https://cejsr.academicjournal.io

Total Water Content in Plant Leaves of Cotton Cultivars, Families and Ranges

N. U. Mavlonova
PhD student of Tashkent State Agrarian University

ABSTRACT

According to the research results, the total amount of water in plant leaves is formed differently in families under different soil and water regime conditions, and changes depending on the composition of parent forms of families, as well as the conditions of water supply.

KEYWORDS: *drought, total leaf water content, family, range, cultivars, gene, ChDNS.*

Systematic water supply of plants ensures that the physiological and biochemical processes in their bodies take place in a normal manner. This creates conditions for obtaining as much as possible. The harmful effects of water deficit are not the same for all plants. Resistance to this depends on the plant species.

Drought tolerance is the ability of plant cells, tissues and organs to adapt to dehydration. The resistance of plants to drought decreases sharply with the appearance of fruiting bodies. In the process of adaptation to drought, the balance of phytohormones changes and the metabolism of amino acids is disturbed [1;176-p]. There are a number of physiological and biochemical mechanisms in the plant to adapt to drought. Changes in agro-ecological conditions during the growth of cotton lead to various changes in plant characters and characteristics, but these are modified or paratypic without being transmitted to the generation. Under the influence of growing conditions, changes in signs and characteristics are different [2; 3-15-p.].

According to the results of the research carried out by M. Tojiev, G.A. Kurbanova, K. Tadjiev [3; 22-24-p.], it was observed that irrigation standards have different effects on the growth, development and harvest of cotton.

Changes in cotton symptoms under water deficit conditions depend on the biological characteristics of the variety and the sensitivity of the plants. Morphological characters controlled by one or more genes change little. Agricultural traits controlled by many genes, such as yield, ripening speed, fiber length, quality, tissue water content, and their water holding properties, are more variable [2; 3-15 p.].

When sufficient amount of water is provided in the stages of development of plants, the physiological and biochemical processes in their bodies are somewhat activated. The amount of water in the soil is higher or lower than the optimal level, which has a negative effect on the passage of these processes, one of the important indicators of the water balance of plants is the total amount of water in the leaves [4; 143-p.; 5; 17-28-p.].

In the conducted studies, the total water content in the leaves of cotton cultivars, families and rows under the conditions of non-saline and saline soils, under optimal irrigation conditions (1-2-1) provided with water, the soil moisture in the flowering-harvest phase was 72-75% compared to ChDNS, and under modeled water deficit conditions (0-1-0) it was 46-50% and was detected simultaneously in plants of both backgrounds. In 2016, the highest indicator of the total water content in the leaves of the varieties studied under non-saline soil conditions and optimal irrigation conditions was recorded in the O-95-96 family (78.6%). The lowest amount of water in leaves was

found in plants of family O-23-24 (77.2%), and this family was reliably distinguished from all other families. In the varieties C-6524 and An-Boyovut-2, which participated in the experiment as a model, it was 77.5-78.1% under optimal conditions, and 75.9-76.4% under water shortage conditions, and there was no significant difference between families and ridges (See Table 1 for information). The highest indicator of the total water content in the leaves was recorded in the O-97-99 family (77.9%) under saline soil conditions and an optimal irrigation system. The lowest amount of water in the leaves was observed in plants of the family O-23-24 (76.6%), while the standard for this indicator was 76.9-77.4% in the varieties, respectively. Under water deficit conditions, the highest index of total water content in leaves was observed in the T-14-16/14 range (76.1%) and the O-10-11 family (76.1%), while this indicator was observed 73.4% in the O-12-14 family.

Table 1. **Formation of total water content in leaves of cotton varieties, ridges and families (in %)**

Family, range and varieties	Non-saline soil conditions (Tashkent)		Saline soil conditions (Syr Darya)	
	optimal watering	water shortage	optimal watering	water shortage
2016 year				
O-95-96	***78,6±0,5***	***74,9±0,2***	***77,2±0,4***	***74,5±0,4***
O-23-24	***77,2±0,3***	***75,3±0,3***	***76,6±0,2***	***74,8±0,5***
O-97-99	***78,3±0,2***	***74,2±5,8***	***77,9±0,3***	***73,7±5,1***
O-10-11	***77,5±0,3***	***76,6±0,3***	***76,5±0,4***	***76,1±0,1***
O-12-14	**77,3±0,2**	**73,9±0,5**	**77,1±0,5**	**73,4±0,2**
O-17-19	**77,4±0,4**	**75,7±0,3**	**77,0±0,7**	**75,2±0,5**
T-14-16/14	**78,4±0,5**	**76,6±0,2**	**77,2±0,9**	**76,1±0,6**
C-6524	**77,5±0,2**	**76,4±0,7**	**76,9±0,3**	**76,0±0,6**
An-Bayovut-2	**78,1±0,3**	**75,9±0,3**	**77,4±0,2**	**75,2±0,7**
2017 year				
O-95-96	79,0±0,1	76,9±0,4	77,2±0,1	76,4±0,5
O-23-24	80,0±0,1	75,9±0,3	78,6±0,1	75,2±0,4
O-97-99	78,0±0,3	76,5±0,3	77,2±0,3	76,0±0,1
O-10-11	77,0±0,3	74,6±0,7	76,8±0,3	74,1±0,8
O-12-14	78,0±0,3	76,5±0,1	77,2±0,3	76,0±0,3
O-17-19	76,6±0,4	73,6±0,2	75,8±0,4	73,2±0,5
T-14-16/14	72,3±0,2	71,0±0,5	71,8±0,2	70,7±0,2
C-6524	77,2±1,0	76,1±0,3	76,4±-7,0	75,8±0,4
An-Bayovut-2	77,7±0,4	76,1±0,1	76,9±11,0	75,7±0,2
2018 year				
O-95-96	77,2±0,3	75,3±0,1	76,8±0,4	74,8±0,2
O-23-24	76,8±0,2	75,2±0,8	76,1±0,2	74,9±1,0
O-97-99	77,5±0,3	76,6±0,3	77,0±0,6	76,1±0,8
O-10-11	75,7±0,2	73,9±0,5	75,1±0,4	73,2±0,7
O-12-14	77,4±1,6	75,7±0,3	76,9±1,2	75,0±0,6
O-17-19	74,3±0,2	72,3±0,2	74,0±0,5	72,2±0,4
T-14-16/14	75,5±0,3	73,3±0,3	75,1±0,7	72,8±0,5
C-6524	76,7±0,3	75,3±0,1	76,2±0,4	74,1±0,3
An-Bayovut-2	78,0±0,1	76,9±0,4	77,1±0,3	76,2±0,2

https://cejsr.academicjournal.io

The experiments showed that the total amount of water in the leaves of all other families was 74.5-76%.

In the next year of our research, in non-saline soil conditions, the indicator of the total water content in the leaves of C-6524 and An-Boyovut-2 varieties, which participated as a model was 77.2-77.7% in the optimal irrigation (1-2-1) system with water supply. In separated families, this indicator was 76.6-80%, and it was observed that it was 72.3% in the T-14-16/14 ridge. The highest index of total water content in leaves was found in the O-23-24 family (80%), and it was 3.4-4.1% higher than the sample varieties. The total amount of water in the leaves in saline soil conditions and optimal irrigation system was 75.8-78.6% in the families, 71.8% in the T-14-16/14 range, and it was observed that in the varieties S-6524 and An-Boyovut-2, which participated as models, this indicator was 76.4-76.9%. It was found that the total amount of water in the leaves was lower by 2.1-3.3% in comparison to all family, ridge and model varieties in water shortage conditions.

In the third year of our research, the indicator of the high total water content in the leaves of the O-97-99 family under non-saline soil conditions and an optimal irrigation system was 77.5%, while this indicator was 76.7% in the model S-6524 variety, An-Boyovut-2 and in the variety it was 78%. As a result of research, it was noted that the amount of total water in the leaves of the T-14-16/14 range was 75.5%. The conditions of saline soils, in our research conducted in the optimal irrigation system, the total water content of the leaves in the isolated families was 72.2-76.1%, and this indicator was 72.8% in the T-14-16/14 ridge.

Conclusion. *It shows that total water content in plant leaves depends on genotypic composition as well as water availability conditions. The obtained results show the different formation of this sign in families under different conditions of soil and water regime, changes depending on the composition of parental forms of families along with the conditions of water supply.*

REFERENCES:

1. Nazirov N.N. Science and cotton. - Tashkent, 1977. - 176 p.
2. Samiev Kh.S. Regulation of water exchange, growth and productivity of cotton varieties // Physiological-biochemical bases of cotton growth. - Tashkent, Science, 1987. -p. 3-15.
3. Tajiev M., Kurbonova G.A., Tajiev K. Effects of different irrigation, feeding rates and seedling thickness on the growth, development and yield of cotton varieties // Problems of increasing the productivity of agricultural crops: Ree. science action conference materials. -Bukhara, 2009. -p. 22-24.
4. Khaidarova O.N., Samiev X.C. Features of water exchange in the fiber and other parts of the cotton boll in conditions of different water supply // 1st Congress of Plant Physiologists of Uzbekistan: Abstracts of reports. -Tashkent, 1991. -p. 143.
5. Abernethy G.A., Mc Manus V.T. Biochemical responses to imposed water deficit in mature leaf tissue of Festuca arundinacea // Environm. And exp. Botani – Oxford, Elmsford, New York, 1998. - V. 40. - N 1. - p. 17-28.
6. J. Kh. Khojaev. Physiology of plants // Textbook. Tashkent "Labor"-2004.