



## **FORMATION OF FIBER'S LENGTH AND FIBER'S YIELD OF COTTON PLANT**

**Jakhongir Abduganiyevich Ergashev**

*Independent Researcher, Department of Genetics, Plant Breeding and Seed Production of Agricultural Crops, Tashkent State Agrarian University, University str., 3, Tashkent-100140, Uzbekistan.*

**Bakhrom Quvondiqovich Madartov**

*Doctor of Agricultural Sciences, Professor of the Department of Genetics, Plant Breeding and Seed Production of Agricultural Crops, Tashkent State Agrarian University, University str., 3, Tashkent-100140, Uzbekistan.*

**Guzal Ruziyevna Kholmurodova**

*Doctor of Agricultural Sciences, Professor of the Department of Genetics, Plant Breeding and Seed Production of Agricultural Crops, Tashkent State Agrarian University, University str., 3, Tashkent-100140, Uzbekistan.*

**Makhliso Nizom qizi Ummatova**

*Assistant of the Department of Genetics, Plant Breeding and Seed Production of Agricultural Crops, Tashkent State Agrarian University, University str., 3, Tashkent-100140, Uzbekistan.*

DOI: <https://doi.org/10.36713/epra3881>

### **ABSTRACT**

*The article analyzes the fiber yield and fiber quality, which have a negative correlation coefficient, using different methods of selection in the selection of mid-fiber cotton varieties, and analyzes the separation of fiber and high fiber content. It is suggested that positive hygiene can be found in pairs of hybrids and families in order to detect positive transgression, and by selecting larger samples, positive plant recombinant plants can be found. Practice is made of O-445 family, created by double hybridization on fiber yield, Range T-33-35/18, family O-580, created by double hybrid to improve fiber length, T-25-27/18 and T-54-56/18. the use of selection processes.*

**KEYWORDS:** cotton, double hybrids, complex hybrids, family, ridge, variety, population, fiber yield, fiber length.

### **INTRODUCTION**

About 20% of the total cotton produced in the world comes from China, 18% to the US, 13% to India, 8% to Pakistan, 8% to the CIS countries, 5% to Uzbekistan. According to the International Cotton Advisory Committee (ICAC), cotton production has declined by 1%, despite a 4% increase over the last decade. Due to the growing population on the earth, and the limited irrigated area, it is important to obtain high quality produce without expanding agricultural land in the world.

In order to solve these problems around the world, the wide use of the various methods used in other crops for the selection of cotton is relevant. Increased ability to isolate recombinants as a source of new genetic variability as a result of transgressive variation in complex hybridization has been confirmed in other plant breeds, allowing for the creation of new varieties with a positive set of valuable economic characteristics in a short time. The research focuses on the indicators of fiber consumption of families created by complex hybridization of medium-fiber cotton and creates new ridges that meet the international standards.

Wide-ranging efforts are being undertaken to create new varieties of cotton that meet the requirements of the global cotton market. At present, it is important to create cotton varieties with more than 40% of fiber consumption in the country are required.

Cotton is mainly cultivated for fiber, and the introduction of high-yielding varieties is of great importance. Therefore, in the evaluation, selection or production of the original material, particular attention is paid to the use of fiber.

Fiber excretion is a complex polygenic mark that varies under the influence of various factors and ranges between 25-40% in varieties and samples. Most scholars in the research of the heredity of fibers Straumal, [12, 13], Simongulyan [11], Ibragimov and others [2], Rammachandran C.K., Krishnamurt J. [9], Saidaliev paid particular attention to long breeding of species [10]. N.Z.Innes [3] in their studies (*G. hirsutum* × *G. arboreum*) × *G. raimondi* and *G. hirsutum* × *G. anomalum* hybrids combine with varieties of Acala-1217 and Acala 4-42 and other local varieties of Uganda and produce very high fiber yield.

B.I. Mamarahimov, M.I.Khalikova, A. Kholmurodov and Kh. Saidaliev [4] studied the heritability of fiber yield in inter-species hybrids and observed that the high yield of fiber in the F1 syndrome is high and that heredity is intermediate when hybrids are present as maternal varieties. D. A. Musaev [6] studied fiber yield in complex hybrids and recognized its independent formation without any other symptoms.

Cotton is a technical crop and cotton is a valuable raw material for the industry. More than 100 different types of industrial products are produced from cotton fiber. Cotton fiber is widely used in the textile, paper, chemical, furniture, and machine-building industries. Fiber yield depends on the weight of the seeds, the absolute weight of the fiber on the seeds, the number of fibers on the seeds, the quality of the fiber and its index.

The heritability of fibers has been studied by many scientists at different times. Among them are A. A. Avtonomov [1], M. Pulatov, R. G. Kim [8].

It is known that cotton is grown mainly for fiber. Therefore, a great deal of attention is paid to the fiber yield of the primary samples involved in the breeding

process. Due to the effective results of the lab research carried out by scientists of the Republic, the high yield of fiber (35-38%) in the majority of cultivated varieties is currently high. However, the yield of most varieties is due to the small seeds and our scientists have the task of creating varieties with a high fiber index. Therefore, special attention was paid to the research of the fiber yield of hybrid families participating in our experiment.

*The aim of the research.* The research of the variability and formation of fiber yield in different hybrids of cotton, together with some valuable economic features, is to bring the best families with high fiber yield to the ridge line and create genetically enriched ridges.

## MATERIALS AND METHODS

The subject of the research was involved and isolated from different types of cotton with the participation of *G. hirsutum* L. species of Bukhara-102, Namangan-77, S-4727, Khorezm-127, Mehnat, Dustlik-2, Besh-Heroim, Andijan-36 used families.

Different hybridization, phenological observations, vortex resistance, sampling, sampling, mathematical, variation and correlation analysis were used. All mathematical and statistical analyzes were performed on the basis of B.A. Dospekhov's methods.

## RESULTS AND DISCUSSION

Analysis of fiber yield in our experiment when analyzing fiber yield in our experiment, it was in the range of 36.41% (Andijan-36) and 41.2% (Namangan-77) in the parent-participating varieties, this figure in double-hybrid families. From 35.46% (O-230) to 39.7% (O-445), complex hybrids were observed in families - 36.4-38.7% (Table). In isolated families, the variance coefficient was 3.76% (O-622) and 17.5% (O-580). Of all the ridges that were created, the fiber yield was at the required level, at 38%, the highest in the T-33-35 / 18 range, with a 42% fiber yield. This figure exceeds the standard S-6524 (36.6%) by 5.4%.

One of the fiber quality parameters is the length of the fiber. Creating cotton varieties that meet the world standards is one of the most important challenges facing our scientists. Scientists like M. Mirjuraev, Kh.Sadykov and others [5], M. Pulatov, R.G.Kim [8].

**Table**  
**Indicator of fiber's yield and length of fiber**

Occurrence of families and lines	Hybrids and species	Fiber's yield			Length of fiber		
		M±m	σ	V%	M±m	σ	V%
	S-4727	37.33±0.66	2.97	7.97	35.86±0.48	2.16	6.38
	Andijon-36	36.41±0.83	1.44	3.97	34.03±0.66	1.15	3.49
	Bukhoro-102	39.4±0.85	2.82	7.17	33.7±0.58	1.93	6.11
	Namangan-77	41.2±3.16	6.33	15.3	35.04±0.64	1.29	4.05
	Khorazm-127	40.9±0.98	1.70	4.16	36.4±0.1	0.14	0.41
	Dustlik-2	37.8±1.53	4.05	10.68	34.8±0.56	1.48	4.50
F4 (S-4727 × Andijon-36)	O-230	35.46±0.98	1.69	4.79	34.6±1.18	2.05	6.27
F4 (Bukhoro-102 × Namangan-77)	O-125	37.55±1.18	1.67	4.46	33.7±0.69	0.98	3.22
F4 (Khorazm-127 × Dustlik-2)	O-445	39.7±0.83	1.66	4.18	34.7±0.49	0.98	3.01
F4 (Mekhnat × Besh-qakhramon)	O-580	39.46±1.67	6.9	17.5	35.67±0.35	1.46	4.33
F <sub>3</sub> (F <sub>1</sub> S-4727 × Andijon-36) × (F <sub>1</sub> Bukhoro-102 × Namangan-77)	O-455	38.7±1,34	1.89	5.09	35.2±0,10	0.14	0.45
F <sub>3</sub> (F <sub>1</sub> Khorazm-127 × Dustlik-2 × F <sub>1</sub> Mekhnat × Besh-qakhramon)	O-622	36.4±0.45	1.37	3.76	34.5±0.67	2.03	6.24
O-125	T-33-35/18	42,0±1.7	2.44	5.79	33.8±0.80	1.13	6.73
O-445	T-25-27/18,	38.4±0.55	2.28	5.93	34.7±0.49	2.02	6.39
O-622	T-54-56/18	38.3±1.01	1.74	4.56	34.6±1.07	1.85	5.86
	C-6524	36.60±1.16	1.62	4.24	35.4±0.56	1.26	3.59
	LSD <sub>0,5</sub>	1.05			0.75		

In our research, we analyzed the length of the fibers in the pair of hybrids of the highest generation (Table). According to the results, the fiber length of the parent species was higher than the standard S-6524 (33 mm) and ranged from 33.7 (Bukhara-102) to 36.4 (Khorazm-127) mm. Khorazm-127 (36.4 mm) was the highest recorded as a parent. In families created as a result of pairing hybridization, the rate was 33.7% (O-125) to 36.67% (O-580). The length of the fiber in the compound hybrids is 34.5 (O-622) -35.2 (O-455) mm. The 1.5-2.2 mm preference was given to the standard. The length of the fiber on the created ridges was 35.7% (T-25-27/18) from 34.8 mm (T-33-35/18). This indicates a 1.8-2.7 mm priority over the standard S-6524 (33 mm).

**CONCLUSION**

In conclusion, it is possible to identify positive recombinant plants by identifying positive transgression by increasing the size of the populations in double hybrids and larger sample sizes. It is desirable to use the O-445 family, the T-33-35/18 ridge, as a result of double hybridization to improve fiber yield in practical breeding processes.

In general, we can conclude that the hybrids created by different fibers of fiber length have the highest probability of choosing the ones that are most favorable for pairing and complex hybrids. The O-580 family, created by double hybridization, has shown positive results in studies, and T-25-27/18 and T-54-56/18 ranges may be recommended for practical breeding processes.

**REFERENCES**

1. Avtonomov V.A. (2009). *Inheritance of fiber output at the line-variety hybrids F<sub>1</sub>-F<sub>3</sub>, of cotton species G.barbadense L.* // Volume of republican scientific-practical convocation "Theoretical and practical bases of development of cotton, alfalfa breeding" №29. OOO "Mekhridaryo", Tashkent, 66 p (In Russian).
2. Ibragimov P.Sh., Avtonomov V.A., (1993). *Inheritance of major economic traits of varieties relivent to species of G. barbadense L.* // Volume of cotton genetics, plant breeding, seed production and problems of alfalfa growing. - Tashkent, pp.47-50. (In Russian).
3. Innes N. *Upland cotton of triple hybrid origin cotton grow rev. 1975. 51. №1. pp. 46-58.*
4. Mamarakhimov B.I., Khalikova M.I., Kholmurodov A.I., Saydaliev Kh.G. (2000). *Inheritance of fiber output in the inter species hybrids taken by the participation of G.tomentosum.* // Volume on the problems of cotton genetics, plant breeding, seed production and alfalfa growing. - Tashkent. pp.67-71. (In Uzbek).
5. Mirdjuraev M., Sodikov Kh., Juraev S., Khaydarova T. (2009). *The new varieties S-2510 and S-2513 meeting the world standard claims on their technological properties* // Volume of republican scientific-practical convocation "Theoretical and practical bases of development of cotton, alfalfa breeding" №29. OOO "Mekhridaryo", Tashkent, 111 p. (In Uzbek).
6. Musaev D.A. (1979). *Genetic collection of cotton.* - Tashkent: Fan. pp.98-112. (In Russian).
7. Namazov Sh., Yuldasheva R., Amanturdiyev I., Rakhimov T. (2009). *Resistance of ecologic-geographic remove cotton hybrids to wilt* // Volume of republican scientific-practical convocation "Theoretical and practical bases of development of cotton, alfalfa breeding" №29. OOO "Mekhridaryo". Tashkent, p.35. (In Uzbek).
8. Pulatov M., Kim R.G. (2009). *Polymorphism and stabilization of fiber output and length on the cotton hybrid at the crossing of synthetic tetraploidy K-58 with*

- the varieties of G. hirsutum L. and G. barbadense L. // Volume of republican scientific-practical convocation "Theoretical and practical bases of development of cotton, alfalfa breeding" № 29. OOO "Mekhridaryo". Tashkent, p.48. (In Russian).*
9. Rammachandran C.K. Krischnamurt J. (1964). *Resent advances in interspecific hybridisation work involving wild of cotton in Madras Indian cotton grow. Vol. 18, Iss. 4, pp. 248-257.*
  10. Saydaliev Kh. (1988). *Genetic potential of species G.hirsutum L. accessions and its importance for plant breeding. Author syllabus to dissertation of candidat agricultural science. – Tashkent, 1988. –28 p. (In Russian).*
  11. Simongulyan N.G. (1968). *About genetics of precocity and cotton plant //j. Cotton growing. №2. pp. 17-20. (In Russian).*
  12. Straumal B.P. (1950). *Inter variety crossing of cotton plant. Social agriculture of Uzbekistan. №3. pp. 72-73. (In Russian).*
  13. Straumal B.P. (1952). *Inter variety crossing of cotton plant //j. cotton growing. №4. pp. 34-39. (In Russian).*