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MAINTENANCE AND PRODUCING Of THE NUCLEOLUS (BREEDER'S SEED) OF GIZA 86 EGYPTIAN COTTON CULTIVAR DURING 2017-2020.

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ABSTRACT

The breeding program of the cultivar Giza 86 was conducted at El-Gemmeiza Experimental Station at El-Gharbia Governorate Egypt, during 2017-2020 seasons to initiate a nucleolus. In 2017 season sixty type plants were selected from the breeding nursery of Giza 86 cotton cultivar that produced sixty progenies (increase A) in 2018. From the latter, 23 families were selected to form (increase B) in 2019, According to the statistical analysis of yield trial which included the twenty three families and comparisons of the latest two strains in cultivation of Giza 86, ten elite families were selected and their seed were massed carefully together to form the nucleolus (Breeder's seed) in 2020 season. The results obtained here indicated that, the pure line method in the sense of pedigree selection for annually renewing Giza 86 breeder's seed could prevent genetic contamination. Meanwhile, the selection technique for producing breeder's seed of Giza 86 cultivar was valid and proved to be effective in holding the true type of the variety.

Key words: ***Cotton, Gossypium barbadense* L., *Maintenance, Breeder's seed, Giza 86 cultivar .***

INTRODUCTION

Egyptian cotton (*Gossypium barbadense* L.) is considered a distinctive type of cotton that is characterized by high quality, and gained a world-wide reputation as being of the highest lint quality among world cottons. Its fineness, strength and superior characteristics, have positioned its products as the world's finest. This reputation in the course of time was attributed to the maintenance procedure followed by Department of Varietal Maintenance in Cotton Research Institute, to maintain the genetic purity and identity standard characteristics of Egyptian cotton varieties. Pedigree selection method has become the most common plant breeding procedure. All Egyptian cotton varieties are maintained by this method. Both of pedigree selection and independent culling levels selection were used in maintenance and renewing Egyptian cotton varieties. Lewis (1970) indicated that Egyptian cotton varietal maintenance consider essential in breeding program to maintain high quality properties and prevent any deterioration for these traits. Maintenance of Egyptian cotton varieties have been reported by many researchers Ware (1959), Turner (1963), Walker (1964) and Riggs (1967). They studied the bulk model system designed to stabilize a variety. They concluded that this system could be considered for cotton variety maintenance. Al-Didi (1974) stated that it was advantageous to mass the seed of the chosen families in which the seed mixture may respond differently to environmental variation and if genotype x environment effects were significant, mixture of seeds might show less

fluctuation in yield and quality than individual progenies However, Abdel-Al (1976), El-Akkad *et al* (1982), El-Kilany and Yousef (1985), Younis *et al* (1993), Lasheen (1997), Al-Ameer (2014), Abd El salam (2015), Al-Hibbiny (2015), Hamed (2016), El-Dahan (2016), Mahrous (2017), Soliman (2018) and Mabrouk (2019) reported that the pure seed and production of cotton cultivar using pedigree selection method is essential to produce, renew and maintain the breeder's seed of the cotton cultivars in the commercial use. This method based on massing selfed seeds of homogeneous type of families, according to their performance in the evaluation with the latest nuclei. Cotton Varietal Maintenance Department is the responsible of maintaining and renewing breeder's seed of the commercial cultivars in addition the further seed production steps are carried out with the collaboration with Central Administration for Seed Production and Central Administration for Seed Certification.

The main objective of this work is to follow the procedure of renewing and maintaining registered cotton varieties in order to produce pure breeder's seed of the cultivar Giza 86.

MATERIALS AND METHODS

Giza 86 cotton variety is a commercial Egyptian cotton cultivar. This cultivar was derived by the pedigree selection method from the cross between Giza 75 x Giza 81**.** The present study was carried out at El-Gemmeiza Experimental Station at El-Gharbia Governorate, Cotton Research Institute, Agricultural Research Center, Egypt, during four seasons from 2017 to 2020.

The basic materials for this study were the individual elite plants selected based on field evaluation and laboratory determination from breeding plot of 2016 season. At harvest each selected individual plant in the breeding plot was picked separately. The plants were screened for yield, yield components as well as fiber properties. In 2017 season, sixty plants representing the type of Giza 86 cultivar were selected to form the increase lines A.

In 2018 season the selfed seeds of the progenies of the 60 selected type plants were grown in number of rows as the amount of seed allowed conveniently named increase line A, as well as the natural pollinated seeds of same 60 selected type plants were grown as adjacent progeny three rows

to be increased for using it in yield trial in the next year. According to the field and laboratory tests of phenotypic yield and its components and fiber properties, 23 families were selected from increase A.

In 2019 season, the selefed seeds of the 23 families were grown in increase B. A yield trial included the 23 selected families as well as the two latest strains of Giza 86 were used as controls. The design of yield trail was a randomized complete blocks design with four replications. The 23 selected families as well as the two latest control strains of G 86 were evaluated for yield, its components and fiber properties.

In 2020 season, according to the results of yield trail, the best ten families representing the type of Giza 86 cultivar were selected from increase B and their selfed seeds were carefully massed together to form the new nucleolus (Breeder's Seed) and propagated in 2020 under the name of season (Giza 86 nucleolus/2020) in about 84 feddans at El-Gemmeiza farms.

Data of the following traits were recorded:

Yield and yield component traits reported were as follows:

- Seed cotton yield (SCY k/f) Yield per feddan was calculated from the mean plot size.
- Lint cotton yield (LCY k/f)
- Boll weight (BW g)
- Lint percentage (L%)
- Seed index (SI g)
- Lint index (LI)

Fiber properties:

- Fiber length (Upper half mean) (UHM)
- Elongation % (E%)
- Pressily index (PI)
- Uniformity index(U I %)
- Sterngth g/tex (ST g/tex)
- Micronaire reading (Mic)
- Yarn strength (YS)
- Fiber reflection as percentage (RD).
- Degree of Yellowness on the lint color (+b).

All fiber properties were measured in the laboratories of the Cotton Technology Research Division, Cotton Research Institute, Agricultural Research Center, Giza, Egypt.

Mean of the selected families and comparison, standard error and coefficient of variability (CV %) were calculated for all the studied traits, also analysis of variance were carried out for all the studied traits in the yield trail.

RESULTS AND DISCUSSION

Means of agronomic and fiber properties for the 60 bulked families of Giza 86 cultivar in 2017 season were estimated, the results are presented in Table (1). With regard to the families compared, it was clear that no substantial differences for all studied traits were found, except for boll weight. Whereas, coefficients of variability were low in magnitude for all studied traits except for boll weight. This could be due to environmental factors as temperature, insects, soil etc. on such traits. These results were in agreement with those obtained by El-Disouqi (2001), Abdel-Zaher (2004), Mohamed (2013), Abd El salam (2015), Al-Hibbiny (2015), Hamed (2016), Mahrous (2017) and Soliman (2018) .

Means of agronomic and fiber properties of the 60 selected type plant progenies (increase A) in 2018 season compared with the three latest strains of G.86 are given in Table (2). It could be noticed that, the means of (increase A) slightly exceeded the means of comparisons for some studied traits. Coefficient of variability as indicated by C.V % decreased for all the studied traits after selection except for boll weight, degree of Yellowness and yarn strength indicating gene fixation beside improvement.

Table (3) shows, the results of the means for yield, yield components and fiber properties of the 23 selected families (increase B) compared with the two latest strains of Giza 86 (controls). These results show no significant differences among the families and control for all the studied traits of yield and yield components. According to the yield superiority, desirable level of lint percentage and standard level of fiber properties, the ten strains following i.e. 1/2017-13, 2/2017-39, 35/2017-26, 37/2017-23, 44/2017-7, 48/2017-16, 49/2017-10, 53/2017-16, 53/2017-30 and 58/2017-5 were selected. These results are in agreement with those obtained by Abo-Arab *et al* (1995), Lasheen (1997), El-Disoqui (2001), Nagib and Hemida (2001), Abdel-Zaher (2004),

Mohamed (2013), Abd El salam (2015), Al-Hibbiny (2015), Hamed (2016), Mahrous (2017) and Soliman (2018).

Regarding, the results in Table (3), the 10 selected families were not significantly different from the control in yield and other agronomic characters and in fiber properties. Pure seeds of the aforementioned 10 selected families in increase B such maintaining program, were massed together to form the breeder"s seed stock of Giza 86 cultivar in 2020 season. The breeder seed was named (Giza 86 nucleolus /2020).

Table (4) presented the characters of the selected families as compared with the latest nucleus of Giza 86. The breeder's seed (nucleolus) was planted in 2020 season in about 84 feddan at El-Gemmeiza farms.

Table 1. Mean of agronomic and fiber properties for the 60 type plants selected from the nursery in 2017 to form increase (A) progenies in 2018 growing season.

Families No.	B W g.	L%	S I g.	L I g.	MIC	P I	UHM 2.5%	UI
1/2017-4	3.20	39.60	10.90	7.15	4.30	11.20	34.00	86.10
1/2017-13	3.90	40.60	10.50	7.18	4.60	10.40	34.10	85.60
2/2017-29	3.60	39.70	10.90	7.18	4.50	10.60	33.70	85.70
2/2017-33	3.20	40.20	10.80	7.26	4.50	10.70	33.90	85.80
2/2017-39	4.00	39.50	10.50	6.86	4.50	10.50	34.10	85.60
4/2017-10	3.30	39.50	11.00	7.18	4.30	10.80	34.10	86.70
6/2017-9	3.80	39.80	11.30	7.47	4.20	11.20	34.00	85.70
10/2017-20	3.30	40.20	11.30	7.60	4.50	10.50	33.50	85.30
10/2017-22	3.70	40.20	11.20	7.53	4.40	10.50	33.90	85.00
10/2017-25	3.40	40.40	10.30	6.98	4.30	10.70	34.00	85.10
13/2017-5	3.40	39.60	10.10	6.62	4.20	11.10	33.50	85.00
13/2017-10	3.80	40.00	10.90	7.27	4.40	10.80	33.80	85.30
13/2017-32	3.70	39.60	11.40	7.47	4.60	10.80	34.20	85.10
33/2017-15	3.50	40.50	10.80	7.35	4.60	10.40	34.30	85.00
33/2017-17	3.90	41.00	12.00	8.34	4.50	10.70	33.60	85.10
33/2017-23	3.80	39.60	11.30	7.41	4.30	10.60	34.10	87.10
34/2017-15	3.90	41.00	10.80	7.51	4.40	10.90	34.00	85.20
34/2017-23	3.90	40.60	11.60	7.93	4.60	10.50	34.10	86.30
34/2017-32	3.80	39.70	10.80	7.11	4.40	10.50	34.10	85.30
34/2017-33	3.60	39.80	11.40	7.54	4.50	10.90	34.30	86.00

Table 1. Cont.

Families No.	B W g.	L%	S I g.	L I g.	MIC	P I	UHM 2.5%	UI
35/2017-2	3.80	39.60	10.90	7.15	4.60	10.60	34.10	85.60
35/2017-6	3.70	40.70	10.50	7.21	4.50	11.00	33.50	85.30
35/2017-14	3.30	40.30	10.90	7.36	4.50	10.40	34.00	86.10
35/2017-24	3.40	39.90	10.10	6.71	4.60	10.80	33.60	85.00
35/2017-26	3.40	39.70	10.50	6.91	4.40	10.70	34.20	85.20
35/2017-37	3.80	39.50	11.00	7.18	4.60	10.40	33.60	85.70
35/2017-38	3.50	39.40	11.40	7.41	4.40	10.80	34.30	85.40
35/2017-40	3.20	39.40	11.70	7.61	4.50	11.10	33.90	85.10
37/2017-19	3.30	40.40	10.70	7.25	4.60	10.70	34.20	86.90
37/2017-23	3.80	39.60	11.00	7.21	4.40	10.40	33.60	85.80
37/2017-25	3.90	39.70	10.90	7.18	4.20	11.10	34.20	85.60
38/2017-6	3.30	39.50	11.60	7.57	4.40	10.70	33.70	85.70
38/2017-18	3.50	39.60	10.80	7.08	4.60	10.40	33.90	85.30
41/2017-13	4.00	39.70	10.30	6.78	4.50	10.50	34.10	85.70
41/2017-29	3.60	39.60	10.70	7.02	4.60	10.70	34.30	86.30
44/2017-1	3.50	40.00	10.40	6.93	4.30	10.50	33.50	84.90
44/2017-7	3.30	39.80	10.50	6.94	4.60	10.50	33.60	84.90
47/2017-7	3.50	40.40	10.50	7.12	4.60	10.60	34.10	85.10
47/2017-33	3.60	40.10	10.60	7.10	4.20	10.90	33.90	85.90
48/2017-16	3.70	39.50	10.90	7.12	4.20	10.60	33.60	85.70

Table 1.Cont.

Families No.	B W g.	L%	S I g.	L I g.	MIC	P I	UHM 2.5%	UI
48/2017-19	4.00	40.20	10.60	7.13	4.40	11.20	34.10	85.70
49/2017-10	4.00	39.80	11.80	7.80	4.50	10.50	33.90	85.60
50/2017-4	3.90	39.90	11.60	7.70	4.60	10.70	34.20	85.90
50/2017-16	3.30	40.00	11.10	7.40	4.40	10.70	34.90	86.50
50/2017-18	3.40	40.10	11.20	7.50	4.50	10.40	34.30	86.70
50/2017-30	3.90	39.50	11.60	7.57	4.50	10.40	34.20	85.70
51/2017-1	3.30	40.40	10.10	6.85	4.50	10.50	34.00	86.30
51/2017-21	3.70	39.90	10.50	6.97	4.50	10.30	34.10	86.60
51/2017-29	3.40	39.60	11.00	7.21	4.60	10.50	33.60	84.90
53/2017-12	3.20	39.30	10.90	7.06	4.30	10.80	34.10	85.90
53/2017-16	3.30	40.10	10.30	6.90	4.20	10.90	33.90	85.10
53/2017-30	4.00	39.60	10.80	7.08	4.50	10.60	33.70	84.90
54/2017-7	3.60	39.90	11.40	7.57	4.60	10.40	34.20	85.30
54/2017-27	3.30	40.00	11.20	7.47	4.60	10.50	33.70	85.10
55/2017-5	3.20	39.70	10.90	7.18	4.60	10.50	33.80	85.00
55/2017-20	3.90	39.50	10.80	7.05	4.40	10.50	34.10	87.10
55/2017-30	3.70	39.40	11.40	7.41	4.60	10.70	34.20	85.70
58/2017-5	3.70	39.40	10.80	7.02	4.50	10.60	34.20	85.90
59/2017-15	3.30	39.80	10.50	6.94	4.30	10.80	34.30	85.30
59/2017-16	3.90	39.60	10.80	7.08	4.40	10.70	33.60	85.50
$\bar{x}$ families	3.60	39.89	10.92	7.24	4.46	10.67	33.97	85.63
$\bar{x}$ comparis	3.50	39.90	10.70	7.10	4.70	10.50	34.00	85.50
S.E	0.03	0.05	0.06	0.04	0.02	0.03	0.04	0.07
C.V%	7.27	1.02	4.06	4.25	2.93	2.14	0.82	0.67

S.E. = Standard error. **C.V% = coefficient of variability.**

Table 2. Mean of yield characters and fiber properties for the 60 Giza 86 selected increases a type families in final of 2018 growing season.

Families No.	BW	L%	SI	LI	MIC	UHM	UI	ST g/tex	E %	+ b	RD	YS
1/2017-4	3.20	40.00	11.10	7.40	4.50	34.10	85.50	43.80	7.20	8.70	72.80	2200
1/2017-13	3.30	39.90	10.40	6.90	4.60	33.60	85.80	44.50	7.20	8.80	73.60	2160
2/2017-29	3.10	39.60	11.10	7.28	4.30	33.90	86.10	41.80	7.20	7.80	72.60	2100
2/2017-33	3.00	38.60	10.60	6.66	4.60	33.20	85.10	40.70	7.50	8.30	75.20	1980
2/2017-39	3.10	38.40	11.00	6.86	4.50	33.10	85.40	43.30	7.30	8.70	74.80	2040
4/2017-10	3.40	39.90	10.00	6.64	4.50	33.10	85.70	43.50	7.50	8.10	73.30	2040
6/2017-9	3.00	40.10	10.10	6.76	4.60	33.20	85.30	42.00	7.20	9.50	74.20	2100
10/2017-20	3.50	39.50	11.20	7.31	4.60	32.00	85.40	41.40	7.30	8.30	73.20	2100
10/2017-22	3.30	41.20	10.00	7.01	4.30	33.60	86.30	42.10	7.50	8.60	72.80	2040
10/2017-25	3.10	40.90	9.60	6.64	4.60	33.10	86.00	40.80	7.50	8.20	75.70	2040
13/2017-5	3.40	40.80	10.30	7.10	4.50	33.70	84.00	41.80	7.20	8.40	76.80	2100
13/2017-10	3.10	41.60	10.00	7.12	4.50	34.30	85.30	39.70	7.50	9.30	76.90	1920
13/2017-32	3.10	40.70	10.00	6.86	4.50	31.40	84.20	42.30	7.10	7.90	78.00	2100
33/2017-15	3.10	40.20	10.30	6.92	4.50	33.20	83.50	43.80	7.30	7.00	75.30	1920
33/2017-17	3.10	40.80	10.10	6.96	4.50	32.60	83.70	43.00	7.50	7.40	78.00	2040
33/2017-23	3.30	40.80	11.00	7.58	4.50	33.70	83.50	42.70	7.20	7.80	76.30	1980
34/2017-15	3.50	40.30	10.60	7.16	4.60	32.50	84.30	43.20	7.40	8.40	77.00	2340
34/2017-23	3.40	38.60	10.30	6.48	4.50	32.40	83.70	41.70	7.00	7.60	77.00	2040
34/2017-32	3.20	41.20	10.10	7.08	4.60	33.20	86.60	43.40	7.30	7.00	76.00	2280
34/2017-33	3.50	40.90	11.10	7.68	4.40	31.90	84.60	43.50	7.00	7.50	79.10	1920

Table 2. Cont.

Families No.	BW	L%	SI	LI	MIC	UHM	UI	ST g./tex	E %	+ b	RD	YS
35/2017-2	3.10	41.30	10.20	7.18	4.40	33.30	86.70	42.20	7.30	7.60	77.80	2040
35/2017-6	3.50	41.00	10.60	7.37	4.40	32.90	86.00	42.50	7.30	8.40	78.70	2040
35/2017-14	3.00	41.20	10.20	7.15	4.60	32.90	82.50	41.50	7.20	7.80	76.70	1920
35/2017-24	3.30	40.10	10.70	7.16	4.50	32.70	84.90	42.00	7.50	8.30	77.40	1980
35/2017-26	3.40	39.80	11.30	7.47	4.60	33.10	85.70	42.20	7.50	8.30	78.10	2220
35/2017-37	3.30	40.10	10.30	6.90	4.60	33.10	85.30	42.10	7.00	7.60	78.90	2100
35/2017-38	3.40	40.40	10.50	7.12	4.50	33.00	84.70	43.90	7.30	7.80	80.90	2100
35/2017-40	3.30	40.80	10.90	7.51	4.50	32.00	83.30	42.00	7.40	7.80	80.30	2100
37/2017-19	3.10	41.70	10.10	7.22	4.50	32.30	82.00	41.30	7.20	8.00	79.00	2100
37/2017-23	3.10	40.20	10.40	6.99	4.50	33.60	86.70	43.50	7.30	7.10	78.00	2100
37/2017-25	3.00	40.80	9.70	6.69	4.60	34.60	85.80	42.80	7.30	9.00	78.90	2160
38/2017-6	3.40	39.10	11.10	7.13	4.50	33.20	83.70	42.80	7.10	7.10	78.80	2100
38/2017-18	3.40	40.40	10.30	6.98	4.60	32.50	86.80	43.50	7.40	8.20	78.20	1980
41/2017-13	3.30	41.80	10.00	7.18	4.60	32.00	86.00	42.70	7.40	8.70	79.60	2040
41/2017-29	3.20	39.30	10.10	6.54	4.60	32.60	87.00	43.70	7.00	8.40	77.20	2100
44/2017-1	3.10	39.60	10.60	6.95	4.60	32.90	86.50	44.00	7.00	8.20	76.30	2340
44/2017-7	3.10	41.50	10.50	7.45	4.40	32.70	86.50	44.80	7.20	8.30	78.00	2400
47/2017-7	3.50	40.50	9.90	6.74	4.50	33.50	87.30	44.50	7.40	8.20	80.40	2400
47/2017-33	3.30	39.70	9.70	6.39	4.60	33.30	86.50	43.30	7.20	8.20	78.20	2460
48/2017-16	3.20	40.80	9.90	6.82	4.50	32.50	86.00	44.50	7.40	8.70	78.50	2220

Table 2. Cont.

Families No.	BW	L%	SI	LI	MIC	UHM	UI	ST g./tex	E %	+ b	RD	YS
48/2017-19	3.50	39.80	10.70	7.07	4.50	33.40	83.90	42.30	7.30	8.00	77.90	2400
49/2017-10	3.60	38.50	11.40	7.14	4.60	32.80	86.40	43.40	7.50	7.80	79.50	2400
50/2017-4	3.40	40.40	10.20	6.91	4.60	32.80	86.20	42.80	7.50	8.20	78.30	2280
50/2017-16	3.10	40.80	10.00	6.89	4.60	32.20	85.30	43.60	7.30	8.40	77.50	2220
50/2017-18	3.40	40.90	10.10	6.99	4.60	33.20	85.60	43.00	7.20	8.30	81.80	2340
50/2017-30	3.40	41.90	10.40	7.50	4.50	32.90	84.90	44.30	7.40	8.60	80.20	2460
51/2017-1	3.10	41.30	10.00	7.04	4.60	33.20	85.10	43.00	7.50	7.90	80.70	2040
51/2017-21	3.70	40.40	10.50	7.12	4.60	32.00	85.40	42.30	7.20	7.80	80.30	1920
51/2017-29	3.10	40.80	10.30	7.10	4.70	32.50	85.20	42.00	7.30	8.20	78.50	2040
53/2017-12	3.50	39.20	11.20	7.22	4.60	33.50	84.70	43.20	7.30	8.80	79.50	2100
53/2017-16	3.60	38.40	11.20	6.98	4.70	33.40	87.80	44.60	7.00	9.40	77.20	2040
53/2017-30	3.10	39.90	10.20	6.77	4.60	33.60	86.30	44.40	7.10	7.80	78.40	2080
54/2017-7	3.10	40.80	10.40	7.17	4.70	32.90	85.80	43.10	7.40	9.30	79.90	2040
54/2017-27	3.10	40.20	10.00	6.72	4.60	31.70	86.20	42.50	7.40	7.80	79.30	2040
55/2017-5	3.10	41.40	10.00	7.06	4.60	32.40	84.90	41.10	7.30	8.10	79.30	2040
55/2017-20	3.30	40.40	10.20	6.91	4.50	32.10	83.80	42.80	7.20	8.20	76.80	2040
55/2017-30	3.50	40.40	9.60	6.51	4.50	32.40	85.60	41.30	7.50	7.50	78.30	2340
58/2017-5	3.50	41.30	11.10	7.81	4.50	33.50	86.40	41.80	7.40	8.30	79.30	2460
59/2017-15	3.40	40.50	11.40	7.76	4.60	32.50	84.10	41.90	7.30	7.70	77.20	2340
59/2017-16	3.30	38.80	11.90	7.54	4.50	32.60	85.90	42.80	7.00	8.00	76.70	2340
$\bar{x}$ families	3.28	40.34	10.45	7.06	4.54	32.94	85.32	42.75	7.29	8.15	77.59	2138
$\bar{x}$ compari	3.35	40.08	10.58	7.08	4.55	33.08	84.83	42.50	7.38	7.88	78.88	2210
SE	0.02	0.11	0.07	0.04	0.01	0.08	0.15	0.14	0.02	0.07	0.28	19.95
CV%	5.53	2.19	4.93	4.46	1.83	1.96	1.40	2.54	2.15	6.85	2.79	7.23

S.E. = Standard error. CV% = coefficient of variability.

Table 3. Means of yield, yield components and fiber prosperities for the 23 selected families (increase B) in 2019 season.

Selected families	SCY K/F	LCY K/F	BW	L%	SI	LI	UHM
1/2017-4	10.60	14.10	3.30	40.40	10.30	6.98	31.70
1/2017-13*	11.90	16.00	3.20	40.90	10.30	7.13	32.80
2/2017-39*	10.80	14.30	3.20	40.30	10.50	7.09	33.40
4/2017-10	11.30	15.00	3.50	40.40	10.30	6.98	32.30
34/2017-15	10.00	13.40	3.30	40.60	10.00	6.84	34.00
34/2017-32	10.20	13.90	3.10	41.00	9.80	6.81	32.40
35/2017-26*	10.90	14.60	3.20	40.50	10.40	7.08	32.70
37/2017-23*	11.10	14.80	3.10	40.60	10.30	7.04	32.30
44/2017-1	11.10	14.60	3.20	40.00	10.20	6.80	32.70
44/2017-7*	11.90	15.80	3.40	40.10	10.50	7.03	32.90
47/2017-7	11.40	15.00	3.30	39.90	10.60	7.04	32.40
47/2017-33	10.40	13.80	3.20	40.00	10.20	6.80	32.50
48/2017-16*	10.40	13.80	3.20	40.40	10.10	6.85	32.60
49/2017-10*	11.20	14.90	3.40	40.10	10.40	6.96	32.80
50/2017-18	11.70	15.40	3.20	40.00	10.40	6.93	32.50
50/2017-30	11.70	15.60	3.30	40.50	10.20	6.94	32.70
51/2017-1	11.20	14.90	3.10	40.20	10.30	6.92	32.00
53/2017-12	10.90	14.20	3.30	39.70	10.50	6.91	32.40
53/2017-16*	11.50	15.10	3.40	40.00	10.50	7.00	32.60
53/2017-30*	11.00	14.40	3.40	39.80	10.40	6.88	32.40
54/2017-7	11.60	15.50	3.10	40.60	10.00	6.84	32.30
58/2017-5*	10.00	13.30	3.10	40.20	10.10	6.79	34.00
59/2017-16	10.40	13.80	3.20	40.30	9.80	6.62	32.10
$\bar{x}$ families	11.01	14.62	3.25	40.28	10.27	6.92	32.63
$\bar{x}$ comparisons.	11.10	14.10	3.25	40.35	10.25	6.95	32.50
S.E	0.12	0.16	0.02	0.07	0.05	0.03	0.11
CV%	5.30	5.20	3.58	0.83	2.13	1.75	1.68
F-test	N.S	N.S	N.S	N.S	N.S	N.S	

Table 3. Cont.

Selected families	E%	UI	ST g/tex	MIC	Y S	+b	Rd
1/2017-4	7.30	87.30	43.90	4.50	2460	7.30	77.20
1/2017-13*	7.50	86.30	45.60	4.50	2640	7.00	76.30
2/2017-39*	7.50	87.40	46.00	4.50	2400	7.40	74.30
4/2017-10	7.00	87.00	46.00	4.50	2340	7.00	77.80
34/2017-15	7.20	86.00	44.40	4.50	2220	8.40	78.30
34/2017-32	7.30	86.50	45.40	4.50	2340	7.80	78.80
35/2017-26*	7.30	88.20	45.40	4.40	2360	7.30	75.40
37/2017-23*	7.40	86.80	46.10	4.50	2350	7.30	78.20
44/2017-1	7.50	86.70	45.80	4.50	2280	6.70	73.10
44/2017-7*	7.30	87.80	45.00	4.50	2340	8.10	76.50
47/2017-7	7.20	87.10	44.30	4.50	2280	7.40	77.40
47/2017-33	7.10	86.30	42.50	4.50	2220	6.80	75.30
48/2017-16*	7.40	88.20	47.40	4.50	2210	7.00	75.30
49/2017-10*	7.30	86.30	48.30	4.50	2220	7.20	76.60
50/2017-18	7.20	86.10	46.30	4.60	2160	7.30	78.30
50/2017-30	7.50	88.50	48.20	4.50	2280	7.30	78.90
51/2017-1	7.50	88.50	45.80	4.60	2200	7.30	73.90
53/2017-12	7.40	87.80	48.20	4.50	2280	7.50	78.90
53/2017-16*	7.50	87.20	45.10	4.50	2200	7.80	77.90
53/2017-30*	7.00	87.30	46.10	4.50	2220	7.70	78.50
54/2017-7	7.40	86.20	45.40	4.40	2400	7.60	76.80
58/2017-5*	7.00	88.70	46.00	4.40	2300	7.70	78.70
59/2017-16	7.40	87.10	45.30	4.40	2340	6.70	73.70
$\bar{x}$ families	7.31	87.19	45.76	4.49	2306	7.37	76.79
$\bar{x}$ comparisons.	7.40	86.70	45.70	4.40	2260	7.80	74.95
S.E	0.04	0.17	0.29	0.01	22.13	0.09	0.38
C.V%	2.31	0.96	3.00	1.15	4.60	5.74	2.38
F-test							

$\bar{x}$ comp= control mean S.E. = Standard error. C.V% = coefficient of variability. * Families selected

Table 4. Mean of studied characters for 10 families selected from increases B families in 2019 growing season which are massed to form new nucleolus (Breeder's seed) of *G.*86 in 2020 season.

Selected families	SCY K/F	LCY K/F	BW	L%	SI	LI	UHM	E%	UI	ST g/tex	MIC	Y S	+b	Rd
1/2017-13	11.90	16.00	3.20	40.90	10.30	7.13	32.80	7.50	86.30	45.60	4.50	2640	7.00	76.30
2/2017-39	10.80	14.30	3.20	40.30	10.50	7.09	33.40	7.50	87.40	46.00	4.50	2400	7.40	74.30
35/2017-26	10.90	14.60	3.20	40.50	10.40	7.08	32.70	7.30	88.20	45.40	4.40	2360	7.30	75.40
37/2017-23	11.10	14.80	3.10	40.60	10.30	7.04	32.30	7.40	86.80	46.10	4.50	2350	7.30	78.20
44/2017-7	11.90	15.80	3.40	40.10	10.50	7.03	32.90	7.30	87.80	45.00	4.50	2340	8.10	76.50
48/2017-16	10.40	13.80	3.20	40.40	10.10	6.85	32.60	7.40	88.20	47.40	4.50	2210	7.00	75.30
49/2017-10	11.20	14.90	3.40	40.10	10.40	6.96	32.80	7.30	86.30	48.30	4.50	2220	7.20	76.60
53/2017-16	11.50	15.10	3.40	40.00	10.50	7.00	32.60	7.50	87.20	45.10	4.50	2200	7.80	77.90
53/2017-30	11.00	14.40	3.40	39.80	10.40	6.88	32.40	7.00	87.30	46.10	4.50	2220	7.70	78.50
58/2017-5	10.00	13.30	3.10	40.20	10.10	6.79	34.00	7.00	88.70	46.00	4.40	2300	7.70	78.70
$\bar{X}$ families	11.07	14.70	3.26	40.29	10.35	6.99	32.85	7.32	87.42	46.10	4.48	2324	7.45	76.77
$\bar{X}$ comparisons	11.10	14.10	3.25	40.35	10.25	6.95	32.50	7.40	86.70	45.70	4.40	2260	7.80	74.95

These results provide good evidence that the pure seed stock released by the cotton breeder would be maintained pure as the stocks and exclusively remained in the hands of the breeder. Being then the breeder's seed (nucleolus) is further increased to produce the foundation seed (nucleus) as a new seed wave of the cultivar carrying the year number of its propagation Giza 86/2020 nucleus. Unfortunately, contamination through out crossing with inferior foreign varieties/ cultivars or off-types used to cause undesirable genetic change of the cultivar. Also, mechanical mixing of varietal seeds in general

cultivation and for handling provides enormous deterioration of cotton cultivars. The results are in agreement with those obtained by Younis *et al* (1993), Abo-Arab *et al* (1995), Lasheen (1997), El-Disoqui (2001), Nagib and Hemida (2001), Abdel-Zaher (2004), Mohamed (2013), Abd El salam (2015), Al-Hibbiny, (2015), Hamed (2016), Mahrous (2017), Soliman (2018) and Mahmoud (2019)

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REFERENCES

Abd El salam, M.E. (2015) Plan for breeding, maintenance and producing the nucleolus (BREEDER'S SEED) of Giza 45 Egyptian cotton variety during 2011 – 2014 growing seasons. J. Plant Production, Mansoura Univ., 6 (6): 879 – 887.

Abdel-Al M.S.M. (1976). Some aspects of breeding methods for maintaining Egyptian cotton varieties. Ph.D. Thesis Al-Azhar Univ.,Egypt.

Abdel-Zaher, G. (2004). Maintenance and producing the nucleolus (Breeder seed) of Giza 83 Egyptian cotton variety, during 2000-2004 seasons. Egypt. J. Plant Breed. 8:77-86.

Abo-Arab, A.R., A.E. Ayoub and A.F. Lasheen (1995). Maintenance and producing the nucleolus (breeder seed) of Giza 76 Egyptian cotton variety during 1990-1992 seasons. Zagazig J. Agric. Res. 22 (2): 399-408.

Al-Ameer, M.A. 2014. Plan for breeding, maintenance and producing the nucleolus (breeder's seed) of Giza 87 Egyptian cotton variety. Egypt. J. Agric. Res., 92 (4), 1341-1355.

Al-Didi, M.A. (1974). Methods of cotton breeding. Egypt. Cot. Gaz. 62: 49-92.

Al-Hibbiny, Y.I.M. (2015) Producing new nucleolus (Breeder's Seed) of Giza 90 Egyptian cotton cultivar, during 2011-2014 seasons. J. Agric. Res., Kafr EL-Sheikh Univ. 41 (1): 181 – 191

El-Akkad M.H., A.F.H. El-Okkia, H. R. El-Hanafi and M.A. Abdel-Dayem (1982). Plan for maintenance and producing the nucleolus (breeder's seed) of Giza 69 Egyptian cotton variety, during 1975- 1979 seasons. Agric. Res. Rev., 60 (9): 111 – 131.

El-Dahan M.A.A. (2016) Maintenance and producing of the nucleolus (Breeder's Seed) of Giza 92 Egyptian cotton cultivar (*Gossypium barbadense* L). . Agric. Res. Kafr El-Sheikh Univ. 42(4): 648- 656.

El-Disouqi, A.E. (2001). Maintenance system of Giza 70 Egyptian cotton cultivar. J. Agric. Sci. Mansoura Univ., 26 (4):1853 – 1862.

El-Kilany M.A. and S.M. Yousef (1985). Comparative study on six nuclei seeds of Dandara cotton cultivar and the corresponding farmer seed in general use. Agric. Res. Rev. 63(6): 53-95.

Hamed Heba, H.E. (2016). Maintenance and producing the nucleolus (Breeder's Seed) of Giza 90 Egyptian cotton cultivar, during 2013-2016 seasons. Egypt . J. of Appl. Sci., 31 (10): 226-239

Lasheen, A.F. (1997). Maintenance and producing the nucleolus (breeder seed) of Giza 75 Egyptian cotton variety. Menofiya J. Agric. Res. 22 (5): 1279–1290.

Lewis, C.F. (1970). Concepts of varietal maintenance in cotton. Cott. Gr. Rev. 47: 272-284.

Mabrouk A.H. (2019) Maintenance and producing of the Nucleolus (breeder's seed) of Giza 86 Egyptian cotton cultivar during 2016-2019. Egypt. J. Plant Breed. 23 (6):1125– 1136.

Mahmoud, Badeaa A. (2019). Maintenance and producing of the Nucleolus (breeder's seed) of Giza 45 Egyptian cotton cultivar. Egypt. J. Plant Breed. 23(8):1615– 1629.

Mahrous, H. (2017) Maintenance and producing the nucleolus (breeder's seed) of giza 90 Egyptian cotton cultivar during 2014-2017 seasons. Egypt. J. Plant Breed. 21:567-576.

Mohamed, A.A. (2013). Maintenance and producing the nucleolus (breeder's seed) of Giza 90 Egyptian cotton variety during 2009-2012 seasons. J. Agric. Res. Kafr El-Sheikh Univ. 39(1): 79-91.

Nagib, M.A.A. and G.M. Hemida (2001). Some aspects on cotton variety renewal and maintenance scheme of Giza 80. Minia J. Agric. Res. Devolop. 21 (1): 67 – 75.

Riggs, T. J. (1967). Response to model selection in Upland cotton in northern and eastern Uganda. Cott. Gr.Rev., 44: 176-183.

Soliman, A. M. (2018) Maintenance and producing of the Nucleolus (Breeder's Seed) of Giza 90 Egyptian Cotton Cultivar (*Gossypium barbadense*. L). J. Plant Production, Mansoura Univ. 9 (6): 567 – 571.

Turner, J. H. (1963). Breeding method used in maintenance and improvement of Acala 4-42 variety of cotton. U.S. Dept.Ar. ARS Cotton Res.Sta. Shafter. Calif., 67-75.

Walker, J. T. (1964). Model selection in Upland cotton. Heredity, 19: 559-583.

Ware, J.O. (1959). Plan for breeding, maintenance and propagation of Egyptian cotton varieties. A report submitted to the ministry of Agric., Egypt.

Younis, F.G., E.M. Ghoneim and M.O. Ismail (1993). Producing the nucleolus (breeder seed) of "Dendera" Egyptian cotton variety, during 1988 -1991 seasons. Egypt. Jape. Sci. 8 (2): 238 – 248.

المحافظة وانتاج النوية (بذرة المربي) لصنف القطن المصري جيزة ٨٦ خلال ٢٠١٧-٢٠٢٠

يسري ابراهيم محمد الحبيني

معهد بحوث القطن – مركزالبحوث الزراعية – الجيزة – مصر

يوضح هذا البحث كيفية إنتاج بذرة المربى وكيفية المحافظة على صنف جيزة ٨٦ وهو من طبقة الأقطان الطويلة للوجه البحري وهذا الصنف ناتج بطريقة الانتخاب المنسب من التهجين بين صنفى القطن جيزة ٧٥ و جيزة ٨١. أجرى هذا البحث فى محطة البحوث الزراعية بالجميزة محافظة الغربية – مصر خلال الفترة من ٢٠١٧-٢٠٢٠ م حيث تم فى موسم ٢٠١٧ زراعة ٦٠ نبات منتخب متفوق من حقل تربية الصنف عام ٢٠١٦ مكونة ٦٠ عائلة زرعت على هيئة نباتات فردية (الوعاء الأساسي الوراثي للصنف). تم انتخاب ٦٠ نبات تمثل نموذج لخصائص الصنف زرعت عام ٢٠١٨ مكونة إكثارات (أ). ثم انتخب منها ٢٣ عائلة أدخلت مع مقارنتين من أحدث نواهات الصنف فى تجربة القطاعات الكاملة العشوائية من أربع مكررات عام ٢٠١٩ . فى نهاية الموسم وحسب الاختبارات التى أجريت- تم انتخاب عشر عائلات نموذجية متفوقة فى صفاتها المحصولية والتكنولوجية وجودة البذرة ثم مزجت بذرتها الذاتية لتكوين النوية الجديدة (بذرة المربى) والتى زرعت فى موسم ٢٠٢٠ فى مساحة ٨٤ فدان فى المزرعة الإنتاجية بالجميزة. وتدل النتائج المتحصل عليها على كفاءة الطريقة المستخدمة فى المحافظة على النقاوة الوراثية للصنف جيزة ٨٦ وذلك باستعمال تجميع البذرة الذاتية لنباتات منتخبة بدلا من نسل نبات واحد . وكذلك تشير النتائج الى ان السلالة الناتجة بهذه الطريقة تمثل المصدر الجيد للبذرة النقية وراثيا والمنتخبة بواسطة المربى والتى يمكن بواسطتها المحافظة على النقاوة الوراثية للصنف جيزة ٨٦.

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