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Comparative Study on some Pure Successive Maintained Nuclei (Foundation Seed) of Giza 95 Cotton Cultivar and its Corresponding Handled one's in General Cultivation

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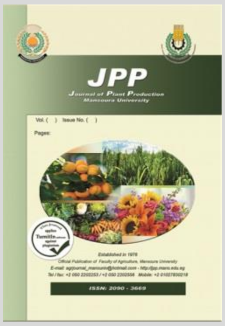

ABSTRACT

Four successive pure maintained nuclei (N) and four handled farmer's seeds (F) of Giza 95 Egyptian cotton cultivar were used to evaluate the changements that might occur in earliness, yield ,fiber quality and genetic constitution of the cultivar after handling the seeds by the farmers. Two field experiments were carried out at Sids Agric. Res. Station, throughout growing seasons 2017 and 2018. Genotypes mean squares were significant and/or highly significant for seed cotton yield, lint yield, earliness index and yarn strength in both seasons and combined analysis. The greatest amount of differences among the studied strains were mainly due to the variances among the farmer's seeds and the interaction (N vs F), for these characters indicating farmer seeds might get genetic imperfection due to mechanical mixture or out-crossing by off-type plants. The interactions of genotypes by environments (G x E) were insignificant for all studied characters except boll weight and fiber fineness. Regarding mean performances, the results indicated that the pure nuclei strains surpassed the farmer's ones for most studied traits. The older farmer's strains (G.95/2014) exhibited lower mean performance estimates for most studied yield traits over the two environments and it's combined data. Also, nuclei seeds gave the best performances for most fiber properties compared with the farmer's ones. Seed cotton yield in both nuclei and farmer's strains was positively and significantly related with earliness index and fiber fineness suggested that any changes when appear in these characters may be correlate with decrease of seed cotton yield or any deterioration appeared.

Keywords: Maintaining Egyptian cotton varieties, genotype- environmental interaction, varietal deterioration, pure nuclei seed.

INTRODUCTION

Maintenance of cotton varieties has been of a major consideration to the Egyptian breeder's who seeks great uniformity, high yielding ability, early maturity and standard fiber quality in the cotton cultivars. The choice of maintenance system depends upon the probability of occurrence of the factors causing varietal deterioration and the possibility for further genetic variations. Hence, the question is how the cotton breeder faces the whether he should try to maintain the original genetic variability, and thus have the potential performance level constant, or make a favorable shift in the gene frequency to obtain a higher performance level. Studied of varietal deterioration, which the maintenance system guards, have been reviewed by many researchers (O'Kelly 1942, Simpson and Duncan 1953 and Lewis 1970). They reported that supplying sowing seeds to the farmers involves three separate activities: varietal development, seed multiplication and varietal maintenance. The important reasons of degeneration of a verity were; mechanical mixing, natural mutations, gene frequency changes caused by random genetic drift and natural selection, gene frequency changing by selection pressure exerted by breeder, and loss of heterozygosity.In Egypt, Abdel-Al (1976) found that both lint % and lint index started to deteriorate badly in the fifth year of general use of Giza 66 cotton variety, while all fiber quality remained unchanged with the exception of yarn strength trait. Both the workers Abdel-Al *et al* (1979) and El-Akkad and El-Kilany (1980) pointed out that using the strains in general cultivation exhibited less lint % and yarn strength traits comparing to the corresponding pure strains of Giza 69 cotton cultivar . They, also, found that the older strains gave lower values for these two traits comparing to the other studied ones i.e. yield, yield components and fiber quality.Also, El-Kilany and Youssef (1985) reported that the older farmer's seed strains from Dendera cotton cultivar gave lower estimates for fiber fineness. They, also, detected insignificant differences among five Dendera maintained nuclei seeds for yield and yield components except slight differences for yarn strength and fiber length in one season. Abo-Arab *et al* (1999) in his investigation of G.70 stated that the oldest strain of farmer's seeds (G.70/93) gave the lowest mean performance for most fiber quality traits. Abdel-Zaher and Nageb (2002) found that the strains G. 83/92 and G. 83/93 showed the lowest values for seed index and fiber length traits, while G. 83/98 and G. 83/2000 strains were the best for most studied traits. In this respect, Lasheen (2002) concluded that the farmer's seeds of Giza 89 cotton cultivar exhibited reduction in yield, lint %, also the older farmer's strains gave lower means for

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seed cotton yield, lint percentage and yarn strength traits. However, Nageb (2003) reported that the decreasing of lint % and lint index characters was affected by the increasing of off-type locks percent in the farmer's seed of Giza 80 cotton cultivar. Abdel-Zaher *et al* (2006) in their investigation of G.83 cotton variety pointed that the oldest strain of farmer's seeds (G.83/2000) recorded the lowest mean performance for lint %, lint index and yarn strength traits in both seasons under this study. Recently, El-Fesheikawy (2014) reported that the oldest farmer's strain (G.80/2007) showed lower mean performance than the other strains for most traits, especially for seed cotton yield, earliness index and elongation characters in both and across environments suggested that these characters, beside lint % and lint index, might be sensitive to the deterioration factors. Also he added that pure nuclei seeds of G.80, generally, gave the best performances for most fiber quality traits compared with the farmer's seeds.

Significant phenotypic correlation coefficient between one or more yield components characters and one or more of fiber quality can be used to detect the range of deterioration of strains when estimate of some of these traits are available without needed to estimate other ones. However, the previous work showed that seed cotton yield had significant negative correlation with fiber fineness, fiber strength and fiber length (Cheng & Zhao, 1991; Khan *et al*, 1991; Gomma, 1995).On the other hand, Azhar *et al* (2004) showed that seed cotton yield was positively and significantly associated with fiber fineness (r_{ph} = 0.59) and fiber strength (r_{ph} =0.28) but association between fiber length and seed cotton yield was significantly negative (r_{ph} =-0.40). El-Fesheikawy (2014) reported that seed cotton yield in farmer's seeds was found to be positively and significantly associated with fiber fineness (r_{ph}=0.630) and brightness (Rd %) (r_{ph} =0.355), suggested that any improvement in these characters may increase seed cotton yield.

The main objective of the present work is to compare the seeds of Giza 95 cotton cultivar that were used in general planting (farmer's seeds) with the corresponding pure nuclei seed.

MATERIALS AND METHODS

Two field experiments were carried out at Sids Agricultural Research Station, Beni-suef Governorate throughout 2017and 2018 seasons. four successive nuclei seeds; G.95/2015, G.95/2016, G.95/2017 and G.95/2018 were used to comparing with four successive farmer's seeds (F); G.95/2014, G.95/2015, G.95/2016 and G.95/2017.The source of pure nuclei seeds (N) is the renewal field of G.95 cultivar at the isolated area of breeding program of this cultivar (Cotton Varietal Maintenance Res. Dept.), which characterized by a high degree of genetic purity. The four farmer's seeds (F) were obtained from the Seed Testing Station at Beni-suef Governorate. A randomized complete block design (RCBD) with three replications was used for each experiment. Each plot consisted of three ridges; 4 meters long and 65 cm wide. Distance between hills was 25 cm apart and each hill was later thinned to two plants per hill after five weeks. Cultural practices were carried out as recommended in cotton fields.

Earliness % were calculated by using the following formula:

(Weight of seed cotton yield of the first pick / weight of seed cotton yield of the two picks) ×100.

Random samples of 50 sound bolls were picked from each plot and used to estimate yield components; boll weight (BW) in g , lint percentage (L%), seed index (S.I.) in g and lint index (L.I.) in g. Both seed cotton yield (S.C.Y.) and lint yield (L.Y.) as an indicator for yield were also computed in the sense of kantar/feddan.

A representative sample of cotton from each plot was used to test yarn strength (Y.S.) .Other fiber properties were measured by using High Volume Instrument (HVI) according to A.S.T.M. (1986) at Cotton Technology Research Lab. at Giza, Cotton Research Institute. These traits are; micronaire value (F.F.) as an indication of both fineness and maturity, fiber length (upper half mean mm) (F.L.), uniformity index (U.I.) and strength in G/tex(F.S.). Statistical procedures used in this study were done according to the analysis of variance for a randomized complete blocks design (RCBD) as outlined by Steel and Torrie (1980). Before calculating the combined analysis, a Bartlett test was done for the homogeneity of error mean squares for the two environments as outlined by Le Clerg *et al*. (1962). Phenotypic correlation coefficient (r_{ph}) between mean performances of studied characters was calculated according to Steel and Torrie (1960).

RESULTS AND DISCUSSION

The ordinary analysis of variance for yield and its components as well as fiber quality traits for both seasons and their combined data are presented in Table (1). Environment's mean squares were detected to be significant or highly significant for seed cotton(S.C.Y.) and lint yield(L.Y.), earliness index(E%), fiber fineness(F.F.), fiber length(F.L.) and fiber strength(F.S.) in combined analysis suggesting the sensitivity of these characters for macro environmental changes.

A Table (1) shows, genotypes mean squares were significant or highly significant for seed cotton yield, lint yield, earliness index and yarn strength in both environments and in the combined analysis. Partitioning the genotypes into differences among nuclei seeds (N), farmer's seeds (F) and (N vs. F), it could be concluded that the variances of genotypes for most studied characters were mainly due to the variances among the farmer's seeds and/or N vs. F. These results indicated that farmer's seeds might have genetic imperfection due to mechanical mixiture or out-crossing by off-type plants. Nageb (2003), Abdel-Zaher *et al* (2006),Al-Hibbiny *et al* (2014), El-Fesheikawy (2014) and Ramadan(2015) reported the same results in their previous investigations.

Regarding the interactions of genotypes by environments (G x E.), results were significant for boll weight (B.W.) and highly significant for fiber fineness which attributed to the interaction of F x E. and (N vs. F) x E. This would reflect the inconsistent of overall farmer's seeds from year to year compared to the nuclei seeds for these characters and suggesting the sensitivity of these characters for macro environmental changes. On the other hand, (G x E.), (N x E.), (F x E.) and {(N vs. F) x E.} were observed to be insignificant for other yield components and fiber quality characters indicating stability of the behavior of strains from year to year for most yield components and fiber quality characters. The results are in agreement with those reported by Lasheen *et al* (1997), Abo-Arab *et al* (1999), Abdel-Zaher *et al* (2006), El-Fesheikawy(2014) and Ramadan(2015).

Table 1. Mean squares estimates for studied traits of four pure nuclei seed of Giza 95 cultivar and its corresponding farmer's seed at two environments.

S.O.V	d.f.		Seed cotton Yield (K/F)			Lint Yield (K/F)			Earliness%		
	Single	Comb.	Env.1	Env.2	Comb.	Env.1	Env.2	Comb.	Env.1	Env.2	Comb.
Environments (Env.)	-	1	-	-	34.85**	-	-	20.541*	-	-	512.87**
Rep. (r)	2	4	0.455	0.2150	0.335	1.25	2.043	1.647	58.23*	10.953	34.59
Genotypes (G)	7	7	4.618**	7.7985**	11.460**	12.385**	12.318**	24.023**	42.64*	27.383*	65.57**
Among nuclei (N)	3	3	1.9475	0.0600	1.2215	13.799**	7.334	20.042**	3.45	0.450	1.223
Among farmer(F)	3	3	0.827	0.03639	0.4339	2.0097	1.0344	2.9493**	23.84	1.096	17.41
(N. vs F.)	1	1	8.3245**	0.28917	8.61367**	47.4262**	25.1053**	72.5315**	81.85**	4.638	86.488**
(G. x E.)	-	7	-	-	0.9569	-	-	0.6800	-	-	4.440
(N. x E.)	-	3	-	-	0.7860	-	-	1.092	-	-	2.673
(F. x E.)	-	3	-	-	0.4300	-	-	0.0949	-	-	7.52
(N. vs F.) x (E.)	-	1	-	-	3.6479*	-	-	3.5596	-	-	30.568
Error	14	28	0.982	0.1969	0.5893	0.9023	2.528	1.715	12.07	8.395	10.23

S.O.V	d.f.		Boll weight(g.)			Lint %			Seed index (g.)		
	Single	Comb.	Env.1	Env.2	Comb.	Env.1	Env.2	Comb.	Env.1	Env.2	Comb.
Environments (E.)	-	1	-	-	0.0102	-	-	0.3333	-	-	0.4800
Rep. (r)	2	4	0.0217	0.04875	0.0352	0.045	0.0838	0.0646	0.3179	0.0579	0.1879
Genotypes (G)	7	7	0.0723	0.01419*	0.06592	1.359**	0.6290	1.8156**	0.0436	0.1074	0.0448
Among nuclei (N)	3	3	0.0831	0.12111	0.0142	0.3253	0.0942	0.2967	0.0053	0.0900	0.0549
Among farmer(F)	3	3	0.0244	0.2100*	0.1128	0.3878	0.6333	0.9928	0.0875	0.1467	0.0271
(N. vs F.)	1	1	0.32247*	0.99333**	1.3158**	2.1391**	2.1825**	4.3216**	0.2783	0.710*	0.9883
(G. x E.)	-	7	-	-	0.1483*	-	-	0.1719	-	-	0.1062
(N. x E.)	-	3	-	-	0.1217	-	-	0.1228	-	-	0.0404
(F. x E.)	-	3	-	-	0.194**	-	-	0.0283	-	-	0.2071
(N. vs F.) x (E.)	-	1	-	-	0.94625**	-	-	0.4533	-	-	0.7426
Error	14	28	0.0864	0.0335	0.0599	0.2064	0.3847	0.2955	0.4013	0.1908	0.2960

Env.1 and Env.2 were 2017 and 2018 growing seasons, respectively. Table (1): Continued.

Table 1. Continued.

S.O.V	d.f.		Lint index (g.)			Fiber fineness (Mic.)			Fiber length (U.H.M.)		
	Single	Comb.	Env.1	Env.2	Comb.	Env.1	Env.2	Comb.	Env.1	Env.2	Comb.
Environments (Env.)	-	1	-	-	0.1008	-	-	2.7552**	-	-	8.7552**
Rep. (r)	2	4	0.1217	0.0163	0.0690	0.0050	0.04188	0.02344	0.070	0.5554	0.3129
Genotypes (G)	7	7	0.1066	0.0638	0.1043	0.2264**	0.03611	0.1193**	0.5357	0.9841	1.0407
Among nuclei (N)	3	3	0.0322	0.0364	0.0249	0.01417	0.00770	0.00177	0.2697	0.6861	0.7333
Among farmer(F)	3	3	0.0653	0.0722	0.0449	0.01417*	0.01830	0.01829	0.9689	1.0200	1.020
(N. vs F.)	1	1	1.1628**	0.3259	1.4887**	0.085**	0.026	0.111**	3.7159**	1.7061	5.422**
(G. x E.)	-	7	-	-	0.0661	-	-	0.1432**	-	-	0.4790
(N. x E.)	-	3	-	-	0.0437	-	-	0.0201	-	-	0.2226
(F. x E.)	-	3	-	-	0.0926	-	-	0.07225**	-	-	0.4440
(N. vs F.) x (E.)	-	1	-	-	0.4091	-	-	0.27718**	-	-	1.9998
Error	14	28	0.1464	0.1334	0.1399	0.00357	0.02212	0.01284	0.3585	0.7126	0.5356

Table 1. Continued.

S.O.V	d.f.		Uniformity index			Fiber strength (g/tex)			Yarn strength		
	Single	Comb.	Env.1	Env.2	Comb.	Env.1	Env.2	Comb.	Env.1	Env.2	Comb.
Environments (E.)	-	1	-	-	0.3169	-	-	7.7602**	-	-	5208.0
Rep. (r)	2	4	0.1217	0.3629	0.2423	0.0829	1.5554	0.8192	3463.0	629.0	2064.0
Genotypes (G)	7	7	0.9514	1.0276	1.6193	0.5790	1.0423	0.7388	19380.0**	16866.0**	34881.0**
Among nuclei (N)	3	3	0.5342	0.4100	0.446	0.3097	2.0831	1.0700	2956.0	453.0	1571.0
Among farmer(F)	3	3	0.4844	1.2539	1.2539*	0.4364	0.4438	0.4438	8030.0**	12833.0**	18904.0**
(N. vs F.)	1	1	3.0558**	1.6639	4.7653**	2.2384**	2.5269*	4.7197*	10986.0**	13286.0**	24272.0**
(G. x E.)	-	7	-	-	0.3597	-	-	0.8826	-	-	1365.0
(N. x E.)	-	3	-	-	0.498	-	-	1.3228	-	-	1837.0
(F. x E.)	-	3	-	-	0.3294	-	-	0.3249	-	-	2737.0
(N. vs F.) x (E.)	-	1	-	-	2.4833	-	-	4.9429**	-	-	4574.0
Error	14	28	0.4626	0.9296	0.6961	0.2253	0.7359	0.4806	963.0	1677.0	1320.0

Env.1 and Env.2 were 2017 and 2018 growing seasons, respectively

Means of yield and its components of the four nuclei of Giza 95 cultivar and the corresponding four handling strains in the general cultivation are presented in Table (2). It is clear that there were no significant differences in the genotypes for boll weight in first environment (2017) and combined data and for lint % in second environment (2018) and for both seed and lint indices in both seasons and its combined. The results also showed that the second environment (2018 season) was higher in the mean performance of overall characters and lower CV% than Env.1 (2017 season) with respect to seed cotton yield, lint yield, lint percentage, lint index and earliness index. This indicated that the second environment (2018) was optimum to the evaluation. However, the results in Table (2) showed that nuclei seeds of G.95, generally, gave the best performances for seed cotton yield, lint yield, ,lint percentage, lint index and earliness index compared with the farmer's seeds. Also, oldest farmer's strain (G.95/2014) showed lower mean performance than the other genotypes for most traits, especially for lint yield, lint %, lint index and earliness index characters in both and across environments suggested that these characters, beside seed cotton yield, might be sensitive to the deterioration factors.

As regard to the fiber properties, the results in Table (2)showed that nuclei seeds of G.95, generally, gave the best performances for most fiber properties compared with the farmer's seeds. The oldest farmer's strain (G.95/2014) showed lower mean performance than the other ones for most cases, especially for yarn strength at the two environments and combined data suggesting that this character, beside yield components and earliness index, might be sensitive to the deterioration factors. El-Akkad and El-Kilany (1980), reported .that the older strains of Giza 69 had a significant reduction in lint percent and yarn strength after handling the seed of this variety by the farmers. Lasheen (2002) indicated that the means were lower in commercial strains compared with the nuclei strains for some fiber quality traits. Abdel-Zaher *et al* (2006) reported that means of fiber length, maturity, uniformity and yarn strength characters were lower in the oldest farmer's strain (G.83/2000) than the other ones and El-Fesheikawy (2014)who reported that the oldest farmer's strains of Giza 80 had a significant reduction in seed cotton yield, earliness index and some fiber quality traits after handling the seed of Giza 80 variety by the farmers in general cultivation.

Table 2. Means of studied traits of four maintained nuclei seed of Giza 95 cotton cultivar and its corresponding handling farmer's seed in 2017 and 2018 growing seasons.

Lines		Seed cotton yield (K/F)			Lint yield (K/F)			Earliness %			Boll weigh (g)			Lint %			Seed index (g)		
		2017	2018	Comb.	2017	2018	Comb.	2017	2018	Comb.	2017	2018	Comb.	2017	2018	Comb.	2017	2018	Comb.
Nuclei seed	2015	9.7	12.6	11.1	14.9	17.2	16.1	75.7	82.5	79.1	3.3	3.5	3.4	40.2	40.5	40.4	10.4	10.4	10.4
	2016	10.1	12.7	11.4	15.4	17.7	16.6	74.8	82.0	78.4	3.4	3.1	3.3	40.9	40.6	40.7	10.4	10.0	10.2
	2017	10.6	12.5	11.6	15.6	16.7	16.2	75.2	82.2	78.7	3.1	3.6	3.3	40.9	40.6	40.8	10.3	10.1	10.2
	2018	11.5	12.8	12.2	19.5	20.2	19.9	77.4	81.6	79.4	3.4	3.2	3.3	40.9	40.9	40.9	10.4	10.2	10.3
Mean		10.5	12.7	11.6	16.4	18.0	17.2	75.8	82.1	78.9	3.3	3.4	3.3	40.7	40.6	40.7	10.4	10.2	10.3
CV%		7.70	1.12	3.40	13.12	8.70	10.65	1.41	0.47	0.07	5.05	6.00	1.25	0.81	0.44	0.55	0.40	1.71	0.93
Farmer seed	2014	7.8	9.7	8.8	12.6	14.0	13.3	66.1	75.8	71.0	3.6	3.3	3.5	39.1	39.4	39.3	10.5	10.3	10.4
	2015	8.3	9.5	8.9	14.5	15.4	14.9	70.3	76.6	73.5	3.4	3.7	3.6	39.7	40.0	39.9	10.2	10.5	10.4
	2016	8.9	9.7	9.3	14.0	14.9	14.5	72.9	77.3	75.1	3.4	3.1	3.3	39.7	40.3	40.0	10.6	10.1	10.3
	2017	8.9	9.7	9.3	14.1	14.9	14.5	69.7	76.3	73.0	3.4	3.2	3.3	39.9	40.4	40.2	10.4	10.1	10.2
Mean		8.5	9.7	9.1	13.8	14.8	14.3	69.7	76.5	73.1	3.5	3.3	3.4	39.6	40.0	39.8	10.4	10.2	10.3
CV%		6.21	1.14	2.97	5.93	3.97	4.91	4.04	0.79	2.33	2.60	7.90	4.02	0.91	1.15	1.02	1.64	2.16	0.65
LSD 5%		1.74	0.78	1.28	1.67	2.79	2.19	6.10	5.09	5.35	NS	0.32	NS	0.80	NS	0.91	NS	NS	NS

NS =Non -Significant. C. V. % = Coefficient of variability

Table 2. Continued

Lines		Lint index (g)			Fiber fineness (Mic.)			Fiber length (U.H.M.)			Uniformity index			Fiber strength (g/tex.)			Yarn strength		
		2017	2018	Comb.	2017	2018	Comb.	2017	2018	Comb.	2017	2018	Comb.	2017	2018	Comb.	2017	2018	Comb.
Nuclei seed	2015	7.0	7.0	7.0	4.3	4.5	4.4	31.4	30.3	30.9	84.2	84.4	84.3	37.1	36.2	36.6	2030.0	2033.3	2031.7
	2016	7.2	6.8	7.0	4.3	4.5	4.4	31.2	31.1	31.2	83.7	83.9	83.8	36.5	37.5	37.0	1966.7	2020.0	1993.3
	2017	7.1	6.9	7.0	4.4	4.4	4.4	31.3	31.0	31.1	84.2	83.3	83.8	37.0	38.2	37.6	2033.3	2003.3	2018.3
	2018	7.2	7.1	7.1	4.2	4.5	4.4	30.7	30.1	30.4	84.7	83.0	83.9	36.4	37.0	36.7	1996.7	2020.0	2008.3
Mean		7.1	7.0	7.0	4.3	4.5	4.4	31.1	30.6	30.8	84.2	83.7	83.9	36.7	37.2	37.0	2006.7	2019.2	2012.9
CV%		1.46	1.58	0.91	1.61	1.12	1.33	0.96	1.56	1.35	0.50	0.44	0.16	0.87	2.24	0.74	1.56	0.61	3.04
Farmer seed	2014	6.7	6.7	6.7	3.7	4.7	4.2	31.6	30.2	30.9	83.8	84.3	84.1	36.5	37.0	36.8	1813.3	1833.3	1818.3
	2015	6.7	7.0	6.9	3.8	4.6	4.2	31.3	30.2	30.7	83.6	84.1	83.8	36.2	37.7	36.9	1873.3	1883.3	1878.3
	2016	7.0	6.8	6.9	3.8	4.4	4.1	30.3	29.8	30.0	82.9	84.8	83.9	36.4	37.5	37.0	1876.7	1943.3	1910.0
	2017	6.9	6.8	6.9	3.9	4.4	4.1	31.1	29.4	30.2	83.5	84.0	83.8	35.7	37.1	36.4	1940.0	1970.0	1955.0
Mean		6.8	6.8	6.8	3.8	4.5	4.1	31.1	29.9	30.5	83.4	84.3	83.9	36.2	37.3	36.8	1875.8	1905.0	1890.4
CV%		2.16	2.28	1.27	1.82	3.55	0.39	1.83	1.36	1.13	0.48	0.72	0.29	1.05	0.89	1.14	2.76	3.43	0.80
LSD 5%		NS	NS	NS	0.10	NS	0.19	NS	NS	NS	NS	NS	NS	NS	NS	NS	73.8	71.89	60.78

NS =Non -Significant. C. V. % = Coefficient of variability

Many relationships were detected between studied characters when estimated the phenotypic correlation**(r_{ph})** in both nuclei and farmer's seeds; Table (3).However, fiber length (U.H.M.) in farmer's seeds was found to be negatively and significantly associated with seed cotton yield (r_{ph} = - 0.407), lint yield (- 0.555) and lint % (-0.475), suggested that any change in this character may decrease yield and lint %. However, in previous studies i.e. Khan *et al* (1991), Cheng and Zhao (1991), seed cotton yield had been reported to be negatively associated with fiber fineness. The association between seed cotton yield and fiber attributes i.e. strength, upper half mean and uniformity index were revealed to be negative and highly significant phenotypic correlation (r_{ph} = -0.571, -0.519 and -0.528, respectively). It means that deteriorates in these traits may be used as an indicators for decrease seed cotton yield. Contrariwise, Table (3) also shown significantly positive earliness index (r_{ph} =0.496) and fiber fineness (0.532) in nuclei seeds suggesting that both characters can be used as an indicator for the purity and homogeneous of the strains. Such results already had been reported by Khan *et al* (1991), Cheng and Zhao (1991), Gomma (1995), Azhar *et al* (2004), El-Fesheikawy (2014) and Ramadan(2015).

Table 3. Phenotypic correlation coefficient (r_{ph}) between pairs of studied characters for nuclei seeds (above) and the farmer seed (below) of Giza 95 cotton cultivar.

Characters	S.C.Y. (K/F)	L.Y. (K/F)	Earliness%	B.W.	L.%	S.I.	L.I.	F.F.	F.L.	U.I.	F.S.	Y.S.
S.C.Y.(K/F)	---	0.660**	0.496*	0.187	0.068	-0.247	-0.218	0.532**	-0.352	0.083	0.101	0.226
L.Y. (K/F)	0.144	---	0.321	-0.003	0.250	-0.141	-0.060	0.250	-0.400	0.088	-0.182	0.019
Earliness%	0.792**	0.267	---	-0.045	-0.124	-0.154	-0.171	0.555**	-0.106	0.167	0.406*	-0.043
B.W. (g)	-0.300	-0.058	-0.299	---	-0.022	0.308	0.302	0.031	-0.327	-0.111	-0.180	-0.034
L.%	0.196	0.607**	0.332	0.047	---	-0.216	0.113	0.088	-0.150	-0.146	-0.236	-0.374
S.I. (g)	-0.012	-0.118	-0.156	0.360	-0.303	---	0.943**	-0.016	-0.044	-0.122	-0.251	0.103
L.I. (g)	0.105	0.263	0.045	0.383	0.338	0.789**	---	0.013	-0.084	-0.163	-0.288	-0.029
F.F.	0.639**	0.401	0.654**	-0.163	0.221	-0.195	-0.063	---	-0.255	-0.080	0.068	0.011
F.L.	-0.407*	-0.555**	-0.489*	0.263	-0.475*	0.378	0.091	-0.641**	---	0.109	0.181	0.099
U.I.	0.087	-0.301	-0.020	0.148	-0.336	-0.083	-0.259	0.320	0.226	---	0.243	0.126
F.S. (g/tex.)	0.375	0.131	0.488*	0.159	0.211	0.094	0.212	0.622**	-0.364	0.180	---	-0.058
Y.S.	0.304	0.364	0.174	-0.349	0.559**	-0.300	0.056	0.179	-0.491*	-0.358	0.048	---

S.C.Y.=seed cotton yield, L.Y.= lint yield, B.W.= boll weight, L.%: lint percentage, S.I.=seed index, L.I.=lint index, F.F.= fiber fineness, F.L.(U.H.M.)= fiber length(upper half mean), U.I.= uniformity index ,FS= fiber strength and Y.S.= Yarn strength.

REFERENCES

Abdel-Al, M.S.M. (1976). Some aspects of methods for maintaining Egyptian cotton varieties. Ph. D. Dissertation, Fac. Agric.,Al-Azhar Univ.

Abdel-Al, M.S.M.; H.M. Abdel-Latif; H.R. Hanafy; M.H. El-Akkad and M.A. Abdel-Dayem (1979). Effect of using Egyptian cotton varieties in general planting on yield and other characters. 1st Cont. Agric. Res. Center, Giza, May, Vol. 2 , 22-29.

Abdel-Zaher, G.H. and M.A. Nageb (2002). Evaluation of nine strains of Giza 83 cotton variety. J. Agric. Sci. Mansoura Univ., 27(9): 5693-5700.

Abdel-Zaher, G.H.; G.M .Hemaida and M.A. Nageb (2006). Comparative study on four nuclei seeds of Giza 83 cotton cultivar and the corresponding farmer's seed in general use. Minia J. of Agric. Res. & Develop. Vol. 26(2):219-232.

Abo-Arab, A.R.; E.A. El-Desouqi and Z.F. Abo-Sen (1999). A comparative study on five pure successive nuclei seed of Giza 70 cotton cultivar and corresponding farmer's seed. Minufiya J. Agric. Res. Vol. 24(6): 2015-2024.

Al-Hibbiny,Y.I.M. ; B.M. Ramadan and M. A. Al-Ameer (2014). Comparative study on three nuclei seed of Giza 90 cotton cultivar and the corresponding farmer's seed in general use. Egypt.J. Agric. Res., 92(1): 61-71.

A.S.T.M. (1986). American Society for Testing Materials, D-4605. U.S.A.

Azhar, F.M; M. Naveed and A. Ali (2004). Correlation analysis of seed cotton yield with fiber characteristics in *Gossypium hirsutum* L. International J. of Agric. &Biology, (4): 656-658.

Cheng, B.J. and L.Y. Zhao (1991). Multiple correlation analysis of yield, fiber quality and plant characteristics in Upland cotton. Acta. Agric. Shanghai, 7: 29-35.

El-Akkad, M.H. and M.A. El-Kilany (1980). Comparative study on nine nuclei seeds of Giza 69 cotton cultivar and the corresponding strains in general use. Ain Shams Univ., Res. Bulletin 1268 January 1980 , 1 - 14.

El-Fesheikawy, A. B. A. (2014). A comparative study on some pure successive nuclei seed of Giza 80 cotton cultivar and its corresponding strains in general use. Egypt. J. Agric. Res., 92(1): 73-87.

El-Kilany, M.A. and S.M. Youssef (1985). Comparative study on six nuclei seeds of Dendera cotton cultivar and the corresponding farmer's seed in general use. Agric. Res. Rev., 63(6): 53-60.

Gomma, N.A.M. (1995). Evaluation of some families derived from two Egyptian cotton crosses. Ann. Agric. Sci., 40: 153-64.

Khan, M.A., H.A. Sadaqat and M. Tariq (1991). Path coefficient analysis in cotton (*G. hirsutum* L.). J. Agric. Res., 29: 177-182.

Lasheen, A.F.; A.R.A. Abo-Arab and H.A. El-Harony (1997). Genetical evaluation of some strains of Giza 75 cotton variety. J. Agric. Sci. Mansoura Univ., 22(11): 3683-3690.

Lasheen (2002). Comparative study on five successive nuclei seed of Giza 89 cotton cultivar and the corresponding farmer's seed in general use. Minufiya J. Agric. Res. 27(6): 1391-1397.

Le Clerg, E.I.; W.H. Leonard and A.G. Clark (1962). Field Plot Technique. Burgess Publishing Co., Minneapolis.

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

Nageb, M.A. (2003). Comparative study on four successive nuclei seeds of Giza 80 cotton cultivar and the corresponding farmer's seeds in two different locations. J. Agric. Sci. Mansoura Univ., 28(2): 797-806.

O'Kelly, J.F. (1942). Degeneration within cotton varieties. Jour. Amer. Soc. Agron., 34: 786.

Ramadan, B.M. (2015). A comparative study on some pure successive nuclei seed of Giza 88 cotton cultivar and corresponding lines in general use. J. Agric. Res. Kfr El-Sheikh Univ.41(2): 453-476.

Simpson, D.M. and E.N. Duncan (1953). Stability of cotton varieties. Agron. Jour., 45: 448-450.

Steel, R.G.D. and J.H. Torrie (1960). Principles and Procedure of Statistics. V ed. Mc Graw-Hill Book Company, Inc. New York, Tronto, London.

Steel, R.G.D. and J.H. Torrie (1980). Principles and Procedures of Statistics. McGraw Hill Book Company Inc., New York.

دراسة مقارنة على بعض نواهات صنف القطن جيزة 95(بذرة الأساس) وسلالاته المتداولة فى الزراعة العامة

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استخدمت فى هذه الدراسة أربع نواهات من صنف القطن المصري جيزة 95لمقارنتها بالسلالات الأربعة المتداولة فى الزراعة العامة وذلك بغرض تقييم التغيرات التي قد تحدث فى المحصول ومكوناته وخواص التيلة بعد تداول هذه السلالات النقية لدى الزراع لعدة سنوات. تم تنفيذ تجربتى التقييم الحقلي بمحطة البحوث الزراعية بسدس ، محافظة بنى سويف (مصر الوسطى) كممثلة لمنطقة زراعة الصنف خلال الموسمين الزراعيين موسم 2017 و 2018 وتم عمل تحليل فردى لكل موسم على حده ثم أجرى التحليل التجميعى للبيئتين كما تم دراسة معامل الإرتباط المظهرى لأزواج الصفات تحت الدراسة وكانت الصفات هى كما يلي: المحصول ومكوناته وتشمل: محصول الفدان من القطن الزهروالشعر (ق/ف)، متوسط وزن اللوزة (جم)، معدل الحليج (%)، معاملي البذرة والشعر (جم)، بالإضافة لمعامل التبكير. صفات التيلة والغزل وتشمل: قراءة الميكرونير كمعيار للنعومة والنضج، طول التيلة ، معامل انتظام الطول (%)، المتانة (جم/تكس)، متانة الغزل. هذا وتم الحصول خلال هذه الدراسة على النتائج الآتية: - أظهر تحليل التباين الفردي لكل موسم مستقل وكذلك التحليل التجميعى للموسمين معاً وجود فروق عالية المعنوية بين السلالات لصفات محصول القطن الزهروالشعرومعامل التبكير بالإضافة لمتانة الشلة فى كلا الموسمين ومتوسط الموسمين معاً ويرجع الجزء الأكبر من هذا التباين أساساً لتأثير السلالات المتداولة فى الزراعة العامة وكذا التفاعل بين النواهات وسلالات التداول. بصفة عامة كان التفاعل بين السلالات و المواسم غيرمعنوياً لمعظم الصفات المدروسة مما يشير إلى أن تلك السلالات ثابتة نسبيا فى أدائها خلال المواسم المختلفة (متأقلمة). - أظهرت السلالة جيزة 2014/95 المتداولة لدى المزارعين (أقدم سلالة) أقل متوسطاً لمعظم صفات المحصول ومكوناته ومعامل التبكير بالإضافة لمتانة الشلة فى كلا الموسمين. أظهرت نتائج قياس الارتباط الظاهرى وجود علاقة قوية وموجبة بين محصول القطن الزهر وكلا من معامل التبكيروقراءة الميكرونير(النعومة) فى السلالات النقية مما قد يمكن معه استخدام هاتين الصفتين كدليل على تجانس ونقاوة النباتات داخل السلالات النقية وبالتالى ارتفاع محصولها.فى حين وجد ارتباط سلبى ومعنوى بين طول التيلة لأليا ف سلالات التداول وكلا من محصول القطن الزهروالشعروتصافى الحليج مما يشير لإمكانية استخدام طول التيلة كمؤشر لانخفاض المحصول والتصافى وبالتالى تدهور تلك السلالات بعد تداولها لعدة سنوات فى الزراعة العامة .