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Dilfuza Mahammadovna Ahmedova
Ferghana State University
Candidate of Biological Sciences, Associate professor

Gulnora Muhammadjonovna Maksudova
Ferghana State University
Assistant lecturer

THE ROLE OF MOISTURE AS AN ECOLOGICAL FACTOR IN GROWTH OF COTTON PLANTS

Abstract: *This article identifies the optimal regimes and water requirements for the pre-irrigation soil moisture of promising varieties of cotton C-6524 and Colden Valiiey-1 in the light gray soil conditions of Fergana region and preliminary results on the development of important agro-measures for obtaining a quality cotton crop.*

Key words: *ecological factors, climate conditions of soil, quantity of water, soil moist, irrigation dates, scheme of irrigation period, and water evaporation in soil.*

Language: *English*

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Introduction

Attaining efficient utilization of water resources has outstanding importance in steady development of agriculture because approximately 92% of water resources in our country are used in agriculture. Over 97% of farm products are produced in the irrigated land.

In our country, the law of "Water and its usage in the Republic of Uzbekistan" was adopted on the 6th of May in 1993 to arrange proper utilization of water resources, so water practices related to it has been controlled according to this law and other additional legislative documents in our country.

The availability of water resources in soil depends on many factors, particularly, rate of percipitation, the depth of fertile soil and its features (granular and mechanical components) and structure. The soil features are defined by its capacity to conserve water and its relative balance of preserving nutritious and organic matters (sand, argil, clay) in various dimensions. Heavy rain drops can smash down topsoil aggregates and tiny porous particles can block off the the flow of water. As a consequence, it prevents water absorption in soil. Shielding topsoil with organic matters can be conducive to better absorption of water and as a result of its effective use, precipitation water can be preserved in soil and water evaporation can be minimized.

It is possible to maintain water schedule of each type of plant watering system according to our country's soil-climate conditions, depth of underground aqueducts and the biology of the plant and along with it efficiency of irrigation water.

The main part

It is known that moist of soil is considered to be an important ecological factor in cotton fertility. Therefore, in terms of irrigation it is essential to create an optimal water regime for plant's development in growth period. During growth period, cotton's demand for water is interrelated with its assimilated action change and the size of leave structure.

As it was noted by M. Nazarov, K. Mirzajanov, o. Ibragimov, C. Isaev (2014) irrigation is held in the care of cotton plants during growth period when the optimal moist of soil is 65-5% according to Bordered Field Moist Capacity (BFMC), as it creates foundation for steady growth of cotton, having proportional

steady root system, yield elements as well as high abundance of cotton harvest.But when moist of soil is reduced to 55% according to BFMC, it has been observed radical lessening of cotton growth. Beside, zenith of cotton plant's demand for water is in its flourishing and cotton-yielding phases during which cotton plant is each hectare requires 50-55m^3 of water, in blossom period 18-20m^3 and while ripening period it consumes 30-50m^3.

According to some data, less water is consumed in 24 hours when plant's fertility to accumulate organic elements per a day is low and also this is a period for cotton plant to use water efficiently which causes high intensity of plant's photosynthesis. The main reason of less water demand of cotton plant in early stages is its short height of leaves. Cotton's average consumption of water in an area unit suddenly increases due its assimilation productivity under the influence of environment andenlargement of cotton leaves along with cotton plants under the influence of environment.

Cotton plant demands a large amount of water when it starts to blossom and grow, that is, during intensive assimilation period of cotton plants. In this period cotton plans evaporates major part of water to protect its leaves' optimal functional structure against negative influence of dry climate and high temperature of summer. Therefore, it is an important factor to irrigate cotton plants on time during this blossom and growth period to yield bigger harvest. It is necessary to designate exact irrigate time during each stage of cotton plant development. If water is maintained before optimal growth, that is even if the cotton plants are not thirsty, in that case, the plant will grow in height and cotton branches' length will become longer but fertilizing body's growth will be reduced.

The root of cotton which grows in extra humid conditions develops in high layers of soil and it can't stand short period of draught, as a result fruits of cotton blossom drops abruptly. Consequently, harvest reduces, and the quality of cotton gets lower.

For experiment, types of cotton, C-6524 and Golden Valley-1 were taken, experiments were conducted in Fergana region's virgin soil to determine amount and norms of seasonal watering. Implanting date, blossom period, the start of ripening period, period between growing and ripening, medium harvesting measures by hundredweight, the weight of cotton in each unripe cotton bolls, fertilizers and irrigation system and their schedule of experimenting cotton types were elaborately studied. These studies were conducted in four repetitive scale.

In each repetitive case, the length of sector were 25m, the number of row was 4 and distance between rows was 60 cm. the width of sector was 2.4, and the planting scheme was 60x15 (Table1).

As it can be said by phrases of Professor Vysotsky, water in soil content is equal to the blood of living organism. Water in soil takes part in all existing process of land (alteration of chemical elements, biological life-span of soil, formation of organic elements, rotting and others) therefore, irrigation of cotton plants is divided into 4 periods according to bolls of cotton demand, that is, first is from cotton's incipient stage of growth to formation of bud, second is from bud stage to blossom period, third is from blossom to formation cotton, and the forth, is ripening period.

Table 1. Division size and feeding area

	Type	quantity of rows in sector	distance between plants in a row	distance between rows (cm)	nutrition per a plant in an area unit	sector area m^3 general	calculated	defined plants quantity (thousands)	number of plants in determined area unit
1	C- 6524 sample	4	15	60	0,9	60	50	100000	500
2	Golden Valley-1	4	15	60	0,9	60	50	100000	500

It is known that first vegetation water is very significant point to determine crop production. Delaying first irrigation deprives cotton's growth. That's why first water is maintained to cotton plants until it blossoms through every other row in the sector by turn. Due to short size of leaves in the early growth stage of cotton, cotton plants consumes less water, but in blooming and bud forming period, air temperature is high and the size of leaves enlarges as water evaporates rapidly. Therefore, consecutive irrigation is held based on exact growth signs. The onset of cotton blossom, irrigation date is defined according to location of cotton flower's growing point.

At the end of growth, particularly at the end of September in autumn, cotton plants' demand for water lessens considerably owing to reduction of environmental factors influence. Taking into account, autumn irrigation is an important factor to improve the quality of cotton, normal ripening of bud. Motion of

nutritious elements, next irrigation is provided after first cotton harvest collection.

Comparing indications of experimenting types, C-6524 type yielded cotton in 32.5 hundredweight in 2017 and 37.0 hundredweight harvest was yielded in 2018. Cotton plants' growing period, from germinating to ripening differed in 9 days. Cases of cotton's getting infested with Vealt were 8.4%, higher in 2017 than in 2018.

It is clear that from 2017-2018 results, cotton types' under experiment in 2018 all indicators, namely harvesting , expenses of cotton cotton's weight in each boll of cotton, overall cotton's harvest was higher than in cotton types experimented in 2017. Cotton types' growing period from germinating to ripening in 2018 was rather shortened to 8-10 days than in 2017. In this experiment bud bursting was accelerated. Especially it was observed that Golden Valley-1 type's ripened 10 days earlier. Cases of getting infected with Vealt in 2018 compared to 2017 in C-6524 sample type were reduced to 8.1% and Golden Valley-1 to 4.0% (Table 2).

Table 2. Extension of the main indecators of cotton varieties by variants

#	Type	Years of experiment	Average crop productivity (hundredweight)	expenses of cotton %	general cotton's harvest (hundredweight)	weight of cotton in each boll Grams	Period between germinating to ripening	Cases of getting infected with Vealt
1	C-6524-Sample	2017	32.5	35.5	11.5	5.3	130	22.5
		2018	37.0	35.6	13.2	4.9	121	14.4
	median		34.8	35.6	12.4	5.1	125	18.3
2	Golden Valley-1	2017	34.2	38.0	13.0	5.0	132	16.4
		2018	37.5	35.4	13.3	5.1	122	12.5
	median		35.9	36.7	13.2	5.0	127	14.5

In our experiment, diverse waster consumptions at various development stages of cotton plants and growing conditions (soil condition, high temperature of climate, humidity and others) were taken under strict control. Considering 400-800 grams of water consumptions of cotton plants in order to accumulate 1 gram of dry substance in plant according to the soil and climate conditions, 1-2-1 irrigation scheme is applied. (Table3)

Table 3. Distribution of water by phases of guza development

№	Irrigation Period	Quantity of water (m^3
1.	before Bud formation	750
2.	From bud stage to blossom	850
3.	From blossom to formation bolls of cotton	850
4.	After first cotton harvest collection	650

Conclusion

It can be noted as conclusion, it is essential to hold juice watering system as an effective watering method. In the usage of dung juice system, dung serves as protection cover along with given nutrition to plants. It also reduces soil evaporation and increases in absorption into soil. For this reason, dung should be formed in each 10 hectare of cotton fields in shape of 10x10 and before irrigation dung pit should be dampened and mixed.

Irrigation should be held in the evening, when water reaches ¾ part of scratch, water consumption should be lessened twice and when water reaches the end of scratch, it should be minimized twice less again. By maintain trickling water flow regularly, it is possible to decrease draining.

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