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YIELD PERFORMANCE OF SOME EGYPTIAN COTTON GENOTYPES IN DIFFERENT ENVIRONMENTS

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ABSTRACT: The aim of this studying to evaluate yield performance for 38 promising long staple genotypes with two check varieties, Giza 95 and Giza 98 in Trial A at Sids agriculture research in 2022 season, and select the best 22 promising genotypes from Trail A to evaluate these selected promising genotypes in Trial B in 2023 season, with the two check Variety at five locations (Beni-sueif, El-Fayoum, Assiut, Sohag and Luxor Governorates). Results of trail A indicated that, 30 promising genotypes belonging to 17 crosses were superior the two check varieties in seed and lint cotton yields. Two promising genotypes which No. 32 and No. 33 belonging a promising cross (G.91 x G.90) x S109 were surpassed the best check variety Giza95 in boll weight (BW). Results of trail B showed that, locations significantly differed for all the studied traits, The genotypes mean squares were significant for seed cotton yield (SCY) and boll weight (BW), the genotypes environment interactions mean squares were significant for (LCY) and highly significant for seed cotton yield (SCY) and boll weight (BW). Mean performance across all locations showed that, seven promising genotypes which No. 1 (G.95 x [(G.91 x G.90) x G.80]), 5 (G.95 x G102), 8 (G.90 x A108), 12 (G.72 x [(G.83 xG.80) x G.89]), 19 and 20 ((G.91 x G.90) x S108 (24202)) and No. 21 ((G.91 x G.90) x S109) were significantly more yielded on the best check variety Giza-95 in seed cotton yield across all locations, and all the same crosses were equal to the check varieties in boll weight trait. Broad sense heritability was obtained for seed cotton yield (LY), lint yield (SCY), and boll weight (BW), which was 14.33, 7.34, and 9.59%, respectively, indicating the presence of low amount of genetic variance because of environmental factor. From results of Trial A and Trial B we can concluded that, five promising crosses which were G.95 x [(G.91 x G.90) x G.80], G.90 x A108, G.72 x [(G.83 xG.80) x G.89], (G.91 x G.90) x S108 (24202) and (G.91 x G.90) x S109 may be considered as a promising materials for future breeding programs to develop and isolate high yielding varieties of Egyptian cotton for upper Egypt conditions.

Key words: *Gossypium barbadense*, genotype x location interaction, heritability, Advanced Trail.

INTRODUCTION

Cotton breeder always searching about new superior cotton varieties that can surpassed the exiting varieties in yield and stable over a lot of environments, where the environmental conditions is the important factor of several factors are influence the success of cotton production, where these conditions differ between locations.

The cotton research institute has used artificial hybridization and pedigree selection to develop and produce a new Egyptian cotton varieties. Many studies found that visual selection in early generations for yield is insufficient and that the evaluation of some strains in such program begins from F5 generation and continue until satisfactory genetic stability is achieved. Many investigators Abd–El–Salam *et al* (2014), Shaker (2014), Abdel–Aziz (2015), Abd El-Aty *et al* (2015), Soliman (2015), El-Seidy *et al* (2017), Mahdy *et al* (2017), and Said (2021). Evaluated some strains *via* two tests, the first test is known as Trial (A), and the second test is the advanced trial, known as Trial (B) in the next season. It should be noted that the (Trial B) is carried out at a several

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locations to study the interaction among of these genotypes and the different environments.

The present investigation was carried out to evaluate thirty-eight lines of nineteen crosses in trial A and twenty-two advanced strains descending from seventeen crosses in Trial B at different locations, in order to select the best lines for developing new cotton varieties of high lint yield and desirable fiber characters.

MATERIALS AND METHODS

In this investigation we carried out two field experiments in seasons 2022 and 2023 as preliminary trail A and delate trail B. Trail A consisted of 38 lines descending from 19 crosses and two commercial varieties (Giza 95 and Giza 98) as a check varieties, (Table 1), which were cultivated at Sids agricultural research station (Beni- suef) in 2022 season. Strains selected from Trail A were cultivated in Trail B in 2023 season. At five locations i.e. Beni- suef, El-fayoum, Assiut, Souhag and Luxor governorates. Each trail consisted 22 strains derived from 17 crosses compared with the check varieties G95 and G98 (Table 2).

A randomized complete block design with six replicates was used in each location with five rows in each plot. Recommended cultural practices were applied for cotton production.

The yield was obtained from the three middle rows of each plot to determine the following traits.

A- Yield traits

The following characters were recorded on each genotype:

(1) Seed-cotton yield (SCY, kentar/fed): Determined as the total seed cotton yield,

(2) Lint yield (LCY, k/fed),

(3) Lint percentage (LP, %): Percentage of lint to seed cotton yield, delate

(4) Boll weight (BW, g): Average weight of fifty sound open bolls.

B- Fiber qualities

Upper half mean length (UHM), fiber uniformity ratio (UR, %), fiber strength (gm/tex.), Micronaire reading (Mic, unit), yarn strength (YSt., unit).

All fiber properties were tested in Cotton Technology Research Division labs, Cotton research Institute (CRI) under constant conditions of temperature ($20 \pm 2\ C^{o}$) and relative humidity (65 ± 5%) according to HVI Instrument.

The analysis of variance was calculated according to Sendecor (1965).

Where:

R, g, M_1, M_2, σ^2e, σ^2g: number of replications, number of genotypes, error mean squares, genotypes mean squares, error variance and genotypic variance, respectively.

Where:

E, r, g,M1, M2, M3, σ^2e and σ^2g: : environments, number of replications, number of genotypes, error mean squares, genotypes by environments interactions mean squares, genotypes mean squares, error variance and genotypic variance, respectively.

Heritability estimates, in broad sense (H^2_{bs}%) was calculated by using the formula: $h^2_{bs}\% = (\sigma^2g / \sigma^2ge + \sigma^2e)x100$

Where:

σ^2g: genotypes variance delate.

σ^2ge: the component due to genotypes x environment.

σ^2e: the variance component.

Table 1. Pedigree of the genotypes and cultivated varieties grown in trail A in 2022 season.

No.	Lines	Parent	Origin
1	H5 91/2021	H4 48/2020	G.95 x [(G.91 x G.90) x G.80]
2	H5 98/2021	H4 49/2020	
3	H5 104/2021	H4 54/2020	
4	H5 107/2021	H4 55/2020	
5	H5 119/2021	H4 61/2020	
6	H5 121/2021	H4 63/2020	G.95 x [(G.83 x G.80) x G.89) x (G.83 x D703)]
7	H5 127/2021	H4 65/2020	
8	H5 130/2021	H4 71/2020	G.95 x [(G.83 x G.80) x G.89]
9	H5 135/2021	H4 75/2020	
10	H6 137/2021	H5 80/2020	G.95 x G102
11	H6 138/2021		
12	H6 144/2021	H5 85/2020	G.98 x G102
13	H6 153/2021	H5 93/2020	(G.90 x S109) x G102
14	H7 161/2021	H6 107/2020	G.90 x A108
15	H7 166/2021		
16	H7 170/2021	H6 111/2020	G.90 x G102
17	H7 173/2021	H6 114/2020	
18	H7 179/2021	H6 117/2020	(G.90 x S109) x [(G.83 x G.75) x 5844]
19	H7 187/2021	H6 128/2020	G.72 x [(G.83 xG.80) x G.89]
20	H7 188/2021		
21	H8 198/2021	H7 137/2020	[[(G.83 x (G.75 x 5844))] x G.90] x G.91
22	H8 200/2021		
23	H8 208/2021	H7 144/2020	[G.83 x (G.72 x Dendara)] x S109
24	H8 212/2021	H7 147/2020	G.80 x S109
25	H8 215/2021		
26	H8 220/2021	H7 150/2020	G.85 x S109
27	H8 223/2021		
28	H9 226/2021	H8 159/2020	[G.83 x (G.72 x Dendara)] x (24202)S109
29	H9 227/2021		
30	H9 237/2021	H8 165/2020	(G.91 x G.90) x S108 (24202)
31	H9 242/2021		
32	H10 244/2021	H9 167/2020	(G.91 x G.90) x S109
33	H10 245/2021		
34	H10 246/2021		
35	H10 256/2021	H9 172/2020	
36	H10 257/2021		
37	H11 258/2021	H10 180/2020	(G.90 x A107) x G.85
38	H11 268/2021	H10 194/2020	(G.90 x A107) x [(G.83 x G72) x Dendara]
39	Giza98		[(G.83 x G.80) x G.89]x A107
40	Giza95		[G.83x(G.75 x 5844)] x G.80

Table 2. Pedigree of genotypes and cultivated varieties grown in Trail B in 2023 season.

No.	Lines	Parent	Origin
1	H5 98/2021	H4 49/2020	G.95 x [(G.91 x G.90) x G.80]
2	H5 107/2021	H4 55/2020	
3	H5 127/2021	H4 65/2020	G.95 x [(G.83 x G.80) x G.89) x(G.83 x D703)]
4	H5 135/2021	H4 75/2020	G.95 x [(G.83 x G.80) x G.89]
5	H6 137/2021	H5 80/2020	G.95 x G102
6	H6 144/2021	H5 85/2020	G.98 x G102
7	H6 153/2021	H5 93/2020	(G.90 x S109) x G102
8	H7 161/2021	H6 107/2020	G.90 x A108
9	H7 166/2021		
10	H7 173/2021	H6 114/2020	G.90 x G102
11	H7 179/2021	H6 117/2020	(G.90 x S109) x [(G.83 x G.75) x 5844]
12	H7 187/2021	H6 128/2020	G.72 x [(G.83 xG.80) x G.89]
13	H7 188/2021		
14	H8 200/2021	H7 137/2020	[[(G.83 x(G.75 x 5844))] x G.90] x G.91
15	H8 208/2021	H7 144/2020	[G.83 x(G.72 x Dendara)] x S109
16	H8 212/2021	H7 147/2020	G.80 x S109
17	H8 223/2021	H7 150/2020	G.85 x S109
18	H9 226/2021	H8 159/2020	[G.83 x(G.72 x Dendara)] x (24202)S109
19	H9 237/2021	H8 165/2020	(G.91 x G.90) x S108 (24202)
20	H9 242/2021		
21	H10 245/2021	H9 167/2020	(G.91 x G.90) x S109
22	H10 246/2021		
23	Giza98		[(G.83 x G.80) x G.89]x A107
24	Giza95		[G.83x(G.75 x 5844)] x G.80

Table 3. Form of the analysis of variance and expectation of mean squares for a single environment.

S.O.V.	d.f	M.S	E.M.S
Replications	r-1		
Genotypes	g-1	M2	$\sigma^2e + r\ \sigma^2g$
Error	(r-1) (g-1)	M1	σ^2e

Table 4. Combined analysis of variances and expectations of mean squares for all genotypes over environments.

S.O.V.	d.f	M.S	E.M.S
Environments (E)	L-1		
Replications/ L	L(r-1)		
Genotypes (G)	g-1	M3	$\sigma^2e+r\ \sigma^2gL+rL\ \sigma^2g$
G x E	(g-1) (L-1)	M2	$\sigma^2e +r\ \sigma^2gL$
Error	L(g-1)(r-1)	M1	σ^2

RESULTS AND DISCUSSION

The preliminary strain test (Trial A)

The analysis of variance (Table 5) for the studied traits of all genotypes (Trail A) indicated that, the genotypes mean squares were highly significant for (BW), revealing that the presence of the genetic variation among the genotypes of this trait. On the other hand (SCY) and (LY) traits recorded significant mean squares, indicated that the effects of environmental factor in this season. Heritability broad sense effects of were obtained for estimates seed cotton yield, lint yield, and boll weight, which was 29.86, 30.73, and 63.16%, respectively, indicating the presence of substantial amount of genetic variance for this trait. These results agreed with those obtained by Abd–El–Salam *et al (*2014), Abdel–Aziz (2015), Abd El-Aty *et al* (2015), Mudada *et al* (2017), and Kumbhalkar *et al* (2021).

Table 5. The analysis of variance, genotypic, environmental and phenotypic variances, and heritability for studied traits (Trail A).

S.O.V.	df	MS		
		Seed cotton yield	Lint yield	Boll weight
Replication	5	4277.033	719.666	0.04
Genotypes	39	852.684	143.849	0.11**
Error	195	598.027	99.651	0.04
Geno. Var.		42.44	7.37	0.012
Envi. Var.		99.68	16.61	0.007
Pheno. Var.		142.12	23.98	0.019
Heritability h^2b. %		29.86	30.73	63.16

**, significant at 0.05 and 0.01 probability levels, respectively.

Mean performance of yield and yield traits (Table 6) of the genotypes showed that, the mean performance seed cotton yield (SCY) ranged from 3.71 k/fed for line No.11 to 7.63 k/fed for line No.24 with a grand mean performance 5.89 k/fed. Thirty genotypes surpassed the better check variety Giza98. The increase ranged from 0.24 k/ fed for genotype no.28 to 2.97 k/fed for genotype no.24. Also, 21 genotypes were surpassed the grand mean by 1.34, 1.52, 32, 1.1, 1.1, 0.47, 1.38, 1.27, 0.03, 1.05, 0.53, 0.78, 0.42, 1.74, 1.27, 1.18, 0.58, 1.62, 1.67, 0.89 and 0.23 k/fed for genotypes No.2, 4, 7, 9, 12, 13, 14, 15, 16, 17, 19, 22, 23, 24, 30, 31, 32, 33, 34, 35 and No. 36, respectively.

The results of lint yield (LY) trait A (Table 6), showed that the means performance ranged from 4.7 k/fed for line No. 11 to 10.05 k/fed for line No. 24 with an average 7.58 k/fed, The all genotypes studied surpassed the best check variety Giza 98 which gave 6.22 k/fed except genotypes No. 3, 6, 8, 10, 11, 21, 29 and No.38. Which gave LY less than check variety G98.

With respect for lint percentage (L%) Table 6, the results showed that means of this trait ranged from 38.6 for line No. 21 to 42.8 for line No.20 with a mean 40.9%, the results indicated that three line which No.2, 35 and No.36 were equal to the best check variety Giza 98, The genotype No.20 exceeded the best check variety Giza98 for lint percentage (L%), (Table 6).

Regarding to results of boll weight (BW) the data in table 6 this indicated that the means performance for boll weight (BW) was 2.8 gm/boll for the lines No. 11, 16 and No.29 while it was 3.3 gm/boll for lines No. 35 and No 36. Only two strains which No. 35 and No.36 belonging to cross ((G.91 x G.90) x S109) showed significant values for boll weight (BW) from the grand mean and surpassed the best variety Giza95. highly heritability value was found for boll weight (BW) (63.16%) indicating

that this trait was delate affected by the environmental conditions. These results were agreement with Soliman (2015), El-Seidy *et al* (2017), Mukoyi and Makunde (2018), and Said (2021) who found that high heritability estimates for yield traits.

Table 6. Mean performance of yield and yield components for the tested genotypes and cultivated varieties grown in Trail A at Sids station in season 2022.

No.	Yield (k/fed)		L%	BW	UHM	U.R%	Str.(gm/tex)	Mic.(unit)	Y.St. (unit)
	SCY	LY							
1	5.22	6.87	41.8	3.2	31.5	85.2	40.3	4.6	2240
2	7.23	9.66	42.4	3.1	31.5	85.6	37.9	4.5	1960
3	4.65	6.2	42	3.2	29.5	85.9	34.6	4.5	2240
4	7.41	9.64	41.3	3.2	30.8	87.5	38.1	4.5	2240
5	5.71	7.31	40.6	3.2	30.5	85.4	36.7	4.6	2280
6	4.37	5.71	41.5	3	30.6	88.5	38.8	4.6	2240
7	6.21	8.08	41.3	3.2	28.6	84.8	36.5	4.6	2200
8	4.14	5.3	40.4	2.9	28.7	85.8	36.7	4.5	2160
9	6.99	8.85	40.2	3.1	30.3	85.4	37.3	4.7	2160
10	4.47	5.65	40.1	3.1	31.2	88.1	40.3	4.7	2280
11	3.71	4.7	40.2	2.8	31	87.7	37.7	4.7	2200
12	6.99	8.72	39.6	3.1	32.8	88.8	40.3	4.6	2040
13	6.36	8.08	40.3	3	31.3	87.4	36.4	4.6	2200
14	7.27	9.18	40.1	3.2	28.8	84.4	38.6	4.6	2200
15	7.16	8.88	39.4	3	33	89.6	39	4.5	2360
16	5.92	7.56	40.6	2.8	28.7	87.2	39.5	4.5	2320
17	6.94	8.74	40	3.2	29.2	86.8	37.3	4.5	2240
18	5.5	6.86	39.6	3.1	29.8	86.2	38.4	4.5	2120
19	6.42	8.33	41.2	3	30.7	86.3	36.5	4.5	2080
20	4.99	6.73	42.8	2.9	30.1	82.7	37.8	4.4	2240
21	4.53	5.51	38.6	2.9	29.9	86.8	37.5	4.6	2360
22	6.67	8.61	41	3	30.5	86.6	38.1	4.6	2360
23	6.31	7.94	39.9	2.9	31.4	86.3	39.7	4.6	2240
24	7.63	10.05	41.8	2.9	31.1	87.2	37.2	4.4	2240
25	5.85	7.65	41.5	3.1	28.6	85.8	38.9	4.5	2280
26	5.11	6.49	40.3	2.9	28.5	84.6	37.1	4.6	2280
27	5.66	7.36	41.3	2.9	30.4	85.2	37	4.6	2240
28	4.9	6.4	40.9	3	30.9	86.1	39.4	4.6	2240
29	4.31	5.39	39.7	2.8	28.2	83.3	38	4.9	2360
30	7.16	9.11	40.4	3	29.6	89.6	38.6	4.1	2240
31	7.07	8.87	39.8	2.9	29.2	86.3	37.1	4.6	1800
32	6.47	8.22	40.3	3.1	31.3	86	37.8	4.6	2120
33	7.51	9.82	41.5	2.9	30.4	85.1	37.7	4.8	1960
34	7.56	9.84	41.3	3.2	29	87	38.9	4.6	2120
35	6.78	9.06	42.4	3.3	30.6	86.6	40.1	4.7	2080
36	6.12	8.18	42.4	3.3	29.4	87.3	36.9	4.6	2120
37	5.28	6.83	41.1	3.1	28.7	86.5	38.8	4.7	2000
38	4.55	6.03	42.1	3.2	30	86.6	34.7	4.6	1960
G.98	4.66	6.22	42.4	3.1	27.7	85.8	35.4	4.6	1840
G.95	3.59	4.65	41.1	3.2	31.4	85.9	36.4	4.6	2120
Mean	**5.89**	**7.58**	**40.9**	**3.05**	**30.1**	**86.4**	**37.9**	**4.6**	**2174**
LSD 0.05	Ns	Ns		**0.21**					
LSD 0.01	Ns	Ns		**0.28**					

ns = non-significant

Evaluation of the advanced strain test (Trial B)

Trail B is the advanced strain test for the promising genotypes that were selected from Trail A. Trail B was carried out under five locations, *i.e*. Beni Sueif, El-Fayoum, Assiut, Sohag and Luxor, in order to study breeding behavior, genotypes of genotypic interaction under these locations.

A. Variances and heritability

Combined analysis of variance for studied traits of all genotypes across in five locations (Table 7) indicated that, locations were significantly differed for all the studied traits, indicating the presence of wide range of variation. The genotypes mean squares were significant for seed cotton yield (SCY) and highly significant for boll weight (BW), indicating the presence of high genetic variation among the genotypes for these traits.

Genotype x location interactions were significant for all traits, it could be due to that these traits were highly responded to the environmental changes and the genotypes performance varied from to another locations. The same results were obtained by El-Seidy *et al* (2017), Mudada *et al* (2017), Mukoyi and Makunde (2018), and Kumbhalkar *et al* (2021). They found high significant (G x E) interaction for yield components. Heritability broad sense was obtained for seed cotton yield (SCY), lint yield (LY), and boll weight, which was 14.33, 7.34, and 9.59%, respectively, indicating the presence of low amount of genetic variance because of environmental factor. These results agreed with those reported by Said (2021) who found that the broad sense heritability estimates low was for seed cotton yield, lint yield, and boll weight.

Table 7. The combined analysis of variance across the five locations forall the studied traits of all genotypes (Trail B).

S.O.V.	df	MS		
		Seed cotton yield	Lint yield	Boll weight
Rep./Loc.	25	2233**	389.96**	0.02
Locations(L)	4	131353.851**	21107.629**	2.86**
Genotypes (G)	23	283.165*	40.5	0.04**
G x L	92	255.096**	43.693*	0.05**
Error	575	165.559	32.72	0.02
Geno. Var.		3.92	0.26	0.0007
Inter. Var.		17.91	2.19	0.006
Envi. Var.		5.52	1.09	0.0006
Pheno. Var.		27.35	3.54	0.0073
Heritability (H2)%		14.33	7.34	9.59

*, ** significant at 0.05 and 0.01 probability levels, respectively

B. Mean performance over five locations

Mean performance of seed cotton yield (SCY) (Table 8) ranged from 5.60 k/fed for genotypes No. 11 and No. 22 to 6.54 k/fed for genotypes No. 19 with a grand mean of 5.88 k/fed. The results showed that all of studied genotypes in Trial B surpassed the two check variety Giza95 and Giza98.

Ten genotypes from 22 studied genotypes which No. 1, 2, 5, 6, 8, 12, 16, 19, 20 and No. 21 were significantly exceeded the low check

variety Giza 98 in seed cotton yield (SCY). And 7 genotypes which No. 1, 5, 8, 12, 19, 20 and No. 21 recorded significantly surpassed the best check variety Giza95 in seed cotton yield. These results are agreement with those reported by Mukoyi and Makunde (2018), Said (2021), and Kumbhalkar *et al.* (2021).

Table 8. Mean performance of yield and yield components for the selected genotypes and cultivated varieties grown in Trail B across five locations in season 2023.

No.	Yield k/fed		L%	BW	UHM	U.R%	Str.(gm/tex)	Mic.(unit)	Y.St. (unit)
	SCY	LY							
1	6.14	8	41.2	2.9	30.7	85	36.9	4.2	2195
2	5.99	7.7	40.7	2.9	30	83.2	36.9	4.2	2200
3	5.86	7.59	41.1	2.9	29.5	84.2	36.7	4.3	2105
4	5.81	7.44	40.4	2.9	30	85.4	37	4.3	2170
5	6.04	7.6	39.8	2.9	30.1	83.9	34.4	4.3	2150
6	5.98	7.46	39.5	2.9	29.8	84.3	36.3	4.2	2205
7	5.68	7.34	40.4	2.9	29.7	84.2	36.3	4.2	2185
8	6.04	7.74	40.3	2.9	28.8	83.7	35.2	4.2	2110
9	5.67	7.09	39.8	2.9	30.2	83.3	35.5	4.2	2140
10	5.76	7.33	40.2	2.9	30.1	84.5	38	4.2	2210
11	5.6	7.14	40.5	2.9	30.4	84.2	36.4	4.2	2170
12	6.37	8.07	40.2	2.9	30.2	85.4	36.5	4.2	2220
13	5.79	7.24	39.4	2.9	30.7	86.2	36.2	4.2	2280
14	5.83	7.52	40.6	2.9	29.9	83.7	36.1	4.2	2085
15	5.78	7.22	39.7	2.9	30.7	84.8	35.6	4.2	2145
16	5.95	7.67	40.7	3	30.9	84.5	37.3	4.2	2220
17	5.65	7.3	40.8	2.9	31.1	84.7	34.3	4.3	2055
18	5.92	7.63	41.2	2.9	30.4	86.1	36.8	4.3	2148
19	6.54	8.33	40.2	2.9	29.7	84.5	35.3	4.3	2118
20	6.21	7.87	40.3	2.9	29.8	84.9	35	4.2	2040
21	6.11	7.94	41.1	2.9	29.9	84.4	36	4.2	2030
22	5.6	7.32	41	2.9	30.3	83.8	35.3	4.3	2090
G.98	5.42	7.21	42.1	2.9	29.5	85.2	34.2	4.3	2025
G.95	5.49	7.05	40.9	2.9	30	85.2	37.5	4.2	2235
Mean	5.88	7.53	40.5	2.9	30.1	84.5	36.1	4.2	2147
LSD0.01	0.52	Ns		0.07					
LSD0.05	Ns	Ns		0.09					

Ns = non-significant

Considering lint yield LY, Table (8) showed that the mean performance of LY ranged from 7.09 k/fed for genotype No. 9 to 8.33 k/fed for genotype No.19 with an average of 7.53 k/fed. The results showed that all the genotypes included in Trial B were surpassed the check variety Giza 95 in LY, 20 genotypes were succeeded the best check variety Giza98, 11 genotypes of these which No. 1, 2, 3, 5, 8, 12, 16, 18, 19, 20 and No.21 were surpassed the grand mean of lint yield. The same results were found by El-Seidy *et al* (2017), Mudada *et al* (2017), and Said (2021). Which reported that the genotypes under studied in advanced trail were surpassed the commercial check variety for yield and fiber quality.

Regarding to lint percentage results Table (8) five genotypes were exceeded the best check variety Giza 95 in lint percentage, i.e. line no 1, 3, 18, 21, and 23 respectively and we will use this to improve this trait.

With respect to boll weight (BW) trait Table (8), the results indicated that, all selected genotypes were equal with the check varieties in boll weight (BW), except genotype No. 16 which surpassed the two check varieties in boll weight, seed cotton yield and lint yield. These results are agreement with these found by Said (2021) who showed some sort of genetic differences between all genotypes this results useful for breeder to improving this trait for produce new cotton varieties.

Results of fiber quality in Trail B, results showed that all genotypes were exactly in the same category of long staple cotton varieties, which have been cultivated in Upper and Middle Egypt.

Conclusion

It may be concluded that 6 strains which belonging to Five crosses below may be considered as promising materials for breeding program to introduce new varieties.
G.95 x [(G.91 x G.90) x G.80]
G.90 x A108
G.72 x [(G.83 xG.80) x G.89]
(G.91 x G.90) x S108 (24202)
(G.91 x G.90) x S109

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الاداء المحصولى لبعض التراكيب الوراثية المبشرة من القطن المصري في بيئات مختلفة

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الملخص العربي

تهدف هذه الدراسة الى تقييم الاداء المحصولي لعدد ٣٨ تركيب وراثي مقارنة بالصنفين المنزرعين جيزة ٩٥ وجيزة ٩٨ خلال بيئات متباينة. تم تقييم هذه التراكيب في محافظة بني سويف في تجربة المحصول الاولية (أ) موسم ٢٠٢٢ بمركز البحوث الزراعية بسدس (بنى سويف). وتم انتخاب افضل ٢٢ تركيب وراثي متفوق لتقييمها في تجربة المحصول المتقدمة (ب) خلال موسم ٢٠٢٣ مقارنة بالصنفين المنزرعين جيزة٩٥ وجيزة ٩٨ في خمس مناطق مختلفة (بني سويف، الفيوم، اسيوط، سوهاج والاقصر). واشارت النتائج المتحصل عليها من تجربة المحصول الاولية (أ) الى تفوق ٣٠ تركيب وراثي مميز ناتجة من ١٧ هجين عن الصنفين التجاريين في صفات محصول القطن الزهر والشعر، كما تفوق تركيبين مميزين وهما ٣٢ و٣٣ الناتجة من الهجين المميز (جـ٩٠ x جـ٩١) S109 x عن الصنف التجاري جيزة ٩٥ في صفة وزن اللوزة.

كما اظهرت النتائج المتحصل عليها من تجربة المحصول المتقدمة (ب) اختلافات معنوية بين البيئات في كل الصفات المدروسة، كما كان التباين الراجع للتراكيب الوراثية معنويا لصفتي محصول الزهر والشعر وكان تباين التفاعل بين التراكيب الوراثية والبيئات معنوي لصفة محصول الشعر وعالي المعنوية لصفتي محصول الزهر ووزن اللوزة.

واظهرت نتائج الاداء المحصولي ان هناك زيادة معنوية لسبعة تركيب وراثية ناتجة من ستة هجن وهى ١ (جـ٩٥ x ((جـ٩١x جـ٩٠)x جـ٨٠)، ٥ (جـ٩٥x G102)، ٨ (جـ٩٠x A108)، ١٢ (جـ٧٢x ((جـ٨٣xجـ٨٠)x جـ٨٩))، ١٩و٢٠ ((جـ٩١x جـ٩٠)x S108) ورقم ٢١ ((جـ٩١x جـ٩٠)x S109) هذه التراكيب تفوقت محصوليا عن افضل اصناف المقارنة جيزة ٩٥ في صفة محصول الزهر في كل البيئات، وتساوت هذه الهجن مع اصناف المقارنة في صفة وزن اللوزة. اعطت درجة التوريث في المدي الواسع قيم منخفضة لصفات محصول القطن الزهر والشعر ووزن اللوزة حيث كانت ١٤,٣٣، ٧,٣٤ و٩,٥٩% علي التوالي.

من نتائج التجربتين الاولية (أ) والمتقدمة (ب) نستطيع ايجازها في ان هناك خمسة هجن وهي (جـ٩٥ x ((جـ٩١x جـ٩٠)x جـ٨٠)، (جـ٩٠x A108)، (جـ٧٢x ((جـ٨٣xجـ٨٠)x جـ٨٩))، ((جـ٩١x جـ٩٠)x S108) و ((جـ٩١x جـ٩٠)x S109) يمكن اعتبارها كمواد وراثية متميزة لبرامج التربية لتحسين وعزل أصناف عالية المحصول من القطن المصري مستقبلاً.