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# COMPARATIVE EVALUATION OF PROMISING HYBRID GIZA 84 X (GIZA 74 X GIZA 68) AND EXTRA-LONG STAPLE COTTON VARIETIES GROWN IN NORTH DELTA

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***Abstract***

Promising hybrid cotton Giza 84 x (Giza 74 x Giza 68) and four commercial varieties i.e.: Giza 45, Giza 70, Giza 87 and Giza 88 were evaluated at six environments in North Delta. Randomized complete block design was used. Nine characters were studied. Significant differences between genotypes for all studied characters except 50% span length and Presly index. The new hybrid Giza 84 x (G. 74 x G. 68) produced the highest overall seed cotton yield, surpassed Giza 45 and Giza 87 in lint percentage and boll weight and on Giza 88 in length uniformity ratio.

El-Beheira region surpassed the two other locations in all studied characters except Pressley index which was insignificant and length uniformity ratio. The effects of the growing year, interactions between genotypes x seasons and location x season were significant on most studied characters butt the effect of the second order interaction was significant on seed index and lint percentage only.

Positive significant correlations were found between seed cotton yield, boll weight, seed index, lint percentage and micronaire reading. Also, between 2.5% span length, boll weight, seed index and micronaire reading and between 50%, 2.5% span length and length uniformity ratio. It can be recommendation by sowing Giza 84 x (G.74 x G. 68) hybrid from the extra long staple cotton category at North Delta, Giza 70 at El-Beheira, Giza 88 at both El-Beheira and Kafr El-Sheikh and concluded that this hybrid may be used for the improvement the Extra long staple cotton category of seed cotton yield, while Giza 88 was the best for the improvement of boll weight, seed index lint percentage and 2.5% span length. Also Giza 87 to improvement of fineness.

## INTRODUCTION

Improving cotton quality through introducing new varieties is the most important objective of the cotton research program carried out by the Cotton Research Institute (CRI). Cotton quality is a complex characteristic. It is included in the cotton breeding program of the CRI, the cultivars along with the established promising hybrids in regional yield trials in different locations (Al-Didi, 1982). Therefore, the Regional Evalua-

tion Res. Section C.R.I., carries out yearly regional variety tests in all cotton locations with the main objective of identifying the best locations for the new varieties and the best substitution variety for each of the existing commercial one in case of degeneration or deterioration of the latter.

The performance of cotton varieties under different environments was studied by several workers, i.e, Abo El-Zahab *et al.* (1992a,b); Gutierres, J.D. and K.M. El-Zik (1992); Abdel-Rahman *et al.* (1994); Badr (1994); Seyam *et al.* (1994);Kill and O. Gercer, (1995a); Abou-Tour *et al.* (1996); Badr *et al.* (1998); Sorour *et al.* (1998); and Abd El-Salam (2000), they reported that the effects of genotypes, location, year and the interactions between them were significant on some cotton characters. Many investigators reported the relation and correlations between different traits Abo-Tour *et al.* (1996) they reported that the relationship between mean length and micronaire reading was negative. Nawar *et al.* (1999), they indicated that micronaire reading showed significant positive correlation with lint percentage, seed index and length uniformity ratio and between 25%, 50% span length, and between 50% S.L., L.U.R. Negative correlation was recorded between lint percentage and lint span length.; Badr and Abd El-Aziz (2000), they found positive significant correlation were found between seed cotton yield, boll weight/g, lint percentage, maturity ratio, hair weight and yarn strength-boll weight/g lint percentage, seed index and micronaire reading maturity ratio with seed index and lint strength, also, positive interrelationships were found among 2.5%, 50% span length with micronaire reading, hair weight, and yarn strength. Negative correlations were recorded between lint span length and boll weight, seed index and lint percentage-Pressley index and lint percentage. Abd El-Salam (2000) and Badr *et al.* (2001), they reported that positive significant correlations were found between seed cotton yield, boll weight, seed index, lint percentage and micronaire reading and between (50% and 2.5%) span length and length uniformity ratio.

The aim of the present investigation was to evaluate new extra long cotton hybrid Giza 84 x (Giza 74 x Giza 68) with four commercial varieties; Giza 45; G. 70; G. 87 and Giza 88 at North Delta Egypt.Correlation between studied characteristics was also carried out beside the studied properties. it also aimed at finding the best genotype among these studied genotypes grown in each location.

## MATERIALS AND METHODS

The materials consisted of one new hybrid cotton; Giza 84 x (G. 74 x G. 68) and four commercial varieties; Giza 45, Giza 70, Giza 87 and Giza 88 of Egyptian cotton were grown in the region of North Delta for the two successive years 2000 and 2001 as follows: Northern Delta (where the extra long staple varieties are normal planted) at Kafr El-Sheikh, El-Beheira (Kafr El-Dawar) and Damiatta (Kafr Saad).

A randomized complete block design with four replications was used at each location. The plots were 5 rows each of 4 m long and 0.65m apart. The distance between hills was 25 cm and each hill was thinned to two plants. Sowing date was at the first week of April. Normal cultural practices were followed. All tested genotypes were evaluated for seed cotton yield (S.C.Y.k/f) = Estimated as the weight of seed cotton yield in kentar per feddan.

- boll weight in grams (B.W.) The overage boll weight in grams of 25 bolls picked at random from each plot.
- Lint percentage (L%): The weight of lint obtained a seed cotton sample : L%

$$= \frac{\text{Weight of lint in the sample}}{\text{Weight of seed cotton in the sample}}$$

- Seed index (S.I.): The weight of 100 seeds in grams.

2.5% and 50% span length was measured by means of the digital Fibrograph 530, according to the standard method of (A.S.T.M.D. 1447.67).

The length uniformity ratio calculated: L.U.R.% $\frac{\text{50 \% span length}}{\text{2.5 \% span length}}$

Micronare reading was carried out using micronaire apparatus (A.S.T.M.D. 1448), and Presly index (P.I.) measurements. Fiber tests were carried out at cotton Technology Dept., Cotton Res. Inst. Under controlled humidity and temperature.

The standard analysis of variance, (Snedecor and Cochran, 1967) was computed for each experiment combined analysis for genotype, location and growing season. Differences between means were tested by the least significant differences (LSD). Simple corrolation coefficients were estimated between the studied characters.

## RESULTS AND DISCUSSION

The extra long staple cotton varieties are usually grown in North Delta of Egypt. The commercially grown varieties Giza 45 and Giza 70 are used as a standard for comparison with the new cotton varieties (Giza 87, Giza 88) and the new hybrid Giza 84 x (Giza 74 x Giza 68).

The combined analysis of the two years and three regions are shown in Table (1). The results of the combined analysis of variance, showed that the effect of the cotton genotypes were significant for all studied characters except 50% span length and Presly index. However, the effect of locations were significant for all studied characters except Presly index. The effect of growing seasons was significant for Boll weight, seed index, lint percentage and micronaire reading, The first order interaction genotypes x locations was significant for seed cotton yield and lint percentage. The interaction between genotypes x years was significant for all studied characters except seed cotton yield, lint percentage and Presly index. The effect of locations x years interaction was significant for all studied characters except lint percentage, 2.5% span length and Presly index. The second order interaction genotypes x regions x years was significant for seed index and lint percentage.

### Cotton genotypes:

Table 2. showed that the effect of different cotton genotypes on some yield and quality traits were significantly different.

The promising hybrid Giza 84 x (Giza 74x Giza 68) produced the highest over all seed cotton yeild (11.70 k/F).The difference between the promising hybrid and all other cultivars was statistically significant.The difference ranged from 1.37 to 3.36 kentar/faddan.It also possessed high lint percentage of 36.44%.However, it was less than Giza 88 and Giza 70.It also had sizable boll weight, 2.73 g.

Concerning fiber properties,the new promising hybrid possessed 2.5% span length of 33.15 which is little shorter than the other varieties.However,it was more uniform than them. It can be seen that the new promising hybrid Giza 84 X(Giza 74 X Giza 68) produced the highest seed cotton yield and at the same time possessed the same quality index level for 50% span length and Presly index.

Table 1. Combined analysis of variance of yield and lint qualities for five cotton genotypes growing in three locations during the two seasons (2000 and 2001).

| Source of variation | Genotypes (V) | Location (L) | Year (Y) | G x L | G x Y | L x Y | G x L x Y |
|---|---|---|---|---|---|---|---|
| Degree of freedom | 4 | 2 | 1 | 8 | 4 | 2 | 8 |
| Characters: | | | | | | | |
| Seed cotton yield (K/f) | 42.209** | 106.25** | 9.092 | 4.004* | 3.898 | 32.012 | 2.525 |
| Boll weight (g) | 0.314** | 2.413** | 0.456* | 0.035 | 0.1157** | 0.256* | 0.062 |
| Seed index (g) | 1.929** | 29.555** | 1.610** | 0.384 | 1.884** | 3.089** | 1.027** |
| Lint percentage % | 86.764** | 35.677** | 70.227** | 3.012** | 2.312 | 1.323 | 2.147* |
| 2.5% span length (mm) | 8.401* | 5.130* | 0.208 | 1.078 | 4.413* | 2.374 | 0.856 |
| 50% span length (mm) | 0.473 | 2.778* | 0.867 | 0.588 | 3.679** | 4.745** | 0.671 |
| Length uniformity ratio (L.U.R.) | 4.762* | 10.442* | 2.494 | 3.034 | 8.245** | 32.450** | 2.478 |
| Micronaire reading (M.R.) | 3.508** | 11.639** | 6.912** | 0.139 | 0.681** | 0.860** | 0.144 |
| Pressley index (P.I.) | 1.043 | 0.169 | 0.147 | 0.332 | 0.893 | 0.928 | 0.566 |

**, * = significant at the 1% and 5% level of probability, respectively.

Table 2. Mean performances of genotypes combined over years and locations.

| Characters | Giza 84 (G 74 x G 68) | Giza 45 | Giza 70 | Giza 87 | Giza 88 |
|---|---|---|---|---|---|
| Seed cotton yield (K/f) | 11.70a[z] | 8.34d | 8.86cd | 9.41c | 10.33b |
| Boll weight (g) | 2.73c | 2.65d | 2.81b | 2.56e | 2.83a |
| Seed index (g) | 9.78bc | 10.04b | 9.86bc | 9.62c | 10.36a |
| Lint percentage % | 36.44b | 33.85c | 37.33a | 33.65c | 37.61a |
| 2.5% span length (mm) | 33.15c | 33.85ab | 33.84ab | 33.78b | 34.22a |
| 50% span length (mm) | 16.91a | 16.75a | 16.72a | 16.67a | 16.72a |
| Length uniformity ratio (L.U.R.) | 50.31a | 49.33b | 49.88a | 49.36b | 49.04b |
| Micronaire reading (M.R.) | 3.40c | 3.33cd | 3.88b | 3.17d | 4.07a |
| Pressley index (P.I.) | 11.00a | 10.44a | 10.63a | 10.80a | 10.74a |

Z Means of the varieties followed by the same lower case letter within a character are not significantly different probability of (0.05)

* (the combined over five genotypes and three locations)

Giza 88 ranked secondly in yeild after the promising hybrid, however it was the first in fiber length. It produced 10.33 k/f, which was significantly less than the hybrid. On the other hand, it had the highest span length. The 2.5% reached 34.22 mm, which was significantly longer than the promising Giza 84 X (Giza 74 X Giza 68) hybrid. With respect to length uniformity ratio the new hybrid was comparatively more uniform.

Giza 88 possessed higher boll weight, lint percentage and seed index than the promising hybrid. Giza 87 came third in yield with 9.41 k/f but was the second in span length; the 2.5% reached 33.87 mm. It was the finest in fiber with micronaire reading of 3.17.The fiber length was uniform with L.U.R equal 49.36%. Giza 87 had a heavy boll weight, 2.56 g. Giza 70 cultivar had comparatively low yield with 8.86 k/f. However, it gave high value for boll weight, (2.81 g) except Giza 88. It produced high lint percentage 37.33%. Regarding fiber properties, it surpassed the promising hybrid Giza 84 X (Giza 74 X Giza 68) in 2.5% span length but was less in length uniformity ratio. Giza 45 was the lowest in seed cotton yield k/f, however it surpassed the promising hybrid in .The 2.5% span length reached 33.85 it gave the fine fiber, 3.33 micronaire reading.

Giza 84 x (Giza 74 x Giza 68) produced the highest seed cotton yield (11.70 K/f) than the other studied varieties, and it gave lint percentage (36.44%) and boll

weight (2.73 g). It was highest over Giza 45, and Giza 87 and surpassed Giza 45, Giza 87 and Giza 88 in length uniformity ratio (50.31%).

Giza 45 surpassed Giza 87 for seed index (10.04 g) and on Giza 84 (G. 74 x G. 68) for 2.5% span length and it gave the lowest micronaire reading (3.33) than Giza 70 and Giza 88.

Giza 70 cultivars gave the highest value for Boll weight (2.81 g) and for lint percentage (37.33%) than all studied genotypes except Giza 88, surpassed Giza 84 (G.74 x G. 68) in 2.5% span length (33.84 mm) and gave the highest value for length uniformity ratio (49.88%) than all studied varieties except Giza 84 (G.74 x G.68).

Giza 87 surpassed Giza 45 for seed cotton yield (9.41 k/f) on Giza 84 (G.74 x G.68) for 2.5% span length (33.78 mm) and gave the lowest value for Micronaire reading (3.17) than all studied genotypes except Giza 45.

Giza 88 cultivar gave the highest value for seed cotton yield (10.33 K/f) than all studied genotypes except Giza 84 (G.74 x G.68), surpassed all studied genotypes for boll weight (2.83 g), gave the highest values for seed index (10.36 g), for lint percentage (37.61%) than all studied genotypes except Giza 70, surpassed Giza 87 and Giza 84 (G.74 x G.68) in 2.5% span length (34.22 mm) and gave the highest value for Micronaire reading (4.07). The data indicated that the new genotype Giza 84 (G.74 x G.68) produced higher seed cotton yield K/f than the other studied varieties and at the same time possessed the same varieties quality for 50% span length and Presly index. These results are in harmony with those obtained by Seyam *et al.* (1994); Abd El-Rahman *et al.* (1994); Badr (1994); Abou-Tour *et al.* (1996); Badr *et al.* (1998, 2000, 2001); Sorour *et al.* (1998) and Nawar *et al.* (1999). They reported that the effect of genotype was significant on some cotton characters.

**Effect of growing locations on yield and quality traits:**

Table (3) shows the average values of studied cotton characters as affected by different growing locations and growing years. The data indicated that the average values of seed cotton yield K/f, Boll weight, seed index, lint percentage %, 2.5% span length and Micronaire reading were highest at El-Beheira than Kafr El-Sheikh and was the lowest at Damiatta. This may be due to the environment of El-Beheira which helped

to improve these characteristics. These results are in harmony with those obtained by Seyam *et al.* (1994); Abd El-Rahman *et al.* (1994); Badr (1994); Abou-Tour *et al.* (1996); Badr *et al.* (1998) and Sorour *et al.* (1998).They reported that the effect of location was significant on some cotton characters.

Table 3. Average of studied traits as affected by different growing locations and years.

| Characters | Locations the combined over five genotypes and two years | | | Years* | |
|---|---|---|---|---|---|
| | Damiatta | Kafr El-Sheikh | El-Biheira | 2000 | 2001 |
| Seed cotton yield (K/f) | 8.37c[Z] | 9.28b | 11.54a | 9.45a | 10.01a |
| Boll weight (g) | 2.67b | 2.50c | 2.98a | 2.78a | 2.65b |
| Seed index (g) | 9.43b | 9.44b | 10.93a | 10.05a | 9.82b |
| Lint percentage % | 34.96b | 35.56b | 36.81a | 36.54a | 35.01b |
| 2.5% span length (mm) | 33.37b | 33.57b | 34.07a | 33.63a | 33.71a |
| 50% span length (mm) | 16.69ab | 16.38b | 16.91a | 16.57a | 16.74a |
| Length uniformity ratio (L.U.R.) | 50.09a | 49.07b | 49.48ab | 49.40a | 49.69a |
| Micronaire reading | 3.32b | 3.20b | 4.19a | 3.81a | 3.33b |
| Pressley index | 10.78a | 10.74a | 10.65a | 10.76a | 10.69a |

Z Means of the varieties followed by the same lower case letter within a character are not significantly different probability of (0.05)

* (the combined over five genotypes and three locations)

## Effect of different growing seasons:

Results in Table (3) show the average values of yield and quality properties as affected by different growing seasons. The first season (2000) gave the highest significant values for Boll weight, seed index, lint percentage, and Micronaire reading. While the second season (2001) gave the highest significant values for the other characters. These results are in harmony with those obtained by Badr (1994, Seyam *et al.* (1994), Abou-Tour *et al.* (1996), Badr *et al.* (1998), Sorour *et al.* (1998), and Abd El-Salam (200). They reported that the effect f growing season was significant on some cotton yield and quality traits.

**Effect of interaction between genotypes and locations:**

Data in Table (4) show that the genotypes x location interaction were significant for seed cotton yield K/f and lint percentage only. Data indicate that genotype behave differently at different locations.

Giza 84x (G.74 x G.68) surpassed all studied varieties in seed cotton yield at Damiatta and El-Beheira, and all varieties except Giza 88 at Kafr El-Sheikh.

Lint percentage for these genotypes can be ranked descendingly as follows: Giza 88 at Damiatta, Giza 88 and Giza 70 at Kafr El-Sheikh and El-Behaira. The effect of variatal variation in the different locations on the productivity and lint percentage of Egyptian extra long staple cotton genotypes was also reported in other studies (Abo El-Zahab *et al.*, 1992; Gutierres, J.C. and K.M. El-Zik (1992); Abd El-Rahman *et al.*, 1994; Badr, 1994; Seyan *et al.*, 1994; Killi and Gencer, (1995a); Abo Tour *et al.*, 1996; Badr *et al.*, 1998; Nawar *et al.*, 1999 and Sorour *et al.*, 1998). They reported that the effect of genotype x location interaction was significant on some cotton characters.

**Effect of the interaction between genotypes and seasons:**

Table (5) shows the average values of the studied cotton characters for the five Egyptian cotton genotypes grown during the two successive seasons (2000 and 2001). Five characters showed significant effects. Boll weight ranged from (2.89 g) for Giza 88 during the first season to 2.48 for Giza 45 at the second season. Seed index ranged from (10.41 g) for Giza 88 at the first season to (9.48 g) for Giza 84 (G.74 x G.68) at the first season. 2.5% span length ranged from (34.41 mm) for Giza 88 at the second season to (32.93 mm) for Giza 84 (G.74 x G.68) at the first season. 50% span length ranged from (17.12 mm) for Giza 84 (G.74 x G.68) at the second season to (16.32 mm) for Giza 87 during the second season.

Micronaire reading ranged from (4.43) for Giza 88 during the first season to (3.04) for Giza 87 during the second season. The data indicated that genotypes under study reacted differently in different seasons. These results were in accordance with those obtained by Seyam *et al.* (1994); Abo-Tour *et al.* (1996); Badr *et al.* (1998) and Nawar *et al.* (1999). They reported that the effect of genotypes x growing season was

Table 4. The interaction between varieties x locations on studied traits.

| Characters / Genotypes | Seed cotton yield K/f | Boll Weight (g) | Seed index (g) | Lint percentage % | 2.5% span length (mm) | 50% span length (mm) | Length uniformity ratio L.U.R. | Micronair reading (M.R.) | Pressley index (P.I.) |
|---|---|---|---|---|---|---|---|---|---|
| | **Damiatta** | | | | | | | | |
| Giza 84 (G.74 x G.68) | 10.2 | 2.61 | 9.25 | 35.86 | 32.56 | 16.14 | 49.61 | 3.19 | 10.86 |
| Giza 45 | 6.87 | 2.6 | 9.35 | 33.59 | 33.7 | 16.9 | 50.26 | 3.06 | 10.6 |
| Giza 70 | 8.14 | 2.8 | 9.34 | 35.86 | 33.16 | 16.91 | 50.94 | 3.61 | 10.76 |
| Giza 87 | 8.47 | 2.59 | 9.17 | 32.23 | 33.59 | 16.88 | 50.21 | 3.02 | 11.11 |
| Giza 88 | 8.2 | 2.75 | 10.4 | 37.26 | 33.85 | 16.6 | 49.41 | 3.7 | 10.56 |
| | **Kafr El-Sheikh** | | | | | | | | |
| Giza 84 (G.74 x G.68) | 10.68 | 2.54 | 9.48 | 36.41 | 32.81 | 16.54 | 50.22 | 3.04 | 11.1 |
| Giza 45 | 8.11 | 2.45 | 9.77 | 33.35 | 33.41 | 16.16 | 48.2 | 3.1 | 10.55 |
| Giza 70 | 8.22 | 2.61 | 9.42 | 37.46 | 34.11 | 16.31 | 49.26 | 3.55 | 10.49 |
| Giza 87 | 8.41 | 2.31 | 8.8 | 33.96 | 33.26 | 16.24 | 48.88 | 2.72 | 10.71 |
| Giza 88 | 10.99 | 2.56 | 9.75 | 36.59 | 34.25 | 16.66 | 48.8 | 3.59 | 10.84 |
| | **El-Beheira** | | | | | | | | |
| Giza 84 (G.74 x G.68) | 14.23 | 3.04 | 10.6 | 37.05 | 32.6 | 16.56 | 50.55 | 3.98 | 11.05 |
| Giza 45 | 10.06 | 2.89 | 11 | 34.6 | 34.42 | 17.2 | 49.51 | 3.81 | 10.18 |
| Giza 70 | 10.23 | 3.01 | 10.8 | 38.65 | 34.25 | 16.95 | 49.44 | 4.46 | 10.64 |
| Giza 87 | 11.35 | 2.77 | 10.9 | 34.76 | 34.5 | 16.91 | 48.99 | 3.77 | 10.59 |
| Giza 88 | 11.81 | 3..19 | 11.3 | 38.99 | 34.56 | 16.91 | 48.9 | 4.91 | 10.81 |
| New L.S.D. 5% | 1.351 | - | - | 1.01 | - | - | - | - | - |
| For V x L 1% | - | - | - | 1.34 | - | - | - | - | - |

- = Not significant

significant on some cotton characters.

**Effect of the interaction between location and season :**

Table (6) shows the average values of the studied cotton characters for the three locations during the two successive seasons (2000 and 2001) and indicated of that six characters were statistically significant due to the interaction of locations and years on seed cotton yield, boll weight, seed index, 50% span length, length uniformity ratio and micronaire reading.

The highest seed cotton yield of 12.55 k/f and seed index (10.94 g.) were obtained by growing cotton at El-Biheira whereas, the lowest yield (7.65 k/f) at Damiatta, the lowest seed index (9.01 g.) and boll weight (2.36 g.) at Kafr El-Sheikh location in the second season for these locations. The highest boll weight (3.5 g.) and micronaire reading (4.44 M.R) were produced at El-Biheira in year 2000. While Kafr El-Sheikh in year 2001 recorded the lowest values for boll weight (2.6 g.) and micronaire reading (2.82 M.R).

The highest values of 50% span length (17.16 M.M) and length uniformity ratio (51.23 %) were recorded at Damietta in year 2001. While the lowest values for (50 % S.L) was found at Damietta in year 2000 (16.21 M.M.) and for L.U.R. at El-Beheira in year 2001 (48.87 %). Therefore it could be concluded that the mean values of different traits varied from location to another according to the year of production. These results corresponded with the finding of Badr (1994), Abo-Tour *et al.* (1996), Badr *et al.* (1998) and Sorour *et al.* (1998). They reported that the interaction between location and years was significantly different on some cotton characters.

**Effect of second order interaction:**

Data in Table (7) shows that the (genotype x season x location) was significant on seed index and ranged from (11.40 g) for Giza 88 at El-Beheira during the second season to (8.33 g) for Giza 70 at Kafr El-Sheikh during the second season.

Lint percentage % ranged from (39.85%) for Giza 88 at El-Beheira during the first season to (30.88%) for Giza 87 at Damiatta during the second season. These results were in accordance with those obtained by (Abd El-Rahman *et al.* (1994); Seyam

*et al.* (1994); Badr (1994); Abo-Tour *et al.* (1996); Badr *et al.* (1998) and Nawar *et al.* (1999).

**Correlations between studied characters:**

Results in Table (8) indicated association for all possible combinations among cotton yield seed cotton yield, boll weight, seed index, lint percentage and Micronaire reading, also between 2.5% span length, Boll weight, seed index and Micronaire reading, and among 50% span length, 2.5% span length and length uniformity ratio were significant positive indicating that these traits are important components of cotton yield. A positive association between major yield components is of considerable significant to the breeder, because component breeding would be very effective under such situation. These results were in accordance with those obtained by Badr *et al.* (2000 and 2001) and Abd El-Salam (2000).

Table 5. Effect of genotypes x growing season interaction on studied characters.

| Characters \ Genotypes | Giza 84 (G.74xG.68) | | Giza 45 | | Giza 70 | | Giza 87 | | Giza 88 | | L.S.D. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $Y_1$ | $Y_2$ | $Y_1$ | $Y_2$ | $Y_1$ | $Y_2$ | $Y_1$ | $Y_2$ | $Y_1$ | $Y_2$ | 5% | 1% |
| Seed cotton yield (K/f) | 11.06 | 12.34 | 8.42 | 8.27 | 8.35 | 9.38 | 9.65 | 9.16 | 9.79 | 10.87 | -[z] | - |
| Boll weight (g) | 2.72 | 2.73 | 2.82 | 2.48 | 2.88 | 2.73 | 2.57 | 2.55 | 2.89 | 2.78 | 0.141 | 0.187 |
| Seed index (g) | 9.48 | 10.08 | 10.44 | 9.63 | 10.2 | 9.52 | 9.72 | 9.52 | 10.41 | 10.32 | 0.452 | 0.6 |
| Lint percentage % | 37.53 | 35.36 | 34.85 | 32.84 | 38.08 | 36.57 | 34.33 | 32.97 | 37.91 | 37.32 | - | - |
| 2.5% span length (mm) | 32.93 | 33.38 | 34.13 | 33.56 | 33.97 | 33.72 | 34.07 | 33.49 | 34.03 | 34.41 | 0.622 | 0.826 |
| 50% span length (mm) | 16.7 | 17.12 | 16.83 | 16.67 | 16.69 | 16.76 | 17.03 | 16.32 | 16.62 | 16.83 | 0.547 | 0.73 |
| Length uniformity ratio (L.U.R.) | 49.14 | 51.12 | 48.95 | 49.7 | 50.09 | 49.67 | 49.91 | 48.81 | 48.92 | 49.16 | - | - |
| Micronaire reading (M.R.) | 3.41 | 3.39 | 3.6 | 3.05 | 4.29 | 3.46 | 3.31 | 3.04 | 4.43 | 3.7 | 0.264 | 0.35 |
| Pressley index (P.I.) | 10.87 | 11.13 | 10.49 | 10.39 | 10.97 | 10.29 | 10.86 | 10.75 | 10.6 | 10.88 | - | - |

Z - = Not significant

Table 6. Effect of the interaction between growing locations and growing seasons on cotton characters studied.

| Characters \ Locations | Damiatta | | Kafr El-Sheikh | | El- Biheira | | L.S.D. | |
|---|---|---|---|---|---|---|---|---|
| | $Y_1$ | $Y_2$ | $Y_1$ | $Y_2$ | $Y_1$ | $Y_2$ | 5% | 1% |
| Seed cotton yield (K/f) | 9.09 | 7.65 | 8.74 | 9.82 | 10.53 | 12.55 | 1.02 | 1.4 |
| Boll weight (g) | 2.65 | 2.69 | 2.63 | 2.36 | 3.05 | 2.91 | 0.173 | - |
| Seed index (g) | 9.36 | 9.5 | 9.88 | 9.01 | 10.91 | 10.94 | 0.31 | 0.43 |
| Lint percentage % | 35.93 | 33.99 | 36.22 | 34.9 | 37.47 | 36.15 | - | - |
| 2.5% span length (mm) | 33.12 | 33.63 | 33.8 | 33.35 | 33.97 | 34.17 | - | - |
| 50% span length (mm) | 16.21 | 17.16 | 16.42 | 16.34 | 17.08 | 16.73 | 0.48 | 0.656 |
| Length uniformity ratio (L.U.R.) | 48.95 | 51.23 | 49.18 | 48.97 | 50.08 | 48.87 | 0.96 | 1.315 |
| Micronaire reading (M.R.) | 3.41 | 3.23 | 3.58 | 2.82 | 4.44 | 3.94 | 0.217 | 0.297 |
| Pressley index (P.I.) | 10.64 | 10.92 | 10.84 | 10.63 | 10.79 | 10.51 | - | - |

- = Not significant

Table 7. Effect of interaction between locations x years x varieties on seed index and lint percentage.

| Location / Genotypes | Seed index | | | | | | Lint percentage | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Damiatta | | Kafr El-Sheikh | | El-Beheira | | Damiatta | | Kafr El-Sheikh | | El-Beheira | |
| | $Y_1$ | $Y_2$ | $Y_1$ | $Y_2$ | $Y_1$ | $Y_2$ | $Y_1$ | $Y_2$ | $Y_1$ | $Y_2$ | $Y_1$ | $Y_2$ |
| Giza 84 (G.74 x G.68) | 8.73 | 9.77 | 9.3 | 9.65 | 10.4 | 10.83 | 37.68 | 34.05 | 37.4 | 35.43 | 37.5 | 36.6 |
| Giza 45 | 9.55 | 9.15 | 10.58 | 8.97 | 11.2 | 10.78 | 34.63 | 32.55 | 34.72 | 31.98 | 35.2 | 34 |
| Giza 70 | 9.58 | 9.1 | 10.53 | 8.33 | 10.5 | 11.15 | 36.55 | 35.18 | 38.2 | 36.73 | 39.5 | 37.8 |
| Giza 87 | 9.2 | 9.15 | 8.73 | 8.88 | 11.23 | 10.55 | 33.58 | 30.88 | 34.13 | 33.8 | 35.3 | 34.22 |
| Giza 88 | 9.73 | 10.33 | 10.28 | 9.23 | 11.23 | 11.4 | 37.25 | 37.28 | 36.63 | 36.55 | 39.85 | 38.13 |
| 5% = 0.782 | | | | | | | 1.424 | | | | | |
| L.S.D. 1% = 1.039 | | | | | | | - | | | | | |

Table 8. Correlation coefficients between studied traits of five Egyptian cotton genotypes combined over two years on three locations.

| Characters | | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 |
|---|---|---|---|---|---|---|---|---|---|
| Boll weight (g) | $X_1$ | 0.475** | 0.656** | 0.265** | 0.672** | 0.097 | 0.154 | 0.225* | 0.11 |
| Lint percentage % | $X_2$ | | 0.349** | 0.318** | 0.619** | -0.076 | -0.09 | 0.046 | -0.128 |
| Seed index (g) | $X_3$ | | | 0.344** | 0.632** | 0.07 | 0.173 | 0.329** | -0.022 |
| Seed cotton yield K/f | $X_4$ | | | | 0.283** | 0.059 | -0.023 | 0.046 | -0.11 |
| Micronaire reading (M.R.) | $X_5$ | | | | | 0.095 | 0.19 | 0.312** | 0.032 |
| Presly index (P.I.) | $X_6$ | | | | | | 0.047 | 0.027 | 0.098 |
| 50% span length (mm) | $X_7$ | | | | | | | 0.567** | 0.634* |
| 2.5% span length (mm) | $X_8$ | | | | | | | | 0.098 |
| Length uniformity ratio (L.U.R.) | $X_9$ | | | | | | | | 1.00 |

r at 5% = 0.1946 r at 1% = 0.2540

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# تقييم الهجين جيزة ٨٤ × (جيزة ٧٤ × جيزة ٦٨) مقارناً بأصناف القطن المصرى فائقة طول التيلة بشمال الدلتا

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تم تقييم الهجين المبشر جـ٨٤ (جـ٧٤ × جـ٦٨) مع أصناف القطن المصرى فائقة طول التيلة ، جيزة ٤٥ وجيزة ٧٠ وجيزة ٨٧ وجيزة ٨٨ فى شمال الدلتا بمناطق كفر الشيخ ، كفر الدوار (بحيرة) ، كفر سعد (دمياط) خلال موسمى الزراعة ٢٠٠٠ ، ٢٠٠١ وقد أختبرت صفات متوسط محصول القطن الزهر ، متوسط وزن اللوزة ، معامل البذرة ، معدل الحليج ، طول التيلة عند نسبتى توزيع (٢,٥٪ ، ٥٠٪) درجة انتظام طول التيلة ، قراءة الميكرونير ، معامل برسلى .

وتضمنت الدراسة تأثير التركيب الوراثى ومنطقة الزراعة وموسم الزراعة والتفاعلات بينهما على تلك الصفات.

**وأوضحت نتائج تحليل التباين المركب ما يلى:**

- كان تأثير التركيب الوراثى معنوياً على الصفات التى تم دراستها فيما عدا طول التيلة عند نسبة توزيع ٥٠٪ ومتانة التيلة (معامل برسلى): تفوق الهجين المبشر جيزة ٨٤ (جيزة ٧٤ × جيزة ٦٨) معنوياً على كل الأصناف تحت الدراسة فى محصول القطن الزهر ق/ف كما تفوق على الصنفين جيزة ٤٥ وجيزة ٨٧ فى وزن اللوزة ومعدل الحليج ونسبة انتظام طول التيلة وأيضاً تفوق معنوياً على الصنف جيزة ٨٨ فى درجة انتظام طول التيلة .

- أوضحت النتائج أن هذا الهجين أعطى أكبر القيم لكل من طول التيلة عند نسبة توزيع ٥٠٪ وكذلك (معامل برسلى) ولم يكن هذا الفرق معنوياً مع باقى الأصناف التى تم دراستها، أما الصنف جيزة ٤٥ فقد أعطى أقل متوسطات لصفات محصول القطن الزهر ووزن اللوزة ، واشترك معه جيزة ٨٧ فى أقل معدل حليج وأقل قراءة ميكرونير ولكنه تفوق على الهجين المبشر فى طول التيلة عند نسبة توزيع ٢,٥٪.

- تفوق الصنف جيزة ٧٠ على جيزة ٤٥ فى وزن اللوزة واشترك معه الصنف جيزة ٨٨ فى التفوق على باقى التراكيب الوراثية فى معدل الحليج ، واشترك معه الهجين المبشر فى اعطاء أعلى نسبة انتظام لطول التيلة وأعطى قراءة ميكرونير أعلى من كل التراكيب الوراثية فيما عدا جيزة ٨٨ .

- تفوق الصنف جيزة ٨٧ على جيزة ٤٥ فى محصول القطن الزهر ق/ف وعلى الهجين المبشر جيزة ٨٤ (جيزة ٧٤ × جيزة ٦٨) فى طول التيلة عند نسبة توزيع ٢,٥٪ ، كما أعطى أقل قراءة ميكرونير مع جيزة ٤٥ عن باقى التراكيب الوراثية.

- تفوق الصنف جيزة ٨٨ على جيزة ٤٥ وجيزة ٧٠ وجيزة ٨٧ فى محصول القطن الزهر وعلى كل التراكيب الوراثية فى وزن اللوزة و معامل البذرة ، واشترك معه جيزة ٧٠ فى التفوق لصفة معدل الحليج ، تفوق على جيزة ٨٧ وجيزة ٨٤( جيزة ٧٤ × جيزة ٦٨) فى طول التيلة عند نسبة توزيع ٢,٥٪ ، كما أعطى أعلى قراءة ميكرونير عن باقى التراكيب الوراثية تحت الدراسة.

- كان تأثير منطقة الزراعة معنويا على كل الصفات تحت الدراسة فيما عدا معامل برسلى أظهرت منطقة كفر الدوار (بحيرة) أعلا قيم معنوياً لكل الصفات المعنوية وأشتركت معها منطقة كفر سعد (دمياط ) فى صفة طول التيلة عند نسبة توزيع ٥٠٪.

- كان تأثير موسم الزراعة معنوياً على كل من وزن اللوزة ، معامل البذرة ، معدل الحليج وقراءة الميكرونير.

- كان تأثير التفاعل بين منطقة الزراعة والتركيب الوراثى معنوياً على وزن القطن الزهر ق/ف حيث أعطى جيزة ٨٤ (جيزة ٧٤ × جيزة ٦٨) أعلا القيم فى كل المناطق واشترك معه معنوياً جيزة ٨٨ فى كفر الشيخ.

- كان هذا التفاعل معنوياً على صفة معدل الحليج حيث أعطى الصنف جيزة ٨٨ أعلا القيم فى دمياط عن باقى الأصناف واشترك معه فى التفوق جيزة ٧٠ فى كل من كفر الشيخ والبحيرة.

- كان تأثير التفاعل بين التركيب الوراثى وموسم الزراعة معنوياً على كل من وزن اللوزة ، معامل البذرة ، طول التيلة عند نسبتى توزيع ٢,٥٪ ، ٥٠٪) ، قراءة الميكرونير ومعامل برسلى.

- كان تأثير التفاعل بين منطقة وموسم الزراعة معنوياً على الصفات المدروسة فيما عدا معدل الحليج ، طول التيلة عند نسبة توزيع ٢,٥٪ ومعامل برسلى.

- كان تأثير التفاعل بين التركيب الوراثى وموسم ومنطقة الزراعة معنوياً على معامل البذرة ومعدل الحليج فقط.

- أوضحت دراسة الإرتباط بين الصفات التى تم دراستها أن هناك أرتباط معنوى موجب الإتجاه بين محصول القطن الزهر وكل من وزن اللوزة ، معامل البذرة ، معدل الحليج وقراءة الميكرونير مما يدل على أن تلك المكونات هامة عند التربية للمحصول ، وكذلك فيما بين طول التيلة عند نسبة توزيع ٢,٥٪ ووزن اللوزة ومعامل البذرة وقراءة الميكرونير وأيضاً بين قياسات طول التيلة ودرجة انتظامها.

- أوضحت النتائج المتحصل عليها أهمية الدور الذى يلعبه كل من التركيب الوراثى والظروف البيئية وكذلك التفاعل بينهما فى صفات المحصول وجودة التيلة مما يدل على أنه من الضرورى استمرار التقييم الدقيق لهذه التراكيب الوراثية سواء كانت تجارية أو حديثة فى جهات متعددة ولعدة سنوات .

- أوضحت هذه الدراسة أن الهجين المبشر جيزة ٨٤ (جيزة ٧٤ × جيزة ٦٨) أنتج أعلا محصول قطن زهر عن باقى أصناف طبقة فائقة طول التيلة وأعطى صفات طول التيلة عند نسبة توزيع ٥٠٪ ومتانة تيلة مساوية معنوياً لهذه الأصناف. وسجل نفس صفات الجودة فى جميع المناطق المدروسة وكان أعلى محصول قطن زهر ق/ف لهذا الهجين بمنطقة البحيرة وبالتالى فهذا الهجين ملائم لزراعته مع طبقة القطن المصرى فائق طول التيلة بشمال الدلتا بالبحيرة ثم كفر الشيخ يليهم دمياط ، والصنف جيزة ٧٠ أفضل مناطق زراعته كانت فى محافظة البحيرة ، والصنف جيزة ٨٨ أفضل مناطق زراعته كانت فى محافظتى البحيرة وكفر الشيخ .كما يمكن استخدام الهجين المبشر فى برامج التربية لتحسين محصول القطن الزهر والصنف جيزة ٨٧ يمكن استخدامه فى برامج التربية لتحسين صفة نعومة التيلة للتراكيب الوراثية لهذه الطبقة.