International Journal of
Biological Engineering and Agriculture

ISSN: 2833-5376
Volume 2 | No 5 | May -2023

# Effect of Fiber Quality in Short-Term Rotation of Winter Wheat and Repeated Crops

**Tadjiyev Mardonkul [1], Tadjiyev Karim Mardonkulovich [2]**

[1] Candidate of Agricultural Sciences, Senior Researcher

[2] Doctor of Agricultural Sciences, Senior Researcher

**Abstract:** The study of fiber quality indicators in fine-fiber cotton varieties is one of the most urgent problems of cotton growing. According to the results of the study, it was observed that winter wheat and repeated intercrops have a positive effect on the fiber length, fiber hardness, micron, specific tensile strength, elongation at break and reflection coefficient of fine fiber cotton compared to the control.

**Keywords:** winter wheat, repeated crops, soybean, sunflower, sesame, peanut, sorghum, fine fiber cotton, fiber, quality, short rotation, etc.

Scientists of our country and foreign countries have conducted many studies on improving the quality indicators of cotton fiber.

According to Z.S. Tursunkhodzhaev, M.A. Sorokin, L.A. Toropkin, they proved that in fields where crop rotation is fully implemented, the cotton yield is high, the quality of seed and fiber is good, and cotton raw materials are transferred to high varieties [7].

According to I.I.Protopopova, I.I.Madraimova, D.K.Ashirova, the use of potassium fertilizers in the cotton field has a positive effect on increasing the tensile strength, metric number, ripeness of cotton fibers and increasing the weight of 1000 seeds [6].

A.I.Imomaliev noted that proper soil cultivation and full introduction of crop rotation improved the quality indicators of cotton fiber [5].

A.A.Abdullaev, M.V.Omilchenko stated that they determined that the fiber quality indicators of the variety can be improved and inherited during cross-breeding when creating new varieties [1].

According to B.Kh.Amanov, Z.A.Ernazarova, N.G.Nabieva, they observed an increase in fiber length in F1, F2 hybrids of Gossipium Barbadenze species [2].

M.I. Iksanov determined that the quality indicators of new lines and varieties of fine-fiber cotton are micron, fiber length, fiber softness and fiber hardness [4].

S. Ortiqov, P.Sh. Ibragimov stated that cotton picking period is one of the important factors affecting fiber quality [8].

N.N. Ochildiev. B. Ch. Jo'raev, M. Tadjiev, K. M. Tadjiev, Kh. D. Chorieva stated that soil fertility, crop rotation, moderate use of mineral and local fertilizers, not to weed cotton and all who expressed opinions that the quality of agrotechnical activities is one of the main factors [9].

Method and method of research. Observations in the conducted research were carried out in accordance with the "Methods of conducting field experiments" (2007) and "Metodika polevyx opytov s xlopchatnika" (1981, UzPITI methodology manuals). Methodology "State test of varieties

of agricultural crops" (Moscow, Kolos, 1969) and the agrochemical composition of soil and plants were carried out in the comprehensive analysis laboratory of PSUEAITI. Productivity indicators were mathematically processed by the method of B.A. Dospekhov (1966).

In 2018-2021, our experiments were conducted in the fields of the Surkhandarya Scientific-Experimental Station of the Scientific-Research Institute of Cotton Selection, Seeding and Cultivation. According to the results of the research, the production of high-quality fiber is considered to be the most urgent problem of cotton farming. If the cotton fiber meets the requirements of the state standards, it is highly valued in the textile industry and purchased at the most valuable prices. Farms and cotton textile clusters will benefit from this. First of all, the quality of cotton fiber is affected by all agrotechnical measures and cotton varieties. Studies have shown that cotton fibers are of high quality if they are not weeded, properly fed with mineral and local fertilizers, followed by crop rotation systems and tillage rules. Researches on fiber quality were analyzed in "Sifat" laboratory of Surkhandarya region (tables 1-2). Researches were conducted with Termiz-202, the first type of fiber of the cotton variety. The length is the most important indicator of fiber quality.

**Table-1. Effects of winter wheat and intercropped oilseeds on cotton fiber quality in crop rotations, 2019**

| № | Experience options | Staple (fiber length, mm) | Mic (mikroneyr) | Strength (relative tensile strength, g/k) | Color Gr (mnu) | Color RD (uniformity coefficient in length %) | Color B (elongation at break, %) | Fresh | Uni form (reflection coefficient %) | Fublen gtn | Relon Gatbion (non-fibrous compounds, %) | Sfi (degree of yellowing. %) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Cotton-plant (control) | 40,0 | 4,6 | 31,9 | 1 | 72,9 | 12,9 | 0 | 83,6 | 121 | 4,5 | 2,9 |
| 2 | Cotton-plant after winter wheat (control) | 40,0 | 4,6 | 32,8 | 1 | 72,7 | 12,2 | 0 | 84,8 | 120 | 4,3 | 3,2 |
| 3 | Cotton-plant followed by winter wheat + soybeans | 41,0 | 4,4 | 34,2 | 1 | 74,2 | 12,4 | 0 | 85,4 | 121 | 4,2 | 2,7 |
| 4 | Cotton-plant followed by winter wheat + sunflower | 40,0 | 4,6 | 32,8 | 1 | 72,9 | 12,0 | 0 | 84,4 | 120 | 4,1 | 2,2 |
| 5 | Cotton-plant is followed by winter wheat + sesame | 40,0 | 4,6 | 34,0 | 1 | 72,6 | 12,2 | 0 | 83,9 | 112 | 4,1 | 2,3 |
| 6 | Cotton-plant followed by winter wheat + peanuts | 42,0 | 4,4 | 34,2 | 1 | 73,0 | 12,9 | 1 | 85,5 | 122 | 4,1 | 2,3 |
| 7 | Cotton-plant is followed by autumn wheat + mahsar | 40,0 | 4,6 | 33,1 | 1 | 72,6 | 12,7 | 0 | 85,3 | 120 | 4,2 | 2,5 |

**Table-2. Effects of winter wheat and intercropped oilseeds on cotton fiber quality in crop rotations, 2020**

| № | Experience options | Staple (fiber length, mm) | Mic (mikroneyr) | Strength (relative tensile strength, g/k) | Color Gr (mnu) | Color RD (uniformity coefficient in length %) | Color B (elongation at break, %) | Fresh | Uni form (reflection coefficient %) | Fublen gtn | Relon Gatbion (non-fibrous compounds, %) | Sfi (degree of yellowing. %) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Cotton-plant (control) | 39,6 | 4,5 | 31,7 | 1 | 71,8 | 11,9 | 0 | 82,6 | 120 | 4,3 | 2,6 |
| 2 | Cotton-plant after winter wheat (control) | 39,7 | 4,5 | 32,6 | 1 | 71,6 | 11,2 | 0 | 83,9 | 119 | 4,1 | 2,9 |
| 3 | Cotton-plant followed by winter wheat + soybeans | 41,0 | 4,3 | 34,1 | 1 | 73,2 | 11,8 | 0 | 84,8 | 120 | 3,9 | 2,5 |
| 4 | Cotton-plant followed by winter wheat + sunflower | 40,0 | 4,4 | 32,7 | 1 | 71,9 | 11,4 | 0 | 83,0 | 119 | 4,0 | 2,0 |
| 5 | Cotton-plant is followed by winter wheat + sesame | 40,0 | 4,4 | 33,8 | 1 | 71,8 | 11,2 | 0 | 82,9 | 111 | 4,0 | 2,1 |
| 6 | Cotton-plant followed by winter wheat + peanuts | 41,8 | 4,3 | 34,2 | 1 | 72,8 | 12,0 | 0 | 84,5 | 121 | 4,0 | 2,1 |
| 7 | Cotton-plant is followed by autumn wheat + mahsar | 39,9 | 4,4 | 32,8 | 1 | 71,9 | 11,7 | 0 | 84,2 | 119 | 4,1 | 2,3 |

According to the results of the research, the length of the cotton fiber was 40.0-42.0 mm in the control fields (var. 1-2), 40.0-40.0 mm, and the fiber length was 42.0 mm when the cotton was cared for after winter wheat and soybeans. , in the experimental variants (3 and 6) it was found that the fiber length was 1-2 mm longer than the control variants. Another important fiber metric is the fiber's micronaire index. Fiber microneur index was 4.4-4.6 in the experiment. In the control variants (var. 1-2) the fiber microneural index was 4.6-4.6 (var. 3-7) and in the experimental variants it was 4.4-4.6. These indicators are a little high for this variety. This situation is explained by anomalous heat, low relative humidity (8-12%) and water shortage. The microneural index of the fiber, the specific tensile strength was found to be 31.9-34.2 g/force in the experiment. It was found to be 31.9-32.8 g/force in the control variants (var. 1 and 2), and 32.8-34.2 g/force in the experimental variants. Relatively high specific tensile strength was found to be 34.2 g/force when planted after winter wheat and soybean and 34.2 g/force when cotton was planted after winter wheat and peanut. Also, the length uniformity coefficient was 72.7-72.9% in the control field, 72.6-74.2% in the experimental variants, a relatively high index when cotton was planted after winter wheat + soybeans and 73.0-74 after winter wheat + peanuts. was 2 percent.

The elongation at break index was 12.2-12.9, and no significant difference was observed between the variants. The reflection coefficient of cotton fiber is also an important indicator in the control variants (var.-1 and var.-2) 83.6-84.8 percent and in the experimental variants 83.9-85.5 percent, and the relatively high reflection coefficient is winter wheat. It was 85.4-85.5 percent in soybean and winter wheat + peanut options. Fiber yellowing coefficient was relatively high 2.9-3.2 percent in control variants and 2.2-2.7 percent in experimental variants. Fiber quality indicators in 2020 (Table 2) also received data similar to the indicators of 2019.

In conclusion, it was found that fine fiber cotton varieties planted after winter wheat and replanted oilseed crops have a positive effect on fiber technological quality indicators. When fine-fiber cotton is planted in the field of winter wheat and repeatedly planted soybeans and peanuts, the length of the cotton fiber is 2.0 mm longer, the micronaire index is less than 2 units, the relative tensile strength of the fiber is 2.0-2.1 g/force tex, the fiber reflectivity the coefficient proved to be higher than the control by 1.8-1.9%.

**References:**

1. Абдуллаев А.А., Омильченко М.В. Влияние условий выращивания на формирование хлопчатника при межвидовой гибридизации ВКН “Генетика хлопчатника”, Ташкент, 1969, -С.95
2. Аманов Б.Х., Эрназарова З.А., Набиева Н.Г. Госсипиум Барбадензе Л. турини $F_1$, $F_2$ дурагайларида тола узунлигининг ирсийланиши // “Ғўза генетикаси, селекцияси ва уруғчилигини ривожлантиришнинг назарий ҳамда амалий асослари номли Республика илмий-амалий анжумани тўплами. Тошкент, “Меҳридарё”, Тошкент, 2009, -Б.23-25
3. Ахмедов Д.Х. Селекция хлопчатника основе повқшения качества и урожайности // Ўзбекистон қишлоқ хўжалиги, Тошкент, 2008, №2 сон, -Б.10
4. Иксанов М.И. Качество волокна новейших сортов и линий тонковолокнистого хлопчатника. Материалы международного научно-практической конференции «Состояния селекции и семеноводства хлопчатника». Ташкент, 2006. -С.192-194
5. Имомалиев А.И. Ғўза дефолиацияси ва десикацияси қилишнинг физиологик асослари. Монография. Тошкент, 1983, -Б.151
6. Протопопова И.И.. Мадраимов И.И., Ашурова Эффективность калийных удобрений на хлопчатнике. Ташкент, 1980. –С.59-60
7. Турсунходжаев З.С., Сорокин М.А., Торопкина Л.А. “Ўзбекистонда алмашлаб экишнинг илмий асослари. Тошкент, 1987. –Б.56-57
8. Ортиқов С.. Ибрагимов П.Ш. Ҳосилни териш муддатларининг тола сифатига таъсири // Ўзбекистон қишлоқ хўжалиги журнали, Тошкент, 1993. №2. –Б.17
9. Очилдиев Н.Н., Джураев Б.Ч., Таджиев М., Таджиев К.М., Чориева Х.Д., “Ингичка толали ғўза навларидан ҳар қандай об-ҳаво шароитида мўл ҳосил ва сифатли тола етиштириш агротехнологияси бўйича тавсиялар”. Термиз, 2023. Б.т. 7,0. –Б.5