SPEED IN F_6 HYBRIDS OBTAINED THROUGH INTROGRESSIVE SELECTION IN COTTON

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Abstract. *The article analyzes the results obtained on the variability of ripening speed in F_6 hybrid combinations obtained by cross-breeding the lines created on the basis of introgressive selection in medium fiber cotton with the Bukhara-102 variety.*

Keywords: *cotton, introgressive, early maturing, cultivar, interspecies, range, variation, heredity, F_6 plant.*

Due to global climate change, it has not lost its relevance to create varieties adapted to soil-climate conditions, quick-ripening, productive, with high fiber yield and quality. It is also important to study the speed of ripening by the method of introgressive selection of cotton.

Cotton plant, like every other type of crop, has a decrease in productivity and quality indicators with the shortening of the growing season. Selection scientists are trying to change the natural laws as much as possible, that is, to shorten the vegetation period without reducing productivity and quality indicators. A number of researches have been carried out on early ripening, and the complexity of the sign, the length of the periods that determine it vary to varying degrees, early ripening depends on the location of the first crop branch, the number of bolls and the total weight of cotton in one boll, and other signs, along with external environment and agrotechnical factors (temperature, day length, fertilizer and irrigation rate) were also found to be related. The research was carried out at the Scientific-Research Institute of Cotton Selection, Seeding and Cultivation, and 17 introgressive lines were obtained by crossing with the Bukhara-102 variety, F_6 hybrids were analyzed for signs of quick ripening.

One of the important tasks is to search for samples that meet the requirements of fiber quality and quickly adapt to the soil and climate conditions of our republic and apply them to selection and genetic research. It has been noted by most scientists that, using varieties and samples of the foreign and domestic gene pool, there is a great possibility of selecting recombinants showing a high heritability coefficient of the sign of rapidity [1,2,3,4].

One of the main components that determine the growing season of the cotton plant is the period from the day of seed germination to the opening of 50% of the bolls. The speed of ripening depends on the genotype of the variety, and environmental and agrotechnical conditions also have a certain influence on the growth and development of cotton.

During the research, F_6 hybrid combinations were analyzed when “germination-50% flowering” was studied, including F_6T-4672-73 x Bukhara-102 (55 days), F_6T-470/1 x Bukhara-102 (55.2 days), F_6T-4684-86 x Bukhara-102 (55.3 days), F_6T-175/248 x Bukhara-102 (55.4 days) and F_6T-95 x Bukhara-102 (55.5 days) had the earliest flowering. At the same time, during research F_6T-158 x Bukhara-102 (57.4 days), F_6T-BSG-2/06 x Bukhara-102 (57.4 days) and F_6T-4747-48 x Bukhara-102 (57.1 day) late flowering hybrid combinations were observed. As a model, S-6524 flowered (in 57 days), and hybrids flowered up to 2 days earlier than the model (Table 1).

Table 1

"Germination and 50% flowering" period indicators of F_6 hybrids

№	Combination	M±m	σ	V%
1	S-6524	57,0±0,54	1,33	2,34
2	F_6T-4672-73 x Bukhara-102	55,0±0,72	1,76	3,21
3	F_6T-4674-77 x Bukhara-102	56,2±0,46	1,48	2,63
4	F_6T-4679-81 x Bukhara-102	56,7±0,53	1,70	3,00
5	F_6T-4684-86 x Bukhara-102	55,3±0,69	1,70	3,08
6	F_6T-138 x Bukhara-102	55,8±0,46	1,48	2,64
7	F_6T-470/1 x Bukhara-102	55,2±0,38	1,23	2,23
8	F_6T-95 x Bukhara-102	55,5±0,65	1,84	3,32
9	F_6T-158 x Bukhara-102	57,4±0,61	1,96	3,41
10	F_6T-200 x Bukhara-102	55,7±0,63	1,57	2,81
11	F_6T-MVG-2 x Bukhara-102	55,9±0,43	1,37	2,45
12	F_6T-58 x Bukhara-102	56,6±0,56	1,78	3,14
13	F_6T-1979 x Bukhara-102	55,7±0,69	1,70	3,06
14	F_6T-175/248 x Bukhara-102	55,4±0,42	1,35	2,44
15	F_6T-12/06 x Bukhara-102	55,7±0,49	1,57	2,81
16	F_6T-4747-48 x Bukhara-102	57,1±1,03	2,92	5,12
17	F_6T-BSG-2/06 x Bukhara-102	57,4±0,80	2,55	4,44
18	F_6T-588 x Bukhara-102	56,7±0,85	2,41	4,24

During research, according to the index of "germination-50% ripening" period of F_6 hybrids, it ranged from 115.6 days F_6T-4674-77 x Bukhara-102 to 121.9 days F_6T-95 x Bukhara-102, respectively. Including F_6T-4674-77 x Bukhara-102 (115.6 days), F_6T-138 x Bukhara-102 (116.2 days), F_6T-588 x Bukhara-102 (116.7 days), F_6T-58 x Bukhara-102 (116.8 days) and F_6T-175/248 x Bukhara-102 (116.9 days) showed earlier "seedling germination and 50% ripening" than other hybrids. The mean square deviation and the amplitude of variation among the different hybrids are relatively low in the F_6T-138 x Bukhara-102 combination (σ=1.14 V=0.98%), and relatively higher in the F_6T-95 x Bukhara-102 hybrid combination (σ =4.93; V=4.05%) was observed. Compared to the medium-fiber cotton variety C-6524 taken as a template variety (119.1) days, some hybrids from the template 4 days F_6T-4674-77 x Bukhara-102, 3 days F_6T-138 x Bukhara-102, 2 days F6T-588 x Bukhara-102, F6T-58 x Bukhara-102, F_6T-175/248 x Bukhara-102, up to 1 day F6T-BSG-2/06 x Bukhara-102, F_6T-4747-48 x Bukhara-102, F_6T-158 x It was found that Bukhara-102 was an early bird. In addition, it was observed that some hybrids are delayed from 1 to 4 days compared to the model variety (Table 2).

Table 2

"Germination and 50% ripening" period indicators of F_6 hybrids

№	Combination	M±m	σ	V%
1	S-6524	119,1±0,46	1,46	1,22
2	F_6T-4672-73 x Bukhara-102	118,7±1,50	3,68	3,10
3	F_6T-4674-77 x Bukhara-102	115,6±0,37	1,17	1,02
4	F_6T-4679-81 x Bukhara-102	119,1±1,24	3,93	3,30
5	F_6T-4684-86 x Bukhara-102	117,3±1,00	2,45	2,07

6	F_6T-138 x Bukhara-102	116,2±0,35	1,14	0,98
7	F_6T-470/1 x Bukhara-102	119,9±1,24	3,93	3,28
8	F_6T-95 x Bukhara-102	121,9±1,74	4,93	4,05
9	F_6T-158 x Bukhara-102	118,1±0,91	2,88	2,44
10	F_6T-200 x Bukhara-102	119,0±1,50	3,68	3,09
11	F_6T-MVG-2 x Bukhara-102	120,8±1,44	4,57	3,78
12	F_6T-58 x Bukhara-102	116,8±0,87	2,78	2,38
13	F_6T-1979 x Bukhara-102	118,4±0,94	2,32	1,96
14	F_6T-175/248 x Bukhara-102	116,9±0,56	1,79	1,53
15	F_6T-12/06 x Bukhara-102	118,6±1,22	3,86	3,26
16	F_6T-4747-48 x Bukhara-102	117,6±1,28	3,63	3,08
17	F_6T-BSG-2/06 x Bukhara-102	117,5±0,81	2,59	2,21
18	F_6T-588 x Bukhara-102	116,7±0,65	2,06	1,76

The analysis of studies showed that in hybrid combinations F_6T-4674-77 x Bukhara-102, F_6T-4684-86 x Bukhara-102, F_6T-138 x Bukhara-102, F_6T-588 x Bukhara-102 and F_6T-58 x Bukhara-102 It was concluded that the separation of positive recombinants showing superiority in terms of speed during the next few years can be used as a starting material for speed in future selection processes.

Based on the results obtained from the research, we can say that by studying the heredity, variability and formation of the “germination-50% flowering” and “germination-50% ripening” periods, which are considered the main indicators of quickness, in F6 hybrids created by introgressive cotton lines, the lines involved in crossbreeding of the quickness sign it can be concluded that it is inherited depending on the genotype of the parents involved in its origin and that it is formed depending on the direction of selection in the next generation.

Conclusion

In conclusion, the introgressive selection approach in cotton has shown promising results in improving the speed of F6 hybrids. Through careful selection and breeding techniques, cotton researchers have been able to introduce desirable traits from one variety into another, leading to the development of hybrids with enhanced speed characteristics. The use of introgressive selection has allowed breeders to incorporate traits such as early maturity, improved fiber quality, disease resistance, and higher yield potential into cotton hybrids. This approach has led to the creation of F6 hybrids that exhibit improved speed in terms of growth, development, and overall performance. The increased speed in F6 hybrids obtained through introgressive selection offers several advantages. It can help cotton growers achieve earlier maturation, which can be beneficial in regions with shorter growing seasons or where weather conditions are unpredictable. Additionally, improved fiber quality and disease resistance contribute to higher yields and reduced crop losses, enhancing the economic viability of cotton production.

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