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COMBINING ABILITY OF NEW YELLOW MAIZE INBRED LINES UNDER TWO DIFFERENT LOCATIONS

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ABSTRACT: *This investigation was carried out at two different locations (Gemmeiza and Mallawy).New seventeen yellow inbred lines of maize were top crossed to two line testers (Gm. 1021 and Gm. 1002) to produce thirty four top crosses in summer season of 2004 and evaluated in addition with two checks (S.C. 155 and S.C. 3084) in summer season of 2005 under the two locations. Highly significant differences were recorded between the two locations. Moreover, mean squares of crosses and their partitioning lines, testers and lines x testers interaction were significant and highly significant for most studied traits. Based on the combined analysis of the two locations, the non-additive genetic variance was more important than the additive genetic variance in the inheritance of all studied traits except, ear position and number of rows/ear. The inbred line Gm. 376 gave positive significant and desirable GCA effects for grain yield, number of kernels / row and ear length, while, four inbred lines gave significant and desirable GCA effects for grain yield only. The inbred lines Gm. 377, Gm. 379 and Gm.381 exhibited negative significant and desirable GCA effects towards earliness and dwarfness. The inbred lines Gm. 373, Gm. 381 and Gm. 383 showed significant and desirable GCA effects for resistance to late wilt disease. On the other hand, the line tester Gm 1002 showed negative significant and desirable GCA effects towards earliness, dwarfness, while, it showed positive significant for ear length and grain yield. On the other side, the line tester Gm. 1021 exhibited desirable GCA effects for resistance to late wilt disease, ear diameter and number of rows/ear. Five top crosses exhibited desirable SCA effects for grain yield, i.e., (Gm.371 x Gm. 1021) , (Gm.377 x Gm. 1021) , (Gm.378 x Gm. 1002), (Gm.381 x Gm. 1021) and (Gm.386 x Gm. 1002), while, the single cross Gm. 386 x Gm. 1002 gave highly significant and desirable of SCA effects for grain yield, ear length, number of rows/ear and number of kernels/row in addition to five top crosses i.e. Gm. 382 x Gm. 1021 (31.9 ard./fed.), Gm. 383 x Gm. 1021 (31.6 ard./fed.), Gm. 385 x Gm. 1021 (31.5 ard./fed.), Gm. 385 x Gm. 1002 (31.4 ard./fed.) and Gm 387 x Gm 1002 (31.4 ard./fed.) outyielded than the commercial crosses S.C. 155 (28.7 ard./fed.) and S.C. 3084 (31.2 ard./fed.) for grain yield and most agronomic traits. The relative increasing percentage of grain yield (ard./fed.) for the top crosses with inbred line Gm 1021 as tester, ranged from -35.9% to 2.2%and from -30.3% to 11.2% relative to S.C. 3084 and S.C. 155, respectively. The highest percentage values of the relative increasing for the top crosses with inbred line Gm 1021 as tester were obtained from the two crosses (Gm.385 x 1021) and (Gm382 x 1021). the relative increasing percentage of grain yield for the* *top crosses with inbred line Gm 1002 as tester, ranged from -57.4% to 0.3% and from -53.7% to 9.1% relative to SC 3084 and SC 155, respectively. The highest percentage values of the relative increasing for the top crosses with inbred line Gm 1002 as tester were obtained from two crosses (Gm387 x 1002) and (Gm385 x 1002). These results are of great utilization for maize breeder to be involved in breeding program to improve grain yield and its contributing characters.*

Key words: *Maize, Zea mays L, Line x tester, Combining ability, Top crosses.*

INTRODUCTION

Its known that inbred lines may be selected based on their general combining ability and crosses based on their specific combining ability performance, and breeding procedures that exploit these genetic parameters may be adopted on the studied materials. Also, developing a high yielding maize hybrid is based mainly on the development of better inbred lines. Davis (1927) was the first who suggested the use of inbred lines x tester or top cross as a method for evaluating maize inbred lines. Ameha (1977) used high and low yielding groups of ten lines. ,Katta (1971) and Galal *et al.*(1987) reported the superiority of single crosses as narrow genetic base testers. Nawar (1985) studied 49 new inbred lines derived from composite variety 108 by using line x tester. Numerous investigators found that the estimates of non-additive genetic variance played an important role in the inheritance of grain yield, plant height and ear height traits such as Lonnquiest and Gardener (1961), Shehata and Dhawan (1975), Nawar and El-Hosary (1984), Ibrahim (2001) and Mosa (2001), while , Mahmoud (1996), Soliman and Sadek (1999), El-Shenawy *et al.* (2003), Mosa *et al.* (2004) and Ibrahim *et al.* (2005) found that the additive gnanetic variance played an important role in the inheritance the days to So% Silking, ear diameter and number of rows/ear traits and it was in the same order.

The aim of this investigation were: 1) to estimate combining ability effects for the new inbred lines, 2) to determine additive and non-additive genetic variance, 3) to compare the relative increasing percent from the crosses under study relative to the two checks hybrids (S.C. 155 and S.C. 3084)

MATERIALS AND METHODS

New seventeen maize yellow inbred lines of were derived from composite 21 population and developed to 5th generations at Gemmeiza Agricultural Research Station. These inbred lines were crossed with two line testers (Gm. 1021 and Gm. 1002) during summer season of 2004. The 34 top crosses and two checks (S.C. 155 and S.C. 3084) were evaluated at Gemmeiza and Mallawy Agricultural Research Stations in summer season of 2005. These materials were arranged in Randomized Complete Block Design with four replications. Plot size was one row, 6 m. length 80 cm apart and 25 cm between hills. All recommended agricultural practices were done. The following data were collected at the proper time i.e., days to 50% Silking (days from planting to 50% emergence silking), plant height (cm.), ear height(cm.) ,ear position % (by determine the ratio between ear height for plant height), resistance to late wilt disease (%),ear length (cm),ear diameter (cm.), number of rows/ear, number of kernels / row and grain yield (ard./fad.) adjusted to 15.5% grain moisture content Statistical analysis of variance for location alone and statistical analysis of the combined data over two locations was performed according to Steel and Torrie (1980). Combining ability analysis was computed using the line x tester procedure suggested by Kempthorne (1957). Combined analysis among the two locations was done when the homogeneity test among them was not significant.

RESULTS AND DISCUSSION

The analysis of variance for Gemmeiza, Mallawy and their combined data included 34 top crosses (17 inbred lines x 2 line testers) for the ten studied traits are shown in Table 1. Mean squares of locations were highly significant for all the studied traits under this study. This indicated that the genotypes (top crosses, lines and testers) were affected from one location to another. These results agreed with what obtained by Soliman *et al.* (1995), Shehata *et al.* (1997), El-Zeir (1999), Amer (2004) and Ibrahim *et al.* (2005). Mean squares due to crosses and their partitioning lines, testers and line x tester were significant and highly significant for most studied traits under Gemmeiza, Mallawy and their combined data, indicating that a large amount of variability in these studied traits. On the other hand, mean squares due to Cr. x loc. and their partitioning L x loc., T x loc. And L x T x loc. were highly significant for some traits such as grain yield, resistance to late wilt disease, plant and ear height, while, mean squares due to T x loc. were highly significant for grain yield, resistance to late wilt disease, ear height and days to 50% silking was significant for number of rows/ear in the same order.

Mean performance of 34 top crosses at Gemmeiza, Mallawy and their combined data are presented in Table 2. Mean performance for grain yield (ard./fed.) ranged from 10.92 to 33.50, 15.70 to 37.20 and 13.30 to 31.90 (ard./fed.) at Gem., Mall. and combined data, respectively. Five top crosses i.e., Gm386x Gm 1002, Gm385x Gm1021, Gm387 x Gm1002, Gm385 x Gm1002 and Gm387 x Gm1021 at Gemmeiza location gave the highest mean values and outyielded the two check varieties SC 155 and SC 3084 by 11.2% and 9.7%, respectively. While at Mallawy location, only two top crosses i.e., Gm 377 x Gm 1021 and Gm 384 x Gm 1021 gave the highest mean values and outyielded the two check varieties SC 155 and SC 3084 by 29.7% and 11.6%, respectively. On the combined data, 5 top crosses i.e. Gm. 382 x Gm. 1021 (31.90 ard./fed.), Gm. 383 x Gm 1021 (31.50 ard./fed.), Gm. 385 x Gm. 1021 (31.60 ard./fed.), Gm. 385 x Gm. 1002 (31.40 ard./fed.) and Gm 387 x Gm 1002 (31.4 ard./Fed.) gave the highest mean values of yield relative to the commercial hybrid S.C. 3084 (31.20 ard./fed.). These top crosses under Gemmeiza, Mallawy and their combined surpassed than the highest commercial hybrids as checks in yield and desirable attributes as earliness, dwarfness and low ear position and resistance to late wilt disease.

Table (1): Mean squares of analysis of variance for the studied ten traits of maize at Gemmeiza (Gm.) and Mallawy (Mall.) locations and their combined data.

S.O.V.	D.F	Days to 50% silking			Plant height			Ear height			Ear position(%)			Resistance to late wilt (%)		
		Gm.	Mall.	Comb.	Gm.	Mall.	Comb.	Gm.	Mall.	Comb.	Gm.	Mall.	Comb.	Gm.	Mall.	Comb.
Locations (loc.)	1	-	-	4489.06**	-	-	1224.0**	-	-	206.50**	-	-	192.37**	-	-	121.80**
Reps/locations	6	-	-	1.81	-	-	122.4	-	-	431.92	-	-	67.09	-	-	1.90
Crosses (Cr)	33	7.27**	3.55*	9.14**	1045.31**	230.84*	887.7**	870.25**	139.11	651.95**	37.94**	5.05	21.20**	18.25**	0.04	9.40**
Lines (L)	16	5.40**	3.02*	6.78**	913.09**	189.82*	744.07**	600.69**	101.17	428.74**	24.30**	4.13	9.20	13.05**	0.04	6.67**
Testers (T)	1	72.10**	21.44**	86.06**	1708.27**	1101.24**	2776.33**	1423.53**	399.18**	1665.18**	24.74	0.47	16.02	44.74**	0.03	23.53**
L x T	16	5.10**	2.97	6.70**	1136.09**	217.45*	871.98**	1105.23**	160.79*	811.83**	52.15**	6.25	33.52	21.78**	0.05	11.19**
Cr x Loc.	33	-	-	1.88	-	-	408.45**	-	-	357.41**	-	-	21.79	-	-	8.90**
L x loc.	16	-	-	1.64	-	-	358.64**	-	-	273.12**	-	-	19.23	-	-	6.42**
T x loc.	1	-	-	7.48**	-	-	33.18	-	-	157.53**	-	-	9.19	-	-	21.24**
L x T x loc.	16	-	-	1.37	-	-	481.56**	-	-	454.19**	-	-	24.88	-	-	10.64**
Error	198	0.42	1.09	0.76	85.08	88.41	76.75	33.70	62.78	48.24	5.15	5.07	5.11	2.20	0.04	1.12

*, ** refer to 0.05 and 0.1 level of significantly , respectively.

Table (1): Count.

S.O.V.	D.F	Ear length			Ear diameter			No. of rows/ear			No. of kernels/row			Grain yield		
		Gm.	Mall.	Comb.	Gm.	Mall.	Comb.	Gm.	Mall.	Comb.	Gm.	Mall.	Comb.	Gm.	Mall.	Comb.
Locations (loc.)	1			314.50**			105.50**			2.19**			1983.4**			266.44**
Reps/locations	6			5.30			0.14			1.20			23.73			14.26
Crosses (Cr)	33	6.71**	10.25**	15.66**	0.54**	0.17	0.47	3.95**	3.03**	6.06**	21.76**	37.90	44.85**	134.09**	109.96**	162.59**
Lines (L)	16	3.06*	6.65**	8.82**	0.37*	0.17	0.45	3.02**	2.33*	4.15**	14.22*	25.06	30.28	103.07**	77.94**	132.24**
Testers (T)	1	36.03**	60.89**	95.30**	1.06**	0.47**	1.47	32.03**	14.24**	44.49**	9.53	50.65*	52.06**	1045.07**	220.07**	1112.13**
L x T	16	8.59**	10.69**	17.52**	0.67**	0.14	0.42	3.12**	3.03**	5.56**	30.06**	49.94*	58.95**	108.18**	135.10**	133.60**
Cr x Loc.	33	-	-	1.33	-	-	0.24	-	-	0.92			14.81			81.46**
L x loc.	16	-	-	0.89	-	-	0.09	-	-	1.20	-	-	9.00	-	-	48.77**
T x loc.	1	-	-	1.62	-	-	0.06	-	-	1.78*	-	-	8.12	-	-	153.01**
L x T x loc.	16	-	-	1.76	-	-	0.39	-	-	0.59	-	-	21.05	-	-	109.68**
Error	198	1.34	1.46	1.4	0.16	0.10	0.13	0.64	0.96	0.80	7.54	21.54	14.54	5.27	9.73	7.5

Table (2): Mean performance of maize genotypes at Gemmeiza (Gm.) and Mallawy (Mall.) locations and their combined data for the studied traits.

Top crosses	Days to 50% silking (day)			Plant height (cm.)			Ear height (cm.)			Ear position (%)			Resistance to late wilt (%)		
	Gm.	Mall.	Comb.	Gm.	Mall.	Comb.	Gm.	Mall.	Comb.	Gm.	Mall.	Comb.	Gm.	Mall.	Comb.
Gm371 x Gm 1021	56.0	63.8	59.9	268.8	263.3	266.0	160.0	159.8	159.9	59.50	60.70	60.10	99.0	100.0	99.5
Gm371 x Gm 1002	55.8	63.5	59.6	254.5	254.8	254.6	137.5	145.8	141.6	54.10	57.20	55.70	100.0	100.0	100.0
Gm372 x Gm 1021	55.8	63.5	59.6	270.0	258.5	264.3	152.3	152.8	152.5	56.40	59.10	57.70	92.3	100.0	96.1
Gm 372x Gm 1002	55.8	63.8	59.8	250.8	258.3	254.5	129.3	154.5	141.9	51.50	59.80	55.70	99.8	100.0	99.9
Gm373 x Gm 1021	57.5	64.5	61.0	275.0	260.3	267.6	167.0	155.0	161.0	60.80	59.60	60.20	99.3	100.0	99.6
Gm373 x Gm 1002	56.0	63.3	59.6	264.8	259.5	262.1	139.8	151.5	145.6	52.90	58.40	55.60	100.0	99.7	99.9
Gm374 x Gm 1021	55.0	63.0	59.0	258.8	253.8	256.3	147.8	148.8	148.3	57.10	58.60	57.90	97.3	100.0	98.8
Gm374 x Gm 1002	55.8	64.3	60.0	250.5	244.8	247.6	134.8	140.8	137.8	53.80	57.40	55.60	100.0	100.0	100.0
Gm375 x Gm 1021	55.3	63.5	59.4	251.3	254.5	252.9	137.5	152.0	144.8	54.70	59.80	57.20	98.0	100.0	99.0
Gm375 x Gm 1002	55.8	63.8	59.8	234.8	262.5	248.6	130.3	151.5	140.9	55.50	57.80	56.60	100.0	100.0	100.0
Gm376 x Gm 1021	55.3	63.5	59.4	279.5	260.5	270.0	166.3	149.0	157.6	59.50	57.20	58.40	93.7	99.5	96.8
Gm376 x Gm 1002	57.3	64.0	60.6	269.0	253.3	261.1	160.5	147.8	154.1	59.70	56.40	59.00	99.3	100.0	99.7
Gm377 x Gm 1021	56.0	64.5	60.3	288.8	267.8	278.3	180.8	160.0	170.4	62.60	59.80	61.20	92.5	100.0	96.3
Gm377 x Gm 1002	57.5	65.0	61.3	260.5	266.0	263.3	159.0	155.8	157.4	61.30	58.40	59.80	99.58	100.0	99.8
Gm376 x Gm 1021	55.0	63.8	59.4	285.3	270.5	277.9	173.0	162.3	167.6	80.70	60.00	80.35	99.7	100.0	99.9
Gm 378x Gm 1002	57.8	64.5	61.1	247.0	248.8	247.9	142.5	144.5	143.5	57.70	58.10	57.90	100.0	100.0	100.0
Gm 379x Gm 1021	55.3	63.0	59.1	262.0	250.3	256.1	154.3	144.5	149.4	58.90	57.00	58.30	96.7	100.0	98.4
Gm 379x Gm 1002	54.5	63.5	59.0	242.8	233.5	238.1	126.3	136.8	131.5	52.00	58.60	55.30	100.0	100.0	100.0
Gm380 x Gm 1021	55.5	63.8	59.6	259.8	254.8	257.3	155.0	147.6	151.4	9.70	58.00	58.80	97.2	100.0	98.6
Gm380 x Gm 1002	53.5	81.5	57.5	227.5	248.5	238.0	128.3	149.5	138.9	56.40	60.20	58.30	99.2	100.0	99.6
Gm381 x Gm 1021	55.0	63.3	59.1	267.8	253.8	260.8	152.3	150.6	151.5	56.90	59.40	58.10	96.2	100.0	98.1
Gm381 x Gm 1002	53.8	61.0	57.4	243.0	258.8	250.9	130.5	147.8	139.1	53.80	57.10	55.40	100.0	100.0	100.0
Gm382 x Gm 1021	54.5	63.3	58.9	258.8	251.3	255.0	146.3	151.0	148.6	56.60	60.20	58.40	98.5	100.0	99.3
Gm382 x Gm 1002	53.3	64.5	58.9	225.8	256.0	240.9	121.8	150.3	136.0	53.90	58.60	56.30	100.0	100.0	100.0
Gm383 x Gm 1021	58.3	64.8	61.5	264.5	249.3	256.8	160.8	145.5	153.1	80.80	56.40	59.60	99.7	100.0	99.9
Gm 383x Gm 1002	54.5	62.5	58.5	243.3	243.5	243.4	138.8	137.0	137.9	57.00	56.20	56.60	100.0	100.0	100.0
Gm 384x Gm 1021	56.5	63.8	60.1	261.0	250.8	255.9	155.6	148.5	152.1	59.70	59.20	59.50	97.0	100.0	96.5
Gm 384x Gm 1002	55.0	63.8	59.4	240.5	259.6	250.1	138.8	152.3	145.5	57.60	58.60	56.10	99.7	100.0	99.9
Gm385 x Gm 1021	55.3	63.3	59.3	288.8	256.3	272.5	174.8	148.8	161.8	60.50	58.10	59.30	99.7	100.0	99.9
Gm385 x Gm 1002	52.8	62.3	57.5	275.5	260.3	267.9	144.0	153.0	148.5	52.30	58.80	55.60	100.0	100.0	100.0
Gm386 x Gm 1021	54.5	64.0	59.3	247.8	243.5	245.6	148.8	140.0	144.4	60.00	57.50	58.80	99.5	100.0	99.8
Gm386 x Gm 1002	53.5	62.5	58.0	256.3	257.6	256.9	142.0	151.3	146.6	55.50	57.70	57.10	100.0	100.0	100.0
Gm387 x Gm 1021	54.3	62.8	56.5	276.5	262.5	269.5	154.5	156.3	155.4	55.90	59.50	57.70	99.5	99.7	99.6
Gm387 x Gm 1002	53.3	61.3	57.3	271.3	250.5	260.9	144.0	151.5	147.6	53.10	60.50	56.80	100.0	100.0	100.0
$\bar{X}$ of all crosses	55.3	63.4	59.4	259.5	255.2	257.3	148.1	149.8	148.9	57.10	58.70	57.90	98.6	99.9	99.3
Checks S.S. 155	55.5	62.0	58.8	270.0	258.0	264.0	159.0	152.0	155.5	0.60	0.59	0.60	100.0	99.0	99.5
S.C. 3084	59.5	66.8	62.7	280.0	257.0	268.5	158.0	149.0	153.5	0.58	0.57	0.58	99.8	99.8	99.8
L.S.D. 0.05	0.635	1.023	0.586	7.906	9.215	6.053	5.689	7.765	4.757	2.524	2.207	1.673	1.078	0.196	0.450
0.01	0.836	1.347	0.772	10.407	1.213	7.644	7.489	10.221	6.261	3.322	2.905	2.202	1.419	0.258	0.593

Table (2): Count.

Top crosses	Ear length (cm)			Ear diameter (cm)			No. of rows/ear			No. of kernels/row			Grain yield (ard./fed.)		
	Gm.	Mall.	Comb.	Gm.	Mall.	Comb.	Gm.	Mall.	Comb.	Gm.	Mall.	Comb.	Gm.	Mall.	Comb.
Gm371 x Gm 1021	18.30	20.20	19.20	4.60	5.90	5.20	16.70	15.50	16.10	36.70	47.20	41.90	25.50	33.00	29.30
Gm371 x Gm 1002	18.60	18.70	18.60	4.80	5.60	5.20	15.50	15.50	15.50	35.10	40.60	37.80	30.70	25.40	28.00
Gm372 x Gm 1021	17.20	19.50	18.30	4.40	5.90	5.10	15.10	14.90	15.00	37.50	39.50	38.50	14.50	25.50	20.00
Gm372 x Gm 1002	18.30	19.60	18.90	4.90	6.00	5.50	16.00	16.50	16.30	34.50	42.50	38.60	26.10	18.80	22.40
Gm373 x Gm 1021	18.90	21.30	20.10	4.60	5.70	5.10	15.10	15.00	15.00	39.10	41.90	40.50	20.50	29.40	25.00
Gm373 x Gm 1002	18.20	21.00	19.60	4.90	6.00	5.50	15.80	15.90	15.90	37.40	46.00	41.70	30.80	21.00	25.90
Gm374 x Gm 1021	17.10	18.40	17.80	4.80	6.00	5.40	17.70	16.70	17.20	38.30	41.90	40.10	24.50	28.20	26.40
Gm374 x Gm 1002	15.40	17.70	16.50	4.80	5.90	5.30	17.50	17.70	17.60	33.60	42.80	38.20	19.60	20.60	20.10
Gm375 x Gm 1021	16.60	19.00	17.80	4.70	6.10	5.40	16.80	15.50	16.10	36.80	40.80	38.80	23.30	30.00	26.60
Gm375 x Gm 1002	16.00	17.90	16.90	4.90	5.90	5.40	15.80	15.30	15.60	33.10	38.80	38.00	22.10	23.70	22.90
Gm376 x Gm 1021	17.30	19.10	18.20	4.40	5.80	5.10	17.50	17.80	17.70	38.30	40.30	39.30	24.60	34.40	29.50
Gm376 x Gm 1002	15.70	17.70	16.70	4.40	5.80	5.10	17.20	16.20	16.70	33.90	38.40	36.10	16.70	23.50	20.20
Gm377 x Gm 1021	17.90	20.30	19.10	4.10	5.70	4.90	16.00	15.90	16.00	39.20	37.90	38.60	25.70	36.20	31.00
Gm377 x Gm 1002	16.70	19.10	17.90	4.40	5.50	4.90	15.10	15.50	15.80	34.50	40.20	37.30	18.50	23.20	20.80
Gm378 x Gm 1021	16.50	18.80	17.60	4.60	5.90	5.20	16.30	14.70	15.50	34.90	38.40	36.70	30.30	28.50	29.40
Gm378 x Gm 1002	13.40	14.40	13.90	3.90	5.40	4.60	14.10	15.20	14.70	27.10	31.00	29.00	10.92	15.70	13.30
Gm379 x Gm 1021	17.90	21.70	19.80	4.50	5.90	5.20	15.30	14.90	15.10	35.50	43.00	39.30	20.60	27.10	23.80
Gm379 x Gm 1002	17.40	20.80	19.10	4.70	6.00	5.40	15.50	15.60	15.60	33.50	41.30	37.50	28.10	23.40	25.80
Gm380 x Gm 1021	18.30	21.70	20.00	4.60	5.90	5.20	15.70	15.50	15.60	36.50	43.50	40.00	24.90	32.70	28.80
Gm380 x Gm 1002	17.30	20.40	19.00	4.70	5.60	5.10	14.60	14.40	14.50	35.10	44.10	39.60	17.50	20.90	19.30
Gm381 x Gm1021	18.40	20.30	19.30	4.30	5.90	5.10	15.10	15.50	15.30	37.20	42.20	39.70	24.20	33.30	28.70
Gm381 x Gm1002	16.80	19.30	18.00	4.90	5.90	5.40	16.00	16.10	16.10	35.60	42.10	38.80	31.50	28.80	30.10
Gm382 x Gm1021	19.10	21.80	20.50	4.30	5.80	5.30	13.90	14.40	14.40	37.70	43.90	40.80	29.50	34.20	31.90
Gm 382 x Gm1002	17.20	19.40	18.30	4.70	5.80	5.20	14.40	14.30	14.40	35.20	40.90	38.00	23.00	24.30	23.70
Gm38 3 x Gm1021	20.70	22.60	21.60	4.90	6.00	5.40	16.20	16.10	16.10	37.70	41.80	39.70	31.50	31.50	31.50
Gm383 x Gm1002	17.10	18.10	17.60	4.70	6.00	5.30	14.90	14.60	14.70	34.50	36.00	35.20	29.20	21.20	25.20
Gm384 x Gm1021	19.20	21.00	20.20	4.60	6.00	5.40	15.10	15.70	15.40	37.80	42.90	40.30	22.70	37.20	29.90
Gm384 x Gm1002	17.80	20.00	18.90	4.70	5.90	5.30	16.00	14.80	15.40	34.60	40.90	37.70	24.90	30.10	27.50
Gm385 x Gm1021	19.00	21.30	20.10	4.90	5.80	5.30	14.30	14.50	14.40	38.80	44.10	41.40	32.10	31.20	31.60
Gm385 x Gm1002	17.60	20.50	19.00	4.70	5.80	5.20	14.70	14.60	14.70	35.20	45.50	40.30	31.90	30.70	31.40
Gm386 x Gm1021	17.70	20.20	18.90	4.70	6.20	5.40	15.20	15.40	15.30	36.10	41.50	38.80	31.10	27.10	29.10
Gm386 x Gm1002	17.90	20.00	19.00	5.10	5.90	5.50	16.20	15.30	15.80	35.30	39.00	37.20	33.50	25.00	29.20
Gm387 x Gm1021	18.60	20.70	19.70	4.60	5.70	5.10	15.40	16.40	15.90	36.70	44.90	40.80	31.80	25.30	28.60
Gm387 x Gm1002	18.00	19.30	18.60	4.80	6.20	5.50	15.90	15.50	15.70	37.00	38.00	37.50	32.00	30.80	31.4
$\bar{X}$ of all crosses	17.60	19.70	18.70	4.60	5.80	5.20	15.70	15.50	15.60	35.90	41.30	38.60	25.40	27.40	26.40
Checks S.S. 155	18.25	19.25	18.75	4.90	6.00	5.45	15.30	15.30	15.30	36.80	40.80	38.80	29.00	28.30	28.70
S.C. 3084	21.20	24.30	22.75	4.70	6.15	5.43	14.80	14.90	14.85	42.95	52.90	47.90	29.40	32.90	31.20
L.S.D. 0.05	0.657	0.715	0.485	0.392	0.049	0.156	0.314	0.960	0.450	2.691	4.548	2.559	2.250	3.057	1.876
0.01	0.864	0.942	0.639	0.516	0.065	0.205	0.413	1.264	0.593	3.542	5.987	3.369	2.961	4.024	2.470

Generally, the mean values for most of the top crosses including inbred line Gm 1021 as tester were higher for grain yield (ard./fed.) and most studied traits than those included line Gm 1002 as tester. Regarding to Table 3. no stable trend was observed for all lines with the two testers, indicating that two testers were markedly differed in their yielding ability and for evaluating these lines. Correlation Coefficient value suggested also that the two testers were markedly differed in their yielding ability and ranked the lines. Similar results were obtained by Diab et al (1994), who pointed out that a good tester should have precision in discriminating among genotypes under test. They believed that the best tester would be the one that would give the most precise classification among entries for a given amount of testing.

Table (3): lines rank of the two testers based on the combined data for grain yield (ard./fed.).

Lines	1021	1002
Gm. 371	8	5
Gm. 372	17	12
Gm. 373	15	7
Gm. 374	14	15
Gm. 375	13	11
Gm. 376	6	14
Gm. 377	4	13
Gm. 378	7	17
Gm. 379	16	8
Gm. 380	10	16
Gm. 381	11	3
Gm. 382	1	10
Gm. 383	3	9
Gm. 384	5	6
Gm. 385	2	1
Gm. 386	9	4
Gm. 387	12	2

Correlation coefficient between the two testers. $r = 0.11$

Estimates of variance for general (k^2 GCA) and specific (k^2 SCA) combining ability and their interactions with two locations (Gemmeiza and Mallawy) are shown in Table 4. The results showed that (k^2 SCA) was higher than (k^2 GCA) for all studied traits except, number of rows/ear. This indicates that the non-additive genetic variance played more important role than the additive genetic variance in the inheritance of all studied traits as reported by El-Hosary (1985). While, number of rows/ear was controlled by additive genetic variance as reported by Amer *et al.* (2002). On the other hand, the magnitude of the (k^2 SCA) x loc. interaction was higher than (k^2 GCA) x loc. for all studied traits except, days to 50% silking and number of rows/ear. This result revealed that the non-additive genetic variance was more influenced

and interacted by locations than the additive genetic variance for most studied traits in this respect.

Table (4): Estimates both of general (k^2 GCA) and specific (k^2 SCA) combining ability effects and their interaction with locations.

Variance	Day to 50% silking	Plant height cm	Ear height cm	Ear Position %	Resistance to late wilt %	Ear length	Ear diameter cm	Number of rows/ear	Number of kernels/ear	Grain yield ard./fed.
k^2 GCA	0.481	15.440	6.237	-2.560#	0.009	0.461	0.011	4.465	-0.070#	6.544
k^2 SCA	0.633	64.143	67.339	1.786	0.596	2.079	0.041	0.545	6.244	10.604
k^2 GCA / k^2 SCA	0.760	0.241	0.093	-1.433#	0.015	0.222	0.268	8.193	-0.011#	0.617
k^2 GCA x loc.	1.595	-7.52#	-6.882#	-0.012#	0.084	0.253	0.086	0.595	-0.329#	-0.801#
k^2 SCA x loc.	0.153	101.20	101.488	4.955	2.385	0.105	0.060	0.058	1.618	24.403
k^2 GCA x loc. / k^2 SCA x loc.	10.425	-0.07#	-0.068#	-0.002#	0.035	2.400	1.433	10.259	-0.203#	-0.033#

(#) Variance estimate preceded by negative sign is considered zero.

Estimates of GCA effects for 17 inbred lines and 2 line testers are shown in Table 5. Six, three and two inbred lines gave negative significant and desirable GCA effects for days to 50% silking, plant height and ear height, respectively, while, the inbred lines Gm. 377 and Gm. 379 exhibited negative significant and desirable GCA effects for days to 50% silking, plant and ear heights towards earliness and dwarfness. Three inbred lines Gm. 373, Gm. 381 and Gm. 383 showed significant and desirable GCA effects for resistance to late wilt disease. Two inbred lines exhibited desirable GCA effects for ear length, ear diameter and number of rows/ear. Four inbred lines gave significant and desirable GCA effects for grain yield, while, the inbred line Gm. 376 gave significant and fruitful GCA effects for grain yield, number of kernels/row and ear length. On the other hand, line tester Gm. 1002 gave negative significant and desirable GCA effects towards earliness, dwarfness, ear length and grain yield, while, the line tester Gm. 1021 exhibited significant and desirable GCA effects for resistance to late wilt disease, ear diameter and number of rows/ear, also.

Table (5): Estimates of general combining ability for seventeen inbred lines and two testers as an average of the two locations.

Genotypes		Days to 50% silking	Plant height cm	Ear height cm	Ear position %	Resistance to late wilt %
Inbred lines						
Gm.	371	0.074	-5.272	-3.257	-0.026	-0.449
Gm.	372	0.261	-1.397	-2.445	-0.688	-0.011
Gm.	373	-0.802**	-6.210*	-3.257	0.063	1.427*
Gm.	374	0.074	0.290	-2.257	-0.938	0.302
Gm.	375	-0.177	1.915	1.118	-0.063	-0.511
Gm.	376	-0.114	1.228	-1.1820	-1.000	-0.261
Gm.	377	-0.487*	-8.772**	-6.820**	-0.813	-0.011
Gm.	378	1.386**	-5.045	-3.507	-0.250	-0.636
Gm.	379	-0.487*	-9.210**	-7.632**	-0.875	-0.199
Gm.	380	0.574*	-5.085	-2.445	0.188	0.052
Gm.	381	0.011	2.728	2.618	0.438	1.052**
Gm.	382	0.574*	9.478	8.993	1.313	-0.449
Gm.	383	-0.489*	15.728	10.493	0.563	1.177**
Gm.	384	0.886**	-2.897	1.930	1.500	-0.449
Gm.	385	-0.677**	10.040	8.180	0.875	-0.636
Gm.	386	0.449	1.353	0.493	0.230	-0.511
Gm.	387	-1.177**	1.165	-0.382	-0.250	0.114
Testers						
Gm.	1021	0.563**	3.195**	2.474**	0.243	0.294*
Gm.	1002	-0.563**	-3.195**	-2.474**	-0.243	-0.294
L.S.D. lines	0.05	0.462	5.459	4.710	1.347	0.730
	0.01	0.608	7.186	6.200	1.772	0.961
L.S.D. testers	0.05	0.159	1.873	1.616	0.461	0.250
	0.01	0.209	2.465	2.127	0.606	0.330

Table (5): Count.

Genotypes		Ear length cm	Ear diameter cm	Number of rows/ear	Number of kernels/row	Grain yield ard./fed.
Inbred lines						
Gm.	371	0.474	-0.022	0.257	1.118	1.103
Gm.	372	0.600*	0.040	-0.055	0.368	1.978
Gm.	373	0.099	-0.085	-0.868	0.368	-6.835
Gm.	374	0.537	0.040	0.070	0.618	-0.897
Gm.	375	0.474	0.040	-0.118	1.055	1.165
Gm.	376	1.287**	-0.022	-0.430	2.680**	2.540*
Gm.	377	-0.713*	0.165	0.195	0.555	-1.460
Gm.	378	0.412	0.228	1.257**	0.243	-0.835
Gm.	379	-0.963**	0.228	-0.180	-1.445	-0.397
Gm.	380	-0.088	0.103	-0.118	-0.445	-0.022
Gm.	381	-0.151	-0.022	1.070**	-0.070	2.228*
Gm.	382	-0.338	-0.022	-0.118	0.180	-0.522
Gm.	383	0.412	-0.147	-0.368	0.868	4.790**
Gm.	384	-0.276	-0.210*	-0.118	-0.507	-1.335
Gm.	385	-0.401	0.040	0.007	-1.632	2.978**
Gm.	386	-1.901**	-0.460**	-0.368	-3.695	-5.397
Gm.	387	0.537	0.103	-0.118	-0.257	0.915
Testers						
Gm.	1021	-0.592**	-0.074*	0.404**	-0.438	-2.022
Gm.	1002	0.592**	0.074	-0.404**	0.438	2.022**
L.S.D. lines	0.05	0.578	0.187	0.444	1.871	2.083
	0.01	0.760	0.246	0.584	2.463	2.742
L.S.D. testers	0.05	0.198	0.064	0.152	0.642	0.714
	0.01	0.261	0.084	0.200	0.845	0.940

Estimates of specific combining ability SCA effects of the 34 top crosses under the locations are presented in Table 6. Five top crosses showed significant and desirable SCA effects such as Gm. 371 x Gm. 1021, Gm. 377 x Gm. 1021, Gm. 378 x Gm. 1002, Gm. 381 x Gm. 1021, and Gm. 386 x Gm. 1002 for grain yield, four top crosses i.e. Gm. 375 x Gm. 1002, Gm. 378 x Gm. 1021, Gm. 383 x Gm. 1002 and Gm. 386 x Gm. 1002 gave negative significant and desirable SCA effects for earliness, four top crosses i.e. Gm. 371 x Gm. 1002, Gm. 378 x Gm. 1021, Gm. 385 x Gm. 1002 and Gm. 386 x Gm. 1021 exhibited negative significant and desirable SCA effects for dwarfness, four top crosses i.e. Gm. 371 x Gm. 1002, Gm. 375 x Gm. 1002, Gm. 378 x Gm. 1002 and Gm. 383 x Gm. 1021 gave desirable SCA effects for ear position towards (low ear position), while, the top cross Gm. 378 x Gm. 1021 gave negative significant and desirable SCA effects for earliness, dwarfness and low ear position, five top crosses Gm. 373 x Gm. 1002, Gm. 374 x Gm. 1002, Gm. 380 x Gm. 1021, Gm. 381 x Gm. 1002 and Gm. 383 x Gm. 1002 gave significant and desirable SCA effects for resistance to late wilt disease. In addition to, five top crosses gave significant and desirable SCA effects for ear length, one top cross gave significant and desirable SCA effects for ear diameter, three top crosses exhibited significant and desirable SCA effects for number of rows/ear, two top crosses gave significant and desirable SCA effects for number of kernels/row. Moreover, the top cross Gm. 386 x Gm. 1002 gave highly significant and desirable of SCA effects for grain yield, ear length, number of rows/ear and number of kernels/row. On the combined data, five top crosses i.e; Gm 382 x Gm 1021 (31.9 ard/fed), Gm 383 x Gm 1021(31.6 ard/fed), Gm 385 x Gm 1021(31.5 ard/fed), Gm 385 x Gm 1002 (31.4 ard/fed) and Gm 387 x Gm 1002 (31.4 ard/fed) out yielded than the two crosses S.C. 3084 and S.C. 155 (31.2 and 28.7 ard /fed.), respectively.

The relative increasing percentage for the top crosses relative to the two check crosses (SC 3084and SC155) for grain yield from combined data are presented in Table(7). For the top crosses with inbred line Gm 1021 as tester, relative increasing ranged from -35.9% to 2.2% and -30.3% to 11.2 %relative to SC 3084 and SC 155, respectively. Out of the seventeen crosses under study two crosses were higher than the two check crosses (SC 3084 and SC 155). Increasing percentage of grain yield (ard./ fed). for the two check crosses i.e (Gm385 x 1021) and (Gm383 x 1021) relative to the two check crosses SC.3084 and SC. 155 ranged from 1.3% to 10.1% and from 2.2% to 11.2%, respectively. For the top crosses with inbred line 1002 as tester, relative increasing ranged from -57.4% to 0.3% and -53.7% to 9.1% relative to SC3084 and SC 155, respectively. Out of seventeen crosses under study two crosses were higher than the two check crosses. Increasing percentage of two crosses (Gm387 x 1002) and (Gm385 x 1002) relative to SC 3084 and SC 155 were 0.3% to 8.4%and 0.3% to 9.1%, respectively from the previous results, it could concluded that line 1021 as tester was more efficient than line 1002 as tester for evaluation of both general and specific combining ability and suggest the immediate use of these lines in producing new single crosses.

Table (6): Estimates of specific combining ability effects for 34 top crosses under two locations for the studied tratis.

Top Crosses		Days to 50% silking	Plant height	Ear height	Ear position	Resistance to late wilt
Gm371 x Gm1021		-0.125	10.743**	11.713**	2.195*	-0.044
Gm371 x Gm1002		0.125	-10.743**	-11.713**	-2.195*	0.044
Gm372 x Gm1021		-0.563	-4.507	-7.349*	-1.805	0.982
Gm372 x Gm1002		0.563	4.507	7.349	1.805	- 0.982
Gm373 x Gm1021		0.500	9.930*	4.338	-0.555	-1.456**
Gm373 x Gm1002		-0.500	-9.300*	-4.338	0.555	1.456**
Gm374 x Gm1021		-0.250	-6.320	-7.287	-1.430	-1.169*
Gm374 x Gm1002		0.250	6.320	7.287	1.430	1.169*
Gm375 x Gm1021		1.250**	5.180	8.463*	2.195*	-0.107
Gm375 x Gm1002		-1.250**	-5.180	-8.463*	-2.195*	0.107
Gm376 x Gm1021		-0.188	0.368	-3.974	-1.618	-0.607
Gm376 x Gm1002		0.188	-0.368	3.974	1.618	0.607
Gm377 x Gm1021		-0.500	4.493	3.651	0.570	0.393
Gm377 x Gm1002		0.500	-4.493	-3.651	-0.570	-0.393
Gm378 x Gm1021		-1.313**	-7.820*	-10.162**	-2.118*	-0.357
Gm378 x Gm1002		1.313**	7.820*	10.162**	2.118*	0.357
Gm379 x Gm1021		-0.125	1.555	0.963	0.132	0.206
Gm379 x Gm1002		0.125	-1.555	-0.963	-0.132	-0.206
Gm380 x Gm1021		-0.750	-6.820	-8.099*	-1.555	1.044*
Gm380 x Gm1002		0.750	6.820	8.099*	1.555	-1.044*
Gm381 x Gm1021		-0.623	6.743	3.588	-0.055	-1.331*
Gm381 x Gm1002		0.623	-6.743	-3.588	0.055	1.331*
Gm382 x Gm1021		0.125	-8.882*	-6.287	-0.430	-0.169
Gm382 x Gm1002		-0.125	8.882*	6.287	0.430	0.169
Gm383 x Gm1021		0.863	1.993	8.463*	2.445*	-1.581**
Gm383 x Gm1002		-0.863**	-1.993	-8.463*	-2.445*	1.581**
Gm384 x Gm1021		0.438	5.618	4.026	0.257	-0.294
Gm384 x Gm1002		-0.438	-5.618	-4.026	-0.257	0.294
Gm385 x Gm1021		0.125	7.805*	8.026*	1.382	-0.232
Gm385 x Gm1002		-0.125	-7.805*	-8.026*	-1.382	0.232
Gm386 x Gm1021		0.750	-14.007**	-8.412*	-0.118	-0.4852
Gm386 x Gm1002		-0.750*	14.007**	8.412*	0.118	0.482
Gm387 x Gm1021		0.375	-5.570	-1.662	0.507	-0.518
Gm387 x Gm1002		-0.375	5.570	1.662	-0.507	0.518
L.S.D. Sij	0.05	0.653	7.721	6.661	1.897	1.033
	0.01	0.860	10.163	8.768	2.497	1.359
L.S.D. Sij-SKI	0.05	0.924	10.919	9.421	2.683	1.460
	0.01	1.216	14.373	12.401	3.532	1.922

Table (6):Count.

Top Crosses		Ear length	Ear diameter	Number of rows/ear	Number of kernels/row	Grain yield
Gm371 x Gm1021		0.717	-0.051	-0.029	2.75*	3.772*
Gm371 x Gm1002		-0.717	0.051	0.029	-2.75*	-3.772*
Gm372 x Gm1021		-0.158	0.136	-0.467	-0.625	1.647
Gm372 x Gm1002		0.158	-0.136	0.467	0.625	-1.647
Gm373 x Gm1021		0.217	0.011	-0.154	-0.125	2.335
Gm373 x Gm1002		-0.217	-0.011	0.154	0.125	-2.335
Gm374 x Gm1021		0.404	0.261*	0.033	-0.250	-1.103
Gm374 x Gm1002		-0.404	-0.261*	-0.033	0.250	1.103
Gm375 x Gm1021		1.717**	0.114	-0.904	1.188	-0.415
Gm375 x Gm1002		-1.717**	-0.114	0.904	-1.188	0.415
Gm376 x Gm1021		0.154	0.323	0.408	0.813	-0.915
Gm376 x Gm1002		-0.154	-0.323	-0.408	-0.813	0.915
Gm377 x Gm1021		0.404	0.136	1.033**	1.438	3.460*
Gm377 x Gm1002		-0.404	-0.136	-1.033**	-1.438	-3.460*
Gm378 x Gm1021		-1.846**	0.074	0.471	-0.125	-3.790**
Gm378 x Gm1002		1.846**	-0.074	-0.471	0.125	3.790**
Gm379 x Gm1021		0.654	0.074	0.408	2.313	2.772
Gm379 x Gm1002		-0.654	-0.074	-0.408	-2.313	-2.772
Gm380 x Gm1021		-0.971	0.074	-0.279	-1.688	-1.478
Gm380 x Gm1002		0.971	-0.074	0.279	1.688	1.478
Gm381 x Gm1021		-0.217	-0.176	-0.783	1.313	3.022*
Gm381 x Gm1002		0.217	0.176	0.783	-1.313	-3.022*
Gm382 x Gm1021		-1.096**	-0.051	0.846**	-2.313	-3.830
Gm382 x Gm1002		1.096**	0.051	-0.846**	2.313	-3.830
Gm383 x Gm1021		0.654	-0.176	0.096	-0.500	1.835
Gm383 x Gm1002		-0.654	0.176	-0.096	0.500	-1.835
Gm384 x Gm1021		0.217	-0.239	-0.279	-0.25.	-2.165
Gm384 x Gm1002		-0.217	0.239	0.279	0.250	2.165
Gm385 x Gm1021		-0.033	-0.011	-0.529	0.250	2.272
Gm385 x Gm1002		0.033	0.011	0.529	-0.250	-2.272
Gm386 x Gm1021		-2.408**	-0.239	-0.904**	-5.438**	-5.728**
Gm386 x Gm1002		2.408**	0.239	0.904**	5.438**	5.728**
Gm387 x Gm1021		1.154**	-0.051	-0.529	1.250	1.665
Gm387 x Gm1002		-1.154**	0.051	0.529	-1.250	-1.665
L.S.D. Sij	0.05	0.817	0.264	0.627	2.646	2.946
	0.01	1.076	0.348	0.826	3.483	3.878
L.S.D. Sij-SKI	0.05	1.155	0.374	0.888	3.742	4.165
	0.01	1.520	0.492	1.167	4.925	5.483

Table (7): Increasing percentage for crosses relative to the two check hybrids for grain yield (ard./fed.) from combined data.

Lines	S.C. 3084		S.C. 155	
	1002	1021	1002	1021
Gm. 371	-10.3**	-6.1**	-2.4	2.1
Gm. 372	-28.2**	-35.9**	-21.9**	-30.3**
Gm. 373	-17.0**	-19.9**	-9.8**	-12.9**
Gm. 374	-35.6**	-15.4**	-29.9**	-8.0**
Gm. 375	-26.6**	-14.7**	-20.2**	-7.3**
Gm. 376	-35.3**	-5.4**	-29.6**	2.8**
Gm. 377	-33.3**	-0.6	-27.5**	8.0**
Gm. 378	-57.4**	-5.8**	-53.7**	2.4
Gm. 379	-17.3**	-23.7**	-10.1**	-17.1**
Gm. 380	-38.1**	-7.7**	-32.8**	0.5
Gm. 381	-3.5**	-8.0**	4.9**	0.0
Gm. 382	-24.0**	2.2	-17.4**	11.2**
Gm. 383	-19.2**	0.96	-12.2**	9.8**
Gm. 384	-11.9**	-4.2**	-4.2**	4.2**
Gm. 385	0.3	1.3	9.1**	10.1**
Gm. 386	-6.4**	-6.4**	1.7	1.7
Gm. 387	0.3	-8.3**	8.4**	-0.4
Mean	-21.4**	-9.3**	-14.6**	-1.4

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

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القدرة على الائتلاف لبعض سلالات الذرة الشامية الصفراء الجديدة تحت موقعين مختلفين

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الملخص العربي

تم إجراء التهجين بين سبعة عشر سلالة صفراء جديدة من الذرة الشامية وكشافين هما سلالة جميزة ١٠٢١ وسلالة جميزة ١٠٠٢ في موسم ٢٠٠٤ ثم قيمت الهجن القمية الناتجة وعددها ٣٤ هجين قمي في محطة البحوث الزراعية بالجميزة وملوى وذلك في موسم ٢٠٠٥ واستخدم هجينين للمقارنة وهما (هـ.ف ١٥٥ – هـ.ف ٣٠٨٤) كهجن قياسية .

أخذت القياسات على الصفات التالية :- عدد الأيام حتى ٥٠% تزهير للحراير (يوم)- ارتفاع النبات (سم)- ارتفاع الكوز (سم)- موقع الكوز (كنسبة مئوية بين ارتفاع الكوز وارتفاع النبات)- نسبة المقاومة لمرض الذبول المتأخر – محصول الحبوب (إردب / فدان) – طول الكوز (سم) – قطر الكوز (سم) – عدد السطور للكوز وعدد الحبوب للسطر .واستخدمت طريقة تحليل السلالة × الكشافات المقترحة بواسطة العالم كمبثورن سنة (١٩٥٧) ويمكن تلخيص النتائج كما يلي:-

١. أظهرت النتائج اختلافات معنوية عالية بين الموقعين (الجميزة وملوي).
٢. أظهرت الهجن القمية ومكوناتها (السلالات – الكشافات – السلالات مع الكشافات)اختلافات معنوية لمعظم الصفات المدروسة.
٣. كان تباين القدرة الخاصة على الائتلاف أكثر أهمية من التباين الوراثي المضيف في وراثة الصفات المدروسة ماعدا صفة عدد السطور بالنسبة للكوز.
٤- أظهرت السلالة جميزة ٣٧٦ تأثيرات معنوية موجبة ومفيدة بالنسبة لصفة محصول الحبوب وعدد الحبوب للسطر وطول الكوز. كما اعطت ٤ سلالات أخرى تأثيرات مرغوبة لصفة المحصول أيضا.
٥- أيضاً أظهرت السلالات جميزة ٣٧٧ ، ٣٧٩ ، ٣٨١ تأثيرات جيدة نحو التبكير وقصر النبات .
٦- أظهرت السلالات جميزة٣٧٣ ، ٣٨١ ، ٣٨٣ تأثيرات مرغوبه للقدرة العامة والمقاومة لمرض الذبول المتأخر . بينما أظهر الكشاف ١٠٠٢ تأثيرات جيدة للقدرة العامة نحو التبكير والتقزم – طول

الكوز ومحصول الحبوب بينما أظهر الكشاف ١٠٢١ تأثيرات جيدة للقدرة العامة لمقاومة مرض الذبول المتأخر – قطر الكوز وعدد السطور للكوز

٧. أعطت خمسة هجن فردية (قمية) تأثيرات جيدة للقدرة الخاصة على الائتلاف بالنسبة لصفة المحصول بينما أعطى الهجين (جميزة ٣٨٦ × جميزة ١٠٠٢) أحسن تأثيرات للقدرة الخاصة لصفات محصول الحبوب – طول الكوز – عدد السطور وعدد الحبوب حيث يعتبر أفضل الهجن بالنسبة لمحصول الحبوب ومكوناته.

٨- تفوقت خمسة هجن قمية وهى جميزة ٣٨٢ × جميزة ١٠٢١ (٣١,٩ إردب/فدان) – جميزة ٣٨٣ × جميزة ١٠٢١

(٣١,٦ إردب/فدان). – جميزة ٣٨٥ × جميزة ١٠٢١ (٣١,٥ إردب/ فدان) – جميزة ٣٨٥ × جميزة ١٠٠٢ (٣١,٤ إردب/ فدان) وجميزة ٣٨٧ × جميزة ١٠٠٢ (٣١,٤ أردب/فدان) محصوليا عن هجن المقارنة وهما هـ٠ف ١٥٥(٢٨,٧ إردب / فدان). هـ٠ف ٣٠٨٤ (٣١,٢ إردب/فدان

٩- تراوحت قيم النسبة المئوية للزيادة المحصولية للهجن القمية مع السلالة جميزة ١٠٢١ ككشاف من -٣٥,٩% إلي ٢,٢% ، من -٣٠,٣% إلي ١١,٢% وذلك بالنسبة لهجين المقارنه وهما هـ.ف ٣٠٨٤ وهـ.ف ١٥٥ على التوالي وكانت أعلى قيم للنسبة المئوية للزيادة المحصولية كانت للسلالات المشتركة مع السلالة جميزة ١٠٢١ في الهجن (جميزة ١٠٢١ × جميزة ٣٨٥) و(جميزة ١٠٢١ × جميزة ٣٨٢).

١٠- تراوحت قيم النسبة المئوية للزيادة المحصولية للهجن القمية مع السلالة جميزة ١٠٠٢ ككشاف من -٥٧,٤% إلي ٠,٣% ومن -٥٣,٧% إلي ٩,١% بالنسبة لهجن المقارنة هـ.ف ٣٠٨٤ وهـ.ف ١٥٥ على التوالي وأعلى قيم للنسبة المئوية للزيادة المحصولية كانت للسلالات المشتركة مع السلالة جميزة في الهجن (جميزة ١٠٠٢ × جميزة ٣٨٧) و(جميزة ١٠٠٢ × جميزة ٣٨٥).

١١- وتعتبرهذة النتائج ذات اهتمام كبير لمربى الأذرة الشامية والتى يتم إدخالها فى برامج التربية لتحسين محصول الحبوب والصفات المساهمة.