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INHERITANCE OF RAW COTTON WEIGHT IN A SINGLE BOLL OF COTTON HYBRIDS (AS AN INITIAL SOURCE F_1, F_1B_1 BACKCROSS PLANTS) ARE BEING GROWN IN THE CONDITIONS OF GREEN HOUSE AND FIELD

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ABSTRACT
The difference of indexes of raw cotton weight in one cotton boll on the plants of varieties (G.hirsutum L.) and F_1, backcross hybrid plants has been identified in the conditions of green house and field and either, incomplete dominance, dominance and high dominant inheritances on this index in F_1 hybrid plants grown in both conditions can be seen in this paper.

KEYWORDS: *cotton plant, field, green house, weight of raw cotton in a single boll, hybrid, reziproc, inheritance, rate of dominancy, variation coefficient, combination, line or strain, variety, heterosis or hybrid vigor, average dominance, dominance, high dominance.*

INTRODUCTION

It is known that the weight of raw cotton per one cotton boll is considered as one of the farm valuable characteristics. Increasing of raw cotton weight in one cotton boll of hybrids F_1-F_2, developed on the base of inter and intra species hybridization than their origin accessions pointed out by many scientists and inheritance of cotton boll size variation under the affect of genotype determined. As the most of quantity characteristics the middle inheritance rate of the character in the first hybrid generations and occasion of splitting in the F_2 plants has a polygen behavior which predicts that several genes taking part in the control of this trait [1, 2, 3, 4, 6, 7].

By the researches of O.KH.Kimsanbaev [3], R.R.Rakhimbaev, R.F.Zelinskiy [5] were shown that full dominance of boll weight inheritance in the F_1 plants and the inclination of boll weight to the side of parents in the variation row and developing of plants (as transgression) with enlarged bolls under the affect of polygenes.

Positive dominancy and middle inheritance behavior were watched on the weight of one boll as the one of farm valuable characteristics of the simple hybrids in the investigations conducted by A.Siddikov [6]. Except this, the F_2 plants with enlarged bolls preserve this attribute in the plants of the third generation either or contrarily there was identified that, the F_2 hybrid plants with small bolls exhibit low indexes on the coefficient of inheritance. But the more participation of recessive genes in the controlling of this trait occurs in the local varieties and the necessity of implementation of selection on the trait at least by the generations of F_3 – F_4 was emphasized.

S.A.Usmanov, S.S.Alikhodjaeva, F.Abdiev, K.Khudergenov [7] have studied the genetic dependence between some of farm characteristics in the older generations from remote geographic hybridization belonging to fine staple cotton *G.barbadense* L. According to their analysis the variation coefficient at its attain to the generation of F_8 does not differ from standard varieties but increases of fiber output with fiber length, weight of one boll with its length and weight of 1000 seeds with the decrease of fiber output.

An intermediate state inheritance of one boll weight was determined by R.R.Egamberdiev [1], in his researches conducted with F_1 of fine staple cotton. Inclination to the side of one parental accession was observed and differed in the dependence of initial materials which one chosen as the quality of paternal or maternal. Positive heterosis on this trait was also watched in the range of one combination. Determination of trait's inheritance coefficient on F_2 plants has identified that insurance of this trait's variation was at mean and strong rates (h^2 =36.0-h^2 =94.0%).

MATERIALS AND METHODS

Planned experiment in the artificial condition was conducted in the condition of complex "Phitotron" at the Scientific institute of Cotton Breeding, Seed Production and Growing Technologies and the field experiments in the pasture soil conditions of Central experimental farm of the institute. Comparative study of one boll weight in the hybridization and in the produced F_1, F_1B_1 backcross hybrids in green house and field conditions was the method of investigation. Introduced varieties Omad, C-6524 in the republic, a perspective C-6541 and T-498, T-442 developed by the scientists of artificial condition laboratory were employed as the initial sources.

RESULTS AND DISCUSSION

The weight of one boll on the plants of cotton varieties and strains in our researches conducted in the conditions of greenhouse consisted of 4,1-5,1 grams. The best index of one boll weight (5,1 gram) in the condition of green house was shown by the cotton strain of S-442 and the low index (table 1) on this trait was determined in the variety of S-6524 (4,1 gram).

The weight of one boll in the hybrids of F_1 studied in green house condition has not significant difference in comparison with initial samples. So, the hybrid combination of F_1 S-6530 × S-442 has slightly heavy bolls than in comparison to other first hybrid generations (5,4 gram). The coefficient of variation made of 7,2 and at this the dominance rate has inherited with the phenomenon of positive inheritance. The inconsiderable index (4,8 gram) was watched in the studied hybrid combinations of F_1 S-498 × Omad, F_1 S-6541 x S-6530, and here the coefficient of variation made of 8,1-8,7. The hybrid combination of F_1 S-6541 × S-6530 has exhibited high dominance of heterosis (6,0) but inheritance rate was not observed in the reziproc hybrid combination of F_1 Omad × S-498 and it was equal to 0. It can be seen that difference between backcross plants of initial samples was not at all (Table 1).

Table 1

Inheritance of one boll weight on the plants of initial sources and backcross F_1, F_1B_1 hybrids in green house and field conditions

In the initial sources and plants of F_1	$\bar{X} \pm S_{\bar{X}}$	S	V%	hp
1	2	3	4	5
In the condition of green house				
Omad	5,0±0,1	0,3	7,1	-
S-6530	4,3±0,2	0,5	6,8	-
S-6141	4,1±0,2	0,3	7,1	-
S-498	5,0±0,1	0,4	6,3	-
S-442	5,1±0,3	0,2	6,5	-
F_1Omad × S-498	5,0±0,1	0.4	9,3	0
F_1 S-498 × Omad	4,8±0,1	0,4	8,7	0
F_1 S-6530 × S-442	5,4±0,1	0,3	7,2	1,7
F_1 S-442 × S-6530	5,2±0,1	0,4	8,7	1,2
F_1 S-6541 × Omad	5,0±0,1	0,4	8,4	1,0
F_1 S-6541 × S-6530	4,8±0,1	0,3	8,1	6,0
BC_1 (Omad × S-498) × Omad	4,5±0,4	0,1	3,5	
1	2	3	4	5
BC_1 (Omad × S-498) × S-6530	4,7±0,1	0,4	8,8	
BC_1 (S-6530 × S-442) × S-6530	4,9±0,6	0,1	3,8	
BC_1 (S-6530 × S-442) × Omad	4,9±0,7	0,2	4.9	
In the condition of field				
Omad	6,3±0,2	0,6	6,1	-
S-6530	4,9±0,3	0,2	7,1	-
S-6141	5,0±0,5	0,7	7,3	-
S-498	5,1±0,2	0,4	6,8	-

S-442	5,8±0,4	0,5	7,1	-
F_1Omad × S-498	5,8±0,1	0,8	9,7	0,2
F_1 S-498 × Omad	5,8±0,4	0,9	7,6	0,2
F_1 S-6530 × S-442	6,5±0,3	0,4	6,6	2,4
F_1 S-442 × S-6530	6,4±0,1	0,1	9,2	2,2
F_1 S-6541 × Omad	5,8±0,5	0,3	6,3	0,3
F_1 S-6541 × S-6530	5,4±0,1	0,5	9,7	5,0
BC_1 (Omad × S-498) × Omad	5,7±0,1	0,5	9,1	
BC_1 (Omad × S-498) × S-6530	5,7±0,3	0,4	7,6	
BC_1 (S-6530 × S-442) × S-6530	5,7±0,2	0,4	7,1	
BC_1 (S-6530 × S-442) × Omad	5,9±0,3	0,6	7,5	

The index on the one boll weight of initial sources studied in the conditions of field consisted of 4,9-6,3 grams. The maximum on the weight of one boll was shown on the variety of Omad and the lower was on the variety of C-6530 (table 1). In the analyze of taken data on the weight of one boll studied in the condition of field, this trait in the F_1 and backcross plants has made of 5,4-6,5 grams and on the variation coefficient 6,3-9,7. At this, F_1 S-6530 × S-442 hybrid combination has a high weight on one boll (6,5 gram), variation coefficient 6,6 and inconsiderably lower indexes 5,4 and 6,6 respectively belongs to hybrid combination of F_1 S-6541 × S-6530. High dominant inheritance (5,0) on the index of one boll weight in the plants investigated in the condition of field was identified in the hybrid combination of F_1S-6541 × S-6530. Incomplete dominance and heterosis phenomenon inheritances were noted in the other hybrid combinations.

CONCLUSION

The taken data demonstrated that the initial materials, hybrid F_1 and F_1 B_1 backcross plants insignificantly differ on the indexes of one boll weight in the conditions of green house and field. The incomplete dominant, dominant and high dominant inheritances on the weight of one boll index can be seen in the hybrid plants of F_1 in both conditions.

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