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Achievement of fiber yield and body weight in G. hirsitium variety and hybrid joints of cotton.

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Annotation. As a result of the introduction of large-scale innovative technologies in the field of cotton growing, which is an integral part of the agricultural network all over the world, great attention is being paid to the creation of varieties with high fiber output, focusing not on the production of raw cotton from each hectare, but on the contrary. In this article, a variety with a high fiber yield and hybrids obtained between them in the conditions of Bukhara were studied and relevant scientific conclusions were made.

Key words: cotton, variety, hybrid, joint, fiber, boll, fiber yield, heterosis, generation, dominance, heredity, seed.

Introduction. As Uzbekistan is a world leader in the field of cotton, the varieties created in Uzbekistan are accepted as a model-standard in international exchanges. Cotton varieties have different fiber content. Also according to researches (Kh. Nematov 2005), different cotton varieties cultivated in different regions of our republic have different fibers. It is known that zoned cotton varieties have an average fiber yield of 35-38 percent, and this indicator varies among cotton varieties. At the same time, the fiber yield coefficient of cotton varieties varies depending on the regions and the quality of agro technical measures. For example: experiments have shown that the yield of fiber varies by 5-8% (34-36%) due to the strength and treatment with herbicides (O. Jalilov, 2005y). From this point of view, there are several reasons for grouping cotton biological varieties into groups for evaluation of fiber production. One of the main activities for the fundamental reform of cotton cultivation in Uzbekistan and its further development is the development of the scientific theoretical and scientific practical aspects of selection and seed breeding. It consists of creating varieties and introducing them to production. The growing demand of agriculture and light industry puts before the breeder the task of always improving cotton varieties. At the present time, there are not many types of cotton to diseases and pests, long fiber and high quality, resistant to soil erosion and drought.

Breeders have urgent tasks such as restoring cotton productivity, reducing the cost of cotton and improving the quality of fiber. In 2005, the international scientific and practical conference dedicated to the 95th anniversary of the birth of Academician S.S Sodikov “Evolutionary and selection methods of fast ripening and adaptability in cotton and other agricultural plants” was held in

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Tashkent, with the participation of domestic and foreign scientists engaged in cotton selection and agro technics. Academician A.A. Abdullaev (2005) stated that the importance of creating varieties suitable for these conditions has been emphasized with the change of climate on the earth today. Z.U Maksudov (1967) stated that if the hybridizing parent samples are close to each other in terms of fiber output and length, then in their F1 generation, in all hybrid combinations, fiber output and fiber length are superior to parental characters, if they are significantly different from each other in terms of characters, it indicates that fiber output and length are intermediately inherited, such opinions were expressed by B.P. Straumal (1950, 1952) and V.M. Efimenko (1974). According to Kh, Bobomuratov (1977), in 3 species G.Hirsutum, G. herbaseum, G. harkensi, the variability of early maturity and weight of one pod is 50,5% higher in interspecies hybrids than in hybrids, and 7-8% in hybrids. It is inherited with an unbroken advantage, and in the weight of the udder, there is an advantage of the harkensi with a small udder. Kh. Ashurbekov, E. Mukimov (1995) reported that fiber length is a feature of each variety and it is genetic traits are passed from generation to generation, and it also depends on the agro technics carried out there during the experiment. They show that the transmission of genetic traits from one generation to the next is levelled off in larger joints than in the same joints. T.Kuliev, I, Urazbaev (2001) studied cotton hybrids in saline soil and came to the following conclusion: the dominance of hybrids in terms of bushel weight and productivity is from 0 to 1, incomplete dominance is noted, and they note that the productivity of hybrid plants is reduced by 10-20%. Experimental material and methodology: the experiments were conducted at the experimental farm of Bukhara State University. 70% of the total land area for irrigated farming in the Bukhara region is irrigated meadow-alluvial soils from ancient times. The mechanical composition of these soils is light and medium. The morphological structure of these soils is formed by 3-4 layers of agro-irrigation horizons, and the level of seepage water is found at a depth of 2-3m. In the experiment (omad), the fast-growing varieties “omad” and “S-4727” with high fiber yield and the first generation obtained as a result of crossing these two varieties (F1 omad and S-4727) plants were tested with the Bukhara-8 variety created under the conditions of Bukhara as a model for comparative study of growth and development in Bukhara climatic conditions. One hundred plants and hybrid joints of each variety were selected, all the plants were selected, cotton picked from each plant was placed in a separate bag and marked with a number. In the laboratory, valuable economic characteristics of each variety and hybrid joint plants were studied. Fiber output, weight of one pod, number of seeds in one pod and other pod and other characteristics were analyzed. We analyzed the obtained results according to the methods and formulas in the book “Methodology of field experiments” by Dospenkov (1985).

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Analysis of the obtained results: fiber yield in Bukhara-8, Omad and S-4727 varieties of cotton and Omad x S-4727 generations. One of the most important current tasks in cotton genetics and selection is to create a promising variety that provides a lot of for agriculture. In fact, the productivity of more than 80 cotton-growing countries per hectare is calculated not as cotton raw ash, but as fiber per hectare. Fiber output, that is, this product obtained from cotton seeds, is very valuable for agriculture. It is a percentage of the raw material is expressed in the calculation. Many scientists have studied the fiber yield from the genetic and selection point of view, and it has been determined that the fiber yield index varies from 0% to 50% among cotton types (Mauer, 1954), academician J. Musaev (1979), F. Jumaev, M. Abzalov (1997, 2005) noted that fiber output is controlled by genes, it is polygenic, it depends on many non-allelic genes, the level of fiber, especially seed hairiness, has di-, tri-, and tetra genic inheritance characteristics, and their fiber production starts from zero percent, that is, in bare seeds, and it is genetic management has been proven in genetic collection lines belonging to the species G. Hirsutum. In out experiments, we compared varieties with high fiber output in the conditions of Bukhara, where the climatic conditions change gradually, with the model Bukhara-8 variety. As can be seen from the obtained data, table1 the average yield of fiber in the Bukhara-8 variety is 35.66%, and among the plants of this variety, it was found that there are those that give fiber from a very low 27% to 42%, that is, as the year goes by, it can be seen that the number of plants with different fiber yield increases, this can be seen (V). It can also be seen in the coefficient of variation, which is V=15.4 percent. If we compare the fiber yield of the sample Bukhara-8 and Omad and S-4727 varieties, the average fiber yield of the Omad variety is 38.3 percent, compared to Bukhara-8. Table 1 shows that Omad variety 6,64 percent and S-4727 variety is 3,64% more fiber compared to the variety.

Table 1. Fiber yield in Bukhara-8, Omad, S-4727 varieties of cotton and hybrid joints (percentages)

Material	Limit	$x \pm m$ (%)	G	V%
Bukhara-8	27-42	35.66 ± 1.7	5.5	15.4
Omad	31.2-43.6	$38,3 \pm 1.64$	5.2	12.3
C-4727	30-36.3	35.3 ± 0.13	7.8	12.08
F_1omad x C-4727	39-42	40.47 ± 0.28	6.1	15.6
F_2Omad x C-4727	24-55.5	40.5 ± 0.86	0.88	2.17

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In the conditions of Bukhara, these two varieties Omad and S-4727 showed that they have high fiber yield. Like the Bukhara-8 variety, the Omad variety also showed a large amplitude of variation in fiber yield, and it was found that the fiber yield of this variety varied from 31.2 percent to 53.6 percent when the plants of this variety were analyzed separately. Among these cultivars, cross-breeding among cultivars with higher fiber yield will result in a cultivar with higher fiber yield. Similar to the Bukhara-8 and Omad cultivars, the S-4727 cultivar showed a small amplitude variation in fiber yield, and plants with fiber yield from 35% to 43.3% were identified (Table 1).

Although there is a large difference between Bukhara-8 variety and Omad, S-4727 varieties in terms of fiber yield, there is a very large difference between Omad and S-4727 varieties. In terms of fiber yield, in the first generation hybrids F1OmadxS-4727 obtained between these two Omad and S-4727 cultivars, intermediate inheritance was observed, and the average fiber yield was equal to 40.47%, and the amplitude variation of fiber yield in this joint was very small, ranging from 39% to 42%. change, it shows that all plants are the same. The second generation (F2 Omad x S-4727) fiber output obtained as a result of interbreeding of these plants showed a double transgression with very large amplitude variability, i.e., both negative (negative) values are smaller than the parental values and positive, both are higher than the parental values big in this section, plant units with fiber output starting from 24% to 55.5% were identified. On average, the fiber yield in the second joint was 40.5%, and they had almost the same value as the first joint (Table 1). The weight of one boll and the number of seeds in the boll weight and the number of seeds in the hybrid joints obtained in Bukhara-8, Omad, S-4727 varieties of cotton and between Omad and S-4727 varieties. One of the most important signs in determining the productivity of cotton in the field of cotton production in agriculture is the weight of a bushel. The weight of one pan is calculated from the complex symbols and how many parts of the pan are in the pan identified by characters such as number of seeds, smallness of seeds and fiber index. It is emphasized in the literature that each of these signs has the characteristic of heredity, without any dependence on each other (A.Abdullaev 1974, A.Egamberdiev 1984). As can be seen from the data obtained on the basis of experiments, Table 2 shows that in the conditions of Bukhara, the average weight of one pod of Bukhara-8 variety is 6.75 grams, and the weight of one pod in this variety is from 6.4 grams to 8.3 grams. Under the same conditions, the average indicator of the Omad variety for this sign was equal to -6.56 grams, and the amplitude of variation was in the range of 6.1 grams to 8.15 grams. “Tezpishar” S-4727, which has a high fiber yield, has an average weight of 5.35 grams per bushel, with a variation of 4.8 grams to 6 grams. According to the data given in the literature, it

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is emphasized that the speed has a negative correlation with the weight of one leg, and in fact, this has been proven once again in these experiments. It can be seen that the weight of one bushel is slightly lighter in the S-4727 variety, which is much faster compared to the medium Bukhara-8 and Omad varieties.

Table 2. In the first generation of F1 Omad x S-4727, a cross between Omad and S-4727 varieties.

Material	Limit	x±m	G	V
bukhara-8	6,4-8,3	6,75-0,64	2.8	29.6
Omad	6,1-8.15	6,56±0.78	0.8	8.2
C-4727	4,8-7	5,36±2.8	0.08	8.6
F_1 Omad X C-4727	3.6-8.8	6,97±1.5	1.7	18
F_2 Omad X C-4727	3,7-9,09	133.99±2.69	8.51	6.35

In the first generation of F1 Omad x S-4727, a cross between Omad and S-4727 varieties (Table 2), the weight of one pod was 8.07 grams on average, and positive heterosis phenomenon was observed in this joint. Also, the difference between the amplitude of variation in the first link is very small, it is in the range of 9.05 grams from 7 graphs. In the first link, the phenomenon of heterosis can occur as a result of the polygenes that provide this trait being lost to the heterozygous state, as a result of combining two demonstrative genes with each other into the same genotype. As a result of cross-breeding plants of this first Omad x S-4727 joint, two generations were obtained, and the weight of one pod in this joint was equal to 6.97 grams on average. Here, it can be seen that the phenomenon of heterosis was preserved, but in the second generation, the amplitude variation in the weight of one pod was observed, both the left and right sided transgression processes were observed in the second period. This groin weight ranged from 3.2 grams to 8.75 grams in the offspring of F1 Omad x S-4727. Such a large variability can also be seen from the coefficient of variation, which is V-18.9 percent. As we mentioned, the weight of the pods is very dependent on the number of seeds in the pods and the size of the seeds. The larger the seeds, the higher the weight of 1000 seeds and the higher the weight of one bushel. The fact that Bukhara-8 is the heaviest pod among the studied varieties is due to the large number of seeds in it, as it can be seen from the obtained data that there is an average of 34.8 seeds per pod of the Bukhara-8 variety, and when the number of seeds in each plant is analyzed separately, this variety ranges from 29 to 37.5 pods. identified. The average number of seeds in

one pod of Omad variety is 27.7, and its variation amplitude can be from 20.5 to 32.6 units, while in S-4727 variety, the average number of seeds in one pod was 31.3. It can be seen that the Omad variety has the least seed yield, but the weight of one clod (in Table 3) is related to the size of the seeds born, so we saw that the weight of 1000 seeds is much higher than other varieties.

Table-3 The number of seeds per boll in Bukhara-8, Omad, S-4727 and hybrid varieties of cotton (units)

Material	Lim	x±m	G	V
bukhara-8	29-37,3	34,8±1.2	2.8	7,3
Omad	20,5-32,9	28,0±2.78	3.8	12.2
C-4727	28,5-26,5	31,3±2.8	2.08	8.6
F_1 omad X C-4727	32,0-38,1	35,88±1.5	10.7	8
F_2 omad X C-4727	18,9-47,1	33.99±2.69	8.51	6.35

On average, 35.88 seeds were produced in one pod of the first generation of the hybrid joint obtained between Omad and S-4727 varieties, and the phenomenon of heterosis was observed. In the first generation, the number of seedlings per pot was 32.0 to 38.1. In the second Omad x S-4727 generation, on average, 30.8 seeds were produced in one pod, and a wide range of amplitude spectrum was observed, and in the plants studied with left and right transgression, from 16.8 to 47.9 seeds per pod were observed in the experiments. The main reason for the observation of such variability in the second stage is that in Omad and S-4727 varieties, this stage is controlled by genes that do not have different alleles.

Conclusions: 1. In adverse Bukhara conditions, the Omad variety has high fiber yield, and it was found that the high fiber yield feature prevails in the hybrid joints obtained with the S-4727 variety.

2. It was determined that Bukhara-8 has the largest index in terms of weight per bushel. According to this trait, the phenomenon of heterosis was observed in the first joint of the hybrids obtained between Omad and S-4727, and it was verified that this condition was preserved in the second joint.

3. Due to the fact that the number of seeds in one pot is the highest in the Bukhara-8 variety, and it was created under these conditions, the hybrids between Omad and S-4727 were observed on the first day of this trait. 4. The hybrid generation obtained between the varieties Omad and S-4727 was proposed to multiply the seeds of separately selected plants with a high fiber

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output from the second generation, and use the breeding stock as a starting material to create varieties with a high fiber output.

References

1. Mauer F.M. "Cotton" T., 1954 edition of the Academy of Sciences of the Uzbek SSR.
2. Maksudov E.Yu. "Study of hybrids obtained from crossing ecological distant varieties of cotton" G. hirsutum L. (Breeding of the USSR and the USA). Abstract of diss. for the degree of candidate of agricultural sciences. Tashkent, 1967.
3. Abdullaev A-Evolution and taxonomy of poly ploid species of cotton // T., 1974 FAN p. 260.
4. Babamuratov H. “Inheritance of boll weight in the offspring of a three-species cotton hybrid. Genetics, breeding and seed production of cotton and alfalfa”. Tashkent, 1977.
5. Straumal B.N. "108-F type". 1977 Tashkent. Edu pub.
6. Musaev D.A. "Cotton Genetic Collection and Traits Inheritance Problems". 1979. Ed. Fan, Art. 130-140,
7. Armor B "Methodology of field experience", Moscow, 1985.
8. Ashurbekov. Kh., Mukimov E. "Collection of problems of cotton genetics, selection, seed production, breeding", Tashkent, 1995, 50 pages.
9. Egamberdiev A.E. "Collection of cotton genetics, selection, seed production, alfalfa issues", Tashkent, 1995.
10. Jumaev F.Kh. Abzalov M.F. "Effect of new Let. dw gene on plant height in cotton Girsutum L." J. Cotton industry 1997 No. 1 10-11 p.
11. Kh. Ne'matov - Scientific basis of cotton seed production. / Tashkent, Mekhnat publishing house, 2005.
12. Jumaev F. and others - genotype dependence of ripening speed in cultivars and hybrids belonging to Girsutum L. species. / International conference, Tashkent "Fan" publishing house, 2005, pp. 37-40
13. Jalilov O and others. - The reliable ground of quality fiber/ International conference, Tashkent "Fan" publishing house, 2005, pp. 35-37