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TRAITS OF FIBER YIELD, INDEX AND LENGTH IN NATURAL COLORED COTTON SAMPLES

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Abstract: In the article, the indicators of fiber yield, fiber index and fiber length of natural brown and green cotton samples of *G.hirsutum* L. species and the results of their analysis are mentioned. It is known that cotton is grown mainly for its fiber. Yield, index and length of cotton fiber are the most important agronomic indicators. According to the results of our research, the parameters of fiber yield, fiber index and fiber length in *G.hirsutum* L. colored fiber samples differed from each other depending on the fiber color. That is, in terms of fiber yield and fiber index, it was found that brown fiber samples have much higher indicators than green fiber samples. According to the indicator of the fiber length, which is an important quality trait , on the contrary was found to have higher indicators in green fiber samples (A-800 sample 29.7±0.3 mm and 010764 sample 29.0±0.1 mm) compared to brown fiber samples (catalog numbers 26.6±0.2 mm in sample 011250 and 25.7±0.2 mm in sample 010108).

Key words: *G.hirsutum* L., colored cotton, trait, fiber yield, fiber length

ПОКАЗАТЕЛИ ВЫХОДА, ИНДЕКСА И ДЛИНЫ ВОЛОКНА В ОБРАЗЦАХ С ЕСТЕСТВЕННО ОКРАШЕННЫМ ХЛОПКА

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Аннотация: В статье приведены показатели выхода волокна, индекса волокна и длины волокна с естественно окрашенным бурым и зеленым волокном у образцов хлопчатника вида *G.hirsutum* L. и результаты их анализа. Известно, что хлопок выращивают в основном ради волокна. Признаки выхода, индекса и длины хлопкового волокна являются наиболее важными ценными сельскохозяйственными признаками. По результатам наших исследований показатели выхода волокна, индекса волокна и длины волокна в образцах с естественно окрашенным хлопка *G.hirsutum* L. отличались друг от друга в зависимости от цвета волокна. То есть по выходу волокна и индексу волокна установлено, что образцы бурого волокна имеют гораздо более высокие показатели по сравнению с образцами зеленого волокна. По показателю символа длины волокна, которая является важным признаком качества, то было обнаружено, что образцы с зеленым волокном (образец а-800 29,7±0,3 мм и образец 010764 29,0±0,1 мм) имеют более высокие показатели по сравнению с образцами с бурым волокном (каталожные номера 011250 26,6±0,2 мм в образце 010108 25,7±0,2 мм).

Ключевые слова: *G.hirsutum* L., цветной хлопок, признак, выход волокна, длина волокна

Cotton is planted mainly for fiber, more than 100 different types of products are produced from its fiber. Cotton fiber is widely used in the textile, paper, chemical, mechanical engineering industries and is considered the most desirable raw material for mankind. In today's cotton farming, much attention is paid to organic production. Fertilizers, along with abandoning toxic chemicals, did not use artificial chemical dyes, which are widely used in the process of dyeing gauze in the

textile industry and lead to various allergic diseases of the human body and high costs. obtaining ecologically pure, naturally colored fiber and textile products made from fiber is of great practical importance. Natural colored fiber has air permeable, antiseptic and hydrophobic properties. The fiber of samples with colored fiber is short, fiber strength is low, and it is important to carry out genetic-selection research to eliminate such defects.

Naturally colored cottons, resist pests, salt, and drought better, so they reduce toxic pesticide application, thereby causing less environmental pollution and are very adaptable to dry land and organic farming [5,7]. These cotton varieties also eliminate the bleaching and dyeing costs and an excessive energy usage [1,2].

Research has been carried out by scientists from Uzbekistan on the study of the inheritance of the color of fiber. Including Simongulyan N.G. et al., *G.hirsutum* L. varieties 108-F and 149-F with white fibers of interbreed with the brown fiber *mexicanum nervosium*. The resulting F_1 hybrids received an intermediate color according to the color of the fiber. In F_2, separation by fiber color was observed, with 9 parts colored and 7 parts white fibrous plants obtained. This ratio is characteristic of the Complementary type of gene interaction. Based on the genetic analysis of the obtained evidence, the authors express an opinion that fiber color is controlled by 3 genes - Lc- lc, Lc2 lc2, Lc3 lc3 [3]. According to research the lint colour is determined by, a group of genes situated at the 3 loci, LC1, LC2 and LC3. They are dominant over the white alleles and operate in association with modifier genes that are either intensifier or suppressors. When strong suppressors are present, white fibre is produced. Genes for lint colur not only control the colour of the fibre but also other traits e.g. gene for brown color in *G.arboreum* and *G barbadense* L. suppresses lint length and fineness. Similarly in green and brown of *G hirsutum* L. fibre development is inhibited (% mature fibres is low). But not all associations are unfavorable, in certain varieties boll weight is higher due to colour gene. Color development is also dependent on external factors like sunlight, soil type and soil nutrition [6].

The purpose of the study is to determine and analyze the parameters of fiber yield, fiber index and fiber length in the samples of colored fiber of G. hirsutum L. species.

The field experiments of our research were conducted at the experimental field of the regional experimental base of the Institute of Genetics and Plant Experimental Biology, located in Zangi-ota district, Tashkent region. This experimental base is located 398 meters above sea level. The land of the experimental field is low humus, typical meadow-saz soil according to its mechanical composition, the soil is moderately sandy. The terrain is slightly sloping, unsalted, weakly damaged by *verticillium* wilt. Groundwater is deep (7-8 m). The climate is sharply variable, summer (June, July, August) is very hot, and winter (especially December and January) is characterized by a sharp drop in air temperature. Sunny days are 175-185 days, the total cold-free period is 200-210 days. In autumn, winter and spring there is precipitation, and in summer the air is dry. This requires artificial irrigation of cotton.

Agrotechnical activities in the experimental area: in the autumn, the ground was plowed to a depth of 35 cm. Planting was carried out in the spring when the air and soil temperature were moderate. Planting was carried out in the 90x20x1 scheme on a marked field. The seeds were planted in the ground at a depth of 4-5 cmThe studied samples were planted in 3 replicates, 1 row per replicate, in 12 slots in each row by the randomization method. Work between the rows and weeding were carried out together with irrigation. In the experiment, watering was carried out according to the 1-2-1 scheme.

Objects of research *G. hirsutum* L. samples of brown fiber: catalog numbers, 010765, 010108, 011250 and green fiber catalog numbers: 010764, 011460 and A-800 were taken.

Methods: Laboratory and field experiments were carried out according to accepted methods [4]. Phenological observations, statistical processing and scientific analysis methods were used.

Results: Fiber yield, fiber index and fiber length characteristics of cotton are important valuable agronomic traits. Therefore, in our research, experiments were conducted on these traits and the indicators of the traits were determined.

Cotton fiber yield is the ratio of fiber weight to total cotton weight. The yield of fiber depends on the weight of the seed, the absolute weight of the fiber in the seed and the quality of the fiber. In our study, when the indicators of fiber yield were analyzed, the highest fiber yield was found in the brown fiber sample of 010765 (36,1±0,5%), and the lowest fiber yield was recorded in the green fiber sample of 011460 (18,3±0,1 %). Fiber index - refers to the amount of fiber per 100 seeds. In our study, when the fiber index symbol was analyzed, the highest fiber index was found in the brown fiber sample of 010765 (6,2 ± 0,5 g), and the lowest index was determined in the green fiber sample of 011460 (2,8 ± 0,1 g) (see Table.1).

Table 1. Indicators of agronomic traits in the samples of colored cotton of *G.Hirsutum* L.

Catalog number of colored cotton samples	Fiber color	Fiber yield (%)	Fiber index (g)	Fiber length (mm)
010765	brown	36,1±0,5	6,2±0,5	28,4±0,2
010108	dark brown	28,6±0,2	4,1±0,1	25,7±0,2
011250	dark brown	29,1±0,2	5,2±0,2	26,6±0,2
A-800	green	23,1±0,2	3,7±0,06	29,7±0,3
011460	green	18,3±0,1	2,8±0,1	28,5±0,4
010764	green	25,2±0,6	3,8±0,1	29,0±0,1

One of the important quality indicators of cotton is fiber length. In our study, the highest indicators of fiber length were observed in samples of green fiber A-800 (29.7±0.3 mm) and catalog number 010764 (29.0±0.1 mm). The lowest indicator was observed in the sample with brown fiber catalog number 010108 and was 25.7±0.2 mm (see Table.1).

Conclusion: Cotton is grown primarily for its fiber. Fiber yield, fiber index, and fiber length in cotton are important agronomic traits. According to the research results, fiber yield, index, and length traits of *G.hirsutum* L. colored fiber samples were different depending on fiber color. It was found that the fiber yield and fiber index, which were recognized from the important parameters of the cotton plant, were much higher in the brown fiber samples than in the green fiber samples. According to the indicator of the fiber length, which is an important quality trait , on the contrary was found to have higher indicators in green fiber samples (A-800 sample 29.7±0.3 mm and 010764 sample 29.0±0.1 mm) compared to brown fiber samples (catalog numbers 26.6±0.2 mm in sample 011250 and 25.7±0.2 mm in sample 010108).

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