MUTUAL CORRELATION OF ECONOMICALLY VALUABLE TRAITS IN COTTON LINES

Mamatkadyrov Jakhongir Bakhtiyor ugli

basic doctoral student of the Tashkent State

Agrarian University in the specialty "Selection and Seed Production"

Kholmurodova Guzal Ruziyevna

Department of "Selection and Seed Production of

Agricultural Crops" of Tashkent State Agrarian University Doctor of

Agricultural Sciences (DSc), Professor

Ahmadjonov Dilshod Olimjon ugli

basic doctoral student of the Tashkent State

Agrarian University in the specialty "Selection and Seed Production"

Numanov Muhammadsodiq Khayrillo ugli

Faculty of Agronomy of the Andijan Institute of

Agriculture and Agrotechnologies

3rd year student of group S23-17 in the direction of

selection and seed production of agricultural crops

Abdimuratov Shokhrukhjon Ilkhom ugli

11-02 grade student of Al Khorezmi school.

Introduction. Cotton is grown on 1.2 million hectares of land in the republic, and the annual fiber yield is 800-900 thousand tons. Digitalization of cotton breeding and seed production is being actively carried out in our country. The Ministry of Innovative Development of the Republic of Uzbekistan, the Research Center of Agriculture of the Republic of Uzbekistan, and the Tashkent State Agrarian University are working on the selection of cotton varieties resistant to unfavorable factors based on GIS (Geographic Information System). Also, international experience in the digitalization of the seed production system using bioinformatics, artificial intelligence, and GIS technologies is being studied in the republic. Therefore, the digitalization of primary seed production processes, the effective organization of breeding processes, and the creation of seed material resistant to adverse factors are of

great importance today. Our research covers these issues and is aimed at improving the primary seed production system based on digitalization in the conditions of Uzbekistan. The Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated June 7, 2022 No. PP-273 "On Additional Measures for the Effective Organization of the Implementation of the Tasks Defined in the Strategy for the Development of Agriculture of the Republic of Uzbekistan for 2020-2030" defines the tasks for the development of the industry. Therefore, the creation of a valuable resource base based on the digitalization of primary seed production processes in cotton is relevant.

The purpose of the research is to systematize the primary seed production processes of medium-fiber cotton using digital technologies, to create a database of valuable breeding materials consisting of high-yielding families and lines with high fiber quality and yield through the digitization of available data.

In the process of digitization of primary seed production processes in cotton, we studied the relationship between early maturity of complex hybrids and cotton diseases and pests, and paid attention to their resistance (see Tables 1-2). As a result, a positive weak, medium, and strong correlation was observed between them. This indicates the effectiveness of joint selection work based on these indicators. Positive and negative relationships between most traits are relatively stable and can be broken through crossbreeding. As a result of research conducted on the study of the interrelationship of various economic traits in cotton breeding, it was established that it is difficult to break the negative relationships between individual traits. For example, it has been established that there is a strong negative correlation between fiber yield and fiber length, the weight of raw cotton in one boll and the number of bolls per plant, yield and early maturity.

Table 1

Early maturity in isolated hybrids and lines

and resistance to wilt

№	ridges	The relationship between early maturity and wilt infestation		
		r	n	t
convergent ridges				
1.	T-445/18	0.03	0.4	0.1
2.	T-580/18	0.17	0.2	0.7
3.	T-230/18	-0.93	0.4	-2.5
4.	T-125/18	0.62	0.4	1.6

t >=1,01 correlation criterion

Table 2

Relationship between early maturity and spider mite infestation in isolated hybrids and lines

№	Families and lines	The relationship between early maturity and spider mite infestation		
		r	n	t
Complex and convergent lines				
1.	T-445/18	-0.27	0.3	-0.9
2.	T-580/18	-0.36	0.2	-1.7
3.	T-230/18	0.93	0.4	2.6
4.	T-125/18	-0.23	0.5	-0.5

t >=1,01 correlation criterion

The obtained results indicate the possibility of disrupting negative correlations between individual traits by applying various crossing methods and conducting repeated selection work. Therefore, in our experiment, the interrelationship of economically valuable traits was studied.

Among the selected lines, line L-230/18 had a strong negative correlation (r =-0.93, respectively), and line L-484-85/07 had a positive average correlation (r = 0.62), while the remaining combinations had a weak positive correlation.

The results of the analysis of the relationship between early maturity and resistance to spider mites showed that in line L-230/18 (r=0.93), a strong positive correlation was observed, while in the remaining lines, negative, medium, and weak correlations were noted (see Table 2).

Our research confirmed the wide possibility of breaking negative relationships between individual traits and isolating recombinants with a positive set of traits through complex hybridization. That is, from the higher generations of complex and convergent hybrids participating in the experiment, lines L-445/18, L-580/18 with a clear advantage over standard varieties in terms of a positive set of main economically valuable traits were selected.

In conclusion, it can be said that complex hybridization expands the possibilities of isolating recombinants with a positive set of traits based on the breaking of negative relationships between individual traits. As proof of our opinion, it is possible to cite the indicators of the upper generations of

complex, convergent hybrids, as well as the isolated lines, which participated in the experiment. It should be noted that in these combinations, these traits are controlled by genes from different groups.

Based on the above analysis, it can be concluded that in cotton breeding, high variability in traits can be achieved in offspring based on complex and convergent hybridization.

The high degree of variability indicates the high effectiveness of convergent hybridization, increasing the possibilities of selection for all traits, ensuring the creation of new lines that surpass cultivated varieties in production in terms of economic traits, and their use in genetic and breeding research as an initial source for improving economically valuable traits.

References:

1. Namazov Sh.E., Kholmurodova G.R. Effectiveness of convergent hybridization in cotton breeding Monograph. "Fan" Publishing House, UzA. Tashkent, 2011, 136 pages.

2. Namazov Sh.E., Kholmurodova G.R. Djumayeva G.P. Effectiveness of convergent hybridization in cotton breeding MonographY. Tashkent, "NAVRUZ" Publishing House, 2015. 160 p.

3. Namazov Sh.E., Kholmurodova G.R. Inheritance and variability of wilt resistance in convergent F1-F3 hybrids and initial forms of cotton. Journal "Actual Problems of Modern Science" No 1 (92) 2017. Moscow, "Sputnik+" Publishing House. P. 173.