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CREATION AND ISOLATION OF HYBRIDS RESISTANT TO VERTICILLIUM DAHLIAE KLEBAHN

One of the main signs determining the yield of raw cotton is the sign "V.dahliae plant damage", which is especially important in the soil and climatic conditions of the Republic of Uzbekistan, as a rule, low temperatures in August and September contribute to significant plant damage and, as a result, low and late harvest of raw cotton. Based on the analysis of the results of the conducted research, conclusions should be drawn: -- the source material involved in hybridization in relation to the differentiator variety C-6524 and the indicator variety Bukhara-102 has a high tolerance resistance to V.dahliae. - judging by the magnitude of the dominance index (hp), six hybrids have a negative effect of complete over-dominance. Five have a heterosis effect. One has a negative effect of incomplete dominance. - the value of the heritability coefficient (h²) in F₂ hybrids ranges from 0.83 in L-588hNamangan-34 to 0.96 in BSG-455 x Namangan-34 and BSG-2/06 x Namangan-102, which suggests a high genotypic variability of the analyzed trait; - the value of the heritability coefficient in F₃ hybrids ranges from 0.71 in L-175/276 Namangan-34 to 0.97 in NSHE-19/06x Namangan-34, and BSG-2/06 x Namangan-102, which indicates that the trait is inherited at a high level, which means that, starting from From f₃, separate families with a low lesion rate of V.dahliae plants should be distinguished, which is important from a breeding point of view.

Key words: cotton, G.hirsutum L., pathogen, Verticillium dahliae Klebahn, selection, hybrid, variety, line

INTRODUCTION

The main problem in the selection of cotton varieties facing breeders is an increase in fiber yield per unit area, and since Uzbekistan is located in the north of the world cotton crop, the creation of precocious, highly resistant varieties to V. dahlia is no less important and urgent. Since the above-mentioned pathogen is most harmful during the formation and accumulation of the raw cotton crop, which is associated with a decrease in average daily temperatures. The problem of creating precocious, V.dahliae-resistant cotton varieties was studied (Mirakhmedov, 1974; Avtonomov, 1992; Avtonomov, 2006, 2007, Namazov, 2006, Kurbonov, Avtonomov, 2020, Ravshanov, Avtonomov, 221, Alimova, Avtonomov, 2024, Bakirova, Ravshanov, 2024). Significant success has been achieved in breeding work to create varieties resistant to V.dahliae (Kanash, 1954, Mirakhmedov, 1974, Avtonomov, 1992, Namazov, 2006). As can be seen from the presented analysis of literary sources, the method of geographically distant hybridization has gained a

strong place in expanding the range of variability of traits in splitting generations and selecting valuable families and lines, with the aim of further elaboration in the breeding process. Due to the high demand of the textile industry for high-quality raw cotton, the country's breeders have a goal in timely saturation of the market with new varieties with ultra-ripeness, high productivity of raw cotton, increased quality and fiber yield, combined with high resistance to the main biotic environmental factors.

The purpose of this work is to establish a number of genetic patterns of variability, inheritance and heritability of the "V.dahliae plant lesion" trait in linear varietal hybrids F₁-F₃.

Based on the problem being solved and the purpose of the research conducted within the framework of this work, the following tasks are defined: - study of the range of variability of the trait "defeat of V.dahliae plants" in hybrids F₁-F₃;

- determination of the dominance index (hp) in F₁ hybrids;

- establishment of the heritability coefficient (h²) of the trait in hybrids F₁-F₃.

Venue, methodology, source material

The research was conducted at the Uzbek Scientific Research Institute of Breeding, Seed Production and Agrotechnology of Cotton Cultivation (NISSAVH) The Ministry of Agriculture of the Republic of Uzbekistan within the framework of the approved work program of the laboratory "Marker of associated breeding". The Institute is located three km from the city.Tashkent with coordinates of 41°20 north latitude and 69°18 east longitude. The soils are typical gray soils of the slopes and foothills of the Tien Shan on forest-like loams, not saline, with deep groundwater (more than 15 m). In the conditions of one year, the parents used in hybridization and F₁-F₃ hybrids were studied. When conducting field experiments, the agrotechnology of cotton cultivation adopted for this zone was used. Hybridization was carried out with the participation of lines created on the basis of polygenomic hybridization L-175/276, BSG-2/06, BSG-455-56/127, L-2007, NSHE-19/06, L-588 as mothers, and Namangan-34 and Namangan-102 varieties were used as fathers. All plants of F₁-F₂ hybrids, as well as parent varieties, were numbered by hanging labels. For each hybrid combination, 20-50 plants were studied in F₁, 100-150 plants in F₂ and parent varieties used as components for hybridization, and 30-70 plants in F₃ families. The field experience was laid out in three-fold repetition, in randomized blocks. The records were carried out in parents and F₁-F₂ hybrids individually by plant, and in F₃ by family. The account of the lesion of V.dahliae plants was carried out according to the method (Popov, Minko, Popov, 1974). Based on experimental data, the following were compiled variation series according to the studied feature. The calculation of statistical indicators was carried out according to B.A.Dospekhov (1979). The value of the dominance index (hp) of F₁ hybrids was determined by the formula: (Y.M.Beil, R.E.Atkins, 1965). The degree of heterogeneity of hybrid populations F₂-F₃ was judged by the indicator of genotypic variability – the value of the heritability coefficient (h²), calculated by the formula A.Allard (1966). Research results Analyzing the results of the conducted field studies, it was found that the minimum average value of the analyzed trait in relation to the differentiator variety C-6524 and the indicator variety Bukhara-102 possessed

all lines and varieties involved in hybridization without exception. Analyzing the average values of the sign "V.dahliae plant lesion on September 1" in F₁ hybrids, it was found that it ranges from 0.32 in BSG-455-56/04 and NSHE-19/06 x Namangan-102 to 0.44 in L-588 x Namangan-34. When analyzing the values of the dominance index (hp), it was found that its value in F₁ hybrids ranges from -1.2 in NSHE-19/06 x Namangan-102 to 13 in L-588 x Namangan-34, which allows us to conclude that the following dominance effects are present: one has a negative effect of incomplete dominance; the other five have the effect of heterosis, six have the negative effect of complete over-dominance. Analyzing the value of the heritability coefficient (h²) in F₂ hybrids, it was found that the sign "defeat of V.dahliae plants on September 1" is inherited at a high level. Its value ranges from 0.83 for the hybrid L-588hNamangan-102 to 0.96 for the hybrid BSG-455-56/ 07khnamangan-34 and BSG-2/06khnamangan-102. Analyzing the value of the heritability coefficient in F₃ hybrids, it was found that the sign "defeat of V.dahliae plants on September 1" is inherited at a high level. At the same time, its value ranges from 0.79 for the hybrid L-588KHNAMANGAN-102 to 0.97 for the hybrid NSHE-19/06khnamangan-34 and BSG-2/06khnamangan-102. This indicates that the trait is inherited at a high level, which means that, starting from F₃, resistant families to the above-mentioned pathogen should be isolated. Based on the analysis of the results of the conducted field studies, the following conclusions should be drawn on the basis of "V.dahliae plant damage on September 1": - the source material involved in hybridization in relation to the grade-differentiator C-6524 and the grade-indicator Bukhara-102, has a high tolerance resistance to V.dahliae; - judging by the magnitude of the dominance index (hp), six have a negative effect of complete over-dominance, five have a heterosis effect, and one has a negative effect of incomplete dominance; - the value of the heritability coefficient (h²) in F₂ hybrids ranges from 0.83 in a L-588hNamangan-34 to 0.96 in BSG-455 x Namangan-34 and BSG-2/06 x Namangan-102, which suggests a high genotypic variability of the analyzed trait; - the value of the heritability coefficient in F₃ hybrids ranges from 0.71 in L-175/276 Namangan-34 to 0.97 in NSHE-19/06x Namangan-34, which indicates that the trait is inherited at a high level, which means that, starting with F₃, highly resistant families to the above-mentioned pathogen should be isolated.

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