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Research Article

COMPARATIVE ASSESSMENT OF AGRONOMIC VALUABLE TRAITS OF FAMILIES OF LINE L-33 DEPENDING ON THE TYPE OF BRANCHING AND GROWING CONDITIONS

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ABSTRACT

The wide range of variation of agronomic valuable traits of cotton makes it possible to form families that differ in the type of plant branching and the complex of agronomic valuable traits. The experiment studied the variability of agronomic valuable traits in families with the limiting and non-limiting type of branching having the same origin. A slight change in the indicators of the main agronomic valuable traits, depending on the growing conditions, characterizes the high adaptive ability of this L-33 line. The most significant influence of the correlation coefficients was observed based on the raw cotton weight of one boll, the fiber output and the weight of 1000 seeds.

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KEYWORDS

Uzbekistan, cotton, lines, a raw cotton weight of one boll, fiber output, fiber length, growing conditions.

INTRODUCTION

Cotton is a valuable agricultural crop, and the introduction of the most productive varieties into production is relevant. Cotton breeding for resistance to adverse environmental factors requires the availability of an appropriate source material, its environmental testing and a comprehensive assessment of the breeding material. From success in increasing the resistance of varieties to adverse environmental factors, first of all, depends on the growth of the size and quality of the crop in adverse, and, moreover, extreme conditions. The productivity of cotton is determined by a combination of a number of indicators, of which the mass of raw cotton in one box and their number, such as the number of grains, fiber yield, etc., have the greatest influence. According to many authors [1–4], plant productivity has a close correlation with the weight of the cob and the mass of grain from the cob, to a lesser extent depends on the height of the plant and the yield of grain. One of the most common methods for assessing the productivity of maize hybrids and lines is the identification of genotypes by quantitative (indirect) traits [4].

Thus, rice varietal diversity is subdivided according to geographical origin and morphological characteristics into agroecotypes adapted to certain soil and climatic conditions of cultivation [2]. Each ecotype is distinguished by hereditary traits; when plants are transferred to other conditions, it can retain or change its hereditary features for several generations, while its morphotype is preserved [3]. In order to reduce the ecological dependence of varieties, it is necessary to conduct targeted breeding for general adaptability to unregulated environmental factors [5]. It is possible to increase the efficiency of the breeding process by having a genetically stable source material with improved morphological features [6].

The purpose of the research is to evaluate the manifestation of economically valuable traits of families of the L-33 line with different types of branching and to determine the degree of correlation between the main economically valuable traits in cotton plants.

MATERIALS AND METHODS

Experimental studies were carried out at breeding nurseries in conditions of deep groundwater (8-10m) Tashkent region and in the Syrdarya region in saline soils with close groundwater (1.5-2m). Line L-33 is divided into families with zero and 1 type of branching. In the Tashkent region, they were sown according to the scheme 60x30-1, and in the Syrdarya region, according to the scheme 90x15-1. In the Tashkent region, 4 irrigations were carried out, and in the Syrdarya region, 1 irrigation.

Statistical processing of the obtained digital material was carried out according to Dospekhov, [7] using the Microsoft Excel software package.

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RESEARCH RESULTS

When growing cotton, various sowing schemes are used, and plants with the limiting type of branching are used in two-line and thickened crops. In this regard, the study of the adaptive abilities of cotton families has a certain practical significance. In table. 1 shows the characteristics of families of line L-33 with different types of branching in the conditions of Tashkent and Syrdarya regions.

Table 1

Characteristics of families of line L-33 with different types of branching in the conditions of Tashkent and Syrdarya regions.

Economically valuable features	Tashkent region		Syrdarya region	
	C-33/0	C-33/1	C-33/0	C-33/1
Weight of raw cotton of one box, g	7,5±0,32	6,8±0,09	6,7±0,06	7,3±0,11
Limit of variability	6,2-10,1	5,1-10,6	5,0-8,7	5,1-9,9
Homeostatic	48	52	68	52
Fiber yield, %	40,1±0,61	41,3±0,02	39,6±0,19	39,7±0,23
Limit of variability	37,0-43,5	38,7-43,5	34,9-45,2	34,3-44,9
Homeostatic	724	1229	821	733
Weight of 1000 pieces of seeds, g	123±2,45	117±1,02	120++1,04	122±1,29
Limit of variability	101-140	96-145	97-142	97-161
Homeostatic	1707	1457	1350	1240
Fiber index, g	8,25±0,26	8,23±0,08	7,82±0,08	7,98±0,08
Limit of variability	6,73-10,07	6,77-10,28	6,38-10,2	6,13-10,56
Homeostatic	72	91	76	84
Fiber length, mm	35,5±0,51	35,3±0,11	35,4±0,16	35,1±0,17
Limit of variability	34,2-38,9	33,9-37,5	32,2-39,2	32,0-38,9
Homeostatic	953	1338	772	780

From the given data, it can be seen that a larger box was observed in C-33/0 in the conditions of the Tashkent region, in the conditions of the Syrdarya region in C-33/1. The limit of variability of this trait did not have significant differences depending on the type of branching and the place of cultivation. Similar results were obtained in terms of homeostatic mass of raw cotton in one box. The fiber yield indicators and the limit of variability of this trait in the studied families also did not have significant differences depending on the type of branching and the place of

cultivation. The highest rate of homeostatic fiber output was observed in the C-33/1 family in the conditions of the Tashkent region. Similar results were obtained for the trait of the mass of 1000 seeds. Here, the highest homeostatic index was observed in the C-33/0 family in the conditions of the Tashkent region. There were no significant differences in fiber index.

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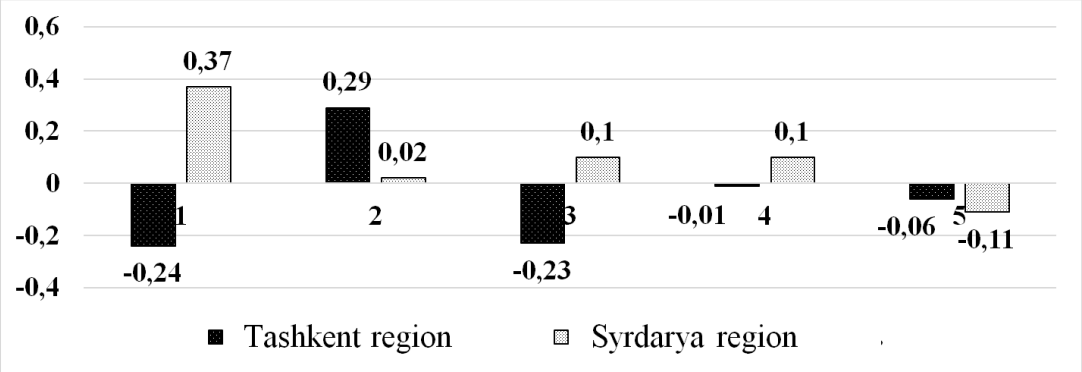
The same picture is observed in terms of fiber length. This indicates a high adaptive capacity of families, although the studied traits are subject to strong variability depending on growing conditions. From the above data, it can be seen that the highest rates of homeostasis were observed in the C-33/1 family both in the conditions of It is customary to determine the indicators of economically valuable traits for a reliable assessment by the correlation coefficient, which will make it possible to establish the tightness of the linear relationship between plant traits and determine the quantitative parameters of the future breeding material. The correlation coefficients between the type of branching and the main economically valuable traits are shown in Figure 1. According to the histogram data, it can be seen that the most significant influence of the correlation coefficients was observed on the traits of raw cotton weight of one box, fiber yield and weight of 1000 seeds in the conditions of the Tashkent region. The sign of the mass of raw cotton in one box is associated with many elements and depends primarily on the number and mass of seeds, fiber yield.



(Picture 1. Correlation dependence between the type of branching and the main economically valuable features.)

Note: 1. type of branching - the mass of raw cotton in one box; 2. type of branching - fiber output; 3. branching type - weight of 1000 seeds; 4. type of branching - fiber index; 5. type of branching - fiber length;

As a result, there is a moderate correlation between the type of branching and the mass of raw cotton in one box, and in the conditions of the Tashkent region, this dependence has a negative value. The correlation between the type of branching - fiber yield and the weight of 1000 seeds in the conditions of the Tashkent region was positive in the first case, and negative in the second. The remaining correlations were not significant.

CONCLUSIONS

The obtained research results show a high adaptive ability of families, although the studied traits are subject to strong variability depending on growing conditions. The highest rates of homeostasis were observed in the C-33/1 family both in the conditions of Tashkent and in the conditions of the Syrdarya region.

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A slight change in the indicators of the main economic traits, depending on the growing conditions, characterizes the high adaptive ability of this L-33 line. And the preservation of indicators in families with different types of branching allows using these families to create varieties adapted to different sowing patterns.

The most significant influence of the correlation coefficients was observed on the basis of the weight of raw cotton of one box, the yield of fiber and the weight of 1000 seeds. Most of the correlations were not significant

According to the results of the research, it was found that this analysis of the relationship of quantitative traits made it possible to identify patterns that can be used in further work with families of the L-33 line. In particular, to an average degree and in most cases, a weak correlation between the type of branching and the main economically valuable traits makes it possible to create varieties based on families of L-33 lines with different types of branching and high adaptive ability.

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