

## CREATION OF EARLY, INTENSIVE, FORK-RESISTANT COTTON VARIETIES ON THE BASIS OF COLLECTION SAMPLES

Yashin Babaev Amanovich <sup>1</sup>, Gulmira Orazbayeva Egambergenovna <sup>2</sup>, Kim Robert Grigorevich <sup>3</sup>

<sup>1,2,3</sup>Cotton Breeding, Seed Production and Agrotechnology Research Institute. Republic of Uzbekistan

**Abstract:** This article studies the creation of early maturing, intensive, wilt-resistant cotton varieties based on collection samples and many wild forms of cultivated species and wild diploid cotton species.

**Key words:** collection, genealogy of varieties, hybrid, early maturity, productivity, wilt resistance, fiber quality, boll size, rate of development, intensive varieties, cotton.

### I. Introduction

Many wild forms of cultivated species and wild diploid species of cotton have unique characteristics, such as immunity to diseases and pests, in particular, verticillium wilt, drought and cold resistance, deciduousness, high fiber quality, such as strength, fineness, and others. Therefore, the desire to transfer valuable traits of wild species to varieties and cultivated forms is of great interest to distant and interspecific hybridization, as highly effective methods for creating new source material for breeding.

The early maturity of cotton is the most important problem of cotton growing not only in the Republic of Uzbekistan, but also in many cotton-growing countries of the world in order to obtain an early high-quality harvest. The economic importance of the precocity of cotton, especially, increases in unfavorable years, when late spring, low sum of effective temperatures during the growing season and early autumn greatly reduce the quantity and quality of raw cotton.

Therefore, the issue of early maturity of cotton has always been acute and needs fundamental research, since early maturity is a genetically determined property of the organism, which is determined by the intensity of the physiological and biochemical processes occurring in the plant organism.

The disease of cotton with the defeat of *Verticillium dahliae* is expressed mainly in a deep change in plants of physiological and biochemical processes (A.B. Amanturdiyev et al.) [2].

H. Saidaliev [7], R. G. Kim [4], R. G. Kim, Kh. Saidaliev, Ya. A. Babaev [5] studied the genotypic wilt resistance of collection varieties of foreign selection. The authors note that the studied varieties of foreign selection have a different degree of susceptibility to wilt on a natural wilt background, where virulent populations of the fungus *Verticillium dahliae* predominate for varieties C-6524, Namangan-77 and Omad.

P.V. Popov and D. Daminova [6], note that with an increase in precocity, the degree of damage to the plant by wilt increases, although the obtained indicators of conjugation of the signs of tolerant resistance and the length of the growing season are genetically determined, however, directional

selection in hybrid populations makes it possible to obtain forms that combine both high precocity, and wilt tolerance.

S.M.Rizaeva [8] recommends using the species *G.raimondii*, *G.thurberi*, *G.trilobum*, *G.harknessii* for genetic breeding work, which have a high donor ability to improve the technological qualities of the fiber, increase resistance to diseases and pests.

S.S. Alikhodzhaeva et al. [1] obtained hybrids with high resistance to wilt with the participation of *ssp. punctatum*.

In this regard, it seems appropriate to identify the most effective ways to use economically valuable traits and properties, modern varieties of different geographical origin in terms of early maturity, resistance to wilt, agricultural diseases and pests, and other traits to create highly productive cotton varieties with complex resistance (Kim R. G. 2009).

However, in the matter of creating early-ripening and resistant to agricultural diseases and pests varieties and forms of cotton with a complex of morphological and economic traits, it is necessary for breeders to decide on the mobilization of the gene pool of cultivated and closely related wild species, the identification and creation of genetically identified sources of resistance to a complex of major diseases, their genetic evaluation as donors. resistance, creation of genetic sets of forms and varieties for identification of virulence genes and territorial distribution, as well as breeding regulation of wilt resistance genes by inoculation of the host plant with new virulent populations of the *Verticillium* fungus, which will allow obtaining new genetic material for the breeding process, which is very important in scientific terms.

## **II. Methods and object of research.**

The experiments were carried out on a naturally infected wilt background in the experimental farm of NIISAVKh. During the growing season of cotton on July 1, August and September, censuses and phenological observations were carried out. The wilt was recorded according to the method generally accepted in research institutes, i.e. visually, by leaf necrosis, in a general and strong degree, every 15 days from August 1 to September 15. The category of the general degree includes plants that have single necrotic spots on the leaves and are completely dead, and the category of a strong degree includes plants in which 80% of the leaves or more have fallen and are dead.

The natural infectious background was formed as a result of long-term cultivation of various varieties, forms, species and hybrid populations of cotton and the conjugated evolution of plants - host and parasite (hybridization and mutation of the fungus).

In autumn, 20 box test samples were collected from all accounting plants for laboratory determination of the mass of raw cotton in one box, yield, fiber length and quality, and other analyzes. Statistical processing of morphoeconomic data was carried out by B.A. Dospekhov [3]. One of the most classic methods of matching couples is matching them on the principle of geographical and genetic remoteness. In breeding work, we widely use geographical distant forms in crosses to obtain hybrids that are distinguished by increased vitality and their adaptability to growing conditions.

Collection samples, domestic varieties and lines, as well as geographically distant intraspecific and interspecific hybrids were used as the source material for breeding work.

The object of research was cotton varieties S-8284, S-8288, S-8292, S-6530 and lines LS-6598, L-030, L-5, L-303, L-175/245 obtained by intervarietal and interspecific hybridization. based on geographically distant forms. The zoned cotton variety C-6524 served as the standard.

### III. Morphological and economic characteristics of new intensive varieties of cotton.

The most common breeding method with cotton is intervarietal and distant hybridization. At the same time, much attention is paid to the study and selection of initial parental forms according to development phases, productivity, fiber quality and yield, bolls size, resistance to verticillium wilt, and other characteristics. Therefore, the selection of parental pairs is the main selection strategy. Pairs must be selected so that one of the parents is more early maturing, especially resistant to wilt. In breeding work, we widely use geographical distant forms in crosses to obtain hybrids that are distinguished by increased vitality with their suitability for various cotton-growing regions of the Republic of Uzbekistan.

As a result of many years of breeding work, we came to the conclusion that in intervarietal, interlinear and distant ecological and geographical crossings, preference is given to maternal and paternal forms, which are distinguished by high wilt resistance, early maturity, productivity, yield and quality of fiber, high mass of raw cotton per boxes, drought tolerance and other features. In the process of breeding work based on selections among families, it seems possible to obtain breeding materials with good economically valuable traits and complex wilt resistance.

Table 1 presents data on economically valuable indicators of the most promising lines. The line was evaluated by early maturity, size of boxes, resistance to wilt, weight of 1000 pcs. seeds, and indicators of fiber quality.

The studied lines in terms of early maturity exceed the standard variety C-6524 by 2-3 days. The lines obtained by the duration of the growing season are of considerable interest. Especially positively differed in this trait than other lines and

**Table 1.**  
**Morphoeconomic features of the line in the breeding nursery.**

№	Varieties and lines, as well as their origin	Soon-ripeness days	Box size, g.	Fiber output, %	Weight 1000 pcs. seed, G.	Wilt disease, %.		Fiber quality indicators			
						General.	Including power damage	Mic.	Str.	Len.	Co d.
1	C-6524(st)	112	5,7	36,7	118,0	35	21	4,8	30,5	1,13	36
2	Л-717 (F <sub>1</sub> C-6530 x ЛS-	110	6,5	36,5	126,0	18	8	4,5	34,5	1,19	39

	6598) x Л-030) x (F <sub>1</sub> C- 8284 x ЛS- 6598) x Л-030										
3	<b>Л-2014</b> (Л-303 x Л-5)	108	6,2	36,3	121,0	16	9	4,4	33, 5	1,1 6	37
4	<b>Л-2017</b> (C-8288 x Л-5)	109	6,3	37,3	119,0	10	4	4,4	33, 3	1,1 5	37
5	<b>Л- 45/573(</b> Л- 155xЛ- 175/245 ) x Л- 175/245	109	6,4	38,7	122,0	13	5	4,3	33, 2	1,1 6	37
6	<b>Л-2022</b> (Л-155 x Л-5) x Л-5	110	6,2	37,3	125,0	8	6	4,6	34, 0	1,1 7	37
7	<b>Л-2024</b> (Л-303 x Л- 175/245 ) x Л- 175/245	109	6,1	36,3	126,0	18	13	4,2	33, 1	1,1 6	37
8	<b>Л-2027</b> (C-8288 x Л- 175/245 )	111	6,5	36,0	121,0	17	8	4,2	33, 4	1,1 7	37
<b>HCP<sub>05</sub></b>		1,71	0,3 7	1,32	6,33						

standard grade C-6524, lines Л-2014, Л-2017, Л-45/573 and Л-2024, in which the growing season was 108-109 days, which is considered an important valuable material for the breeding process.

In terms of the mass of raw cotton in one box, all the lines obtained are superior to the variety C-6524 in 0.4 - 0.8 g. The size of the box varies from 6.1 to 6.5 g. Y copra C-6524 it equals 5,7 g. Relatively large boxes have lines JI-717, JI-2021 and JI-2027 in which it is from 6.4 to 6.5 g. Y for the rest of the lines, it varies from 6.1 to 6.3 g.

In terms of fiber yield, the line did not show a significantly higher result than the standard. For most lines, the fiber yield fluctuated at the level of the standard, except for the line JI-2017, JI-45/573 and JI-2022. The fiber yield of these lines ranged from 37.3% to 38.7%, which exceeds the standard C-6524, which the fiber yield is 36.7%.

Weight 1000 pcs. seeds is considered the main influencing factor on the size of the boxes and on the field germination of seeds of breeding material. The above table 1 weight 1000 pcs. seeds in these lines varied from 119.0 g to 126.0 g. A relatively high result was observed in the line JI-717, JI-2022 and JI-2024 in which it is from 125.0 g to 126.0 g.

Wilt resistance is one of the most important parameters of the created cotton varieties, which depends on the pathogenicity of the parasite and on the genetic nature of the host plant. The resulting lines had a higher resistance to *Verticillium* wilt than the standard variety. C-6524. Lines had higher stability JI-2017, JI-45/573 and JI-2022 in which stability fluctuated in general 8-13%, and in a strong degree 4-6%.

The fiber length of the studied lines in inches (Len.) varies from 1.15 to 1.19, while the fiber length of the standard variety is 1.13. Lines had higher fiber length in inches JI-717, JI-2022 and JI-2027, in which it is equal to 1.17-1.19. In other respects, the fiber quality of all studied lines exceeds the standard. At the same time, it should be noted that the fiber length of the studied lines meets the requirements of type III-IV.

## Conclusion

1. The conducted studies show the breeding possibility in creating varieties, lines and families of cotton for the future, which will have high wilt resistance to more virulent populations (isolates) of the *Verticillium* fungus, since in nature there is a constant accumulation in the soil of more virulent and aggressive races (biotypes) of the fungus *verticillium* due to the conjugated evolution between resistant varieties and the parasite, which is a great danger to cotton growing.

2. Lines with high early maturation, yield, resistance to wilt and good technological properties of the fiber have been identified, which can be used in the breeding process to create new highly productive, early maturing cotton varieties with complex wilt resistance to more virulent natural populations of the *verticillium* fungus.

3. Due to the violation of correlations between early maturity and wilt resistance, between early maturity and the mass of raw cotton in one box and the quality of the fiber, early ripening, wilt-resistant, highly productive varieties have been created. C-8297, C-8298, C-8299 and lines JI-717, JI-2022, JI-2027 cotton, which have a growing season of 110-115 days, a raw cotton weight of one box of 6.0-6.5 g, a fiber yield of 37.0-38.0% and IV-type fiber quality, which are unique in the genetic and breeding practice.

## REFERENCES:

1. Alikhodzhaeva S.S., Madartov B., Kuchkarov O.E., Usmanov S., Amanturdie A., Norov B. "Biological and economic characteristics of new specimens of varieties of the species *G.hirsutum* L. from Mexico". //Materials of the republican scientific-practical conference "The use of breeding and genetic methods in the creation of new varieties of cotton and alfalfa resistant to various extreme conditions." Tashkent. 2012. S. 17-20.
2. Amanturdiyev A.B., Kim R.G. "The structure of the bush and its relationship with the morpho-economic characteristics and wilt resistance of the Goss cotton plant. *hirsutum* L. // Monograph. Tashkent. 2008 348 p.
3. Armor B.A. Methods of field experience. M., Kolos, 1985, 351 p.
4. Kim R.G. Morphological and economic features of the best breeding families and lines of the species *G.hirsutum* L. // Proceedings of the international scientific and practical conference. Tashkent, 2007. - S. 186-188.
5. Kim R.G., Saidaliev Kh., Babaev Y. "Morpho-economic features of collection varieties of cotton species *G.hirsutum* L." //AGRO ILM. Uzbekiston qishloq khzhligi magazines. Tashkent, 2007. - 2-dream. 5-6 b.
6. Popov P.V., Daminova D. "The relationship between resistance to wilt and the length of the growing season on different backgrounds of infection" Proceedings of the international scientific conference "Evolutionary and breeding aspects of early maturity and adaptability of cotton and other crops" Iz-vo "Fan", Tashkent, 2005, p. 120-121.
7. Saidaliev H. "Using the genetic potential of the species *G.hirsutum* L and *G.tomentosum* in improving the economically valuable traits of cotton." Abstract of the dissertation for the degree of Doctor of Agricultural Sciences. -Tashkent. 2003. -41 p.
8. Rizaeva S.M. "Remote hybridization of cotton and obtaining new donors". Abstract of the dissertation for the degree of Doctor of Agricultural Sciences. -Tashkent. 1996. -48 p.