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Combining ability studies of local land races based restorers in sorghum

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ABSTRACT

The experiment material comprised of four male sterile line *viz.*, 1409 A, 104 A, 185 A and 116 A were crossed with ten local land races in a line x tester mating design to produce forty hybrid combinations. These hybrid combinations were evaluated in Randomized Block Design with three replication during *rabi* 2005. Analysis of variance for combining ability revealed that significant variation for general combining ability among males and females for all characters under study. Male x Female interaction indicated the significant variation for specific combining ability for all characters studied. The general combining ability effects showed that none of the parents was a good general combiner for all characters. Among the females 185A contributed favorable genes for panicle length, panicle breadth, 1000 grain weight and grain yield. While 1409 A was the good general combiner for days to 50 % flowering and panicle length. In term of plant height, 104 A was a good general combiner. Amoung the males RSLG 301 was found to have a high and desirable gca for grain yield and panicle breadth. Another male parents RSLG 320 was the best general combine for 1000 grain weight plant height and panicle length.

Key words : Hybrid, Local land race, General combining ability and Specific combining ability.

INTRODUCTION

Knowledge of the genetic behavior of various characters is important in the selection of superior parents for hybridization is a successful breeding programme. Therefore, present study was undertaken to assess the combining ability of different local land races of *rabi* sorghum collected from different *rabi* sorghum growing tracts of Maharashtra. However, these local land races are good source of drought, shootfly tolerance and having local adaptability. Using line x tester analysis with objectives to collect information about*= -*-gca effects of parents and gca effects of crosses in F_1 generations with view to identify promising hybrids better than CSH 15 R.

MATERIALS AND METHODS

The experiment material comprised of four male sterile line *viz.*, 1409 A, 104 A, 185 A and 116 A were crossed with ten local land races in a line x tester mating design to produce forty hybrid combinations. These hybrid combinations were evaluated in Randomized Block Design (RBD) with three replication during *rabi* 2005. Each entry was planted in two rows of 4.50 m with spacing of 45 cm between rows and 15 cm between plant with in a row at experimental field of AICSIP, MPKV., Rahuri.(M.S.). The recommended agronomic practices were followed to raise a healthy crop. The data were recorded in randomly selected five plants in each plots for days to 50 per cent flowering, plant height, panicle length, panicle breadth, 1000 grain weight and grain yield plant^{-1}. The combining ability analysis was performed according to methodology suggested by Kempthrone (1957).

RESULTS AND DISCUSSION

Analysis of variance for combining ability (Table 1) revealed that significant variation for general combining

Table 1 : Analysis of variances for combining in *rabi* sorghum

Source	DF	Days to 50% flowering	Plant height (cm)	Panicle length (cm)	Panicle breadth (cm)	1000 grain weight	Grain yield (g)
Lines	3	377.85**	1373.67**	30.50**	9.87**	37.00**	3165.66**
Tester	9	196.60**	2937.11**	16.52**	3.68**	30.53**	346.00**
L x T	27	65.06**	1813.44**	8.46**	2.04**	27.24**	812.00**
Error	39	1.84	80.88	1.14	0.20	0.92	41.46
O^2 gca	-	2.34	3.42	0.72	0.22	0.31	44.94
O^2 sca	-	21.08	577.54	2.43	0.39	8.77	256.86
O^2 gca/ O^2 sca	-	0.11	0.005	0.30	0.56	0.40	0.17

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