Table 1. Mean squares for genotypes and their general and specific combining abilities, and gca/sca ratio for the studied characters

Source of variance	d.f.	Mean squares							
		Dayes to 50% flowering	**Plant height (cm)**	**First fruiting node**	**Number of branches/plant**	**Number of seeds/pod**	**Number of pods/plant**	**100-seed weight (g)**	**Seed yield/plant (g)**
Blocks	2	23.59**	6.13	0.94	1.68**	0.03	5.94	10.13	4.05
Genotypes	27	42.52**	366.21**	13.31**	1.03**	0.10*	115.83**	280.91**	209.64**
G.C.A.	6	143.36*	754.83**	15.71**	1.78**	0.153**	234.90**	139.56**	86.84**
S.C.A.	21	13.71**	255.204**	12.63**	0.82**	0.078*	81.81**	321.29**	244.719**
Error	54	5.06	17.08	1.34	0.17	0.03	6.60	7.26	4.52
g_i^2 / S_{ij}^2	--	1.78	0.34	0.14	0.28	0.28	0.34	0.05	0.04

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

Table 2. Means of parents and their F_1-hybrids for the studied characters:

Genotypes	Dayes to 50% flowering	Plant height (cm)	First fruiting node	Number of branches/plant	Number of seeds/pod	Number of pods/plant	100-seed weight (g)	Seed yield/plant (g)
M1	47.33	141.07	17.25	4.21	2.90	16.40	79.35	40.60
M2	51.67	120.75	12.55	4.15	2.86	17.00	93.79	37.44
G2	56.67	153.07	14.54	4.18	2.54	17.92	74.49	26.45
G843	46.67	141.97	11.33	4.48	2.99	26.02	89.71	26.97
As67	55.33	150.10	12.60	3.50	2.93	17.19	84.26	30.31
G40	42	152.50	13.16	3.20	2.65	27.37	93.86	41.65
G429	49	131.92	13.2	3.84	2.91	34.31	76.60	32.54
M1/M2	45.67	138.96	10.32	3.64	3.01	18.96	107.50	52.78
M1/G2	54.67	165.60	12.83	3.88	3.13	22.00	97.88	47.63
M1/G843	52.67	148.76	11.4	3.74	2.96	15.97	93.03	46.48
M1/As67	50.67	167.73	10.83	3.60	3.10	17.07	95.18	29.08
M1/G40	46.33	158.94	13.05	3.95	2.89	17.83	98.21	42.03
M1/G429	49	150.71	15.87	3.83	2.85	31.69	87.71	33.04
M2/G2	56	156.50	10.75	5.75	2.90	21.75	98.74	49.39
M2/G843	53.67	150.60	11.5	4.82	3.05	18.88	78.80	50.25
M2/As67	55.67	138.71	13.67	4.71	3.21	15.25	96.92	49.90
M2/G40	48	152.40	13.17	3.83	2.97	25.35	86.71	51.12
M2/G429	50.67	149.33	14.32	4.43	2.81	18.95	75.09	30.12
G2/G843	51	161.81	17.15	3.43	2.86	20.07	95.94	39.58
G2/As67	57.33	147.00	9.17	4.44	2.92	25.89	102.30	48.42
G2/G40	49	161.30	16.02	4.30	2.75	23.00	92.51	42.69
G2/G429	52.33	156.98	14.3	3.48	2.84	15.02	89.92	41.26
G843/As67	49	152.80	12.12	4.62	3.25	14.92	107.12	53.53
G843/G40	49	170.06	14.09	3.65	2.95	24.50	88.62	41.58
G843/G429	51	155.38	17	3.83	3.00	26.50	110.44	41.78
As67/G40	48.33	166.92	11.65	3.48	2.92	32.13	98.75	42.59
As67/G429	51	146.79	13.58	4.33	3.31	34.75	101.18	53.24
G40/G429	46	154.74	14.9	2.83	3.32	28.29	87.77	48.22

Table 3. Mean squares of Wr+Vr and Wr-Vr analysis

Source of variance	d.f.	Mean squares							
		Dayes to 50% flowering		Plant height (cm)		First fruiting node		Number of branches/plant	
		Wr+Vr	Wr-Vr	Wr+Vr	Wr+Vr	Wr+Vr	Wr-Vr	Wr+Vr	Wr-Vr
Reps	2	269.26	15.94	918.12	5131.76	45.18	29.95	0.01	0.09
Bet. Arrays	6	187.38*	54.64	21364.59**	718.33	38.81*	25.04	0.11	0.18
Error	12	40.77	45.67	2834.35	615.61	11.42	12.71	0.05	0.07
Source of variance	**d.f.**	**Mean squares**							
		Number of pods/plant		**Numberof seeds/pod**		**100-seed weight (g)**		**Seed yield/plant (g)**	
		Wr+Vr	Wr-Vr	Wr+Vr	Wr-Vr	Wr+Vr	Wr-Vr	Wr+Vr	Wr-Vr
Reps	2	1381.098	57.9666	0.00019	0.00407	872.368	992.6036	63.38926	125.6924
Bet. Arrays	6	4504.6**	789.89**	0.00113	0.00088	8625.2**	12617.95**	2077.948**	4634.861**
Error	12	106.6673	45.15565	0.00090	0.00102	644.824	585.8392	354.0969	40.93742

*,** significant at 0.05 and 0.01 level of probability

Table 4. General combining ability (gca) effects for the seven parents for all the studied characters

Parents	Days to 50% flowering	Plant height (cm)	First fruiting node	Number of branches/plant	Number of seeds/pod	Number of pods/plant	100-seed weight (g)	Seed yield/plant (g)
M1	-1.201**	0.046	0.270	-0.109	0.010	-2.219**	0.043	-0.249
M2	0.947*	-9.376**	-0.840**	0.383**	0.002	-2.573**	-0.721	2.662**
G2	3.243**	4.770**	0.326	0.178*	-0.130**	-1.414**	-1.282**	-1.339**
G843	-0.534	1.214	-0.050	0.111	0.045	-0.929	1.727**	-0.816*
As67	2.021**	0.863	-1.129**	0.017	0.103**	-1.095*	3.572**	0.323
G40	-3.757**	6.330**	0.313	-3.999**	-0.062*	2.949**	0.274	1.894**
G429	-0.720	-3.846**	1.110**	-0.180*	0.032	5.282**	-3.612**	-2.416**

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

Table 5. Specific combining ability effects (sca) for F_1 hybrids for all the studied characters

Crosses	Dayes to 50% flowering	Plant height (cm)	First fruiting node	Number of branches/ plant	Number of seeds/pod	Number of pods/plant	100-seed weight (g)	Seed yield/plant (g)
M1/M2	-4.639**	-3.259	-2.407**	-0.641**	0.042	1.716	15.946**	8.557**
M1/G2	2.065	9.235**	-1.059	-0.190	0.293**	3.597**	6.888**	7.468**
M1/G843	3.843**	-4.079	-2.114**	-0.266	-0.051	-2.918*	-0.965	5.735**
M1/As67	-0.713	15.276**	-1.605**	-0.312	0.031	-1.656	-0.660	-12.804**
M1/G40	0.731	1.018	-0.833	0.451*	-0.014	-4.936**	5.665**	-1.425
M1/G429	0.361	2.955	1.190*	0.111	-0.148	6.591**	-0.946	-6.102**
M2/G2	1.250	9.557**	-2.033**	1.184**	0.075	3.701**	8.515**	6.321**
M2/G843	2.694*	7.213**	-0.908	0.318	0.047	0.343	-14.434**	6.591**
M2/As67	2.139	-4.322*	2.338**	0.309	0.152	-3.119*	1.838	5.105**
M2/G40	0.250	3.897	0.397	-0.155	0.073	2.935*	-5.068**	4.758**
M2/G429	-0.120	11.007**	0.749	0.226	-0.181*	-5.795**	-12.805**	-11.939**
G2/G843	-2.269	4.277*	3.577**	-0.867**	-0.015	0.374	3.270*	-0.011
G2/As67	1.509	-10.182**	-3.324**	0.244	-0.003	6.363**	7.783**	7.686**
G2/G40	-1.046	-1.349	2.084**	0.517*	-0.021	-0.570	1.290	0.385
G2/G429	-0.750	4.504*	-0.433	-0.520*	-0.015	-10.884**	2.586	3.262**
G843/As67	-3.046**	-0.826	-0.002	0.484*	0.146	-10.039**	9.590**	12.210**
G843/G40	2.731*	10.967**	0.533	-0.066	0.007	0.444	-5.606**	-1.307
G843/G429	1.694	6.460**	2.643**	-0.103	-0.037	0.111	20.097**	3.202**
As67/G40	-0.491	8.175**	-0.831	-0.139	-0.080	5.237**	2.767*	-1.437
As67/G429	-0.861	-1.772	0.305	0.491*	0.216*	8.527**	8.989**	13.523**
G40/G429	-0.083	0.711	0.180	-0.596**	0.393**	-1.977	-1.120	6.929**

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

Table 6. Percentage of heterosis relative to mid- and better parent fro the studied traits

Entry	days to 50% flowering		Plant height		First fruiting nodes on the main stem		Number of branches/plant	
	M.P heterosis	B.P. heterosis	M.P heterosis	B.P. heterosis	M.P heterosis	B.P. heterosis	M.P heterosis	B.P. heterosis
M1/M2	-7.74*	-3.51	6.15**	-1.50	-30.74**	-17.76*	-12.96	-13.54
M1/G2	5.13	15.51**	12.60**	8.19**	-19.28**	-11.76	-7.42	-7.84
M1/G843	12.06**	12.86**	5.12*	4.78*	-20.22**	0.61	-13.94*	-16.52
M1/As67	-1.29	7.06	15.21**	11.74**	-27.46**	-14.05	-6.63	-14.51
M1/G40	3.72	10.31*	8.29**	4.22	-14.17*	-0.84	6.55	-6.24
M1/G429	1.72	3.53	10.41**	6.83**	4.20	20.23**	-4.93	-9.11
M2/G2	3.38	8.38*	14.31**	2.24	-20.63**	-14.34	38.09**	37.57**
M2/G843	9.15**	15.00**	14.65**	6.07*	-3.69	1.50	11.68	7.60
M2/As67	4.06	7.74*	2.43	-7.59**	8.66	8.92	23.21**	13.56
M2/G40	2.48	14.29**	11.55**	-0.06	2.45	4.94	4.31	-7.63
M2/G429	0.66	3.41	18.20**	13.20**	11.22	14.10	10.97	6.83
G2/G843	-1.30	9.28*	9.69**	5.70*	33.15**	51.37**	-20.85**	-23.48*
G2/As67	2.375	3.61	-3.02	-3.97	-32.42**	-27.22**	15.77*	6.38
G2/G40	-0.69	16.67**	5.57**	5.37*	15.67*	21.73**	16.57*	2.93
G2/G429	-0.97	6.80	10.16**	2.55	3.10	8.33	-13.14	-16.65
G843/As67	-3.92	4.99	4.63*	1.80	1.30	6.97	15.79	3.16
G843/G40	10.51**	16.67**	15.50**	11.51**	15.07*	24.36**	-4.97	-18.52*
G843/G429	6.61	9.28*	13.46**	9.44**	38.61**	50.04**	-7.81	-14.36
As67/G40	-0.70	15.07**	10.32**	9.46**	-9.55	-7.54	3.98	-0.57
As67/G429	-2.23	4.08	4.10	-2.20	5.27	7.78	18.08*	12.85
G40/G429	1.10	9.52*	8.81**	1.47	13.05*	13.22	-19.54*	-26.24**

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

Table 6. continue.

Entry	Number of pods/plant		Number of seeds/pod		100 seed weight'g		Seed yield/plant'g	
	M.P heterosis	B.P. heterosis	M.P heterosis	B.P. heterosis	M.P heterosis	B.P. heterosis	M.P heterosis	B.P. heterosis
M1/M2	13.53	11.53	4.58	3.79	24.18**	14.62**	35.27**	30.01**
M1/G2	28.21*	22.77	15.29**	7.93	27.25**	23.35**	42.08**	17.32**
M1/G843	-24.71**	-38.62**	0.55	-1.00	10.06**	3.71	37.58**	14.49**
M1/As67	1.64	-0.70	6.50	5.80	16.35**	12.96**	-17.98**	-28.37**
M1/G40	-18.53*	-34.86**	4.15	-0.34	13.40**	4.63	2.20	0.91
M1/G429	24.99**	-7.64	-1.75	-2.06	12.49**	10.54**	-9.65*	-18.62**
M2/G2	24.57*	21.37	7.62	1.40	17.35**	5.28*	54.61**	31.92**
M2/G843	-12.23	-27.44**	4.26	2.00	-14.11**	-15.98**	56.03**	34.21**
M2/As67	-10.79	-11.29	11.12*	9.56	8.86**	3.34	47.31**	33.28**
M2/G40	14.27	-7.38	7.96	3.85	-7.58**	-7.62**	29.27**	22.74**
M2/G429	-26.14**	-44.77**	-2.43	-3.44	-11.86**	-19.94**	-13.92**	-19.55**
G2/G843	-8.65	-22.87**	3.32	-4.35	16.86**	6.94**	48.18**	46.76**
G2/As67	47.48**	44.48**	6.97	-0.34	28.88**	21.41**	70.61**	59.75**
G2/G40	1.57	-15.97*	5.79	3.77	9.90**	-1.44	25.37**	2.50
G2/G429	-42.49**	-56.22**	4.47	-2.41	19.02**	17.39**	39.89**	26.80**
G843/As67	-30.94**	-42.66**	9.66*	8.70	23.15**	19.41**	86.91**	76.61**
G843/G40	-8.22	-10.49	4.31	-1.34	-3.44	-5.58*	21.19**	-0.17
G843/G429	-12.15*	-22.76**	1.59	0.33	32.81**	23.11**	40.41**	28.40**
As67/G40	44.21**	17.39*	4.49	0.34	10.88**	5.21*	18.37**	2.26
As67/G429	34.95**	1.28	13.31**	12.97**	25.79**	20.08**	69.42**	63.61**
G40/G429	-8.27	-17.55*	19.49**	14.09**	2.98	-6.49**	29.99**	15.77**

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