Eureka Open Access Journals
Open Access | Peer Reviewed | International Journals | Multidisciplinary Areas

Eureka Journal of Agricultural Science & Bio-Innovation (EJASB)

ISSN 2760-4969 (Online) Volume 2, Issue 3, March 2026

https://eurekaoa.com/index.php/7

EXPRESSION OF CERTAIN AGRONOMIC TRAITS IN THE MEDIUM-FIBER COTTON VARIETY “KELAJAK-3”

O. R. Ergashev [1]
I. T. Qahhorov [1]
G. Ch. Kholliev [2]
[1]Institute of Genetics and Experimental Plant Biology
Tel: +998 71 264-23-90. Fax: +998 71 264-23-90
E-mail: igebr_anruz@genetika.uz Website: www.genetika.uz
[2]Tashkent State Agrarian University

Abstract

This article presents the results of scientific research conducted in **2023** to determine the differences in the average values of important agronomic traits of the new medium-fiber cotton variety **“**Kelajak-3”, developed by breeders of the Republic of Uzbekistan. The traits studied included 1000-seed weight, seed cotton weight per boll, fiber yield, and fiber length. These indicators were compared with the standard varieties Namangan-77 and S-6524.

The results showed that under the soil and climatic conditions of the Tashkent region, the plants of this variety demonstrated positive differences in all analyzed traits compared to the standard varieties. Based on the obtained data, conclusions and recommendations were provided regarding the wide introduction of this genotype into agricultural production and its use in breeding programs.

Keywords: Gossypium hirsutum L., variety, 1000-seed weight, boll, seed cotton, weight, fiber yield, fiber length, indicators.

Eureka Open Access Journals
Open Access | Peer Reviewed | International Journals | Multidisciplinary Areas

Eureka Journal of Agricultural Science & Bio-Innovation (EJASB)

ISSN 2760-4969 (Online) Volume 2, Issue 3, March 2026

https://eurekaoa.com/index.php/7

Introduction

Cotton varieties and hybrids with different characteristics are cultivated in **86 countries** across tropical and subtropical regions of the world, particularly within the area extending from **36° south latitude to 45° north latitude**, covering more than **40% of the world's agricultural land** [6].

At present, each newly developed cotton hybrid is of particular importance due to its **unique traits and characteristics**. In the progeny of such hybrids, numerous **polymorphic biotypes with wide variability of traits and new plastic genotypes with diverse adaptive capacities** are formed [1,2,4,5].

In genetic and breeding studies of plants, it is crucial to comprehensively study the processes occurring in the populations of initial forms obtained in experiments. Establishing a genetically balanced set of biotypes according to certain regularities and expanding the range of variability to form groups of plastic plants within the population plays a decisive role.

A high level of **heterogeneity and heterozygosity** in populations ensures the mobility of their population structure and increases the efficiency of the **individual selection method**. All qualitative and quantitative traits of plants are regulated by numerous major and modifier genes.

A detailed study of population processes occurring in the initial lines, the formation of genetically balanced biotype complexes according to established patterns, and the expansion of the variability range are crucial for the development of **plastic plant groups within the population** [3].

Ali M.A. and co-authors studied the expression of genes determining the inheritance of quantitative traits in cotton and reported that improvement of traits such as **plant height, number of sympodial branches, and fiber quality through selection** is closely associated with heterosis. They also emphasized the importance of traits such as **number of monopodial branches, number of bolls per plant, fiber yield, and seed cotton weight per boll** from the perspective of genetic progress [7].

Eureka Open Access Journals
Open Access | Peer Reviewed | International Journals | Multidisciplinary Areas

Eureka Journal of Agricultural Science & Bio-Innovation (EJASB)

ISSN 2760-4969 (Online) Volume 2, Issue 3, March 2026

https://eurekaoa.com/index.php/7

Research Objective

The aim of this study was to determine the differences in the average values of **1000-seed weight, seed cotton weight per boll, fiber yield, and fiber length** in the new medium-fiber cotton variety **"Kelajak-3"**, developed at the **Institute of Genetics and Experimental Plant Biology of the Academy of Sciences of the Republic of Uzbekistan**, in comparison with the standard varieties **Namangan-77 and S-6524**, and to evaluate their significance for breeding.

Analysis and Results

In the study, the **Kelajak-3 variety** was evaluated for economically important traits in comparison with the standard varieties **Namangan-77 and S-6524**. The obtained results are presented in the following table.

Table 1. Indicators of Selected Agronomic Traits of the Cotton Variety Kelajak-3

№	Varieties	Traits	X ± m	σ	v
1	2	3	4	5	6
2	Наманган-77 (Standard-1)	1000-seed weight (g)	119.2±0.24	1.58	1.33
	C-6524 (Standard-2)		122.5±0.27	1.80	1.47
	Kelajak-3		119.2±0.38	2.55	2.14
3	Наманган-77 (Standard-1)	Seed cotton weight per boll (g)	5.10±0.08	0.52	10.2
	C-6524 (Standard-2)		5.80±0.09	0.60	10.3
	Kelajak-3		6.51±0.11	0.70	10.7
4	Наманган-77 (Standard-1)	Fiber yield (%)	37.9±0.27	1.81	4.78
	C-6524 (Standard-2)		34.5±0.31	2.02	5.87
	Kelajak-3		38.9±0.34	2.23	5.73
5	Наманган-77 (Standard-1)	Fiber length (mm)	33.5±0.17	1.15	3.42
	C-6524 (Standard-2)		34.4±0.16	1.08	3.13
	Kelajak-3		34.5±0.17	1.10	3.18

Eureka Open Access Journals
Open Access | Peer Reviewed | International Journals | Multidisciplinary Areas
Eureka Journal of Agricultural Science & Bio-Innovation (EJASB)
ISSN 2760-4969 (Online) Volume 2, Issue 3, March 2026

https://eurekaoa.com/index.php/7

According to the table, the parameters of economically valuable traits in the medium-fiber cotton variety Kelajak-3 were studied in comparison with the indicators observed in the standard varieties Namangan-77 and S-6524. The results of the analysis showed that this variety possesses certain advantages over the standard varieties in some traits.

In particular, when analyzing the 1000-seed weight, the Namangan-77 variety showed a value of 119.2 ± 0.24 g, while in the S-6524 variety it was 122.5 ± 0.27 g. In the Kelajak-3 variety, this indicator was 119.2 ± 0.38 g, which is almost the same as in the Namangan-77 variety, but 3.3 g lower than in the S-6524 variety. At the same time, the coefficient of variation ranged between 1.33–2.14%, indicating a low level of variability for this trait and demonstrating its relative stability.

Another important trait of cotton varieties is the seed cotton weight per boll. The analysis showed that this value was 5.10 ± 0.08 g in the Namangan-77 variety and 5.80 ± 0.09 g in the S-6524 variety. In contrast, the Kelajak-3 variety showed a higher value of 6.51 ± 0.11 g, which is 1.41 g higher than Namangan-77 and 0.71 g higher than S-6524. This indicates that the mass of cotton formed in each boll in the Kelajak-3 variety is relatively higher, which may positively influence overall yield. The coefficient of variation for this trait ranged between 10.2–10.7%, indicating a moderate level of variability among the varieties.

The fiber yield trait is also one of the most important characteristics of cotton for the fiber processing industry. According to the analysis results, the fiber yield in the Namangan-77 variety was 37.9 ± 0.27%, while in the S-6524 variety it was 34.5 ± 0.31%. In the Kelajak-3 variety, this indicator reached 38.9 ± 0.34%. This means that the fiber yield of Kelajak-3 is 1.0% higher than Namangan-77 and 4.4% higher than S-6524. These results indicate that the Kelajak-3 variety has a higher fiber yield compared with both standards, which represents one of its technologically valuable characteristics. The coefficient of variation ranged between 4.78–5.87%, indicating relatively low variability for this trait.

Eureka Open Access Journals
Open Access | Peer Reviewed | International Journals | Multidisciplinary Areas
Eureka Journal of Agricultural Science & Bio-Innovation (EJASB)
ISSN 2760-4969 (Online) Volume 2, Issue 3, March 2026

https://eurekaoa.com/index.php/7

Another important trait of cotton for the light industry is fiber length. The analysis showed that the fiber length in the Namangan-77 variety was 33.5 ± 0.17 mm, while in the S-6524 variety it was 34.4 ± 0.16 mm. In the Kelajak-3 variety, this indicator reached 34.5 ± 0.17 mm. Thus, the Kelajak-3 variety has 1.0 mm longer fiber than Namangan-77 and 0.1 mm longer fiber than S-6524. The coefficient of variation for the studied cotton genotypes ranged between 3.13–3.42%, indicating a low level of variability for this trait.

Overall, the results of the conducted research showed that the Kelajak-3 variety has certain advantages over the standard varieties in several important agronomic traits, particularly seed cotton weight per boll, fiber yield, and fiber length. This indicates that the variety is promising for use in breeding programs as well as for practical agricultural production.

References

1. Avtonomov V.A. “Variability and inheritance of traits in geographically distant F1–F2 hybrids of cotton (G. hirsutum L.)”. In: Proceedings of the International Scientific Conference “State of Cotton Breeding and Seed Production and Prospects for Its Development”. Tashkent, 2006. pp. 36–41.
2. Kakhkharov I.T. “Indicators of fiber yield traits in geographically distant F2 hybrid populations of cotton (G. hirsutum L.)”. Uzbek Biological Journal. Tashkent, 2006, No. 6, pp. 55–58.
3. Lobashev M.E. “Genetic Processes in Populations”. In: Genetics. Leningrad: LSU Publishing House, 1967. 138 p.
4. Mukhitdinov T.I., Choriev A.K., Jumayev S.Q., Kodirova Sh.N. “Fundamentals of studying fiber yield and length of parental forms and hybrids within the species G. hirsutum L.”. In: Proceedings of the Republican Scientific-Practical Conference “Integration of Fundamental Science and Practice: Problems and Prospects”. Tashkent, 2018. pp. 233–235.
5. Musaev D.A. “Genetic Collection of Cotton”. Tashkent: FAN, 1979. 112 p.

Eureka Open Access Journals
Open Access | Peer Reviewed | International Journals | Multidisciplinary Areas

Eureka Journal of Agricultural Science & Bio-Innovation (EJASB)

ISSN 2760-4969 (Online) Volume 2, Issue 3, March 2026

https://eurekaoa.com/index.php/7

6. Nesterenko G.I. Bulletin of KrasGAU. 2020, No. 9, pp. 36–40.
7. Ali M.A., Abbas A., Younas M., Khan T.M., Hassan H.M. “Genetic basis of some quantitative traits in upland cotton (Gossypium hirsutum L.)”. Plant Omics Journal, 2009, Vol. 2(2), pp. 91–97.