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EVALUATION OF SOME EGYPTIAN COTTON GENOTYPES UNDER DIFFERENT ENVIRONMENTS

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Abstract

Comparative studies for thirty-nine genotypes descending from eighteen crosses and three check varieties Giza90, Giza83 and Giza80 were included in Trial A at Seds Agricultural experiment station in 2002 season, whereas the advanced genotypes (21 genotypes) descending from 13 crosses and the three check varieties were grown in Trial B at six different locations in Middle and Upper Egypt in the same season. The results obtained from Trial A showed that only two crosses exceeded the check varieties Giza90, Giza83 and Giza80 in both yield and its contributing variables. These crosses were [(Giza83 x Giza80) x Giza89] and (Giza85 x Giza83). While three crosses were promising as regard to their performance for yield and its contributing variables in Trial B. These crosses were [(Giza83 x Giza80) x Giza89], [(Giza83 x Giza80) x Giza75] and the cross [Giza83 x (Giza75 x 5844)]. High heritability estimates in the broad sense were recorded for most traits in trial A indicating that phenotypic selection for these traits could be highly effective. The relatively low and moderate heritability values estimated in broad sense for boll weight, seed cotton yield and lint cotton yield in trail B were verified by the presence of significant, genotypes x locations interaction and suggested that such material should be evaluated for a number of years at different locations. Generally, it can be concluded from the results in Trials A and B that the cross [(Giza83 x Giza80) x Giza89] has shown to be promising cross due to its performance for yield components and fiber quality than other crosses.

INTRODUCTION

The main objective for the cotton breeder is producing new superior cotton varieties that can replace the existing ones. The Cotton Research Institute uses artificial hybridization between the desired genotypes, followed by the pedigree method of selection.

The promising and desired families in the fifth generation for the different crosses were tested in the preliminary strain test (Trial A), along with the commercial varieties. Families selected in Trial A were tested through the advanced strain test Trial B beside the cultivated varieties for comparison at different locations to study their performance under different environments. The superior crosses over commercial varieties will be grown in another programmer for increasing enough seeds to produce the breeder seed

Performance of cotton genotypes under different environments was studied by several workers i.e. El-Moghazy *et al.* (1982), Abo-Zahra *et al.* (1986), Sallam *et al.* (1987), Ismail *et al.* (1989) and Awaad and Mostafa (1996)

The present investigation was conducted to evaluate genotypes of 18 crosses in Trial A and 13 crosses in Trial B to recognized the promising cross which surpassed the commercial varieties for some major characters i.e. earliness yield component and fiber quality.

MATERIALS AND METHODS

In 2002 season, the Cotton Research Institute carried out tow field experiments. Trial A and the advanced Trial B. Trial A consisted of 42 genotypes. 39 lines descending from 18 crosses and the three check varieties, Giza 90, Giza 83 and Giza 80 It was cultivated at Seds experiment Station. Agricultural Research Center While Trial B cultivated at six locations in Upper Egypt i.e Seds. El-Fayoum El-menia Assuit. Sohaag and El-Mattana Each trial consisted of 24 lines. 21 lines descending from 13 crosses and the three commercial varieties Giza 90. Giza 83 and Giza 80

Experimental design in trial A, and trial B in all locations, was randomized complete block with six replications where each plot consisted of five rows. The row was four meters long. 60 cm apart, and 20 cm between hills. The hills were thinned to two plants per hill The middle three rows of each plot were hand harvested to determine the following traits

A. Yield components:

1 Seed cotton yield (SCY.Ken/fed): estimated as weight of seed cotton yield Ken/fed.
2 Lint cotton yield (LY. Ken/fed): measured as average weight of lint yield in Ken/fed.
3 Boll weight (BW): the weight of 50 bolls picked at random from the first and fifth row of each plot.

4. Lint percentage (L%): calculated as the relative amount of lint in a seed cotton sample, expressed in percentage:

$$L\% = \frac{\text{weight of lint cotton in sample}}{\text{weight of seed cotton}} \times 100$$

5. Earliness index (E%): expressed as yield of the first pick X 100 / total of. Seed cotton yield
6. Seed index (SI). estimated as average weight of 100 seeds in grams.
7. Lint index (LI): estimated as average weight in grams of lint born by 100

$$LI = \frac{SI \times L\%}{(100 - L\%)} = \frac{\text{seed index x lint percentage}}{(100 - \text{lint percentage})}$$

B. Fiber properties:

1. Fiber fineness and maturity (Mic): measured by Micronaire apparatus in Micronaire units
2. Hair weight (HW): expressed as millitex (10^{-5} g/cm).
3. 2.5% Span length: Determined by the digital Fibrograph
4. Yarn strength (Y.St). is the product of " Lea strength X yarn count " (60s carded and 3.6 twist multiplier) measured by the Good Brand Tester.

All fiber properties tests were performed in the Laboratory of the Cotton Technology Research Division. Cotton Research Institute at Giza according to ASTM (1961).

The analysis of variance was calculated according to Le Clerge *et al.* (1962) and Sendecor (1965)

Heritability estimates, in broad sense (h^2_{bs}%) were calculated by using the formula as follows (Sakai, 1960):

$h^2_{bs}\% = (\sigma^2 g / (\sigma^2 ge + \sigma^2 e)) \times 100$

Where:

$\sigma^2 g$: genotypes variance component.
$\sigma^2 ge$: variance component due to genotypes x environment.
$\sigma^2 e$: error variance component.

RESULTS AND DISCUSSION

The present investigation included the evaluation of 39 genotypes descending from 18 crosses in Trial A and 21 genotypes belong to 13 crosses in Trial B. The check varieties were Giza 90, Giza 83 and Giza 80 as control through Trial A and Trial B. Differences between the tested genotypes were detected for yield, yield components and fiber properties compared with the check varieties Giza 90, Giza 83 and Giza 80

The preliminary strain Test (Trial A):

A. Yield and yield components

1. Seed cotton yield (SCY)

Table (1) shows that 26 genotypes out of 39 exceeded the check variety Giza 90 in seed cotton yield. The increase ranged from 0.02 to 2.60 Ken / fed. The estimates were significant for 19 genotypes belonging to 10 crosses i.e. (Giza81 x Giza83). [(Giza83 x Giza80) x Giza75]. (Giza85 x Giza83). (Giza83 x Pima S6). [(Giza83 x Giza80) x Giza89], [(Giza83 x Giza75) x 5844,], [(Giza83 x Giza80) x Dendera], [(Giza83 x Giza80) x Giza85], [(Giza83 x Giza72 x Delecero) x Giza85], and [(Giza83 x Giza80) x Giza72]. The highest yield was achieved by the cross (Giza81 x Giza83), which exceeded the control variety Giza90 by 2.58 Ken/fed. The increases in seed cotton yield ranged from 2.0 to 2.5 Ken/fed for the crosses [(Giza83 x Giza80) x Giza75]. While it ranged from 1.5 to 2.0 Ken/fed to the crosses [(Giza83 x Giza80) x Giza89], (Giza83 x Pima S6),) [(Giza83 x Giza75) x 5844]. [(Giza83 x Giza80) x Dendera] and [(Giza83 x Giza80) x Giza85] respectively. On the other hand the crosses [(Giza83 x Giza72 x Delecero) x Giza85] and [(Giza83 x Giza80) x Giza72] were equal with Giza90 variety. The cultivated variety Giza83 gave higher seed cotton yield than most genotypes and check variety (Giza90) in Trial A except the genotypes F6 215\2001, F9 269\2001 and breeder seed1 for the crosses [(Giza83 x Giza80) x Dendera], (Giza85 x Giza83) and (Giza81 x Giza83), respectively. The commercial variety Giza80 was lower in seed cotton yield compared with other genotypes. Heritability value was 0.80, which indicated low environmental effect on this character. Ismail *et al.* (1989) found high heritability value of 0 76 for seed cotton yield.

2. Lint cotton yield (LCY)

Table (1) shows that 33 genotypes out of 39 genotypes exceeded the check variety Giza90 in this character. The excess ranged from 0.13 to 3.71. Ken/fed. Only 18 genotypes belonging to six crosses showed significant values for lint cotton yield. These genotypes were F6 159/2001, 161/2001 and 163/2001, belong to the cross [(Giza83 x Giza80) x Giza89], F6 180/2001and 186/2001, that were descendant of the cross [(Giza83 x Giza80) x Giza72])), F6 208/2001,210/2001 and 216/2001 which belonged to the cross [(Giza83 x Giza80) x Dendera], F8 230/2001,belonged to the cross [(Giza83 x Giza80) x Giza85], F9 259/2001, 261/2001 and 296/2001 were selected from the cross (Giza85 x Giza81). F9 272/2001, 280/2001 and 283/2001 were descendants of the cross [(Giza83 x Giza80) x Giza75] , F11 297/2001 belonged to the cross Giza83 x Pima S6 , mixed family seeds for the cross [(Giza83 x Giza75) x 5844], and breeder seed1 for the cross (Giza81 x Giza83). On the other hand the commercial variety Giza83 had the highest lint cotton yield (17.38 Ken\fed) while Giza80 had the lowest lint cotton yield (10.61 Ken\fed). Heribitability value of 0.79 was calculated for lint cotton yield indicating high genetic variability of this trait. Similar finding were recorded by Abou-Zahra *et al.* (1989).

3. Boll weight (BW)

Table (1) shows that only 18 genotypes surpassed the check variety Giza 90 for boll weight eight of them were significant. Those crosses Giza83 x Australian (F5 133/ 2001 and 134 /2001), Dendera x Australian (F5 139/2001), (Giza83 x Giza80) x Giza89 (F5 161/2001), (Giza83 x Giza80) x Dendera (F6 208/2001 and 215/2001), (Giza83 x Giza80) x Giza85 (F8 230/2001) and the cross (Giza83 x (Giza75 x 5844). It is worth to mention that most of the genotypes included in Trial A did not show significant improvement over Giza90 in boll weight. Selections of heavy boll weight genotypes could help the cotton breeder to improve the yield; because it is one of the main components of high seed cotton yield. The heritability value was 0.83. Indicating that this trait was slightly affected by the environmental condition. The present results somewhat varied with the finding of Sallam *et al.* (1987) who reported the low heritability estimates were obtained for boll weight trait.

4. Lint Percentage (L%)

Table (1) shows means of this trait which ranged from 37.60% to 41.20% for the genotype F5 119/2001 that was descending from the cross (Giza80 x Australian), F5 134/2001 which was derived from the cross (Giza83 x Australian) F10 293/2001 from the cross (Giza83 x Giza75) and breeder seed1 for the hybrid (Gza81 x Giza83), respectively. Evidently, the genotypes that descended from all the crosses in Trial A showed lint percentage values higher than the check variety Giza90 and commercial varieties Giza83 and Giza80. except the family F5 150/2001 for the cross Giza83 x Pima early (37.9%) and breeder seed1 for the cross Giza81 x Giza83 (37.6%). Heritability value of 0.57 was estimated indicating that this trait was considerably affected by environmental conditions.

5. Earliness index

As shown in Table (1), seven families were earlier than the check variety Giza90, It could be noted that all the earlier genotypes were selected from the crosses [(Giza83 x Giza80) x Giza89], (Giza89 x Giza 83), [(Giza83 x Giza72 x Dele) x Giza85], (Giza83 x Giza75) and (Giza 83 x Pima S6). Generally, earliness index is very important characters for cotton breeder to produce early varieties, which can escape from the bollworm infection and can be harvested early enough before sowing winter crops.

6. Seed index (SI)

It appeared from Table (1) that means of this trait ranged from 9.4 to 11.3 for the strain F5 139/2001 that belonged to the cross (Dendera x Australian) and the strain F6 180/2001 descending from the cross [(Giza83 x Giza80) x Giza72]. Three genotypes F5 137/2001,139/2001 belonged to the cross (Dendera x Australian) and the strain F11 297/2001 descending from the cross (Giza83 x Pima S6), gave significantly higher seed index value than the check variety Giza90. The broad sense heritabilty estimates of 0.70 was obtained for this trait.

7. Lint index (LI)

As shown in Table (1) mean of lint index ranged from 7.6 grams for F5 128/2001 to 5.6 grams for F6 180/2001. 15 genotypes produced significantly higher lint index than the check variety Giza90, the genotypes were F5 128/2001 and F5 130/2001, from cross (Giza 83 x Australian), F5137/2001 and F5 139/2001 from cross (Dendera x Australian), F6 208/2001,210/2001 and 215/2001 from the cross [(Giza83 x Giza80) x Dendera], F9 261/2001 and F9283/2001 from the cross [(Giza83 x Giza80) x Giza75], F10 293/2001 from the cross (Giza83 x Giza75), F11 297/2001 (Giza83 x Pima S6) and families for the cross [(Giza83 x Giza75) x 5844]. Heritability value for lint index was 0.62.

B. Fiber Properties

1. Fiber fineness and maturity (MIC)

Fiber fineness and maturity (MIC) reading presented in Table (2) showed that genotypes belonging to the crosses (Giza80 x Australian), [(Giza83 x Giza80) x Giza89], and [(Giza83 x Giza80) x Giza85] and some families i.e.F6 180/2001, 183/2001 and 185/2001 for the cross [(Giza83 x Giza80) x Giza72], F6 215/2001 for the cross [(Giza83 x Giza80) x Dandara], F7 226/2001 for the cross (Giza89 x Giza83), F9 269/2001 for the cross (Giza85 x Giza83) and F9 276/2001 for the cross [(Giza83 x Giza80) x Giza75 had Micronair reading which exceeded the check variety Giza90 . Other families in Trial A showed Micronair values less than the check variety Giza90 and the commercial variety Giza83 and Giza80. The desired Micronair reading for the genotypes of Middle and Upper Egypt (above 4.0) could be achieved through selecteing genotypes that exceed 4.0 MIC values.

2. Hair weight (HW)

Hair weight measure for fiber fineness in terms of militex. The results of this trait (Table 2) were nearly in the same direction and comparable to those of Micronaire reading.

3. Fiber length at 2.5% span length

All the genotypes of all crosses could be considered in long staple category (Table 2). Seven genotypes descended from five crosses revealed that fiber length exceeded the check variety Giza90 and the commercial varieties Giza83 and Giza80. The genotypes were F5 120/2001,cross Giza80 x Australian), F5 128/2001,130/2001 and 132/2001,cross Giza83 x Australian), F5 146/2001 (cross Giza80 x Pima early), F10 293/2001 (cross Giza83 x Giza75) and the mixed families belonging to the cross [(Giza83 x Giza75) x 5844].

4. Yarn strength (Y.St)

From (Table2), The genotypes of the crosses Giza83 x Australian, Dendera x Australian, Giza80 x Pima early, Giza83 x Pima early, [(Giza83 x Giza80) x Giza89], [(Giza83 x Giza80) x Giza85], [(Giza83 x Giza72 x Delecero) x Giza85] and Giza85 x Giza83 and one strain F5 119/2001 for the cross Giza80 x Australian were slightly stronger than the control varieties Giza90, Giza83 and Giza80.

From the results obtained of Trial A, it could be stated that there were two promising crosses [(Giza83 x Giza80) x Giza89] and (Giza85 x Giza83) which exhibited increases for yield component and fiber properties than the check varieties Giza90, Giza83 and Giza80. High heritability estimates in broad sense were computed for seed cotton yield, lint yield and boll weight in trial A, It could be stated that the environmental conditions slightly affected these characters.

The advanced strain test (Trial B):

Trial B is the advanced strain test for the promising genotypes that were selected from Trial A. Trial B was carried out at six locations in Middle and Upper Egypt, i.e. El-Fayoum, Seds, El-Minia, Assiut, Sohaag, and El-Mattania in order to study the breeding behaviour of the genotypes grown under different environments to evaluate the genotype stabilities in different locations.

A. Yield components

1. Seed cotton yield (SCY)

Table (3) showed that 11 genotypes out of 21 included in Trial B exceeded the check variety Giza90 and the commercial varieties Giza 83 and Giza80 in the yield of seed cotton. These genotypes were F5 98\2000 and 102\2000 descending From the cross [(Giza83 x Giza80) x Giza89], F5 157\2000 from the cross [(Giza83 x Giza80) x Dedera], F6 173\2000 from the cross (Giza89 x Giza83), F8 234\2000, 235\2000 and 236\2000 descended from the cross (Giza85 x Giza83), F8 248\2000, 255\2000 and 259\2000 belonged to the cross [(Giza83 x Giza80) x Giza75] and the mixed families for the hybrid [Giza83 x (Giza75 x 5844)]. The increments ranged from 0.5 to1.38, Ken\fed. On the other hand the improvement in seed cotton yield character was significant for only two genotypes F5 98\2000 (1.38 kan\fed) and F8 234\2000 (0.62 kan\fed) descending from the crosses [(Giza83 x Giza80) x Giza89] and (Giza85 x Giza83), respectively. The heritability value for the combined analysis was 0.60. This value indicated that the genotypes were moderately affected by the environmental conditions. Moreover, the interaction between genotype and locations for seed cotton yield was highly significant. This suggests that the performance of these crosses varied from location to another. Bader *et al.* (1999) studied the two new Egyptian cotton cultivars and four commercial varieties at three locations and found that highly significant interaction for seed cotton yield.

2. Lint cotton yield (LCY)

Results in Table (3) revealed that means of lint yield values ranged from 9.98 Ken\fed for the family F7 201\2000 from the cross [(Giza83 x Giza72 x Dele) x Giza85] to 13.21 Ken\fed for the family F5 98\2000 from the cross [(Giza83 x Giza80) x Giza89]. Two genotypes showed significant increases for lint yield compared with the control varieties, i.e. F5 98\2000 (1.97 kan\fed) from the cross [(Giza83 x Giza80) x Giza89] and F5 157\2000 (0.94 kan\fed) from the cross [(Giza83 x Giza80) x Dendera]. Heritability values estimated from combined data for this trait was 0.56 indicating that the environmental conditions affected this trait. Moreover, the genotype x environments interaction for this trait was highly significant. The same results were obtained by Abdel-Rahman *et al.* (1994) and Sarma *et al.* (1994)

3. Boll weight (BW)

The data presented in Table 3 indicated that seven genotypes i.e. F5 102\2000 from the cross [(Giza83 x Giza80) xGiza89], F5157\2000 from the cross [(Giza83 x Giza80) x Dendera], F7182\2000 from the cross [(Giza83 x Giza80) xGiza85], F8 234\2000 from the cross (Giza85 x Giza83), F8 259\2000 from the cross [(Giza83 x Giza80) xGiza75] and mixed families from the hybrid [Giza83 x (Giza75 x5844] had bolls heavier than control varieties. The broad sense heritabilty estimate of 0.3 was obtained for this trait indicating that the environmental factors had higher effect of boll weight than seed cotton yield and lint yield. Highly significant genotype x locations interaction at different locations was recorded for this character. On the other hand Hassan *et al.* (2001) reported that the boll weight for Giza80 and Giza83 were higher than the other genotypes under study.

4. Lint Percentage (L%)

Lint percentage values presented in Table (3) showed that all genotypes didn't exceed the check variety Giza90. On the other hand, seven genotypes belonging to five crosses revealed that lint percentage values were exceeded and significant than the commercial varieties Giza83 and Giza80. These crosses were [(Giza83 x Giza80) xGiza89], [(Giza83 x Giza80) xGiza72], [(Giza83 x Giza80) xGiza90], [(Giza83 x Giza80) x Dendera] and (Giza83 x Giza75). Heritability value estimated from combined analysis was 0.73 indicating that the environmental conditions affect slightly for this trait. Highly significant interaction between genotypes and locations was showed for lint percentage. Mohamed (1991) reported that the Egyptian cotton variety Giza83 had a good material for lint percentage.

5. Earliness

It could be indicated from (Table 3) that some genotypes were earlier than the check variety Giza90. Genotypes descending from the crosses (Giza89 x Giza83), [(Giza83 x Giza72 x dele) x Giza85], (Giza83 x Giza75) and (Giza81 x Giza83) showed also higher earliness index than the control variety. The earliest cross was (Giza83 x Giza75). The heritability value was 0.73 for the combined analysis indicating the environment slightly affected of this character. Same results for heritability estmates were obtained by Sallam *et al.* (1987).

6. Seed index (SI)

The seed index of most genotypes ranged from 9.2 to 10.5 gram. The highest seed index (10.5) was obtained by the mixed families from the cross [Giza83 x (Giza75 x 5844)] followed by the family F9 280\2000 from cross (Giza83 x Pima S6), family F8 234\2000, 235\2000 and 236\2000 from the cross (Giza85 x Giza83), family F8 248\2000, 255\2000 and 259\2000 from cross [(Giza83 x Giza80) x Giza75]. On the other hand, the control varieties Giza90, Giza83 and Giza80 recorded 9.8, 10.0

and 9.9 gram for seed index, respectively. While the cross [(Giza83 x Giza72 x Dele) x Giza85] had the lowest seed index than the other crosses in Trial B. Heritability value of 0.78 was high indicating that the environments slightly influenced this trail. Highly significant interaction between genotypes x locations was noticed for this trait.

7. Lint index (LI)

It appeared from Table (3) that means of this trail ranged from 5.5 to 6.8 gram. Nine genotypes belonging to some crosses revealed higher lint index than the check varieties Giza90, Giza83 and Giza80. The genotypes were F5 157\2000 from cross [(Giza 83 x Giza 80) x Dendera], F8 234\2000, 235\2000 and 236\2000 from cross (Giza 85 x Giza 83), F8 248\2000, 255\2000 and 259\2000 from [(Giza 83 x Giza 80) x Giza 75], F9 290\2000 from cross (Giza 83 x Pima S6) and mixed families from the cross [(Giza 83 x Giza 75) x 5844]. The heritability value for the combined analysis was 0.62 indicating that environment considerably affected on lint index. The interaction between genotypes x locations was highly significant.

B. Fiber properties

1. Fiber fineness and maturity (MIC)

The results of Micronaire reading in all genotypes under study ranged from 3.6 to 4.1, (Table 4). The genotypes i.e. F5 124\2000 and 138\2000 F6 182\2000 and F8 234\2000 had the same Micronaire reading as Giza90, (3.6). On the other hand, the remaining genotypes in Trial B recorded the higher Micronaire reading than the check variety Giza90.

2. Hair weight (HW)

Hair weight estimates (Table 4) showed nearly the same trend as the micronaire reading.

3. Fiber length at 2.5% span length

The genotypes of all crosses showed same trend as Giza90 and the control varieties i.e. Giza83 and Giza80. Generally, staple length of all genotypes fall in the category of medium staple cotton (Table 4)

Yarn strength (Y.St)

All the genotypes of the crosses [(Giza 83 x Giza 80) x Giza 89], [(Giza 83 x Giza 80) x Giza 72], [(Giza 83 x Giza 80) x Giza 85]. [(Giza 83 x Giza 72 x Dele) x Giza 85] and (Giza 83 x Pima S6) and the genotypes F6 174\2000, F8 234\2000, 235\2000 descended from the crosses (Giza 89 x Giza 83) and (Giza 85 x Giza 83), respectively, have higher fiber strength than the Giza 90 or the commercial varieties Giza 83 and Giza 80, (Table 4). The improvement ranged from 45 units by the cross [(Giza 83 x Giza 80) x Giza 72] to 245 units by the cross [(Giza 83 x Giza 80) x Giza 85].

From the results obtained in Trial B the crosses [(Giza 83 x Giza 80) x Giza 89], [(Giza 83 x Giza 80) x Giza 75] and [Giza 83 x (Giza 75 x 5844)] have almost shown increase for yield and yield components and fiber properties than the check varieties Giza 90, Giza 83 and Giza 80.

Comparing the best three crosses [(Giza 83 x Giza 80) x Giza 89], [(Giza 83 x Giza 80) x Giza 75] and [Giza 83 x (Giza 75 x 5844)] with the newest variety Giza90 through trial B at different locations (Table 3), it could be concluded that the promising cross [(Giza 83 x Giza 80) x Giza 89] exceeded the crosses [(Giza 83 x Giza 80) x Giza 75] and [Giza 83 x (Giza 75 x 5844)] and the newest Giza 90 in seed cotton yield the increase was 8.2%, 9.9% and 14.8% kan\fed, respectively. In the meantime, it increased for lint cotton yield from 8.8%, 9.1% and 16.2% kan\fed, respectively and having desirable fiber characters for middle and Upper Egypt. It had higher Yarn strength than the other two crosses and Giza 90.

Low heritability estimates in broad sense were computed for boll weight and high heritability values were recorded for seed cotton yield and lint yield which indicated that the environmental factors had more effect on boll weight than the other characters.

The interaction between genotype x locations for yield traits were highly significant. This suggests that the performance of these crosses varied from one location to another.

FUTURE BREEDING STRATEGY

Results in Trial A and B indicated that the genotypes of the cross [(Giza83 x Giza80) x Giza89] exceeded all genotypes and another families of crosses and the control varieties for yield and yield components and fiber properties, Therefore they are promising material and be continued in the breeding program.

The somewhat low and high heritability values estimated in broad sense for boll weight and seed cotton yield and lint cotton yield in trail B verified by the presence of significant, genotypes x locations, suggested that such material should be evaluated for number of years at different locations.

The promising families that were selected from trail (A), will be grown in trail (B) in the next season with the check variety Giza90 and the commercial varieties Giza83 and Giza80 It should be noted that trail (A) represents the descendant from the progenies of families grown in trail (B) in the same season, besides the families that reached the fifth generation.

Table 1. Mean performance of yield and yield components for the selected genotypes and cultivated varieties grown in Trial (A) at Seds in 2002 season.

N.O	Families	Parent	Origin	SCY Ken/fe	LCY Ken/fe	BW gm	L%	Earliness	SI gm	LI gm
1	F5 119 \ 2001	F4 52 \ 2000	G.80 X Australian	11.91	14.58	147	41.2	75.1	9.8	6.9
2	F5 120 \ 2001	,, ,,	,, ,,	11.47	14.07	152	40.5	72.8	9.7	6.6
3	F5 121 \ 2001	,, ,,	,, ,,	10.93	13.30	139	40.0	76.1	10.4	6.9
4	F5128 \ 2001	F4 57 \ 2000	G.83 X Australian	11.18	14.31	145	40.8	70.1	10.9	7.6
5	F5 130 \ 2001	, ,,	,, ,,	10.08	13.00	154	40.2	61.5	10.9	7.1
6	F5132 \ 2001	F4 65 \ 2000	,, ,,	11.96	14.42	155	39.3	74.4	10.5	6.8
7	F5133 \ 2001	,, ,,	,, ,,	11.07	13.41	163	40.2	73.5	10.3	6.9
8	F5 134 \ 2001	F4 68 \ 2000	,, ,,,	10.67	13.69	164	41.2	76.0	9.7	6.8
9	F5137 \ 2001	F4 75 \ 2000	Dendera x Australian	10.20	12.57	149	39.7	74.3	11.2	7.4
10	F5139 \ 2001	,, ,,	,, ,,	10.32	12.49	162	39.6	71.3	11.3	7.4
11	F5146 / 2001	F4 83 \ 2000	G.80 x Pima early	10.02	12.69	142	40.6	67.4	10.0	6.8
12	F5 150 \ 2001	F4 92 \ 2000	G.83 x Pima early	10.65	12.81	151	37.9	81.7	10.0	6.1
13	F6159 \ 2001	F5 98 \ 2000	[(G.83 xG.80) x G.89]	13.40	16.36	144	39.1	69.9	10.0	6.4
14	F5161\ 2001	,, ,,	,, ,, ,,	13.30	16.15	166	39.3	72.3	9.7	6.4
15	F6 163 \ 2001	F5 102 \ 2000	,, ,, ,,	13.12	16.27	154	40.0	67.3	10.2	6.8
16	F6 180 \ 2001	F5 117\ 2000	[(G.83 xG.80) x G.72]	12.26	15.70	145	40.5	74.3	9.4	5.9
17	F6183 \ 2001	, ,,	,, ,, ,,	11.32	14.33	157	40.4	70.5	9.9	6.7
18	F6185 \ 2001	F5 124\ 2000	,, ,, ,,	10.93	13.68	142	39.6	73.2	9.9	6.5
19	F6 186 \ 2001	, ,,	,, ,, ,,	12.42	15.89	159	39.3	68.0	9.9	6.4
20	F6 201\ 2001	F5 138 \2000	[(G.83 xG.80) x G.90]	10.79	14.13	139	40.5	76.8	9.8	6.7
21	F6 208 \ 2001	F5 157 \2000	[(G.83 xG.80) x Dendera]	12.23	16.21	161	40.7	68.6	10.8	7.4
22	F6210 \ 2001	, ,,	,, ,, ,,	13.15	17.03	148	40.6	65.6	10.8	7.4
23	F6 215 \ 2001	F5 163 \2000	,, ,, ,,	11.57	15.26	160	40.1	72.7	10.4	7.0
24	F6 216 \ 2001	, ,,	,, ,, ,,	13.92	16.73	158	39.1	73.8	10.1	6.5
25	F7 226 \ 2001	F6 173 \2000	(G.89 x G.83)	11.36	13.67	142	39.9	77.2	10.0	6.6
26	F7 228 \ 2001	F6 174 \2000	,, ,,	12.01	14.70	143	39.9	72.6	10.2	6.7
27	F8 230 \ 2001	F7 182 \2000	[(G.83 xG.80) x G.85]	12.94	16.04	163	38.9	73.9	10.0	6.4
28	F8 244 \ 2001	F7 201\ 2000	[(G.83xG.72X Dele) x G.85]	11.96	14.95	158	39.0	77.4	9.5	6.1
29	F8 245 \ 2001	,, ,,	,, ,,	12.38	15.46	141	39.3	87.0	9.1	5.9
30	F9 25 0 \2001	F8 234 \2000	(G.85 x G.83)	12.65	15.75	157	39.9	72.2	10.3	6.8
31	F9 261\ 2001	F8 235 \2000	,, ,,	13.41	16.50	157	39.5	72.4	10.9	7.1
32	F9 269 \ 2001	F8 236 \2000	,, ,,	13.94	17.25	149	39.8	72.6	10.7	7.1
33	F9 273 \ 2001	F8 248 \2000	[(G.83 xG.80) x G.75]	13.67	17.09	146	40.3	74.9	10.6	7.1
34	F9 280 \ 2001	F8 225 \ 000	,, ,, ,,	13.38	16.46	145	40.1	71.3	10.7	7.1
35	F9 283 \ 2001	F8 259 \2000	,, ,, ,,	13.43	16.59	151	39.6	75.5	10.9	7.2
36	F10 93 \ 2001	F9 284 \2000	(G.83 x G.75)	11.24	14.61	141	41.2	79.1	10.2	7.1
37	F11297 \2001	F10 290\2000	(G.83 x Pima S_6)	13.30	16.50	141	39.4	78.4	11.1	7.2
38	Mixed families		[(G83xG75) x5844]	13.15	16.52	169	40.1	70.2	10.8	7.3
39	Breeder seed 1		(G81 X G83)	13.92	16.70	142	37.6	76.0	10.3	6.2
40	GIZA 90			11.34	13.54	151	38.8	76.0	10.8	6.2
41	GIZA83			13.89	17.38	150	39.0	72.0	10.7	7.1
42	GIZA80			8.61	10.61	160	39.0	59.5	10.8	6.9
	Mean			12.04	14.99	151	39.8		10.3	6.8
	LSD 1%			1.11	2.66	12.39			0.107	0.100
	LSD 5%			0.85	2.02	9.43			0.282	0.265
	Heritability			80.4	79.8	83.4	57.6		70.00	62.8

Table 2. Mean performance for fiber properties of the selected genotypes and cultivated varieties grown in Trial (A) at Seds in 2002 season.

N.O	Strains	Parent	Origin	MIC	HW	2.5% SL	Y.St
1	F5 119 \ 2001	F4 52 \ 2000	G.80 X Australian	4.5	193	30.3	2120
2	F5 120 \ 2001	,, ,,	,, ,,	4.1	194	31.2	1940
3	F5 121 \ 2001	,, ,,	,, ,,	4.2	194	30.0	1855
4	F5 128 \ 2001	F4 57 \ 200	G.83 X Australian	3.8	132	32.9	2130
5	F5 130 \ 2001	,, ,,	,, ,,	3.8	133	32.5	2070
6	F5 132 \ 2001	F4 65 \ 2000	,, ,,	3.8	149	31.4	2145
7	F5 133 \ 2001	,, ,,	,, ,,	3.5	131	30.9	2000
8	F5 134 \ 2001	F4 68 \ 200	,, ,,	3.8	135	30.8	2220
9	F5 137 \ 2001	F4 75 \ 2000	Dendera x Australian	3.5	148	29.5	2160
10	F5 139 \ 2001	,, ,,	,, ,,	3.8	144	29.0	2150
11	F5 146 \ 2001	F4 83 \ 2000	G.80 x Pima early	3.5	130	31.4	1995
12	F5 150 \ 2001	F4 92 \ 2000	G.83 x Pima early	3.5	133	30.5	1990
13	F6 159 \ 2001	F5 98 \ 2000	[(G.83 xG.80) x G.89]	4.3	160	29.0	2095
14	F6 161\ 2001	,, ,,	,, ,, ,,	4.5	168	28.8	2100
15	F6 163 \ 2001	F5 102 \ 2000	,, ,, ,,	4.5	170	29.7	2020
16	F6 180 \ 2001	F5 117 \ 2000	[(G.83 xG.80) x G.72]	4.5	168	28.9	1835
17	F6 183 \ 2001	,, ,,	,, ,, ,,	4.7	174	28.8	1810
18	F6185 \ 2001	F5 124 \ 2000	,, ,, ,,	4.5	165	29.2	1830
19	F6 186 \ 2001	,, ,,	,, ,, ,,	3.7	142	30.1	1780
20	F6 201\ 2001	F5 138 \ 2000	[(G.83 xG.80) x G.90]	3.9	144	29.1	1845
21	F6 208 \ 2001	F5 157 \ 2000	[(G.83 xG.80) x Dendera]	3.9	148	30.1	1780
22	F6 210 \ 2001	,, ,,	,, ,, ,,	4.0	153	29.9	1805
23	F6 215 \ 2001	F5 163 \ 2000	,, ,, ,,	4.2	167	30.7	1955
24	F6 216 \ 2001	,, ,,	,, ,, ,,	4.4	165	29.6	1920
25	F7 226 \ 2001	F6 173 \ 2000	(G.89 x G.83)	4.1	154	29.2	1860
26	F7 228 \ 2001	F6 174 \ 2000	,, ,,	3.9	147	29.1	1815
27	F8 230 \ 2001	F7 182 \ 2000	[(G.83 xG.80) x G.85]	4.1	151	30.8	2100
28	F8 244 \ 2001	F7 201\ 2000	[(G.83 xG.72 X Dele) x G.85]	3.9	144	29.7	1975
29	F8 245 \ 2001	,, ,,	,, ,,	3.8	144	29.7	1965
30	F9 25 0 \ 2001	F8 234 \ 2000	(G.85 x G.83)	3.5	129	30.0	2100
31	F9 261\ 2001	F8 235 \ 2000	,, ,,	4.0	148	29.2	2025
32	F9 269 \ 2001	F8 236 \ 2000	,, ,,	4.1	156	29.9	2020
33	F9 273 \ 2001	F8 248 \ 2000	[(G.83 xG.80) x G.75]	4.1	158	28.7	1985
34	F9 280 \ 2001	F8 225 \ 2000	,, ,, ,,	4.0	154	30.3	1950
35	F9 283 \ 2001	F8 259 \ 2000	,, ,, ,,	3.9	150	30.6	1930
36	F10 293 \ 2001	F9 284 \ 2000	(G.83 x G.75)	3.9	145	31.2	1810
37	F11297 \ 2001	F10 290 \ 2000	(G.83 x Pima S6)	3.9	140	28.2	1925
38	Mixed families		[(G83xG75) x5844]	4.0	156	32.5	1920
39	Breeder seed 1		(G81 X G83)	3.9	144	29.8	1830
40	GIZA 90			4.0	152	31.0	1940
41	GIZA83			4.1	152	29.9	1845
42	GIZA80			4.1	162	31.1	1900
	Mean			4.0	151	30.1	1970

Table 3. Combined analysis for yield component of selected genotypes and cultivated varieties in Trial B at six different locations in Upper Egypt in 2002 season.

NO	Strain	Parent	Origin	SCY Ken\fe	LCY Ken\fe	BW gm	L%	Earliness	SI gm	LI gm
1	F5 98\2000	F4 81\ 99	[(G.83 XG.80) X G.89]	10.73	13.21	136	38.8	85.5	9.5	5.5
2	F5 102\2000	F4 82 \ 99	,, ,, ,,	9.65	12.15	146	39.8	80.3	9.8	6.3
3	F5 117\2000	F4 89 \ 99	[(G.83 XG.80) X G.72]	8.23	10.49	136	40.1	85.7	9.4	6.1
4	F5 124\2000	F4 91 \ 99	,, ,, ,,	8.84	11.00	140	39.2	85.1	9.7	6.0
5	F5 138\2000	F4 106 \99	[(G.83 XG.80) X G90]	9.28	12.00	133	40.8	83.1	9.2	6.2
6	F5 157\2000	F4 123 \99	[(G.83 XG.80) XDendera]	9.86	12.80	145	40.8	82.7	9.9	6.5
7	F5 163\2000	F4 124\ 99	,, ,, ,,	9.13	11.39	142	39.2	82.7	9.8	6.3
8	F6173\2000	F5 140 \99	(G.89 X G.83)	9.78	11.93	140	38.5	87.3	9.7	6.2
9	F6 173\2000	F5 141 \99	,, ,,	9.12	11.11	139	38.5	86.4	9.7	6.0
10	F7 182\2000	F6 148 \ 99	[(G.83 XG.80) X G85]	9.40	11.44	145	38.3	81.8	9.4	5.8
11	F7 201\2000	F6 172 \99	[(G.83 XG72 X Dele) XG85]	8.10	9.98	139	38.8	85.9	9.2	5.8
12	F8 234\2000	F7 209 \ 99	(G.85 X G.83)	9.97	12.07	144	38.2	83.9	10.0	6.5
13	F8 235\2000	F7 212 \ 99	,, ,,	9.54	11.66	142	38.6	84.9	10.2	6.6
14	F8 236\2000	F7 212 \ 99	,, ,,	9.64	11.73	144	38.4	83.2	10.1	6.5
15	F8 248\2000	F7 232 \ 99	[(G.83 XG.80) X G75]	9.92	12.14	142	38.6	85.3	10.0	6.5
16	F8 255\2000	F7 236 \ 99	,, ,, ,,	9.74	11.85	139	38.4	84.8	10.0	6.7
17	F8 259/2000	F7 246 \ 99	,, ,, ,,	9.76	11.80	146	38.2	83.9	10.0	6.5
18	F9 284/2000	F8 254 \ 99	(G.83 X G.75)	8.57	10.74	139	39.7	88.4	9.6	6.3
19	F9 290/2000	F8 259 \ 99	(G.83 X Pima S6)	9.13	11.11	141	38.3	84.7	10.4	6.8
20	Mixed families		[G.83 x (G. 75 x 5844)]	9.76	12.02	148	38.8	84.2	10.5	6.8
21	Breeder seed1		(G. 81 x G. 83)	9.25	10.99	143	37.4	86.2	9.6	6.0
22	Giza 90		(G.83 X Dendera)	9.35	11.14	138	40.8	85.8	9.8	6.2
23	Giza 83		(G.72 X G.67)	9.40	11.43	142	38.4	83.0	10.0	6.1
24	Giza 80		(G.66 X G.73)	8.59	10.61	143	38.8	78.1	9.9	6.3
	Mean			9.36	11.53	141	39.1	84.3	9.8	6.3
	LSD 5%			0.60	0.74	4.72	0.68		0.34	0.49
	LSD 1%			0.79	0.97	6.20	0.92		0.46	0.67
	Heritability			60.2	56.3	31.4	73.5		78.5	62.04
	Family x Location M.S			3.047**	3.352**	3.058**	1.34**		1.77**	1.44**
	Genotypes M.S			7.656**	7.675**	4.459**	9.51**		3.89**	3.70**

*, ** Significant at 0.05 and 0.01 levels respectively.

Table 4. Combined analysis for yield component of selected genotypes and cultivated varieties In Trial B at six different locations in Upper Egypt in 2002 season.

NO	Strain	Parent	Origin	Mic	HW	2.50% SL	Y.St
1	F5 98\2000	F4 81\ 99	[(G.83 XG.80) X G.89]	4.0	151	29.17	1940
2	F5 102\2000	F4 82 \ 99	,, ,, ,,	4.0	150	29.92	2045
3	F5 117\2000	F4 89 \ 99	[(G.83 XG.80) X G.72]	3.7	139	29.18	1910
4	F5 124\2000	F4 91\ 99	,, ,, ,,	3.6	136	29.47	1910
5	F5 138\2000	F4 106 \ 99	[(G.83 XG.80) X G90]	3.6	140	29.27	1740
6	F5 157\2000	F4 123 \ 99	[(G.83 XG.80) XDendera]	4.1	155	29.27	1575
7	F5 163\2000	F4 124 \ 99	,, ,, ,,	4.0	150	29.63	1810
8	F6173\2000	F5 140 \ 99	(G.89 X G.83)	3.7	138	29.02	1745
9	F6 174\2000	F5 141 \ 99	,, ,,	3.6	137	28.92	1905
10	F7 182\2000	F6 148 \ 99	[(G.83 XG.80) X G85]	3.6	134	29.93	2110
11	F7 201\2000	F6 172 \ 99	[(G.83 XG72 X Dele) X G85]	3.6	135	28.80	1930
12	F8 234\2000	F7 209 \ 99	(G.85 X G.83)	3.6	131	30.38	2005
13	F8 235\2000	F7 212 \ 99	,, ,,	3.7	138	29.73	1905
14	F8 236\2000	F7 212 \ 99	,, ,,	3.9	140	29.70	1815
15	F8 248\2000	F7 232 \ 99	[(G.83 XG.80) X Giza75]	3.8	141	29.50	1845
16	F8 255\2000	F7 236 \ 99	,, ,, ,,	3.8	136	29.73	1855
17	F8 259/2000	F7 246 \ 99	,, ,, ,,	3.8	144	29.57	1785
18	F9 284/2000	F8 254 \ 99	(G.83 X G.75)	3.7	141	29.50	1805
19	F9 290/2000	F8 259 \ 99	(G.83 X Pima S6)	3.7	139	30.48	1870
20	Mixed families		[G.83 x (G. 75 x 5844)]	3.8	143	29.95	1780
21	Breeder1		G. 81 x G. 83	4.0	149	28.73	1800
22	Giza 90		Giza 83 x Dendera	3.6	140	29.20	1815
23	Giza 83		Giza67 x Giza72	3.7	140	29.43	1770
24	Giza 80		Giza66 x Giza73	3.7	141	30.88	1865
	Mean			3.8	141	29.56	1855

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تقييم بعض التراكيب الوراثية فى القطن المصرى تحت بيئات مختلفة

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يهدف هذا البحث الى تقييم بعض سلالات هجن القطن طويل التيلة مع مقارنتها بالأصناف المنزرعة جيزة٩٠ ، جيزة٨٣ ، جيزة٨٠ وذلك من خلال أختبار النسل فى تجربة المحصول الاولية(أ) بمحطة البحوث الزراعية بسدس وكذلك فى تجارب المحصول المتقدمة (ب) فى مناطق الفيوم ، سدس ، المنيا، اسيوط ، سوهاج ، المطاعنة وذلك بالوجة القبلي فى موسم ٢٠٠٢ .

وقد اوضحت النتائج المتحصل عليها ان هناك عدد من الهجن المبشرة من حيث المحصول والصفات التكنولوجية وهذة الهجن هى (جـ٨٣ × جـ٨٠) × جـ٨٩ و (جـ٨٣ × جـ٨٥) وذلك فى تجربة (أ) والهجن (جـ٨٣ × جـ٨٠) × جـ٧٥ و جـ٨٣ × (جـ٧٥ × ٥٨٤٤) فى تجربة (ب) وان ألاستمرار فى تربية وتقييم السلالات المبشرة لهذة الهجن بحيث يمكن للمربى الحصول على هجن متفوقة على ألاصناف المحلية فى صفات المحصول والتيلة.

كذلك اوضحت النتائج ان سلالات الهجين المبشر (جـ٨٣ × جـ٨٠) × جـ٨٩ تفوقت على كل سلالات الهجن وكذلك الاصناف المحلية المنزرعة فى الصفات المحصولية والتكنولوجية فى كل من تجربتي (أ) و (ب) .

كذلك اوضحت النتائج ان كفاءة التوريث كانت عالية فى المعنى الواسع لكل الصفات المحصولية وذلك فى تجربة (أ) وتجارب (ب) عدا صفة وزن اللوزة فى المتقدمة (ب) والتى اظهرت درجة توريث منخفضة فى المعنى الواسع كذلك هناك تفاعل معنوى بين السلالات والمناطق للصفات المحصولية المدروسة مما يدل على انة يجب ان يتم تقييم هذة السلالات تحت ظروف المناطق المختلفة ولعدد من السنوات وذلك قبل الحكم على مدى التحسين فيها.