Combining ability studies in greengram (*Vigna radiata* (L.) *wilczek*)

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SUMMARY

Intra- specific hybridization was carried out by adopting L x T model for which the parents were selected from the core collection by giving due weightage for genetic diversity and wide adaptability. Computation of GCA and SCA variances for most of the traits indicated predominance of dominant gene action as SCA variances were higher than GCA variance. The mean performance of parents and hybrids were higher for various characters viz.,K1(3.05) and Vellore local (3.00), VRM(Gg)1 x Vellore local (4.50) for number of branches per plant, CO4 (53.80) and K1 x Pusa bold (50.70) for length of branch. For number of clusters per branch, Vellore local (14.85) and K1 x Vellore local (14.38) recorded highest mean performance. Vellore local (22) and VRM(Gg)1 x Vellore local (25.50) for number of cluster per plant, CO4 (59.15) and VRM(Gg)1 x VBN(Gg)2 (49.90) for number of pods per plant and for hundred seed weight highest mean performance among the parents and crosses were registered by Pusa bold (3.90) and K1 x ML 267 (3.57) and K1 x Pusa bold (3.56).

Key words: Green gram, Intra-specific hybidization

*V*igna radiata (L.) wilczek, commonly known as green gram or mungbean is the most widely distributed species among the six Asiatic Vigna species. The average yield of mungbean is very low not only in India (425 kg/ha) but in entire tropical and subtropical Asia. In Tamil Nadu it is cultivated in an area of 1.63 lakhs hectare with a production of 0.78 lakh tonnes. Besides management factors the prime cause for the low productivity can be ascribed to the inherently low yielding potential of the cultivars coupled with susceptibility to diseases. The varietal breeding program taken up in this crop had resulted only with limited success as far as yield improvement is concerned. The basic reason for limited success had been due to the limited variability prevailed among the parents used for hybridization in most of the studies. There had been always possibility of improving the crop by creating variability through hybidization. This study was taken up keeping the following objectives in mind, to generate variability through intra specific crosses involving Vigna radiata and to evaluate intraspecific hybrids for yield and yield components.

MATERIALS AND METHODS

The lines and testers were selected from the clusters of the core collection in such a way that no line and tester were from the same cluster. Adaptability and stability of parents were also given due weigtage in the selection procedure.

Female viz., CO 4(L1) VRM(Gg)1 (L2), VBN1 (L3) and K1 (L4). Male viz., Pusa bold (T1), ML 267 (T2), ML 682 (T3), VBN (Gg) 2 (T4) and Vellore local (T5). Twenty crosses were made using above parents in L x T fashion

and their F_1s were planted in a randomized block design with two replications during Rabi 2003. Each entry was grown in a single row of 4-m length. The spacing was 30 cm between and 10 cm within the rows. Observation were recorded on five randomly selected plants from each plot for days to 50 per cent flowering, plant height, number of branches per plant, length of branch, number of clusters per branch, number of cluster per plant, number of pods per plant, length of pod, number of seeds per pod, hundred seed weight, single plant yield, dry matter production and days to full maturity. Statistical analysis for combining ability was performed with AGRISTAT software used. The values observed in the F_1s were subjected to ANOVA as per the procedure.

RESULTS AND DISCUSSION

The resultant 20 hybrids were evaluated for 13 traits in terms of mean performance and combining ability. The ruling variety VRM(Gg) 1 served as check. The analyses of variance for different characters are presented in Table 1. The analysis of variance for combining ability for the 13 characters are presented in Table 2. In general the SCA variance for the traits were higher as compared to the GCA variances except for number of pods per plant, length of pods, number of seeds per pod and hundred seed weight. The Lines Vs testers variance was significant for all the characters studied (Table 7). Parents Vs crosses showed significant variance for all the traits (Table 7).

Wide range of variation was observed in mean performance for different 18 characters among parents and hybrids in table 3 and 4. The parental general mean for seed yield was 7.35. The hybrid L4 x T1 recorded the highest

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