SELECTION EFFICIENCY IN SINGLE AND TRIPLE CROSSES SEGREGATING GENERATIONS FOR IMPROVING BOLL WEIGHT AND LINT PERCENTAGE IN EGYPTION COTTON.

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ABSTRACT

The present investigation aimed to evaluate selection efficiency in segregating generations of single crosses and triple crosses between two Egyptian cotton varieties G85 ,G 91 and Australian one in improving boll weight and lint percentage of Egyptian cotton . This work was carried out during 2011 – 2013 at Sakha Experimental station , Agriculture Research center , Kafr EL-Sheikh , Egypt . The six population chosen in F2 generation were planted in 2011 season (three single crosses and three triple ones) whenever two selection intensity i.e. 5% and 10% were conducted and the two derived generation F3 and F4 were grown in 2012 and 2013 seasons, respectively . Results indicated that, for improving boll weight the use of the single cross (G85 x Aust.) or the triple crosses which used Giza 85 as a female parent at selection intensity 5 % was the best way . Also , for improving lint percentage the use of the single cross (G91 x Aust.) or the triple crosses which used Giza 91 as a female parent at selection intensity 5 % was the best way .

So , the Egyptian cotton breeder can improve both boll weight and lint percentage in cotton through using the triple cotton crosses which contain at least one exotic cotton variety belong to *Gossypium barbadense*,L. in the investigated materials with the preference of using Giza 85 as a female parent for improving boll weight and using of Giza 91 as a female parent for improving lint percentage .

INTRODUCTION

Cotton breeding programs aim to produce new cotton varieties of high yield potential. Therefore selection pressure usually placed on boll weight and lint percentage for their great influence on seed and lint cotton yield.

Selection and breeding programs for the desirable characters of cotton are largely depending on the type and relative amount of genetic variance components in the population. Most of the Egyptian cotton varieties morphologically and in their yield production are similar due to insufficient genetic variation among them.

(Salama *et al.*, 1992) found that, thus hybridization followed by pedigree selection was and still the breeding procedure that yielded all Egyptian cotton varieties grown commercially. El-Harony (1998) showed that the direct selection for high lint percentage may by improved through improvement of both boll weight and seed index traits. Younis (1999) mentioned that large discrepancies were between predicted and realized gains because genotypic variances and covariances used to calculate predicted gains were likely biased by certain genotypic x environment interaction. In the same time, El-Lawendey (2003) found highest predicted responses to selection for lint percentage and seed index in F_4 generation. Iqbal *et al.* (2006) indicated that, breeder had to use reciprocal recurrent selection method or modified back cross or three-way cross within genetic material under study. Their results of the study indicated that for involving a superior genotype possessing high yield, breeder should focus on improving number of bolls and boll weight Esmail, (2007) emphasized that, the Three-way crosses may be considered as a good tool to obtain a better homozygous progenies when tested in early generation. Srour *et al.* (2010) results showed that the highest predicted genetic advance (ΔG) were in F_3 generation for cotton yield, boll weight and lint percentage relative to other selected traits in two populations.

The present work aimed to compare the selection efficiency in segregating generation drived from both single crosses and three way crosses obtained from three *G. barbadense,L.* cotton genotypes i.e. two Egyptian varieties (Giza 85 , Giza 91) and one Ustralian genotype.

MATERIALS AND METHODS

The present investigation was carried out at Sakha Experimental Station; Agriculture Research Center, Kafr El-Sheikh governorate; Egypt, during the growing seasons of 2011-2013. The three single crosses namely, (Giza 85 x Giza 91) , (Giza 85 x Australly) and (Giza 91 x Australly); and the three triple crosses namely, [(Giza 85 x Giza 91) x Australly], [(Giza 85 x Australly) x Giza 91] and [(Giza 91 x Australly) x Giza 85)] derived from intraspecific crossing between two Egyptian cotton varieties (Giza 85 and Giza91) and an Australian one. These breeding materials were chosen from a diallel and triallel crosses made and evaluated for combing ability in F_1 generation for several agronomic and fiber quality characters (Darweesh, 2010). These crosses included the highest general combiner for most of agronomic and fiber quality characters.

In the growing season of 2011, all the selfed seeds the six F_2 populations were planted in none replicated rows. Each row consist of 10 single plants spaced 70 cm apart and rows as well. All plants were self pollinated. At harvest 180 individual plants from each F_2 population were selected .The selection intensity was applied on two level 5% and 10% to select 9 and 18 plants, respectively on the basis of group's boll weight and lint percentage. In the growing season of 2012, all the selfed seeds of 18 F_3 families of the 6 populations were planted in field trial experiment at a randomized complete blocks design (RCBD) with three replications for each family from each population for the two groups (boll weight and lint percentage). In the growing season of 2013 all selfed seeds from the highest plant form each replication and each family were bulked and planted to represent the F_4 families of the six populations in field trial experiment in a randomized complete blocks design (RCBD) with three replications for each family from each population for the two groups (boll weight and lint percentage)

Statistical procedures:

- Heritability in broad sense (h^2b) was calculated as follows in F_2 generation using the formula:

$$h^2_b = \frac{V_{F_2} - V_E}{V_{F_2}} \times 100 \qquad \text{(Allard, 1960)}$$

- The environmental variance in F2 generation of single crosses was calculated as the arithmetic mean of the variance of its two parent while in the triple crosses was calculated as the arithmetic mean of variance of the three parents .

- The analysis of variance between families means in F3 and F4 generation were done according to procedures outlined by Scendecor and Cocharn, (1967) for RCBD.

- while in F_3 and F_4 generations it was calculated according to Walker (1960) using the formula :-

$$(h^2b \text{ in } F_3 \text{ and } F_4) = (\sigma 2g / \sigma 2p) \times 100.$$

where :-

VF2 = the phenotypic variance of the F2 generation.

VE = the environmental variance.

$\sigma 2g$ = the genotypic variance of the F3 generation.

$\sigma 2p$ =the phenotypic variance of the F3 generation.

-The phenotypic (PCV) and genotypic (GCV) coefficients of variation were estimated using the formula developed by Burton (1952):-

-The phenotypic coefficient of variability (PCV) = $(\sigma p / \bar{x}) \times 100$

-The genotypic coefficient of variability (GCV) = $(\sigma_g / \bar{x}) \times 100$

.Expected genetic gain under selection (ΔG) was computed according to Johnson *et al*., (1955).

$$\Delta G = K \times \sqrt{\sigma^2_p} \times h^2_b$$

where :

K = constant where: value of K at 5% = 2.06 and at10% = 1.76

σ^2_p = Phenotypic variance

h^2_b Heritability in broad sense

- Expected genetic gain represented as percentage of Grand mean for the trait.

(ΔG %) was estimated according to Miller *et al.* (1958).

$$\Delta G \% = (\Delta G / \bar{X}) \cdot 100$$

Where: X = Grand mean for the trait.

- The realized gains was calculated as deviation of generation mean for each character from proceeded mean of that character.

RESULTS AND DISCUSSION

F_2 generation

Means, ranges , phenotypic (PCV)and genotypic (GCV) coefficients of variation ; phenotypic (V_p) and Genotypic (V_g) variances , heritability values in broad – sense and genetic gain for boll weight and lint percentage are presented in Table (1) Comparing means of single crosses with those triple crosses it is apparent that the means of the single crosses selections showed higher than values in means of with triple crosses . but those showed higher values in genetic gain and significant genetic variance as well . This indicated to the possibility of using the triple crosses in improving boll weight if these selections performed well in the F3 generation and the derived one .On the other hand , the estimates of PCV and GCV in the triple crosses were higher than the single crosses for most cases boll weight and lint percentage . the heritability in broad sense was more than 50 % in all cases except with single cross which contain the two Egyptian parent G 85 and G 91. High PCV and GCV for yields traits were earlier reported by Khan et al., (1999) and Khan (2003) indicating that, genetic coefficient of variation together with heritability estimates would give the best indication of the amount of gain due to selection. Abdel-Hafez et al., (2003) estimates high heritability for lint percentage and halo length in the three populations. Khan *et al.* (2009) found that , High broad sense heritability and genetic gain were boll weight of (0.96 and 0.64g), respectively. Srour *et al.* (2010) showed that, the highest predicted genetic advance (ΔG) were in F_3 generation for cotton yield, boll weight and lint percentage relative to other selected traits in two populations.

F_3 generation

From the results obtained from F_2 generation , the two characters which were taken into consideration were boll weight and lint percentage .Form both traits there were two level of selection intensity i .e , 5% and 10% which produced 9 and 18 selected families evaluated in F_3 generation Table (2) manifested results of this generation including means , ranges , phenotypic variance , genotypic variance , PCV , GCV and heritability.

Results of the evaluation of selected F_3 families concerning boll weight trait are presented in table (2) and cleared that among F_3 families means were reduced as a result of increasing selection intensity level form 5% and 10% over all single and triple crosses .

The variance between families means were increased with the increase in selection intensity level especially in the case of triple crosses while the trend of single crosses means didn't take the same trend. Significant variance between families were found in two cases when the Australian parent was found in the cross . The significant variance between families selected form triple crosses were postulated in 5 cases from six ones. Both PCV% and GCV % were comparable in all crosses and not reached to 5% . Heritability in broad sense was more than 50 % in all cases except with single cross which contain the two Egyptian parent G 85 and G 91.

Table (1):- Means , range, phenotypic , genotypic variance phenotypic (PCV) , genotypic (GCV) coefficients of variation , broad sense heritability (h^2b) and genetic gain in F_2 generation.

Cross	$\bar{X}$ F_2	Range	V p	V_G	PCV %	GCV %	h^2_b %	ΔG 5%	ΔG 10	ΔG% 5%	ΔG% 10%
Boll weight											
Giza 85 × Giza 91	2.91	2.2 - 3.5	0.068*	0.033	8.95	6.22	48.	0.2	0.2	8.9	7.62
Giza 85×Australian	2.76	2.2 - 3.4	0.079*	0.049	10.23	8.07	62.	0.3	0.3	13.	11.2
Giza 91 × Australian	2.86	2.3 - 3.6	0.085*	0.050	10.15	7.77	58.	0.3	0.3	12.	10.4
(Giza 85 × Giza 91)	2.83	2.3 - 3.4	0.089*	0.056	10.57	8.37	62.	0.3	0.3	13.	11.6
(Giza 85 ×	2.76	2.1 - 3.4	0.088*	0.055	10.77	8.50	62.	0.3	0.3	13.	11.8
(Giza 91 ×	2.82	2.0 - 3.5	0.098*	0.065	11.12	9.05	66.	0.4	0.3	15.	12.9
Lint percentage% .											
Cross	$\bar{X}$ F_2	Range	V p	V_G	PCV %	GCV %	h^2_b %	ΔG 5%	ΔG 10	ΔG% 5%	ΔG% 10%
Giza 85 × Giza 91	39.8	33.5 -	2.538*	1.663	4.00	3.24	65.	2.1	1.8	5.4	4.61
Giza 85×Australian	39.4	34.2 -	2.511*	1.567	4.02	3.17	62.	2.0	1.7	5.1	4.41
Giza 91 × Australian	38.9	34.5 -	2.925*	2.013	4.39	3.64	68.	2.4	2.0	6.2	5.32
(Giza 85 × Giza 91)	39.1	35.1 -	2.943*	2.033	4.38	3.64	69.	2.9	2.4	7.5	6.38
(Giza 85 ×	37.9	34.0 -	3.184*	2.274	4.70	3.97	71.	3.1	2.6	8.1	6.95
(Giza 91 ×	38.1	32.2 -	5.039*	4.128	5.89	5.33	81.	4.1	3.5	10.	9.33

Table (2):- Means, range, phenotypic , genotypic variance , phenotypic (PCV) , genotypic (GCV) coefficients of variation , broad sense heritability (h^2b) in F_3 generation.

Boll weight (g)								
Cross	Level	Mean	Range	V p	V_G	PCV %	GCV %	h^2_b
Giza 85 x Giza 91	5%	2.98	2.87 - 3.20	0.0132	0.0041	3.85	2.15	31.13
	10%	2.94	2.78 – 3.20	0.0128	0.0033	3.85	1.96	25.75
Giza 85×Australian	5%	3.02	2.78 - 3.24	0.0179	0.0097	4.43	3.26	54.27
	10%	2.94	2.78 - 3.24	0.0165*	0.0106	4.37	3.50	64.13
Giza 91 x Australian	5%	3.02	2.90– 3.26	0.0151	0.0080	4.07	2.96	52.84
	10%	2.94	2.84– 3.26	0.0138	0.0063	4.00	2.69	45.31
(Giza 85 x Giza 91) x Australian	5%	2.94	2.72 – 3.21	0.0102*	0.0064	3.43	2.73	63.22
	10%	2.89	2.53 – 3.21	0.0117*	0.0061	3.74	2.71	52.47
(Giza 85 x Australian) x Giza 91	5%	2.97	2.73 – 3.19	0.0136*	0.0089	3.93	3.18	65.38
	10%	2.94	2.70 – 3.19	0.0121	0.0061	3.74	2.65	50.30
(Giza 91 x Australian) x Giza 85	5%	3.02	2.73 – 3.30	0.0143*	0.0098	3.96	3.28	68.61
	10%	2.96	2.73 – 3.30	0.0136*	0.0084	3.93	3.09	61.80
Lint percentage%.								
Cross	Level	Mean	Range	V p	V_G	PCV %	GCV %	h^2_b
Giza 85 x Giza 91	5%	40.61	39.74 – 41.18	0.2020	0.0925	1.11	0.75	45.80
	10%	40.44	39.74 – 41.18	0.2805	0.1122	1.31	0.83	40.00
Giza 85×Australian	5%	42.14	40.03 – 43.01	0.6766	0.3580	1.61	1.42	52.91
	10%	41.83	40.00– 43.01	0.4591	0.2234	1.97	1.13	48.67
Giza 91 x Australian	5%	41.92	39.75 – 43.21	1.2294*	0.8285	2.64	2.17	67.39
	10%	41.79	39.75 – 43.21	0.6242	0.3106	1.89	1.33	49.76
(Giza 85 x Giza 91) x Australian	5%	41.85	40.07 -43.39	0.7581*	0.4287	2.08	1.56	56.55
	10%	41.43	40.07 -43.39	0.7711	0.3615	2.12	1.45	46.87
(Giza 85 x Australian) x Giza 91	5%	41.12	38.71 -42.21	1.1254*	0.7242	2.58	2.07	64.35
	10%	40.95	38.71 - 42.21	0.5860	0.2672	1.87	1.26	45.61
(Giza 91 x Australian) x Giza 85	5%	40.29	39.89–40.62	0.5868*	0.3621	1.90	1.49	61.70
	10%	40.03	39.67 -40.62	0.5873*	0.3685	1.91	1.52	62.74

Results of the evaluation of selected F_3 families concerning lint percentage trait table (2) cleared that, among F_3 families means were reduced as a result of increasing selection intensity level form 5% and

10% over all single crosses and triple crosses . The variance between families means were increased with the increase in selection intensity levels especially in the case of triple crosses while the trend of single crosses means didn't take the same trend. Significant variance between families were found in one cases (G91x Aust.). The significant variance between families selected from triple crosses were postulated in 4 cases from six ones. Both PCV% and GCV % were comparable in all crosses and not reached to 5% . the heritability in broad sense was more than 50 % in all cases for selection level 5% except with single cross which contain the two Egyptian parent G 85 and G 91.

F_4 generation

From the results obtained from F_3 generation , the two characters which was taken into consideration were boll weight and lint percentage .Form both traits there were two level of selection intensity i .e , 5% and 10% these produced 9 and 18 selections evaluated in F_4 generation Table (3) manifested results of this generation including means, ranges , phenotypic variance , genotypic variance , PCV , GCV and heritability.

The results of this work in F4 generation for boll weight and lint percentage was in generally accordance with that of F3 generation .

Gomaa *et al.* (1999) found that, high percentage of response to selection was detected in F_3 family means for seed cotton yield/plant and boll weight in the first cross, lint percentage in other cross. Gooda (2007) showed that, P.C.V. and G.C.V. were decreased from F_2 to F_3 generations for all studied traits in the two populations. EL-Lawendey and El-Dahan(2012) obtained heritability estimates in both F_3 and F_4 generations ranged from moderate to high (51.3 to 96.3%) for all traits. El-Feskeikawy *et al.* (2014) studied the heritability estimates in broad sense obtained in F_2 , F_3 and F_4 generations were ranged from moderate to high (56.18 to 92.2 %) for most traits. These estimates indicate a possible success in the selection of the early generations that were evaluated.

Table (3):- Means, range, phenotypic , genotypic variance , phenotypic (PCV) , genotypic (GCV) coefficients of variation , broad sense heritability (h^2b) in F_4 generation.

Boll weight (g)								
Cross	Level	Mean	Range	V p	V_G	PCV %	GCV %	h^2_b
Giza 85 × Giza 91	5%	2.76	2.50- 2.90	0.0082	0.0036	3.27	2.18	44.37
	10%	2.67	2.45- 2.90	0.0039	0.0011	2.33	1.23	27.69
Giza 85×Australian	5%	2.88	2.73 -3.00	0.0090	0.0047	3.299	2.37	51.71
	10%	2.75	2.52 – 3.00	0.0096	0.0044	3.57	2.42	45.95
Giza 91 × Australian	5%	2.95	2.74 – 3.14	0.0182*	0.0112	4.57	3.59	61.54
	10%	2.81	2.70 – 3.14	0.0192	0.0109	4.93	3.72	56.93
(Giza 85 × Giza 91) × Australian	5%	2.87	2.60 – 3.02	0.0315	0.0166	6.18	4.49	52.77
	10%	2.75	2.50 – 3.02	0.0314*	0.0177	6.45	4.84	56.38
(Giza 85 × Australian) × Giza 91	5%	2.95	2.73 – 3.07	0.0306	0.0147	5.93	4.11	47.98
	10%	2.87	2.57 – 3.07	0.0287	0.0128	5.91	3.94	44.41
(Giza 91 × Australian) × Giza 85	5%	3.07	2.77 – 3.17	0.0303	0.0139	5.67	3.84	45.86
	10%	2.88	2.60 – 3.17	0.0342*	0.0184	6.42	4.71	53.97
Lint percentage%.								
Cross	Level	Mean	Range	V p	V_G	PCV %	GCV %	h^2_b
Giza 85 × Giza 91	5%	40.67	39.86 – 41.99	0.4300	0.1010	1.57	0.76	23.50
	10%	40.18	38.50 – 41.99	0.5518	0.2845	1.85	1.33	51.56
Giza 85×Australian	5%	41.40	39.52 – 41.82	0.3894	0.1344	1.51	0.89	34.52
	10%	40.60	39.15 – 41.82	0.5789	0.3336	1.87	1.42	57.62
Giza 91 × Australian	5%	41.22	39.17 – 41.97	0.4790	0.3125	1.68	1.36	65.23
	10%	39.69	38.44 – 41.97	1.0983*	0.5774	2.64	1.91	52.58
(Giza 85 × Giza 91) × Australian	5%	41.23	39.66 – 42.00	1.1935*	0.7750	2.65	2.14	64.93
	10%	40.95	38.36 – 42.00	0.8859	0.2417	2.30	1.32	33.22
(Giza 85 × Australian) × Giza 91	5%	41.20	40.00 – 42.09	0.5851	0.2848	1.86	1.30	48.67
	10%	40.53	39.80 – 42.09	0.5293	0.2455	1.80	1.22	46.39
(Giza 91 × Australian) × Giza 85	5%	41.01	39.64 – 41.50	0.2619	0.0792	1.25	0.76	37.57
	10%	39.63	38.39 – 41.50	1.3104*	0.7212	2.89	2.14	55.04

Gain from selection :-

Tables (4) and (5) showed the values of predicted and the realized gains from selection at selection intensities 5% and 10% for boll weight and lint percentage in the segregating generations F_2 , F_3 and F_4 of both single crosses and triple crosses derived from three cotton varieties.

Also, results confirm the use of the single cross (G85 x Aust.) in the improving of boll weight or the triple crosses which used Giza 85 as a female parent at selection intensity 5 % . The aforementioned results confirm the use of the single cross (G91 x Aust.) in the improving of lint percentage or the triple crosses which used Giza 91 as a female parent at selection intensity 5 %

Table (4):- Predicted gains (PG%) and Realized gains (RG%) by direct selection in the F_2 F_3 and F_4 generations for Boll weight (g) 5% and10 % selection intensity.

Cross	Level	Genetic advances (Δg)			Selection advances (%)			Generations means and checks means
		PG. F_2/F_3	RG. F_3	RG. F_4	PG. F_2/F_3	RG. F_3	RG. F_4	
Giza 85 × Giza 91	5%	0.26	0.07	-0.15	7.78	2.10	-4.49	F_2 = 2.91- F_3 = 2.98 Check = 3.34
	10 %	0.22	0.03	-0.24	6.94	0.95	-7.57	F_2 = 2.91 F_3 = 2.94 Check = 3.17
Giza 85×Australian	5%	0.36	0.26	0.12	10.65	7.69	3.55	F_2 = 2.76- F_3 = 3.02 Check =3.38
	10 %	0.31	0.18	-0.01	9.69	5.63	-0.31	F_2 = 2.76 F_3 = 2.94 Check = 3.20
Giza 91 × Australian	5%	0.35	0.16	0.09	10.57	4.83	2.72	F_2 = 2.86 - F_3 = 3.02 Check =3.31
	10 %	0.30	0.08	-0.05	9.43	2.52	-1.57	F_2 = 2.86 F_3 = 2.94 Check = 3.18
(Giza 85 × Giza 91) × Australian	5%	0.39	0.11	0.04	11.57	3.26	1.19	F_2 = 2.83 F_3 =2.94 Check = 3.37
	10 %	0.33	0.06	-0.08	9.97	1.81	-2.42	F_2 = 2.83 F_3 =2.89 Check = 3.31
(Giza 85 × Australian) × Giza 91	5%	0.38	0.21	0.19	11.41	6.31	5.71	F_2 = 2.76 F_3 = 2.97 Check =3.33
	10 %	0.33	0.18	0.11	10.19	5.56	3.40	F_2 = 2.76 F_3 = 2.94 Check = 3.24
(Giza 91 × Australian) × Giza 85	5%	0.43	0.20	0.25	12.57	5.85	7.31	F_2 = 2.82 F_3 = 3.02 Check =3.42
	10 %	0.37	0.14	0.06	10.98	4.15	1.78	F_2 = 2.82 F_3 = 2.96 Check = 3.37

Generally , it could be concluded from the results of the present work that for improving boll weight and lint percentage as well, the Egyption cotton breeder can reach this goal if he used the triple cotton crosses which contain at least one exotic cotton variety belong to G. barbadense ,L. in the investigated materials with the preference of using Giza 85 as a female parent for improving boll weight and using of Giza 91 as a female parent for improving lint percentage . El-Harony (1998) results showed that the direct selection for high lint percentage may be improved by both boll weight and seed index traits. Awaad and Hassan (1996) found that,correlated response to selection revealed that improving seed cotton yield/plant could be achieved by selection for number of open bolls/plant, and boll weight. Esmail, (2007) emphasized that , the three-way crosses may be considered as a good tool to obtain a better homozygous progenies when tested in early generation.

Table (5):- Predicted gains (PG%) and Realized gains (RG%) by direct selection in the F_2 F_3 and F_4 generations for (g) Lint percentage 5% and10 % selection intensity.

Cross	level	Genetic advances (Δg)			Selection advances (%)			Generations means and checks means
		PG. F_2/F_3	RG. F_3	RG. F_4	PG. F_2/F_3	RG. F_3	RG. F_4	
Giza 85 × Giza 91	5%	2.15	0.80	0.86	5.09	1.89	2.04	F_2 = 39.81- F_3 = 40.61Check = 42.26
	10 %	1.84	0.63	0.37	4.43	1.52	0.89	F_2 = 39.81 F_3 = 40.44 Check = 41.50
Giza 85×Australian	5%	2.04	2.69	1.95	4.87	6.42	4.65	F_2 = 39.45-F_3 = 42..14 Check =41.90
	10 %	1.74	2.38	1.15	4.19	5.73	2.77	F_2 = 39.45 F_3 = 41.83 Check = 41.50
Giza 91 × Australian	5%	2.43	2.94	2.24	5.79	7.01	5.34	F_2 = 38.98-F_3 = 41.92 Check =41.97
	10 %	2.07	2.81	0.71	5.01	6.81	1.72	F_2 = 38.98 F_3 = 41.79 Check = 41.29
(Giza 85 × Giza 91) × Australian	5%	2.94	2.72	2.10	7.03	6.50	5.02	F_2 = 39.13 F_3 =41.85 Check = 41.84
	10 %	2.49	2.30	1.82	6.01	5.55	4.39	F_2 = 39.13 F_3 = 41.43 Check = 41.46
(Giza 85 × Australian) × Giza 91	5%	3.11	3.14	3.22	7.42	7.50	7.69	F_2 = 37.98 F_3 = 41.12 Check = 41.89
	10 %	2.64	2.97	2.55	6.42	7.22	6.20	F_2 = 37.98 F_3 = 40.95 Check = 41.15
(Giza 91 × Australian) × Giza 85	5%	4.19	2.17	2.89	9.94	5.15	6.86	F_2 = 38.12 F_3 = 40.29 Check = 42.15
	10 %	3.56	1.91	1.51	8.54	4.58	3.62	F_2 = 38.12 F_3 = 40.03 Check = 41.70

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كفاءة الانتخاب في الأجيال الانعزالية للهجن الفردية والثلاثية لتحسين وزن اللوزة ومعدل الحليج في القطن المصري

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الملخص

يهدف هذا البحث لتقييم كفاءة الانتخاب في الأجيال الانعزالية للهجن الفردية والثلاثية الناتجة بين صنفين من القطن المصري هما جيزة ٨٥ ، جيزة ٩١ وصنف القطن الاسترالي . أجرى هذا البحث خلال المدة من ٢٠١١ إلى ٢٠١٣ بمحطة بحوث سخا بمحافظة كفر الشيخ التابعة لمركز البحوث الزراعية ، تم اختيار العشائر الستة الممثلة للهجن الفردية والثلاثية وزرعت فى موسم ٢٠١١ بينما زرع كل من الجيل الثالث والرابع بنفس محطة البحوث في موسمي ٢٠١٢، ٢٠١٣ على الترتيب وتم استخدام مستويين لشدة الانتخاب هما ٥% ، ١٠%. أشارت النتائج إلى انه لتحسين وزن اللوزة يمكن استخدام الأجيال الانعزالية للهجين الفردي (جيزة ٨٥ × استرالي) أو الهجين الثلاثي الذي استخدام فيه الصنف جيزة ٨٥ كأم ،و انه لتحسين معدل الحليج يمكن استخدام الهجين الفردي (جيزة ٩١ × استرالي) أو الهجين الثلاثي الذي استخدام فيه الصنف جيزة ٩١ كأم وذلك عند مستوى شدة انتخاب ٥% في جميع الحالات . ومن النتائج السابقة يمكن لمربى القطن المصري إن يقوم بتحسين صفتي وزن اللوزة ومعدل الحليج باستخدام الهجن الثلاثية والتي تحتوى أحد الأصناف المستوردة من *G.barbadense,L.* في مواد التجارب مع تفضيل استخدام جيزة ٨٥ كأم لتحسين وزن اللوزة وجيزة ٩١ كأم لتحسين معدل الحليج .