

Combining ability studies in sunflower (*Helianthus annus* L.)

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SUMMARY

In the present study 4 CMS lines and 9 testers were crossed in Line X tester fashion. The 36 hybrids with 16 parents and 3 standard check hybrids (KBSH-1, MSFH-17 and SCH-35) were grown to estimate gca and sca effects for nine characters. The CMS-234B and CMS-207 B were good general combiners while among the testers LTR-DMLT-1(Y)22, LTRR-1-856II and LTR-17-B were good general combiners for seed yield per plant. Among hybrids, the best performance for seed yield and sca effects were noticed for CMS-234A x LTRR-1-822 which out yielded all the check hybrids.

Key words :Sunflower, *Helianthus annus*, Heterosis, Specific combining ability.

In the sunflower a cross pollinated crop, combining ability analysis is of special significant to identify parental lines to be used to develop good hybrids/synthesis/ composites. Earlier studies led to the selection of inbreds with high gca and predominance of non additive gene action for seed yield and its components. The present investigation aims at identification of superior parents (lines and testers) and cross combinations for seed yield and its component characters.

MATERIALS AND METHODS

In the present study, four male sterile lines were crossed with 9 testers in line x tester fashion. The 36 F₁ hybrids, 13 parents and 3 check hybrids KBSH-1, MSFH-17 and SCH-35 were grown in randomized block design

with three replications. In each replication the parents and hybrids were sown separately in single row plot of 4.5 m length and spacing of 60 cm and 30 cms between and within row respectively. The recommended cultural practices including plant protection measures were followed. The morphological observations on nine quantitative characters were recorded by selecting five competitive plants in each breeding lines. The individual plant data for days to 50 per cent flowering, days to maturity, plant height, head diameter, test weight, oil content, volume weight, hull content and seed yield per plant was subjected to statistical analysis of variance.

RESULTS AND DISCUSSION

Analysis of variance for gca (Table 1) revealed that

Table 1 : Analysis of variance for combining ability

Character	Source of variation					
	Replication (2 d.f.)	Lines effects (3 d.f.)	Tester effect (8 d.f.)	Line x Tester (24 d.f.)	Error (70 d.f.)	Total (107 d.f.)
Days to 50 % flowering	3.44	250.30**	41.12**	8.40**	2.32	13.55
Days to maturity	0.17	401.43**	30.36	25.95**	4.77	22.47
Seed yield /plant (g)	6.28	1969.40**	622.00	198.51**	9.94	152.87
Head diameter (cm)	2.50	8.20*	8.38**	1.74	102.31	240.99
Volume weight (gms/ 100 ml)	9.75	121.39*	84.72*	27.84**	12.10	24.08
Test weight (g)	0.24	1.84	6.89	0.67**	0.17	0.38
Plant height (cm)	25.23	1808.40**	1480.49*	229.41**	55.26	249.48
Hull content (%)	5.95	7.97	5.51	7.75**	2.32	6.01
Oil content (%)	0.36	80.22**	55.85*	14.82**	0.66	10.19

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