

Evaluation of New Cotton Ranges According to Their Indices Quality of Fiber

H. A. Boltabaev

Namangan State Technical University

Received: 2025, 04, Nov

Accepted: 2025, 05, Dec

Published: 2026, 12, Jan

Copyright © 2026 by author(s) and Bio Science Academic Publishing. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0). <http://creativecommons.org/licenses/by/4.0/>



Open Access

Annotation: The article presents the results of the analysis obtained during the testing of the fiber quality in the competitive variety testing of cotton lines, and provides an assessment of the fiber micronaire, strength, length, uniformity, short fiber index, relative elongation, contamination, and the number of defects. To solve the assigned tasks, scientific research work is being carried out in a certain volume at the Namangan Experimental Station of the "Research Institute of Selection, Seed Production and Agrotechnology of Cotton Cultivation". A number of new lines were created, which were compared in terms of valuable economic traits and technological indicators of fiber quality with standard cotton varieties. The experiments were conducted based on the "Instructions for state variety testing of agricultural crops". Based on the results of analyses obtained in competitive tests of the fiber quality of new cotton lines, it was revealed that the highest results for 4 technological indicators (Str, Len, Unf, SFL) were obtained on lines 158 and 162. These lines fully meet all the requirement.

Keywords: cotton, lines, fiber quality, micronaire, strength, length, index of short fibers, elongation, blockage.

The article states about the results of analysis which learned through testing the range of cotton fibers according to their micronaire, durability, length, similarity of fibers, short fiber quantity, breaking length, dirtiness, number of deficiency, range, reflection coefficient, degree of yellowness and were estimated as reliable to the demands of Light industry [].

It is very important to create new cotton varieties in order to increase cotton production in the Republic of Uzbekistan. For that reason, nowadays new varieties of cotton should meet the requirements of the standards of the world cotton namely, competitiveness, maturity, high-yield, high-quality and their corresponding technology remains an urgent task.

It is very crucial that to meet the requirements of the international standards of increasing productivity of cotton adapted to the specific soil and climatic conditions for cultivation, early maturing, high yield and fiber quality [].

In addition, in order to create new varieties of cotton which give high quality fiber, seed it should meet the unfavorable external environment conditions (soil salinity, low temperatures, hot dry, drought, etc.) as well as it should be resistant to diseases and pests, and a number of mechanisms between the processing and harvesting must pick the car.

In this topic we are carrying out research on the selection of cotton with the help of the branch of the cultivation of seed and agricultural research institute in Namangan scientific - experimental station.

It was created a number of new ranges which are high in quality included in the State Register. It is vital to assess them and select the standard preferred varieties to evaluate their first experience in increasing agricultural seeds and ranges according to the selection of practical test.

Conducted experience of the seed ranges of Namangan scientific experiment station were two types of field experience that is yielding damaged (each variety area of 50.4 m² with a four - duplication, four - lane) and infected (each variety area of 12.6 m² duplication of the two - lane 6) test environment.

Experiments were carried out on the basis of "Agriculture crop variety testing guidelines" (1986). Planting seeds were 90 x 10 - 1 according to system. Carried out the following cotton growth and development work and keeping track:

Cotton on 50 % germination, planting thickness (before picking), plant height measurement (1st of August), to determine the level of disease (15th of September), the varietal purity (mass flowering and ripening period), 50 % of the ripening time of unripe cotton bell, to determine the quality of the fiber (for collecting samples of 100 pieces of unripe cotton bell), which will reach 30th of September and cold cotton harvest (to harvest from 30.09 to 15.10.) have been completed.

For experimental evaluation of the ranges of medium - fiber S - 6524 (belongs to the types of IV fiber group) was used as the standard range. Given 20 new medium - fiber cotton varieties learnt in 2024 and 2025 years. Agricultural research conducted according to the propositions of "the Uzbek Scientific Research Institute of Cotton" were studied.

To determine the quality of the cotton varieties competitive examination of the varieties was held and tested 100 samples of cotton bell of the Regional Analysis Lab called "Quality".

The quality of cotton varieties fiber checked on the basis of HVI system. Uster HVI 900 SA semi - automatic system measures seven physical characteristics. HVI 900 SA system measures the following features: fiber length, strength, length, uniformity, elongation, micronaire, color, pollution criteria.

All of these properties is essential to improve the training of determining the quality of fiber and weaving the mixture. Fiber HVI 900 SA test system calibration and diagnostics enables accurate and reliable with computer control.

The data obtained from the analysis of the results listed in Table 1 and Diagram 1. In the following table of fiber main technical indicators given: micronaire, strength, length, conformity, short fiber index, pulled apart spaces, dirtiness, and if the number of copying space, indicator light break and the results of the analysis of the degree of yellowness.

It is obvious from the given data that the best results on the basis of the micronaire index (4.2) 4 and the range 12 (4.3) 18 range, (4.4), 14 and 19 of the ranges. This figure ranges differ from each other in Diagram 1.

High results taken on the basis of strength of the ranges 14, 12, 19 and 11.

Fiber length is relatively high results (1,29-1,20) taken 12, 2, 11 and 14 ranges. Low length results of 1.07 taken in range 17. Information about it given as a fiber - inch the length of the form.

Short fibers index (S.F.I) - Usually, fibers which are shorter 0.5 inches are not used in the production of raw thread and removed as waste in the process of spinning.

A length of 0.5 inches short fibers percent of the total mass of short fibers called the amount of short fibers. This varies largely from 2 % to 20 % of the interval.

A glance at the new ranges provided reveals the amount of short fibers to be in the range of 2.8 % to 10.1 %.

Fiber length is relatively high (1,29-1,20) in 12, 2, 11 and 14 ranges . Low range 17 of the length indicator of 1.07. Given are the data about the fiber - inch the length of the form.

Short fiber index (S.F.I) - Short fibers index (S.F.I) - Usually, fibers which are shorter 0.5 inches are not used in the production of raw thread and removed as waste in the process of spinning.

A length of 0.5 inches short fibers percent of the total mass of short fibers called the amount of short fibers. This varies largely from 2 % to 20 % of the interval.

A glance at the new ranges provided reveals the amount of short fibers to be in the range of 2.8 % to 10.1 %.

To conclude, given information about selected sort test results and according to the technological indicators high results taken from 12, 14 and 19 ranges. These ranges fully meet the demands of light industry standards and now we are conducting research on seed culturing and manufacture tests.

Used literature

1. Egamov X., Kasimov A., Rahmonov Z., Teshayev A. "The technological quality indicator of cotton ranges", "Complex agricultural improvement of cotton and cotton crops" collection of articles of the republican scientific and practical conference. Tashkent 2013, 377-378 pages.
2. Saakova S., Khujamberganov N., Nizamov Sh. "New cotton varieties- is a guarantee of quality and plenty of crop ". The agriculture of Uzbekistan, 2002, №3, 50 page.
3. Nazarov R., Akhmedov J., Kuziboev Sh, Boboev Y., Omonturdiyev A. "The prospects for the development of cotton" 2003.
4. Kasimov A. "New variety and harvest." Agriculture and quality of the harvest remains agrotechnological problems and their solutions . (The collection of articles in the scientific - practical conference) . Publishing and printing an open joint - stock company, Andijan 2006, 12-15 pages.
5. Abdullaev A. "Cotton biology, selection and seed". Tashkent , 1989, 57- pages.

6. Ahunov A.A., Vshivkov S.O., Golubenko Z., Pshenichnov E.A., Namazov SH., Stipanovic R.D. Definition of the quantitative maintenance gossypol in selection of cotton by capillary electrophoresis method. 8 th International Simposium on the Chemistiry of Natural Compounds, 15-17 June, 2009, Turkey.
7. Namozov Sh.E., Bell A.A., Stipanovic R.D., Golubenko Z., Usmanov S.A., Marupov A.I., Khalmanov B.A., Yuldasheva R.A. Initial Materials for Cotton Varieties Development with (+) Gossypol Level// Revized Edition World Cotton Research Conference-4 September 10-24, 2007. –Lubbock Memorial Civic Center, Lubbock, Texas, USA p.201-205.
8. Namozov Sh.E., Alois A. Bell A.A., Robert D., Stipanovic R.D., Usmanov S.A., Yuldasheva R.A. Ikrom Amanturdiyev, Tojiddin Rakhimov Inheritance and variability of fiber output and fiber length at ecological remote hybrids of cotton. Beltwide Cotton production and reseach Conferences, Atlanta, GA, USA, January, 2011.
9. Golubenko Z., Ahunov A.A., Vshivkov S.O., Stipanovic R.D. Quantitative Determination of (+) and (-)-Gossipol gossypol in Flover Petals of Selekted Cotton Cultivaris Using Capillary Zone Electrophoresis // Beltwide Cotton Production and research Conferences, Marriot Rivercenter and Riverwalk Hotels, San Antonino, texas, januariy 5-8, 2009.
10. Golubenko Z., Ahunov A.A., Vshivkov S.O., Pshenichnov E.A., Namazov SH., Stipanovic R.D. Quantitative determination of gossypol enantiomers using capillary zone electrophoresis of selected cotton cultivars posses high level of (+)- gossypol// International congress of Biotechnology, Moscov, March 16-21, 2009.
11. Uzbekov V.V., O.N.Veshkurova, I.A. Arzanova, E.M. Sultanov, Sh.I.Salixov, R.A.Yuldasheva, A.A.Bell, R.D.Stipanovich. Compared studiy of total gossypol and the ratio of its optical isomers in some Uzbek cotton cultivars. 8 th International Simposium on the Chemistry of natural Compounds (8th SCNC), 15-17 June, 2009, Anadolu Universitiy, Faculty Pharmacy, turkey. p.
12. Harlan H.V., Martini M.L. The effect of natural selection on a mixture of barley varieties // J. Agr. Res. 57. - 1938. -p. 189.
13. Kadapa S.N. Composite crossing methodology pays rich dividend in cotton breeding-a resume // Indian.J.Genet, and plant breeding. -1995. -№55(3). - p.p.290-301.
14. Kadapa S.N., Rajapati R.M. Heterosis and line strength analysis in G.barbadense // Indian J., Gen. and plant breeding. -1989. -№3. - p.p. 369-374.
15. Pandya P.S., Patel C.T. Possibilities of imparting resistantance to pests in cotton by use of mild species of Gossypium // Indian cotton grow. Rew. - 1964. - p.p. 175-176.
16. Roberts F.M. Heritability of tolerance to v. albo-atrum in American upland cotton. Master, c thesis, N. mex.state univ. Las Cruces, 1969. P. 56.

Table 1. New ranges of cotton fiber technology indicators

№	Indicators	Ranges																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Microneir. Mic	4.8	4.5	4.8	4.2	4.8	4.6	4.7	4.4	4.4	4.7	4.5	4.2	4.6	4.4	5.2	4.6	5.1	4.3	4.4	5.3
2	Strength. Str	31.8	37.5	34.5	34.4	35.2	31.4	35.9	33.2	34.5	35.8	37.7	38.5	34.5	38.6	35.1	39.4	35.9	36.9	38.4	35.3
3	Length. Len	1.12	1.25	1.16	1.13	1.21	1.17	1.12	1.18	1.16	1.16	1.21	1.29	1.11	1.20	1.13	1.14	1.08	1.19	1.19	1.12
4	Uniformity. Unf	84.6	86.4	85.1	85.3	85.6	83.6	85.4	85.0	84.8	85.7	85.9	86.4	85.2	85.5	85.5	84.8	85.3	84.8	85.9	85.0
5	Short fibers index. SFI	6.6	3.4	5.3	5.8	3.9	10.1	5.2	6.3	6.3	4.5	3.5	2.8	6.1	4.3	6.2	5.9	5.0	5.8	4.4	6.3
6	Elongation. Elg	6.8	7.8	9.6	6.8	10.2	7.5	9.6	8.8	8.5	9.4	9.0	6.8	6.8	7.0	6.8	8.6	7.7	6.6	7.1	6.5
7	Dirtness. T	2	2	0	1	2	2	1	2	1	3	2	3	2	1	1	2	3	1	1	1
8	Shortcoming. Cnt	6	8	3	2	9	8	3	10	4	8	6	8	9	6	4	6	6	4	4	3
9	Dirtness area. Area	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.3	0.2	0.3	0.2	0.1	0.1	0.2	0.3	0.1	0.1	0.1
10	Sort. CB	41-1	21-2	21-1	31-2	31-2	21-2	31-2	31-1	31-1	21-2	41-1	31-2	31-2	21-1	21-1	41-1	31-1	21-1	31-2	21-1
11	Indicator light break. Rd	76.7	80.6	81.0	77.7	75.6	79.8	76.2	79.5	77.8	78.8	77.7	77.6	77.7	82.3	81.4	74.9	79.8	80.5	79.5	81.5
12	The level of yellowness. +b	7.3	7.8	8.5	7.4	8.3	8.2	8.1	7.9	8.7	8.4	7.1	7.5	7.2	7.5	8.1	8.0	7.9	7.8	8.0	8.3