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«Characterization of cotton lines resistant to salinization and water deficiency, obtained on the basis of wild and ruderal varieties of the species *G.hirsutum* L.»

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Abstract

Researched cotton lines are highly resistant to water deficiency and salinization, are characterized by high technological qualities of the fiber and among the used species of *G.hirsutum* L. among the best donors for resistance to the 2 race of the fungus *Verticillium dahliae* Kleb, prevailing in the soils of Uzbekistan. The use of these lines allows you to create varieties with high rates on agronomically valuable traits in combination with resistance to the wilt and to the stress factors studied.

Introduction

The problem of water scarcity and salinization is now becoming of paramount importance due to climate change in the Central Asian region, which leads to a reduction in water resources and an increase in saline soils. In this connection, there was an urgent need to create varieties resistant to these stress factors. For these purposes, the entire genus *Gossypium*, and in particular the species *G.hirsutum* L., is not fully understood in terms of its possible use in connection with the problem of water deficiency and salinity. The goal of the research is to create cotton varieties that are comprehensively resistant to salinization and water deficiency through the use of wild and ruderal varieties of the species *G.hirsutum* L.

Material and methods of researches

The research is aimed at creating cotton varieties that are comprehensively resistant to salinization and water deficiency using the extensive genomic-based breeding and water-salinity research lines created by the CBCPARI laboratory on an extensive genomic basis. They were obtained on the basis of studying the global gene pool, taking into account, from the standpoint of adaptive selection, the genetic diversity expressed by various levels of resistance in conditions of water deficiency, salinization of wilt and healthy backgrounds, which made it possible to identify new sources of germplasm (*ssp. Yucatanense, punctatum, morilli,*

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richmondi, m .galante, brasiliense, G.thurberi, G.raimondi and others) are resistant to the studied stress factor. At the same time, hybridization was performed on linear material (F_{17}), where the best varieties of the American Acala 1517-70, Acala Sj1, Acala Sj5, Deltapine 16, Paymaster 266, Delcot 277, 06, 045, 0225, 0226, Selection Compositae and domestic selection: C participated -9070, Tashkent-1, S-6524, 108-F, 149-F, Namangan-77 and the above species and varieties. The entire breeding process took place on 3 backgrounds in parallel: - a severe water deficit (0-1-0) in the CBCPARI Tash. reg. with (8-10 m) depth, occurrence of groundwater, salinization - branch - Syrdarya region. (0-1-0) with a depth of groundwater of 1.5-2.0 m. And a normal background of growing (1-2-1) – CBCPARI. The experiments were laid in 3x repetition. Standard varieties used as control varieties S-6524, An-Bayaut-2.

The focus of the research was on combining the high potential productivity and early maturity of the new varieties with the ability to withstand the effects of abiotic and biotic factors.

The solution to the scientific problem is based on previously developed methods for creating cotton varieties and lines resistant to water deficiency and salinization on a new genomic basis.

Results of researches

In recent years, climatic conditions in the country have changed dramatically in the direction of increasing air temperature to significant values (40-50 ° C) in all regions of the country during the entire period of cotton growing, including in the northernmost regions (Tashkent, Kharezm region). At the same time, the water supply of the rivers decreased, which affected the water shortage, which led to a decrease in the number of irrigation on cotton. In this connection, the increase in the percentage of soil salinity continues.

Given these factors, our research was aimed at creating varieties of cotton that can successfully develop in conditions of 1-2 irrigations, with a water supply regime and depending on their number 1100-1300 m^3 in total 2500 m^3 (the first in the period of mass flowering and the second in the middle August) giving at the same time IV-type fiber, both in conditions of saline soils, and in its absence. At the same time, we necessarily took into account the depth of the water depending on the region under study. The work went in parallel with salinization and water scarcity.

Today it is important that the material created is tested in different regions of the republic with different depths of groundwater and a different percentage of salinity. In this case, it is necessary to identify lines that, possessing plasticity, can be grown simultaneously in different regions, and some varieties would be specific for a particular region.

It is necessary to notice, that received lines it is result of selection when in a genealogical each line participates from 2-8 and more initial forms from which 2-

4 are wild and half wild forms. The linear material of such order is received for the first time. At such schemes of crossing, at change of ecological factors, the latent reserve of variability here again an important role is found out belongs recombination to processes. Such recombination selection provided continuous expansion of a spectrum accessible to us to selection of genetic variability of agronomic-valuable traits and is adaptive significant traits, including the number of the identified genetic donors of potential productivity and ecological stability constantly increased. Thus, we pursued the aim to create not only steady lines to salting but that they could possess a complex of agronomic-valuable traits in these conditions and could meet the requirements of manufacture and the textile industry.

Within several years on skilled sites we carried out the soil analysis on salinity. Researches have shown, on prevalence chloralsalting which on the average made 0,040-0,045 % with the dense rest 1,550-1,565 by the vegetation end.

Table 1. The characteristic of lines to agronomic-valuable traits in conditions salinity

№	Name of combinations or sorts	Boll waiting (g.)	Fiber output (%)	Micro-naire	Staple length (inch)	Stren-gths (gt|tex)	1000 seeds waiting (g)
1	st.S-6524	5,1	36,4	4,6	1,10	31,3	113
2	st.An-Bayaut-2	5,5	39,4	5,1	0,99	26,1	112
3	S-9070 x (Acala 1517-70 x *punctatum*)	6,2	38,0	4,2	1,24	32,5	120
4	(SG-1 x S-9070)x(Acala 1517-70 x *punctatum*)	7,4	38,2	4,2	1,22	31,2	109
5	(SG-6 x (149-F x S-6524)	7,0	38,5	3,9	1,26	32,4	122
6	Acala-1517-70 x *marie-galante*	5,5	35,0	4,0	1,26	34,2	128
7	(SG-1 x IK-1) x DPL-61	8,1	38,0	4,0	1,21	33,2	121
8	(Acala-1517-70 x (T-1 x *bras.*) x SG-3 x S.Compos.	7,0	40,9	4,0	1,22	30,3	120
9	S-6530 x Acala 1517-70 x *marie-galante*	8,1	37,5	4,4	1,22	31,3	140
10	SG-1 x (149-F x S-6524)	6,5	40,0	4,2	1,22	32,3	114
11	*Yucatanense* x *punctatum*	7,0	38,6	4,2	1,24	32,4	114

First of all, we were interested in the combination of a complex of positive agronomic-valuable traits as far as possible at cultivation of plants of late generations (F_{17}) in the conditions of the salted background at water deficiency (0-1-0) at depth flooding subsoil waters of 1,5-2,0 m. And the emphasis that for

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creation of varieties such is necessary selection on efficiency of a message in late generations when set of other necessary traits is reached was placed, as has been undertaken by us.

As show given (tab. 1) us the high combination of a complex of agronomic-valuable traits is reached in the presented lines (for convenience of their analysis we have given them numbers) at their cultivation in the conditions of a studied background. On precocity of a line it is insignificant, differed from each other with distinctions in 1-3 days and were up to standard of standard varieties S-6524 and An-Bayaut-2. Here it is necessary to underline, that any zoned varieties in the conditions of the salted soils, appear late ripen. All material without an exception on precocity was up to standard of standard varieties and surpassed these varieties which are grown up in these conditions in all studied parameters. So on weight of a raw of one box in 6 lines from 9 weight of a clap-raw of one box it was equal 7,0-8,0 gr, and at the others it has made 5,5-6,5 gr.

Simultaneously for them the high indicator of an exit of a fiber, 38,0-40,9 % was characteristic. The given characteristic has not proved to be true in the combination (SG-1 x IK-1) x DPL-61. In unique combination Acala-1517-70 x *marie-galante* it has made 35,0 % at exclusive indicators on technological qualities of a fiber. It is the donor of quality of a fiber which goes from a version marie-galante. Such limit of an indicator of an exit of a fiber, has allowed to have high enough absolute weight of 1000 seeds - 120-130 and even to 140 г, as for example, in combinations S-6530 x (Acala-1517-70 x *marie-galante*) and only in two cases absolute weight of 1000 seeds reached 108-114 on, that is especially necessary to turn, attention as we already noticed, that all of them had high technological qualities of a fiber that does not meet in domestic varieties. So the indicator micro neuron has made 4,0-4,4 at length of 1,21-1,30 inches that exceeds indicators of IV type and gives indicators III and even II type of a fiber. All have allowed to have specific explosive loading in the basic 31,2-34,2 with/teks. For all it was characteristic, presented to *tab. 1* precocity presence at level of standard varieties from tendencies to its acceleration and stability presence to *Verticillium* wilt race 2.

Conclusions

Proceeding from the received data, it is possible to draw a conclusion:

- to create an ecologically plastic variety, the source material must be studied in different ecological zones of the republic with different irrigation regimes and taking into account soil salinity;

- varieties and lines obtained on the basis of complex hybridization of American varieties using wild and ruderal varieties contribute to increased productivity in combination with other agronomically valuable traits when grown under conditions of complex water deficiency and soil salinity;

- for the first time, a new varietal linear material with high characteristics parameters was obtained that differs from the previously created varieties by a

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combination of early maturity (121-123 days) with the size of the bolls (5.5-8.1 g) and when the fiber is released (35.0-40, 9%) with high microneire (3.9-4.4), specific breaking load (30.3-34.2) and fiber length (1.17-130 inches) with complex resistance to water deficiency and salinization at growing them in saline soil conditions.

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