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INHERITANCE OF VALUABLE-ECONOMIC CHARACTERS OF F_3 HYBRIDS OF DIFFERENT GENETIC ORIGIN IN TASHKENT, FERGANA AND KASHKADARYA REGIONS

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Abstract

Comparative analysis of the manifestation of quantitative traits in different soil-climatic conditions, the adaptability of valuable economic traits in hybrids and ridges, the influence of genotype and environment, their interrelationship with productivity and other valuable economic traits, the ability of the genotype to respond to a set of conditions, new high adaptability and the creation of varieties, research on ensuring the stability of the cotton crop in different soil and climate conditions has not been carried out sufficiently

Key words

cotton, length of vegetation period, adaptability, geographical long hybridization, introgressive forms, variety testing.

ТОШКЕНТ, ФАРҒОНА ВА ҚАШҚАДАРЁ ВИЛОЯТЛАРИДА ГЕНЕТИК КЕЛИБ ЧИҚИШИ ТУРЛИЧА БЎЛГАН F_3 ДУРАГАЙЛАРИНИНГ ҚИММАТЛИ-ХЎЖАЛИК БЕЛГИЛАРИНИ ИРСИЙЛАНИШИ

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Аннотация

Миқдорий белгиларнинг намоён бўлишини турли тупроқ-иқлим шароитларда қиёсий таҳлил қилиш, дурагай ва тизмаларида қимматли хўжалик белгиларининг мосланувчанлик имконияти, генотип ва атроф-муҳитнинг таъсири, уларнинг

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ҳосилдорликка ва бошқа қимматли-хўжалик белгиларни ўзаро боғлиқлиги, генотипнинг шароитлар мажмуасига жавоб бериш қобилияти, янги юқори мослашувчан навларни яратиш эса турли тупроқ-иқлим шароитларида пахта ҳосилининг барқарорлигини таъминлаш бўйича тадқиқотлар етарли даражада олиб борилмаган

Калит сўзлар

ғўза, вегетатsiя даври давомийлиги, мослашувчанлик, географик узоқ дурагайлаш, интрогрессив шакллар, нав синаш.

INTRODUCTION.

In the world, a number of researches are being carried out on cotton in different soil-climate conditions, including the following priority areas: adaptation possibilities, the degree of variability of quantitative traits in introgressive hybrids and ridges, comparative analysis in different soil-climate conditions, genetic and external environment to the general phenotypic variability of valuable economic traits. influence of factors, determination of mutual correlation of value-economic signs, creation of new highly flexible varieties of value-economic signs based on traditional and non-traditional methods of genetics and selection and modern MAS technologies.

The purpose of the study. In the process of selecting four F3 hybrid combinations in the conditions of Tashkent, Fergana and Kashkadarya regions, the purpose is to study the heredity and variability of valuable economic traits of the cotton plant.

RESEARCH RESULTS

One of the ways to identify forms with wide flexibility in the creation of new varieties of agricultural crops is to evaluate genotypes simultaneously in a number of geographical locations.

The problem of quickness of cotton is one of the most important issues in the conditions of Uzbekistan. The complexity of selection is related to the strong paratypic variability of this character. In solving the problem of early ripening of cotton, the systematic use of samples of the global collection of cotton, including wild diploid species and introgressive forms derived from them, is of great importance [7.9.10.15.13.17.18].

In order to create hybrids with high fiber output and productivity, foreign selection varieties with high fiber output were used as the parent form: Paymaster Dwarf (collection number - 010930), Sls 21726 (011604), PD 6520 (011590) of USA origin as well as Qalla Lot 361 (04841) and Ruwden Lot 70 (04840) are of Australian

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origin. Rapidly introgressive forms with unique fiber quality served as maternal forms. The duration of their growth period was shorter by 5-13 days compared to paternal forms [8.9.11.14.16.17.].

We determined the early ripening of hybrids by the date of opening of 50% of buds in plants.

This year, the main economic characteristics of four hybrid combinations of different genetic origins were tested in three regions of the republic (Tashkent, Kashkadarya and Fergana regions of the republic). Experiments were arranged in a randomized manner with four replications. According to the data presented in Table 1, the hybrid combination F_3 [(F_8 (Bukhara 6x L-h) x L-247) x (F_8 L-247 x S-6593)] was considered to be the fastest and the duration of the growing season was the shortest in all three regions : 116.6 days in Tashkent region, 112.3 days in Fergana region and 106.6 day in Kashkadarya region. The longest growing season duration was observed in two hybrid combinations: F_3 [(F_8 L-247 x S-484) x F15 L-248] showed 124.3, 113.9 and 118.6 days, respectively, while F_3[(F15 L- 248) x S-2016] this indicator was 122.5, 112.8 and 122.9 days.

1-table

Growth period duration of cotton F_3 hybrids.

Region	Hybrid combinations	n	$\bar{x}$ (days)	S	S^2	V %
Tashkent (Salar)	F_3 [(F_8 Л-247 x S-484) x F_{15} Л- 248]	51	124.3	3.67	13.44	2.95
	F_3 [(F_8 (Bukhara 6x Л-h) x Л-247)x (F_8 Л-247 x S-6593)]	49	116.6	2.16	4.67	1.85
	F_3 [(F_{15} Л- 248) x (F_8 Л-243 x S-2552)]	47	121.4	1.24	1.55	1.03
	F_3 [(F_{15} Л- 248) x S-2016]	55	122.5	1.51	2.28	1.23
	St. Namangan 77	57	125.4	1.34	1.80	0.01
	St. C-6524	54	124.2	1.85	3.42	0.03
Fergana (Quva)	F_3 [(F_8 Л-247 x S-484) x F_{15} Л- 248]	50	113.9	1.05	1.09	0.92
	F_3 [(F_8 (Bukhara 6x Л-h) x Л-247)x (F_8 Л-247 x S-6593)]	49	112.3	1.52	2.30	1.35
	F_3 [(F_{15} Л- 248) x (F_8 Л-243 x S-2552)]	49	113.1	0.87	0.76	0.77
	F_3 [(F_{15} Л- 248) x S-2016]	44	112.8	1.62	2.63	1.44
	St. Namangan 77	41	118.4	1.25	1.56	0.01
	St. C-6524	45	120.0	1.47	2.16	0.02
Kashkadary	F_3 [(F_8 Л-247 x S-484) x	47	118.6	1.48	2.18	1.24

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a (Kasbi)	F_{15} Л- 248]					
	F_3 [(F_8 (Bukhara 6x Л-h) x Л-247)x (F_8 Л-247 x S-6593)]	51	106.6	0.30	0.09	0.29
	F_3 [(F_{15} Л- 248) x (F_8 Л-243 x S-2552)]	49	108.6	1.18	1.38	1.08
	F_3 [(F_{15} Л- 248) x S-2016]	50	122.9	1.45	2.10	1.18
	St. Namangan 77	53	112.5	1.14	1.56	0.01
	St. C-6524	47	113.8	1.38	2.16	0.02

2 -table

Dispersion analysis of growing season duration

A source of variation	*SS*	*df*	*MS*	*F*	*P- value*	*F- critical*
Selection	482.3493	3	160.7831	55.96166	1.24E-13	2.866266
Columns	629.1102	2	314.5551	109.4831	4.97E-16	3.259446
Interaction	390.2893	6	65.04822	22.64048	7.37E-11	2.363751
Inside	103.4314	36	2.873094			
Total	1605.18	47				

Genotype	30%
Environment	39%
(GA) interaction	24%
Random deviation	06%

As a result of the two-factor dispersion analysis conducted with repetitions, significant differences in the duration of the growing season were found between the studied ridges. The sign is more influenced by the environmental factor 39%. The percentage of genotypic influence was equal to 30%. The effect of the genotype-environment interaction on the character indicator was considered sufficiently significant - 24%. The percentage of factors that were not taken into account was not large – 6% (see Table 2).

Weight of cotton raw material per bag in F_3 hybrids. The highest weight of cotton raw material per boll was determined in all three regions of Tashkent, Fergana and Kashkadarya districts in the hybrid combination F_3 [(F_{15} L- 248) x S-2016], the indicators were 6.3, 6.9 and 7.7 g, respectively (see Table 3.17). The smallest values for this symbol range from 5.5 g to 6.2 g, F_3 [(F_8 (Bukhara 6 x L-h) x L-247) x (F_8 L-247 x S-6593)] and F_3 [(F15 L - 248) x (F_8 L-243 x S-2552)] combinations were detected.

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Two-way analysis of variance showed that there were significant regional differences between selection groups and hybrid combinations. The percentage of influence of genotype and environment on the weight of cotton raw materials in one boll showed approximately the same result in our experiments and was 27% and 28%, respectively. The effect of the interaction of these factors on the manifestation of this symptom was insignificant. The share of unaccounted factors was much higher and made up 40%. According to Table 3, the weight of cotton raw material in the smallest bag was observed in the hybrid combination F_3 [(F_8 L-247 x S-484) x F_{15} L- 248], the indicators according to the regions - 2.1, 10.2 and 1.7% was equal. Due to the regional differences of indicators, it can be assumed that this indicator is still not stabilized.

3-table

Indicators of the weight of raw cotton in one sack.

Region	Дурагай комбинациялари	n	$\bar{x}$	S	S^2	V %
Tashkent (Salar)	F_3 [(F_8 Л-247 x S-484) x F_{15} Л- 248]	51	6.1	0.13	0.02	2.13
	F_3 [(F_8 (Bukhara 6x Л-h) x Л-247)x (F_8 Л-247 x S-6593)]	49	5.5	0.69	0.48	12.57
	F_3 [(F_{15} Л- 248) x (F_8 Л-243 x S-2552)]	47	5.7	0.39	0.15	6.87
	F_3 [(F_{15} Л- 248) x S-2016]	55	6.3	0.39	0.16	6.24
	St. Namangan 77	57	5.0	0.15	0.02	0.03
	St. C-6524	54	5.4	0.34	0.12	0.06
Ferghana (Quva)	F_3 [(F_8 Л-247 x S-484) x F_{15} Л- 248]	50	6.9	0.70	0.49	10.15
	F_3 [(F_8 (Bukhara 6x Л-h) x Л-247)x (F_8 Л-247 x S-6593)]	49	6.2	0.73	0.54	11.76
	F_3 [(F_{15} Л- 248) x (F_8 Л-243 x S-2552)]	49	6.2	0.79	0.62	12.84
	F_3 [(F_{15} Л- 248) x S-2016]	44	6.9	1.16	1.35	16.86
	St. Namangan 77	41	6.5	0.18	0.03	0.03
	St. C-6524	45	5.9	0.65	0.42	0.11
Kashkadarya (Kasbi)	F_3 [(F_8 Л-247 x S-484) x F_{15} Л- 248]	47	7.3	0.12	0.01	1.65
	F_3 [(F_8 (Bukhara 6x Л-h) x Л-247)x (F_8 Л-247 x S-6593)]	51	6.4	0.15	0.02	2.35
	F_3 [(F_{15} Л- 248) x (F_8 Л-243 x S-2552)]	49	6.1	0.38	0.15	6.29
	F_3 [(F_{15} Л- 248) x S-2016]	50	7.7	0.36	0.13	4.73

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	St. Namangan 77	53	6.5	0.12	0.01	0.02
	St. C-6524	47	5.6	0.21	0.04	0.04

4-table

F_3 дурагайлари бир дона кўсакдаги пахта хом-ашёси вазнининг икки омилли дисперсион таҳлили

A source of variation	*SS*	*df*	*MS*	*F*	*P- value*	*F-critical*	
Selection	8.008207	3	2.669402	7.931919	0.000346	2.866266	
Columns	8.537478	2	4.268739	12.68422	6.77E-05	3.259446	
Interaction	1.542898	6	0.25715	0.7641	0.602886	2.363751	
Inside	12.11541	36	0.336539				
Total	30.204	47					
Genotype	27%						
Environment	28%						
(GA) interaction	05%						
Random deviation	40%						

Fiber yield of F_3 hybrids. The high rate of fiber yield was shown in the hybrid combination F3 [(F8 L-247 x S-484) x F15 L- 248] in three regions and was 39.0, 39.3, 37.5%, respectively. In comparison with others, the low index of fiber output was determined in the combination of F_3 [(F_{15} L-248) x S-2016] in Tashkent and Fergana regions, equal to 35.2 and 32.9%. In Kashkadarya region, a low fiber yield was observed in combination F_3 [(F_8 (Bukhara 6x L-h) x L-247) x (F_8 L-247 x S-6593)] – 35.5% (see Table 5).

5-table

Fiber yield parameters of F_3 hybrids of cotton.

Region	Hybrid combinations	n	$\tilde{x}$ (%)	S	S^2	V %
Tashkent (Salar)	F_3 [(F_8 Л-247 x S-484) x F_{15} Л- 248]	51	39.0	0.54	0.30	1.39
	F_3 [(F_8 (Bukhara 6x Л-h) x Л-247) x (F_8 Л-247 x S-6593)]	49	37.6	0.89	0.79	2.36
	F_3 [(F_{15} Л- 248) x (F_8 Л-243 x S-2552)]	47	37.5	0.53	0.29	1.42
	F_3 [(F_{15} Л- 248) x S-2016]	55	35.2	0.59	0.34	1.67
	St. Namangan 77	57	36.6	0.48	0.23	0.01
	St. C-6524	54	36.6	0.64	0.41	0.02
Ferghana	F_3 [(F_8 Л-247 x S-484) x	50	39.3	3.00	8.98	7.62

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(Quva)	F_{15} Л- 248]					
	F_3 [(F_8 (Bukhara 6x Л-h) x Л-247)x (F_8 Л-247 x S-6593)]	49	37.7	0.40	0.16	1.06
	F_3 [(F_{15} Л- 248) x (F_8 Л-243 x S-2552)]	49	38.3	1.35	1.82	3.52
	F_3 [(F_{15} Л- 248) x S-2016]	44	32.9	0.93	0.87	2.83
	St. Namangan 77	41	37.3	0.53	0.28	0.01
	St. C-6524	45	37.9	0.84	0.71	0.02
Kashkadarya (Kasbi)	F_3 [(F_8 Л-247 x S-484) x F_{15} Л- 248]	47	37.5	0.27	0.07	0.72
	F_3 [(F_8 (Bukhara 6x Л-h) x Л-247)x (F_8 Л-247 x S-6593)]	51	35.5	1.32	1.75	3.72
	F_3 [(F_{15} Л- 248) x (F_8 Л-243 x S-2552)]	49	37.1	2.71	7.34	7.31
	F_3 [(F_{15} Л- 248) x S-2016]	50	36.7	1.08	1.17	2.94
	St. Namangan 77	53	38.1	0.35	0.12	0.01
	St. C-6524	47	38.0	0.74	0.55	0.02

6-жадвал
F_3 дурагайлари тола чиқимининг икки омилли дисперсоин таҳлили

Selection	*SS*	*df*	*MS*	*F*	*P-value*	*F-critical*		
Columns	85.03399	3	28.34466	14.25217	2.79E-06	2.866266		
Interaction	3.363791	2	1.681895	0.845685	0.437613	3.259446		
Inside	49.00504	6	8.167507	4.10676	0.003066	2.363751		
	71.59665	36	1.988796					
Total								
Genotype	208.9995	47						
Environment	41%							
(GA) interaction	02%							
Random deviation	23%							
Selection	34%							

Regarding the degree of variability of fiber yield in the studied hybrid combinations, one combination showed different variability in different regions. For example, in the combination of F_3 [(F_8 L-247 x S-484) x F_{15} L-248], the coefficient of variation of fiber yield was observed to be the highest -7.62% in Fergana region and the lowest in Kashkadarya region.

According to the results of the two-factor dispersion analysis of the fiber output in the studied hybrid combinations, the combinations are significantly

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different from each other, and the selection groups are not different by region, because the R-value for the factor of environmental influence on the sign is greater than 0.05 (see Table 3.22). The share of the effect of genotype on fiber yield was 41%, the share of the interaction of genotype-environment factors was 23%, and the share of the influence of unaccounted factors was 34%.

Yield of F_3 hybrids. When the productivity of the studied hybrid combinations was compared and analyzed, the productivity was the lowest, F_3 [(F_8 (Bukhara 6 x L-h) x L-247) x (F_8 L-247 x S-6593)] combination (indicators Tashkent, Fergana and Kashkadarya regions was equal to 23.3, 31.3, 28.3 ts/ha respectively) and F_3 [(F_{15} L-248) x (F_8 L-243 x S-2552)] hybrid combinations were calculated, the yield was 22.9, 34.5 and 33.3 ts, respectively /ha (see Table 7).

The combination F_3 [(F_8 L-247 x S-484) x F_{15} L- 248] was considered to be the most productive. Its productivity was 40.7, 39.5, 36.8 ts/ha by region. In Fergana region, the highest productivity was shown in combination F_3 [(F_{15} L- 248) x S-2016] and was 40.9 ts/ha.

7-table

Yield indicators of cotton F_3 hybrids.

Region	Hybrid combinations	$\tilde{x}$ (ц/га)	S	S^2	V %
Tashkent (Salar)	F_3 [(F_8 Л-247 x S-484) x F_{15} Л- 248]	40.7	4.63	21.44	11.38
	F_3 [(F_8 (Bukhara 6x Л-h) x Л-247)x (F_8 Л-247 x S-6593)]	23.3	3.77	14.25	16.21
	F_3 [(F_{15} Л- 248) x (F_8 Л-243 x S-2552)]	22.9	1.90	3.62	8.30
	F_3 [(F_{15} Л- 248) x S-2016]	29.9	4.31	18.58	14.42
	St. Namangan 77	29.1	2.41	5.81	0.08
	St. C-6524	27.9	3.15	9.92	0.11
Ferghana (Quva)	F_3 [(F_8 Л-247 x S-484) x F_{15} Л- 248]	39.5	3.86	14.87	9.75
	F_3 [(F_8 (Bukhara 6x Л-h) x Л-247)x (F_8 Л-247 x S-6593)]	31.3	3.85	14.84	12.32
	F_3 [(F_{15} Л- 248) x (F_8 Л-243 x S-2552)]	34.5	6.60	43.59	19.13
	F_3 [(F_{15} Л- 248) x S-2016]	40.9	4.61	21.28	11.27
	St. Namangan 77	31.2	2.12	4.49	0.07
	St. C-6524	28.7	4.16	17.31	0.14

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Kashkadarya (Kasbi)	F_3 [(F_8 Л-247 x S-484) x F_{15} Л- 248]	36.8	4.59	21.10	12.47
	F_3 [(F_8 (Bukhara 6x Л-h) x Л-247)x (F_8 Л-247 x S-6593)]	28.3	4.34	18.81	15.33
	F_3 [(F_{15} Л- 248) x (F_8 Л-243 x S-2552)]	33.3	5.81	33.81	17.49
	F_3 [(F_{15} Л- 248) x S-2016]	36.1	3.02	9.13	8.36
	St. Namangan 77	33.4	2.65	7.02	0.08
	St. C-6524	32.1	3.10	9.61	0.10

8-table

	F_3 дурагайлари хосилдорлигининг дисперсион таҳлили							
	Selection	*SS*	*df*	*MS*	*F*	*P-value*	*F ctitical*	
	Columns	958.5399	3	319.5133	16.29305	7.45E-07	2.866266	
	Interaction	440.6582	2	220.3291	11.23532	0.000162	3.259446	
	Inside	290.0971	6	48.34951	2.465504	0.042259	2.363751	
		705.9744	36	19.6104				
	Total							
	Genotype	2395.27	47					
	Environment							
	(GA) interaction	40%						
	Random deviation	18%						
	Selection	12%						
	Selection	29%						

As for the variability of the yield character in the studied hybrids, the combinations showed great variability in different growing regions. For example, combination F_3 [(F_{15} L-248) x (F_8 L-243 x S-2552)] showed the lowest coefficient of variation in Tashkent region - 8.3% and the highest coefficient in the other two regions -19.3, 17.5%. The high coefficient of variation of hybrid combinations allows us to conclude that the character is highly dependent on environmental conditions in a multi-component form (see Table 8).

Two-factor dispersion analysis of yield showed that in these experiments, the yield of the hybrid combinations was more affected by the genotype of 40% and to a lesser extent by the environment by 18%. The interaction of these two factors affected the mark by 12%, and the influence of unaccounted factors was a relatively high 29%.

CONCLUSIONS

1. The two-factor dispersion analysis showed that the influence of genotype on the variability of the duration of the growth period in F_2-F_4 hybrids during 2018-2020 was insignificant, the contribution of environment was 68.3%, and the contribution of genotype/environment was 19.0%, while growth in introgressive lines A significant effect of both genotype and environment on period duration variability was found

2 When analyzing hybrid plant groups according to cotton weight in one boll in the three-year segment by region, the highest average in Kashkadarya region was 6.7 grams, according to the two-factor dispersion analysis, genotype was 14.3%, environment was 26.1%, and the variability of this sign was reliably affected.

3. In different soil-climate regions, the average productivity index was significantly different in introgressive lines, from 132 grams (T-705) to 179 grams (T-681), the effect of genotype on the variation of the trait was 41.7%, and the effect of environment was 4.1%. , their joint effect was observed at 18.9% and it was noted that the productivity trait was determined more by genotype than by yield

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