, c/ga	Cotton yield, c/ga	Additional cotton harvest,, c/ga	Cotton yield, c/ga	Additional cotton harvest, c/ga
1	27,1	-	29,3	-	30,6	-
2	29,8	-	31,2	-	30,9	-
3	31,6	4,5	32,1	2,8	33,3	2,7
4	32,1	2,3	33,1	1,9	34,2	3,3
5	34,3	7,2	34,9	5,6	37,9	7,3
6	36,6	6,8	35,5	4,3	39,0	8,1

Compared to the control variant 1, which was irrigated with a regular furrow and alternating rows, the third variant, which was irrigated with a regular furrow in the beginning two-thirds of the field and winter wheat straw in the last third of the field, yielded an average of 4.5; 2.8; 2.7 centners per hectare, and the fifth variant, which was irrigated with a black polyethylene film in the upper two-thirds of the field and winter wheat straw in the last third, yielded an average of 7.2; 5.6; 7.3 centners per hectare.
The fourth variant, which was irrigated with a regular furrow and alternating rows in the last third of the field, yielded an average of 2.3; 1.9; 3.3 centners and the option 6, which was irrigated alternately with black polyethylene film in the upper two-thirds of the field and winter wheat straw in the lower one-third, achieved an average additional cotton yield of 6.8; 4.3; 8.1 centners per hectare.
In general, by mulching the rows between the rows with black polyethylene film and winter wheat straw in layers along the field, when the method of inter-row and alternate row irrigation was used during the growing season, a favorable agrobiological environment was created for the growth and development of the plant due to uniform soil moisture, prevention of washing out of the fertile topsoil layer, and reduction of unnecessary evaporation of moisture. Also, mulching the cotton rows with black polyethylene film and winter wheat straw improved the water, nutrient, heat, and air regimes in the soil layer where the plant's root system was distributed, and increased the activity of microorganisms.

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