EVALUATION OF THE QUALITY INDICATORS OF THE KHORAZM-127 AND KHORAZM-150 COTTON FIBER VARIETIES

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Abstract: This article presents an analysis of the agricultural technology of cotton varieties “Khorezm-127” and “Khorezm-150” grown in the Khorezm region, as well as an analysis of fiber quality indicators determined by the modern HVI system.

Keywords: cultivated areas, Type of selection, Khorazm-127, Khorazm-150 cotton.

According to the Decree of the President of the Republic of Uzbekistan No. PF-4947 dated February 7, 2017, in Priority Area III of the Strategy for the Development of the Republic of Uzbekistan for 2017-2021 (Priority Areas of Economic Development and Liberalization), special attention is paid to expanding scientific and research work on the creation of new varieties of agricultural crops that are resistant to diseases and pests, adapted to local soil, climate and environmental conditions, in the modernization and accelerated development of agriculture[1].

Currently, one third of the world's arable land is in drought, which is caused by frequent and prolonged droughts, in addition to strong winds, high temperatures and low relative humidity, which negatively affect the yield of grain and industrial crops. Therefore, one of the ways to reduce the negative impact of water scarcity on crops is to create and introduce into production high-yielding and environmentally friendly cotton varieties that maintain high-quality fiber in these conditions.

The FAO (Food and Agriculture Organization of the United Nations) estimates that by 2050, drought and salinity may significantly deteriorate the quality of more than 50% of arable land in many regions of the world [2].

As is known, the issue of water scarcity in Uzbekistan is especially acute in the Syrdarya, Jizzakh, Navoi, Khorezm, Bukhara and Aral Sea regions. Therefore, breeders are working on creating cotton varieties that are resistant to water scarcity and saline conditions, including patents for new cotton selection varieties (“Zafar”, “Zangi-Ota-2”, “Ishonch”) obtained by scientists from the Institute of Genetics and Experimental Biology of the Academy of Sciences of Uzbekistan. It is noted that the “Zafar” variety is distinguished by its early ripening and high fiber quality, the “Zangi-Ota-2” variety is distinguished by its fiber yield and resistance to various conditions, and the “Ishonch” variety is distinguished by its early ripening, high yield, and resistance to drought and saline soil conditions [3]. Although the Khorezm region is also a region with water scarcity and saline soil, breeders are conducting research on the creation of new varieties that are competitive, early ripening, high-yielding, and yielding high-quality cotton that meet world standards in cotton cultivation, and appropriate agrotechnologies [4]. As a result of research, the medium-fiber cotton varieties “Khorazm-127” and “Khorazm-150” created by the breeders of the Khorezm Scientific and Experimental Station are planted on thousands of hectares of land and produce high yields. The study of these varieties studied the effect of cotton seedling thickness, feeding, and irrigation standards on growth and

development. Both varieties studied were irrigated according to the 0-3-1 scheme. Samples were taken from the cotton fiber of the "Khorazm-127" and "Khorazm-150" varieties and their quality indicators were determined using the HVI system.

Table 1

Analysis of the quality indicators of cotton fiber of the "Khorazm-127" and "Khorazm-150" varieties

Type of selection	micron aire	Str Relative breaking strength,cN/teks	Len Above average length,duym	Unf Uniformity in length	Area Dirty Mixture Area	Rd Light reflection coefficient	+b Yellowness level %
1	2	3	4	5	6	7	8
O'zDst 604:2016 requirements: 5 type for grade I	3,5-4,9	23,0-27,8	1,05-1,1	70-84	0-5,5	55-85	3,5-18,5
Khorazm-127	4,2	34,2	1,14	85,9	0,4	79,8	8,5
Khorazm-150	4,4	32,4	1,13	84,3	0,5	74,4	8,8
The difference, %	4,54	0,61	0,88	1,89	20	7,2	3,4

The analysis of the test results shows that the "Khorazm-127" selection variety differs from the "Khorazm-150" variety in micronaire by 4.54%, relative breaking strength by 0.61%, high average elongation by 0.88%, uniformity along the length by 1.89%, area of impurities by 20%, light reflection coefficient by 7.25, and yellowness level by 3.4%.

Thus, the "Khorazm-127" and "Khorazm-150" varieties were confirmed to correspond to 5 type I varieties according to the requirements of UzDst 604:2016 for cotton fiber.

According to the results of Table 1, the null hypothesis that the significantly different indicators of the "Khorazm-150" variety compared to the "Khorazm-127" variety in terms of micronaire (Mik), impurity area (Area) and light reflection coefficient (Rd) correspond to the law of normal distribution was tested based on the Laplace criterion [5].

$$\Phi(z) = \frac{1}{\sqrt{2\pi}} \int_0^z \exp\left[-\frac{z^2}{2}\right] dz, \qquad (1)$$

here, standardized $\Phi(z)$ Laplace function or Laplace criterion.

$$Z_1 = \frac{y_1 - \overline{y}}{\sigma}, \quad Z_2 = \frac{y_2 - \overline{y}}{\sigma}$$

The random values are determined by the following Laplace formula calculation value.

$$U_R = \frac{\overline{y_1} - \overline{y_2}}{\sqrt{\frac{S^2(y_1)}{m_1} + \frac{S^2(y_2)}{m_2}}}, \qquad (2)$$

where u_1, u_2-1, 2 are the random indicator values of the samples

$\overline{y_1}$, $\overline{y_2}$ - average values;

$S^2(y_1)$, $S^2(y_2)$ - dispersions;

m_1, m_2 – number of experiments.

In the first case, random indicators $M\{y_1\} \neq M\{y_1\}$ significance of given values α The two-sided criterion equality values are obtained from the table of the Laplace function, i.e.

$$\Phi_x(U_{T2}) = \Phi(Z) = \frac{1-\alpha}{2} \qquad (3)$$

[63] The value of F_x was selected from Table 5.

If $|U_x| \rangle U_T\{P_d = 0{,}95; m\}$ then the values y_1 and y_2 obey the null hypothesis. The calculation results are given in Table 2.

Table 2

Table of testing the differentiating indicators of the samples based on the null hypothesis Laplace criterion

T.r	Indicators	micronaire		dirty mix area		light reflection coefficient	
		Khoraz m -127	Khoraz m -150	Khoraz m -127	Khoraz m -150	Khoraz m -127	Khoraz m -150
1.	Number of samples	5	5	5	5	5	5
2.	Random indicator value Y_1, Y_2	4,2	4,4	0,4	0,5	79,8	74,4
3.	Dispersion S^2 (Y_1), S^2(Y_2)	0,02	0,05	0,072	0,083	0,75	1,26
4.	Calculation of the difference of random values, U_x	1,82		0,25		8,5	
5.	α Laplace function table value $U_T\{P_d = 0{,}95; m = 4\}$	0,1808		0,1808		0,1808	
6.	α Laplace function condition $\|U_x\| \rangle U_T\{P_d = 0{,}95; m = 4\}$	1,82 > 0,1808		0,25>0,1808		8,5>0,1808	

So, microneur $\{U_1 = 1{,}82 \rangle 0{,}1808 = U_{T_1}\}$, dirty mix area $\{U_2 = 0{,}25 \rangle 0{,}1808 = U_{T_1}\}$, and the coefficient of reflection $\{U_3 = 8{,}5 \rangle 0{,}1808 = U_{T_1}\}$ $\{P_D = 0{,}95; m = 4\}$ The null hypothesis is that the difference in mean values for $P_D = 0{,}95$ confidence probability rejects, therefore $P_D = 0{,}99$ In all likelihood, the indicators compared with the table indicate write-offs.

Thus, the Laplace criterion was used to verify that the errors in the quality indicators of the "Khorazm-127" and "Khorazm-150" varieties were within the norm.

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