

Hereditation of fiber release of f2 hybrids obtained with the participation of us and Mexican cotton samples in the conditions of Karakalpakstan

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Received: 24 January 2025; **Accepted:** 27 February 2025; **Published:** 25 March 2025

Abstract: This article presents an analysis of the variability of fiber yield of F2 hybrids obtained with the participation of US and Mexican cotton samples. In this case, in F2 hybrids, the highest indicators (42.2%) were obtained when S-4727 was taken as the mother, and in other combinations, when varieties were taken as the mother, the hybrids had positive indicators. In the hybrid combination F2 (Chimboy-5018 x 011656), the fiber yield indicator was 39.9%, and when the Chimboy-5018 variety participated as the mother, the fiber yield indicator was 35.5%, that is, in this case, the indicator was 4.4% higher than the Chimboy-5018 variety, and 2.8% higher than the sample No. 011656, which participated as the father.

Keywords: Hybridization, biological nursery, material, reciprocal, observation, fiber yield, cotton, productivity, inheritance, variability, combination, individual selection, sample.

Introduction:

The continuous development of agriculture and technology increases the demand for new varieties of agricultural crops. Therefore, to date, the fiber yield of medium-fiber varieties differs sharply compared to varieties created in different soil and climatic conditions. It is necessary to study new breeding lines obtained from simple and complex crosses using the cotton collection in the soil and climatic conditions of Karakalpakstan, that is, by determining the variability of the main economically valuable traits of the best individual selections collected in field conditions, it will

be possible to select complex resistant forms of cotton resistant to verticillium. The introduction of such varieties will increase the intensity of agricultural production and ensure the development of farms. This is one of the urgent problems of modern agriculture and allows for the propagation of transgressive plants that combine the correlation of economically valuable traits.

Literature review

Data obtained as a result of research by B.K.Madaratov [3] and others show that it is possible to maintain high

fiber yield and quality indicators of the variety without single irrigation and in areas with close groundwater (1.5-2.0 m). According to I.A. Aliyev [1], early maturity is associated with the height of the first fruiting branch, the beginning of flowering, and the rate of boll opening. According to X. Matyakubov [2], the need to use interspecific hybrids is also expanding due to the year-on-year increase in demand for new intensive cotton varieties. Since the missing genes for fiber quality, resistance to drought, salinity, diseases, and pests in existing cotton varieties are often present in wild cotton species, interspecific hybridization plays an important role in the transgression of these genes into cultivated forms. The main conclusion of Y.F. Uzakov's [4] scientific work is that as a result of working with varieties with high fiber quality by hereditary nature (Mexico), when hybridizing with varieties, it can transfer these characteristics to hybrid offspring. They showed a high metric number from 6990-8600, fiber 3.3-3.5 g, from these varieties in our work, the samples with high indicators for this property were used. They were the ones that participated in the polymer lines we studied.

METHODS

Our research was conducted in the laboratory "Cotton Breeding and Seed Production" of the Karakalpak Research Institute of Agriculture. The Institute is located 4 km northeast of the city of Chimbay, at 430-440 northern longitudes, in the territory of the Chimbay district of the Republic of Karakalpakstan. The weather is warm during the day and cool at night. In summer, there are mostly cloudless days, and due to direct sunlight, the temperature is high and precipitation is low. According to long-term data, the average annual precipitation in this region is 99.0 mm. The last spring frosts occur in April, and the first autumn frosts are observed on the last days of September. All field observations were carried out according to the "Methods of Conducting Field Experiments." Variational analyses were calculated on an electronic computer created by M.Mirzasulov and O.Toirov.

RESULTS

Currently, the introduction of new varieties with high fiber yield into production is of great importance in selection work. Therefore, special attention should be

paid to fiber yield when evaluating the initial material, selecting and creating it. Fiber yield is a complex polygenic trait that varies under the influence of various factors and ranges from 25-40% in cotton varieties. In the F2 hybrids we studied, it was possible to observe some changes in the fiber yield indicator, namely, the indicators were noticeably lower. In particular, in the F2 (C-4727 x 011843) hybrid combination, a significant separation process occurred in terms of fiber yield, which amounted to 42.2%, while when the C-4727 variety participated as the maternal parent, the fiber yield was 38.6% (Table 1). That is, in this case, the indicator for this trait was 3.6% higher compared to the C-4727 variety, and it was observed to be 8.6% higher compared to the 011843 sample, which participated as the paternal parent. When the US sample 011843 participated as the mother, the fiber yield trait of the hybrid was 37.6%, the difference from the parental sample was higher by 0.7-0.5%, for this trait, only in the hybrid combination F2 (011843 x S-4727) a similarity of indicators was observed, and in other hybrid combinations, a positive trend was observed.

In the studied hybrid combination F2 (C-4727 x 011782), the fiber yield indicator was 39.6%, and with the participation of the variety C-4727 as the maternal form, the fiber yield indicator was 39.1%, i.e., in this case, the indicator was higher than 0.5% compared to the variety C-4727, and compared to the US sample No. 011782, which participated as the paternal form, it was higher by 1.5%. In the reciprocal state, with the participation of the female sample 011782, the fiber yield indicator of the hybrid was 37.7%, which is 1.3% lower than the paternal sample and 0.7% higher than the maternal sample.

According to the obtained results, in the hybrid combination F2 (Chimboy-5018 x 011656), the fiber yield indicator was 39.9%, and when the Chimbay-5018 variety participated as the mother, the fiber yield indicator was 35.5%, that is, in this case, the indicator was 4.4% higher than the Chimbay-5018 variety, and 2.8% higher than the sample No. 011656, which participated as the father. In the case of reciprocity, the fiber yield indicator was 37.7%, which is 1.2 and 1.5% lower than the parental sample.

Table 1.

Variability of fiber yield in F₂ cotton hybrids, 2024

№	Hybrid combinations	Fiber yield in hybrids, %			Fiber yield of parent forms		Difference from Pt-R2	
		X±Sx	G	V	P ₁	P ₂	Pi	P ₂
1	F ₂ (C-4727 x 011843)	42,2±0,6	1,4	3,3	38,6±0,4	33,6±0,8	3,6	8,6
2	F ₂ (011843 x C-4727)	37,6±0,9	2,1	5,6	36,9±1,4	37,1±1,7	0,7	0,5
3	F ₂ (C-4727x011782)	39,6±0,7	1,5	3,9	39,1±0,5	38,1±1,1	0,5	1,5
4	F ₂ (011782x C-4727)	37,7±0,9	1,9	5,1	39,0±0,6	37,1±1,5	- 1,3	0,7
5	F ₂ (Chimboy-5018 x 011656)	39,9±0,9	1,9	5,0	35,5±1,1	37,1±0,8	4,4	2,8
6	F ₂ (011656 x Chimboy-5018)	38,9±0,6	1,3	3,2	36,7±1,2	39,0±1,5	2,2	-0,1
7	F ₂ (Chimboy-5018 x 011761)	37,6±1,3	2,9	7,8	35,6±1,5	36,4±0,9	2,0	1,2
8	F ₂ (011761 x Chimboy-5018)	37,7±0,9	1,9	5,2	36,5±1,6	39,2±0,7	1,2	-1,5
9	F ₂ (Do'stlik-2 x 07291)	38,9±0,6	1,4	3,6	37,0±1,0	38,2±1,1	1,9	0,7
10	F ₂ (07291 x Do'stlik-2)	36,1±1,5	3,3	9,2	36,8±1,7	38,6±0,4	-0,7	2,5
11	F ₂ (Do'stlik-2 x 011560)	38,0±1,6	3,6	9,5	36,9±1,1	39,7±0,8	1,1	-1,7
12	F ₂ (011560 x Do'stlik-2)	37,2±1,6	3,7	9,9	37,4±1,4	38,6±1,0	2,0	0,8
13	F ₂ (Mehnat x 011790)	39,4±0,6	1,3	3,4	37,4±1,4	38,6±1,4	2,0	0,8
14	F ₂ (011790 x Mehnat)	38,9±1,3	2,8	7,3	38,8±0,9	37,3±1,4	0,1	1,6
15	F ₂ (Mehnat x 011571)	38,9±1,3	2,7	7,3	38,4±1,3	35,2±1,5	0,5	3,2
16	F ₂ (011571 x Mehnat)	38,3±0,9	2,1	5,5	34,0±0,4	31,8±1,3	4,3	6,5
17	F ₂ (Omad x 011787)	37,7±0,9	2,2	5,7	35,7±1,4	35,7±1,0	2,0	2,0
18	F ₂ (011787 x Omad)	38,1±1,0	2,3	5,9	35,7±1,1	35,3±1,0	2,4	2,8
19	F ₂ (Omad x 06655)	36,3±1,3	2,9	8,1	37,6±0,6	36,2±1,5	-1,3	0,1
20	F ₂ (06655 x Omad)	36,1±2,1	4,7	12,9	32,7±1,2	34,4±0,9	3,4	1,7

CONCLUSION

Fiber yield, being a complex polygenic trait, had high indicators in F₂ hybrids when S-4727 was taken as the mother (42.2%), and in other combinations, when varieties were taken as the mother, the hybrids had positive indicators. In the hybrid combination F₂ (Chimboy-5018 x 011656), the fiber yield indicator was 39.9%, and when the Chimbay-5018 variety participated as the mother, the fiber yield indicator was 35.5%, that is, in this case, the indicator was 4.4% higher than the Chimbay-5018 variety, and 2.8% higher than the sample No. 011656, which participated as the father.

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