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OPISANIYA SEMEYSTV, POLUChENNYX OT HLOPCHATNIKA RODA GOSSYPIUM L., I LINII T-52

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Abstract. This paper examines the morphological and physiological characteristics of valuable economic traits in cotton (productivity, fiber yield and length, strength, early maturity, etc.), and establishes correlations between them. The study revealed a positive correlation between medium and high fiber quality and yield, as well as a negative correlation between fiber length and an extended growing season. The data obtained are important for a comprehensive analysis of source material and improving the efficiency of the breeding process.

Keywords: Gossypium barbadense L., economic traits, fiber quality, yield, correlation, interrelationship, breeding.

Абстрактный. В статье анализируются морфологические и физиологические особенности ценных агрономических признаков хлопчатника (Gossypium barbadense L.), таких как урожайность, выход волокна, длина волокна, прочность и скороспелость, а также корреляционные связи между этими признаками. В ходе исследования выявлены средние и сильные положительные корреляции между показателями качества волокна и урожайностью, тогда как длина волокна и процент ворса отрицательно связаны с продолжительностью вегетационного периода. Полученные результаты создают научную основу для комплексной оценки хозяйственно ценных признаков и повышения эффективности селекционной работы по тонковолокнистому хлопчатнику .

Ключевые слова. Gossypium barbadense L., агрономические признаки, качество волокна, урожайность, корреляция, взаимосвязь, селекция .

Introduction. Of all cotton fiber produced globally, 20% is produced in China, 18% in the United States, 13% in India, 8% in Pakistan, 8% in the CIS countries, and 5% in Uzbekistan. According to the International Cotton Advisory Committee (ICAC), although global cotton fiber production has increased by 4% over the past decade, fiber yields have decreased by 1%. Due to global population growth and limited irrigated arable land, achieving high-quality yields without expanding arable land is a pressing challenge for agricultural countries worldwide.

To achieve higher cotton yields worldwide, scientists in the United States, China, and India are conducting research to improve breeding methods and develop new cotton varieties that meet modern requirements by determining the additive effect and the degree and direction of dominance of genes controlling quality traits. The objective of the study was to determine the variability of valuable economic traits in fine-fiber cotton hybrids and study their dependence on

the type and color of seed hairs, to create a family and line with a positive complex of traits and to recommend them as source material for genetic selection processes.

Materials and methods of the study. The object of the study was the T-52 line and families isolated from it, having different types and colors of grain pubescence in plants, created in the laboratory of the Research Institute of Cotton Breeding, Seed Production and Agrotechnology "Artificial Climate". The fine-fiber cotton varieties Surkhan-14, Surkhan-103 and 9871-I were used as models. The study was conducted based on the methodological manual "Methodology for Conducting Field Experiments" [3; p. 351]. Fiber quality indicators were analyzed in the laboratory of the "Quality" center using the HVI system, and statistical analysis of the obtained results was carried out using Microsoft Excel according to the method of B.A. Dospekhov. Results and analysis. In 2023-2024, the study of promising families of the T-52 line with partially white pubescence of the studied naked seedlings was continued. Photographs of seedlings from the studied families are presented in Figures 1-9. Table 4.1 presents the economically valuable traits of families of hybrid combinations F 8 -F 9 (F 2 [F 4 (F 8 (F 1 T-817 x 010972) x T-817) x Surkhan-16] x (F 2 Surkhan-16 x Surkhan-18). The obtained data showed that in the studied years, the Tisa variety had a cotton boll weight of 3.1-3.2 g, fiber yield of 31.3-32.3%, 1000 seed weight of 117-121 g, fiber length of 43.0-43.5 mm. as a relatively low fiber yield, high-quality bullet fiber with separated. Received a rating of 9871-I. It was found out that in families, the cotton weight in one bag in 2023 will be 3.0-3.6 g, in 2024 - In 2024, fiber production volume will be slightly higher than 35.0–41.5 percent in 2023. The organization produced 1,000 seeds in 2023 weighed 100–111 grams. If so, then in 2024 this figure will be 102–126 grams.

Also, in 2024, relative fiber length indicators observed and increased should also be emphasized. In 2023, the fiber length of the studied families ranged from 40.4–43.2 mm. If this occurs, this figure will reach 40.2–44.4 mm in 2024. From this point on, with the exception of most families, fiber lengths up to 42.0–43.4 mm have been separated. The results of the studied families show that most of them are promising.

The main requirements for cotton varieties are high fiber quality, Productivity, early maturity, and stability. Therefore, in global practice, molecular selection methods are being integrated into traditional breeding processes to increase productivity, quality, and stability, accelerating the development of new varieties. At the same time, it is planned to effectively utilize the achievements of domestic and international scientists in identifying genes involved in regulating economically valuable traits in cotton.

Table 1

F 8-9 (F 2 [F 4 (F 8 (F 1 T-817 x 010972) x T-817) x Surkhan-16] x (F 2 Surkhan-16 x Surkhan-18) (T-52) according to valuable economic characteristics (2023-2024)

Types and families of patterns	Valuable Farmer's Marks				
	Weight of cotton in one bag, g	Fiber yield, %	Weight of 1000 seeds, g	Fiber index	Fiber length, mm
2023 y.					
9871-И	3.1	31.3	121	5.49	43,5
1	3.2	36.8	100	5.82	41.4
2	3.6	36.7	111	6.41	41.2
3	3.6	36.0	109	6.13	42.2
4	3.0	38.3	111	6.85	40.4
5	3.1	35.9	103	5.74	41.0

6	3.2	35,5	110	6.05	42.6
7	3.1	37.0	101	5.93	43.2
8	3.2	37.3	100	5.91	40.4
9	3.4	36.9	100	5.84	42.0
2024 y.					
9871-И	3.2	32.3	117	5.91	43.0
1	3.2	37.9	106	6.40	43.4
2	3.3	37.2	106	6.24	43.0
3	3.3	38.3	107	6.64	44.4
4	3.1	36.7	102	5.88	42
5	3.3	38.7	102	6.43	40.2
6	3.3	36.3	103	5.84	43.4
7	3.4	37.7	111	6.69	43.2
8	3.8	36.0	126	7.06	43.2
9	3.6	36.0	126	7.1	42.4
10	3.5	41.5	104	6.69	43.4
11	3.2	39.2	104	6.71	41.2
12	3.2	35.0	111	5.95	41.4
13	3.2	40.2	105	7.06	41.6
14	3.3	38.8	118	7.45	41.2

G. barbadense L. is adapted to hot climates and is cultivated primarily in the southern regions of our country with a long growing season. Fine-fiber cotton varieties possess more valuable characteristics than medium-fiber varieties, such as productivity and fiber yield. Under current economic conditions, only highly profitable cotton varieties should be grown in Uzbekistan's cotton industry.

Furthermore, highly profitable varieties are important for the entire cotton industry in the country: raw cotton producers, processors, and consumers of cotton fiber. As is well known, the main factors in a variety's high profitability are yield and high consumer properties of the fiber, i.e., the quality of the raw cotton.

In production, special attention is always paid to the fiber quality of the cotton varieties grown, as it determines their industrial application (types of yarn and fabric) and is a factor determining the price on global markets. It is also very important to consider the correlations between high average yarn length, high average yarn spinning ratio, and yarn spinning ratio during primary propagation and selection of families.

The high fiber yield (36.3%) in the hybrid combination families F 9 (F 2 [F 4 (F 8 (F 1 T-817 x 010972) x T-817) x Surkhan-16] x (F 2 Surkhan -16 x Surkhan-18) (T-52 series) studied by us is an important economic factor. More fiber means higher profitability. Finally, its use in the textile and manufacturing industries is economically feasible.

Some of the selected families include drawings showing the type and color of the seminal hairs.

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Conclusion. The fiber yield in the families demonstrated superiority over the standard grade in terms of cotton weight per boll. Most families had a fiber length of 42.0-43.4 mm. The results indicate that most of the families studied are promising. Fiber quality analysis revealed that all the families studied had high yarn spinning coefficients, with the range of variability ranging from 190-216 depending on the family. Most families had values above 200. Microneural indices did not differ significantly between families and ranged from 3.8-4.2. Very high values were obtained for the evenness index. The obtained values for relative tensile

strength indicated that the fiber in the families studied was high-quality. Most families were distinguished by high fiber quality and met the requirements for Type I cotton fiber.

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