

## EVALUATION OF NINE STRAINS OF GIZA 83 COTTON VARIETY

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### ABSTRACT

Nine strains of Giza 83 cotton variety, named as G. 83/92-G. 83/2000 were used in this study. The experiment was carried out at Mallawy Agricultural Research Station during two successive growing seasons (2000 and 2001). The strains G. 83/92 and G. 83/93 showed the lowest values for maturity, seed index and 50% fiber length traits, while G. 83/98 and G. 83/2000 strains were the best for most studied traits. Years mean squares were found to be highly significant for seed index, boll weight, lint index, micronaire value and 2.5% fiber length traits. The interactions of strains with years were detected to be highly significant for most studied traits. Strain mean squares were highly significant for all studied traits in the two successive growing seasons and their combined except boll weight trait. The results indicated that seed cotton yield showed highly and positively correlated with lint yield. Lint percentage showed highly and positively correlated with lint index, while, it was negatively correlated with seed index. Boll weight was highly and positive correlated with maturity and lint index. Fiber length (2.5% span length) was highly and positively correlated with 50% span length.

### INTRODUCTION

The objective of breeding program is to increase the yielding capacity and improve fiber properties of commercial cotton varieties. Homogeneity and uniformity of such characteristics represent the practical criteria for identification and judging the purity of the cotton varieties. The choice of a maintenance system depends upon the probability of occurrence of the factors causing varietal deterioration and the possibility for further genetic advance. Maintaining genetic purity among cotton genotypes offers a measure of protection against degeneration of yield potentials. There was a general agreement among cotton breeders that any cotton variety will degenerate, unless considerable efforts were made to maintain and improve it.

Maintenance of the Egyptian cotton varieties have been reported by many authors among them Simpson and Duncan (1983), Walker (1964), Lewis (1970), Abdel-Aal (1976), Al-Didi (1982), El-Kilany and Youssef (1985), and El-Akkad and El-Kilany (1980) stated that even the seed of Giza 69 cotton in general use maintained its identity with respect to the yield and yield components, but the older strains had a significant reduction in both lint percent and yarn strength.

Younis *et al.* (1993) reported that no significant differences among the 10 nuclei. The recent nuclei Dandara (9) gave the highest means of the fiber properties which remained unchanged and were more uniform during the successive generations as long as the seed maintained pure.

Correlation coefficients between yield and yield components traits were reported in different cotton studies. Gad (1973), reported that yield was positively correlated with both lint percentage and seed index.

The main objective of this study was to evaluate some strains developed from Giza 83 variety under two successive growing seasons and to estimate correlation coefficients among studied traits.

## **MATERIALS AND METHODS**

The present investigation was conducted at Malloway Agricultural Research Station, during the two successive growing seasons, 2000 and 2001. Nine strains of Giza 83 cotton variety, from Giza 83/92 to Giza 83/2000 were used in this study. In each growing season, the nine strains were sown in a randomized complete blocks design with four replicates. Each replicate consisted of two rows for each strain of 4.5 meters long each with 20 hills spaced 20 cm, apart and the distance between rows were 65 cm. Soon after completely emergence, seedlings were thinned to two plants per hill. Normal cultural practices were applied as recommended for ordinary cotton growing. At the end of the two seasons, random sample of 25 bolls were picked from each plot and used for estimation of boll weight in gram, seed index in gram, lint percentage and lint index in gram. A sample of lint from each strain was used to test fiber properties, i.e. fiber length, fiber fineness and yarn strength at Cotton Technology Research Lab. at Giza, Cotton Research Institute. Also, earliness index, seed cotton yield and lint yield were calculated in Kentar/feddan for each plot.

The analysis of variances were made according to by Snedecor (1956) and Le Clerge *et al.* (1962). Simple correlation coefficients were estimated according to Snedecor and Cochran (1980).

Duncan's M.R.T. was conducted to determine the significant differences among the means at 0.05 level.

## **RESULTS AND DISCUSSION**

Table 1 showed the results obtained for the studied agronomic characters and fiber properties for the nine strains of Giza 83 cultivar in 2000 growing season. It was cleared that G. 83/94 strain gave the lowest values for seed cotton yield (k/f), lint yield (k/f), lint percentage and lint index except seed index. Also, G. 83/93 strain gave the lowest for maturity. While, G. 83/98 strain showed the highest values for seed cotton yield, lint yield, seed index and lint index. Also, G. 83/2000 strain was the best for lint percentage, maturity and 50% fiber length. Abo-Arab *et al.* (1999) found that the Giza 70/91 farmer's strain (the oldest strain) gave the lowest mean performance for most fiber traits in both growing seasons.

The differences between the nine strains were insignificant for boll weight and 2.5% fiber length.

In the growing seasons of 2001 the results of Table 2 observed that the differences between strains were insignificant for boll weight and lint index. In this respect, G. 83/92 and G. 83/93 strains were the lowest values for maturity and seed index and 50% fiber length, respectively.

Table (1): means of studied characters in season 2000.

Strain	S.C.Y. k/f	L.Y. k/f	L.P. %	S.I. gm	B.W. gm	L.I. gm	Ear. %	Mic. lb/mg	P.I. lb/mg	S.L.	
										2.5% S.L.	50% S.L.
G. 83/92	9.00 a-c	11.11 a-c	39.3 bc	11.8 ab	3.2	7.6 ab	76 cd	4.5 b	9.6 a	31.7	16.0 ab
83/93	9.46 ab	11.86 a	40.4 ab	11.6 ab	3.4	7.9 a	75 d	4.4 b	9.8 a	31.2	15.8 a-c
83/94	8.24 c	9.25 d	35.0 e	12.0 a	3.5	6.5 c	80 b	4.5 b	8.9 bc	31.8	15.6 a-c
83/95	9.19 ab	11.26 a-c	38.9 c	11.6 ab	3.1	7.4 ab	79 bc	4.5 b	8.7 cd	31.1	15.8 a-c
83/96	9.42 ab	11.6 ab	39.7 a-c	11.5 b	3.5	7.6 ab	81 b	4.2 c	8.0 e	30.8	15.3 bc
83/97	8.7 bc	10.4 c	40.3 ab	11.0 c	3.2	7.4 ab	80 b	4.5 b	8.5 d	31.1	15.2 c
83/98	9.77 a	11.9 a	39.6 a-c	11.6 ab	3.1	7.6 ab	81 b	4.5 b	9.1 b	31.1	16.3 bc
83/99	8.68 bc	10.55 c	37.5 d	11.9 ab	3.3	7.1 b	82 ab	4.0 d	8.8 b-d	32.0	15.9 a-c
83/2000	8.82 bc	10.83 bc	40.8 a	10.9 c	3.2	7.5 ab	85 a	4.7 a	8.5 d	31.8	16.3 a
X	9.03	10.97	39.06	11.54	3.3	7.4	79.9	4.4	8.9	31.4	15.7
S.E.	0.270	0.270	0.385	0.139	0.119	0.163	1.139	0.06	0.119	0.366	0.24
C.V. %	5.97	4.92	1.97	2.41	7.26	4.39	2.86	2.7	0.68	2.33	3.06

S.C.Y. = Seed cotton yield  
 L.Y. = Lint yield  
 L.P. = Lint percentage  
 B.W. = Boll weight  
 S.L. = Span length  
 L.I. = Lint index  
 Ear. = Earliness  
 Mic. = Micronaire value  
 P.I. = Pressly index  
 S.I. = Seed Index

Table (2): means of studied characters in season 2001.

Strain	S.C.Y. k/f	L.Y. k/f	L.P. %	S.I. gm	B.W. gm	L.I. gm	Ear. %	Mic.	P.I. lb/mg	S.L.	
										2.5% S.L.	50% S.L.
G. 83/92	10.78 ab	12.93 a	39.7 a	9.9a-c	2.8	6.5	61 b	4.6 b	9.5 a	31.9 a	15.9 a-c
83/93	9.32 a-d	11.22 a-c	39.6 a	9.5 c	2.8	6.2	71 a	4.3 d	9.2 ab	31.3 ab	15.3 d
83/94	11.56 a	12.88 a	36.4 b	10.8 a	2.9	6.2	74 a	4.8 a	8.5 de	30.0 d	15.5 b-d
83/95	9.07 b-d	10.57 a-c	40.1 a	10.1 a-c	2.9	6.7	73 a	4.5 bc	8.8 cd	30.2 cd	15.4 cd
83/96	8.14 cd	9.83 bc	39.9 a	9.5 c	2.6	6.3	70 a	4.5 bc	8.2 e	29.9 d	15.5 b-d
83/97	8.21 cd	9.80 bc	39.2 a	9.6 bc	2.8	6.2	73 a	4.6 b	9.1 bc	30.9 bc	16.3 a
83/98	7.66 cd	9.50 bc	40.2 a	9.7 bc	2.8	6.5	70 a	4.5 bc	8.4 e	31.7 ab	16.0 ab
83/99	7.07 d	8.56 c	39.9 a	9.5 c	2.7	6.3	73 a	4.4 cd	8.9 bc	31.3 ab	16.0 ab
83/2000	9.77 a-c	12.29 ab	39.1 a	10.5 ab	3.0	6.7	76 a	4.4 cd	8.4 e	31.5 ab	16.2 a
X	9.06	10.84	39.3	9.9	2.8	6.4	71	4.5	8.8	31.0	15.8
S.E.	0.745	0.864	0.380	0.304	0.096	0.190	2.108	0.05	0.113	0.268	0.176
C.V. %	18.41	15.97	1.93	6.16	6.88	5.93	5.92	2.33	2.57	1.73	2.23

S.C.Y. = Seed cotton yield

L.Y. = Lint yield

L.P. = Lint percentage

B.W. = Boll weight

S.L. = Span length

L.I. = Lint index

Ear. = Earliness

Mic. = Micronaire value

P.I. = Pressly index

S.I. = Seed index

On the other hand, G. 83/2000 strain was the best for most studied traits except fiber strength (P.I.). In the light at those results, it could be concluded that the older strains were less for most studied traits over the two successive growing seasons compared with the newest strains. These results were in harmony with those obtained by El-Disoqi (2001).

The data in Table 3, illustrated that the strain G. 83/2000 showed higher values for all studied traits except seed index in the combined data. While, G. 83/92 strain showed the lowest values for seed index and maturity. Also, G. 83/94 strain were the lowest for lint percentage and lint index. Lasheen *et al.* (1997) found that seed index and 50% span length escaped from the newly Giza 75 strains.

**Table (3): Means of studied characters in combined.**

Strain	S.C.Y. k/f	L.Y. k/f	LP. %	S.I. gm	B.W. gm	L.I. gm	Ear %
G. 83/92	9.89 a	12.02 a	39.5 ab	10.9 b	3.	7.1 a	69 d
83/93	9.39 ab	11.54 a	40.0 a	10.6 b	3.1	7.1 a	74 c
83/94	9.90 a	11.07 ab	35.7 c	11.4 a	3.2	6.4 b	77 bc
83/95	9.13 ab	10.92 a-c	39.5 ab	10.9 b	3.1	7.1 a	76 bc
83/96	8.78 a-c	10.72 a-c	39.8 a	10.5 b	3.1	7.0 a	76 bc
83/97	8.46 bc	10.10 bc	39.8 a	10.4 b	3.0	6.9 a	76 bc
83/98	8.73 bc	10.71 a-c	39.9 a	10.7 b	3.0	7.1 a	76 bc
83/99	7.88 c	9.56 c	38.7 b	10.7 b	3.1	6.7 ab	78 ab
83/2000	9.30 ab	11.56 a	40.0 a	10.7 b	3.1	7.1 a	81 a
X	9.05	10.91	39.2	10.8	3.1	6.9	76
S.E.	0.400	0.453	0.270	0.167	0.077	0.125	1.198
C.V. %	12.37	11.74	1.95	4.41	7.12	5.12	4.49

The ordinary analysis of variance of each year with the combined analysis data for some attributes are presented in Table 4. The results cleared that years mean squares were highly significant over combined data for seed index, boll weight, lint index, micronaire value and 2.5% fiber length. The results indicated that strain mean squares were significant and highly significant for all studied traits in the two successive growing seasons and their combined except boll weight. These results confirmed the presence of genetic variability in these traits, while the other traits remained stable. Younis *et al.* (1993) stated that the older strain in Dandara variety had the lower values for lint percentage, while the yield and yield components remained stable. The strains x year interaction mean squares were detected to be highly significant and significant for most studied traits in combined analysis, revealed that these strains behaved differently from year to year or indicating the presence of correlation between strains and environment. Lasheen *et al.* (1997). found significant mean squares of strains and the interactions of strains with years for most and all studied characters, respectively.

Simple correlation coefficients between all studied characters are shown in Table 5. The results revealed that positive and highly significant correlation was found between seed cotton yield and lien yield. Lien percentage was highly and positively correlated with lint index, while it was highly and negatively correlated with seed index. Seed index was highly significant and possibly correlated with maturity, line index and boll weight.

**Table (4): Analysis of variance for studied characters.**

S.O.V	d.F	S.C.V.		L.Y.		L.P.		S.I.		B.W.		L.I				
		2000	2001	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001			
Strains	8	0.983	8.841	3.53	2.819	9.859	4.633	15.035	0.596	0.679	0.738	0.090	0.039	0.643	1.418	0.485
Years	1	-	-	0.02	-	-	0.311	1.20	-	50.004	-	-	4.15	-	-	18.10
Strains X years	8	-	-	6.10	-	-	8.146	3.455	-	0.738	-	-	0.096	-	-	0.325
X years	3	0.141	5.544	2.84*	0.125	5.832	2.843	1.294	0.033	0.263	0.148	0.013	0.012	0.135	0.537	0.157
Rept. Error	24	0.269	2.199	1.234	0.291	2.885	1.838	0.824	0.078	0.370	0.224	0.057	0.047	0.106	3.355	0.123

\* , \*\* Significant at 0.05 and 0.01 levels of probability, respectively.

**Table (4): Cont.**

S.O.V	d.F	Ear		Mic.		P.I		2.5% S.L.		50% S.L.			
		2000	2001	2000	2001	2000	2001	2000	2001	2000	2001		
Strains	8	34.64	71.0	83.26	0.178	0.088	0.189	1.852	2.272	1.975	0.552	0.525	0.568
Years	1	-	-	1292.01	-	-	0.12	0.17	-	3.187	-	-	0.180
Strains X years	8	-	-	22.58	-	-	0.085	0.342	-	1.051	-	-	0.509
X years	3	0.63	20.77	10.7	0.012	0.011	0.011	0.004	0.134	0.208	0.002	0.189	0.088
Rept. Error	24	5.192	17.77	11.48	0.014	0.011	0.013	0.051	0.287	0.411	0.124	0.210	0.167

Boll weight was highly significant and positively correlated with maturity and lint index. Positive and highly significant correlation between lint index and maturity. Fiber length (2.5% span length) was highly and positively correlated with 50% span length. Gad (1993) in agreement with those report these results.

**Table (5): Simple correlation coefficients between studies traits.**

Characters	50% S.L.	2.5% S.L.	P.I	Mic.	Ear. %	L.I.	B.W.	S.I.	L. %	L.Y.
S.C.Y.	-0.242	-0.190	0.139	0.248	-0.125	-0.114	0.069	0.222	-0.180	0.954**
L.Y.	-0.144	-0.075	0.174	0.127	-0.096	0.285	0.118	0.248	0.022	
L. %	0.126	0.135	0.065	-0.153	-0.196	0.616**	-0.419	-0.628**		
S.I.	-0.140	0.279	0.130	-0.205	0.721**	0.740**	0.895**			
B.W.	-0.134	0.347	0.056	-0.335	0.748**	0.754**				
L.I.	-0.114	0.225	0.159	-0.210	0.616**					
Ear. %	-0.066	0.149	-0.304	-0.208						
Mic.	0.174	-0.276	0.032							
P.I.	0.174	0.359								
2.5% S.L.	0.659**									

\*, \*\* Significant at 0.05 and 0.01 levels of probability, respectively.

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**تقييم تسعة سلالات من صنف القطن جيزه ٨٣  
جمال حسين عبدالظاهر ، محمد عبدالحكيم نجيب  
معهد بحوث القطن – مركز البحوث الزراعية**

استخدمت في هذه الدراسة تسعة سلالات من صنف القطن جيزه ٨٣ وهي جيزه ٩٢/٨٣ – جيزه ٢٠٠٠/٨٣. وأجريت التجارب بمعطة البحوث الزراعية بملوى موسمى (٢٠٠٠ ، ٢٠٠١) وأهم النتائج المتحصل عليها كما يلي:

- أظهرت كل من السلالتين جيزه ٩٢/٨٣ ، جيزه ٩٢/٨٣ قيم منخفضة لصفات التبكير ومعامل البذر وطول التيلة عند ٥٠% ، بينما أظهرت كل من السلالتين جيزه ٩٨/٨٣ ، جيزه ٢٠٠٠/٨٣ قيم عالية لمعظم الصفات المدروسة ما عدا صفة متانة التيلة.
- اتضح من الدراسة معنوية تأثير السنوات على صفات معامل البذر ووزن النوزة ومعامل الشعر وقراءة الميكرونير وطول التيلة عند ٢,٥%.
- كان التفاعل بين السلالات والسنوات عالى المعنوية لمعظم الصفات المدروسة.
- كذلك تبين وجود فروق عالية المعنوية بين السلالات لكل الصفات المدروسة ما عدا صفة وزن النوزة خلال موسمى الدراسة وكذلك للتحميل المشترك.
- وجد ارتباط موجب وعالى المعنوية بين محصول القطن الزهر ومحصول القطن الشعر.
- كما أظهرت النتائج وجود ارتباط موجب وعالى المعنوية بين معدل الحليج ومعامل الشعر بينما تبين وجود ارتباط سالب وعالى المعنوية بين معدل الحليج ومعامل البذر.
- كما ظهر ارتباط موجب وعالى المعنوية بين وزن النوزة وصفات التبكير ومعامل الشعر.
- كما كان هناك ارتباط موجب وعالى المعنوية بين طول التيلة عند ٢,٥% وطول التيلة عند ٥٠% أيضا.