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INHERITANCE OF COTTON AND QUALITY INDICATORS OF TOLA F_1 HYBRID VARIETIES

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ANNOTATION

The article describes the evacuation of the results obtained on fiber consumption and inheritance of certain fiber quality indicators on F_1duragay plants obtained with the participation of rubella varieties and families. Depending on the parent genotype of origin and the quality of fiber, inheritance is established on stagnant plants under conditions of intermediate, complete dominance and extreme dominance, unique recombinants are distinguished, on the basis of which the continuation of genetic selection studies ensures the achievement of positive results.

Keywords: goose, travel, nab, family, inheritance of signs, origin and length of fibre, heterosis, dominant, genotype, combination, intersection.

INTRODUCTION

As a result of systemic reforms implemented during the years of independence, Uzbekistan has become one of the major centers influencing the formation of the global cotton fiber market, the regulation of trade in textiles. In accordance with the Action Strategy for the five priority areas of development of the Republic of Uzbekistan, the sectors of the economy, in particular, the cotton sector of agriculture are being radically reformed.

As a result, cotton fields are being optimized and cotton-textile clusters are being created, which are able to fully cover all stages of cotton growing and processing. Breeding scientists are creating cotton varieties that are suitable for soil and climatic conditions of the country's regions, fast-ripening, high-yielding, resistant to various diseases and pests, water scarcity and other adverse environmental factors, fiber quality indicators in line with world cotton market requirements. Nevertheless, on the basis of genetic-selection research, there is a possibility to further increase the yield of cotton, in particular, fiber yield and quality. For this reason, in

recent years, special attention is paid to the creation of varieties with high fiber consumption and quality.

The percentage of fiber in the raw cotton is the main criterion for determining the fiber yield obtained from the crop area, and the inheritance of the trait is controlled by several genes in the literature. In particular, the researches of M.F.Abzalov, J.A. Musaev revealed that fiber yield is formed on the basis of complex interaction of genes and is controlled by at least 2 groups of genes, and it is recognized that this trait is formed independently of other traits [1, 2].

In the selection of cotton varieties, the problem of fiber yield, the existing feedback between high fiber yield and quality indicators has not been sufficiently solved to date. The various blending methods used in recent years make it possible to distinguish forms with high fiber yield and quality based on the elimination of inverse correlations between characters [3, 5].

Essam El-Hashash mixed a variety of cotton varieties of Egyptian and American selection and obtained a number of hybrids, and based on the study of heredity and variability in fiber yield and single-stalk cotton weight traits, it was determined that these traits are expressed under the influence of additive genes [7].

The state of heterosis in intercultural F_1 hybrids of cotton when the indicators of the parental forms are close to each other on the basis of traits, if they differ sharply in their characteristics, the observation of heredity in the intermediate state is scientifically based [6, 8].

SOURCE AND METHODS

The study examined the inheritance of fiber yield and quality traits in F_1 hybrids involving varieties with different genotypes, i.e., radically different origins, ridges, and families. Fiber consumption was determined by mathematical calculation of fiber weight and seed weight in individual samples and samples collected from hybrid combinations. In our experiments, the fiber quality of the collected samples was determined using HVI (USTER) equipment. The degree of dominance of the characters was determined according to the S.Wright formula given in the works of G.M.Beil and R.E.Atkins [4].

The results obtained and their analysis: The fiber consumption of the parent variety, ridge, and family used in the hybridization ranged from 36.2% to 37.5%. Fiber consumption was relatively high in the T-1380, O-107-12, O-87-91 families, with a rate of 37-37.5%.

In the first generation, it was found that fiber yield was inherited in cases of complete dominance, negative and positive heterosis due to hybrid combinations. Depending on the hybrid combinations, fiber consumption ranged from 35.8-38%. In the studied F_1 SP-1303 x T-282-85 combination, negative heterosis was observed, while in the F_1 T-282-85 x T-1380 combination (hr = -1.0), heredity was detected in the negative fully dominant state. In all other hybrid combinations, positive complete dominant inheritance of the trait and heterosis were inherited. In the combinations F_1 O-107-12 x T-282-85 (hr = 3.0) and F_1 O-87-91 x Sakhovot (hr = 2.25) the phenomenon of heterosis was observed, and a significant advantage of fiber consumption over the parent forms was observed and the average was 37.2% and 38%, respectively (Table 1).

Table 1 Heredity of the sign of fiber output and length at the stops of the goose F_1

№	Parental forms and hybrids	Plant number, pieces	Fibre output, %	hp	Fibre length, mm	Hp
1	T-282-85(limited type)	20	36,4+0,5		33,8+0,6	
2	Baraka-79(limited type)	20	36,5+0,6		34,1+0,5	
3	СП-1303(II-tip branching)	20	36,8+0,5		34,6+0,4	
4	T-1380 (II-tip branching)	20	37,2+0,6		35,2+0,6	
5	O-107-12(II-tip branching)	20	36,8+0,5		37,0+0,4	
6	O-87-91(II-III-tip branching)	20	37,5+0,6		35,0+0,7	
7	O-160-71(II-III tip branching)	20	36,9+0,6		34,4+0,5	
8	СП-1303 (I-tip branching 2-annual form)	20	36,2+0,7		34,3+0,6	
9	Sahovat (I-tip branching)	20	36,8 +0,5		34,5+0,4	
10	F_1T-282-85 x T-1380	50	36,4+0,8	-1,0	34,9+0,7	0,57
11	F_1 СП-1303 x T-282-85	50	35,8+0,9	-4,0	34,2+1,0	0
12	F_1O-107-12 x T-282-85	50	37,2+0,9	3,0	35,6+0,8	0,12
13	F_1 O-87-91 x Sahovat	50	38,0+0,8	2,25	34,4+0,9	-1,0
14	F_1O-160-71 x Baraka-79	45	36,9+0,7	1,0	34,6+0,8	2,0
15	F_1 СП-1303 (2nd form) x Барака-79	50	36,5+1,0	1,0	34,4+1,0	2,0

There is an inverse correlation between fiber yield and 1000 seed weight, which was also confirmed in the hybrid combination because fiber yield was observed to be low when 1000 seed weight was high.

The indicators of the parent forms involved in the hybridization on the fiber length mark, which determines the fiber quality index, ranged from 33.8 mm (T-282-85) to 37 mm (O-107-12). The remaining varietal, ridge, and family characteristics were in the range of 34.4–35.2 mm without significant differences in character (Table 1). There was no significant difference in the mean values of the studied hybrid combinations on the fiber length mark. Fiber length was found to be inherited in intermediate, negative dominant, and positive heterosis cases in the first generation. The readings ranged from 34 to 35.6 mm, with the highest result recorded in the F_1 O-107-12 x T-282-85 combination (35.6 mm). The complete predominance of families involved in the inheritance of the trait in the form of motherhood was noted, and it was found that under the influence of its genotype, the trait shifts in a positive direction or is inherited in a state of heterosis. In the hybrid combinations F_1 SP-1303 (Form 2) x Baraka-79 and F_1 O-160-71 x Baraka-79, inheritance in the fully dominant state was observed, and the degree of dominance was hr = 2.0. In the remaining hybrid combinations, intermediate-state inheritance was observed, and accordingly, the fiber length of the hybrids was found to deviate in the range of the parental forms indicator or in the direction of the parental form with a partially positive indicator. In the inheritance of this trait, the predominance of the maternal form belonging to the high index was determined.

Fiber quality indicators of samples collected from parents and hybrids were determined using USTER equipment and the results obtained were analyzed.

A positive result for the high average fiber length was observed in the O-160-71 and O-107-12 families, whose index was 1.28 inches, while the low index was recorded in the T-282-85 ridge (1.19 inches). Table 2). The performance of the remaining parent forms was found to be higher than 1.22 inches, indicating that these indicators fully meet the requirements for type IV fiber quality. The upper mean length values of the F_1 hybrids were close to or higher than those of the parent forms. The lowest figure among the hybrids was observed in the F_1 SP-1303 (Form 2) x Baraka-79 combination, averaging 1.22 inches and at the level of the parent forms.

High results on this mark were observed in hybrid combinations F_1 T-282-85 x T-1380, F_1 O-107-12 x T-282-85 and F_1 O160-71x Baraka-79. Their scores were significantly higher than those of the parent forms, respectively, 1.29; 1.31; and 1.29 inches (Table 2). In general, it was observed that the trait was inherited in a dominant position specific to the paternal form with a high rate. It was found that the performance of all hybrids on the mark meets the requirements for type IV fiber. The results obtained fully confirmed the data measured (in mm) on a velvet board under laboratory conditions.

According to the micronaire indicator, which is another indicator of fiber quality, among the parent forms, the ridges O-160-71 (4.7) and T-282-85 (4.8) showed a negative result, while in all other forms, the characteristics of this sign were positive. and can be seen to be in the range of 4.0–4.6. The fiber micronaire of F_1 hybrid plants ranged from 4.3 to 4.7, with the most positive result observed in the F_1 T-282-85 x T-1380 combination (4.3).

It was found that the micronaire performance of hybrids also fully meets the requirements for fiber quality today, without drastically differing from the parent forms.

Table 2 Indicators of some quality marks of fiber in the hybrids of the goose F_1

№	Parental forms and hybrids	High average length, inches	Micronair (mic.)	Packing-tensile strength, G/K Teks (Str)
1	T-282-85(limited type)	1,19	4,8	34,5
2	Барака-79 (limited type)	1,22	4,6	35,0
3	СП-1303(II- tip branching)	1,23	4,5	35,2
4	T-1380 (II- tip branching)	1,26	4,0	35,4
5	O-107-12(II- tip branching)	1,28	4,3	36,5
6	O-87-91(II-III- tip branching)	1,25	4,3	35,1
7	O-160-71(II-III- tip branching)	1,28	4,7	35,0
8	СП-1303 (spindle form I-type branching)	1,22	4,6	35,1
9	Sahovot (I- tip branching)	1,22	4,6	33,1
10	F_1T-282-85 x T-1380	1,29	4,3	35,1
11	F_1 СП-1303 x T-282-85	1,23	4,7	34,8
12	F_1O-107-12 x T-282-85	1,31	4,5	35,3
13	F_1 O-87-91 x Sahovot	1,24	4,5	38,0
14	F_1O-160-71 x Baraka -79	1,29	4,7	36,0
15	F_1 СП-1303 (2nd form) x Baraka-79	1,22	4,7	37,1

Positive results were also observed for the specific tensile strength of the fiber. The performance of the parent forms involved in the hybridization ranged from 33.1 g/k tex (Sakhovot) to 36.5 g/k tex (O-107-12). It was found that the performance of hybrids on this trait was at the level

of parental forms or higher. High results were observed in the combination of F_1 SP-1303 (Form 2) x Baraka-79 and F_1 O-87-91 x Sakhovot.

CONCLUSIONS

Symptoms of fiber yield and length were found to be inherited in cases of intermediate, complete dominant, and negative and positive heterosis, depending on the parental genotype involved in the hybridization; Among the F_1 hybrid plants, it was found that there are rare plants that fully meet the requirements of fiber quality type IV, fiber yield more than 40%, fiber length 35-37 mm, micronaire index 4.0-4.2, and they were isolated. They can be used in subsequent genetic-selection research to create new cotton varieties that meet production requirements.

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