



Combining ability for yield and yield contributing characters in pigeonpea

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Abstract : Combining ability and genetic variance for nine quantitative traits in pigeonpea [*Cajanus cajan* (L.) Millsp] were estimated through line x tester analysis involving four male sterile lines, 23 testers and 92 F₁ crosses. The analysis of variance revealed there were significant differences among the parents for all characters and for hybrids except for number of seeds per pod. Non additive gene effects were predominant for all characters. The parents ICPA-2092, ICPA-20108, ICPA-2047, BDN-2, ICP-12320 were good general combiner for grain yield and pods per plant. The two crosses ICPA-2092 x ICP-12057 and ICPA-2047 x BSMR- 253A exhibited high SCA effects for grain yield per plant. The study was carried out during 2009-10 to 2010-11 under International Central Research Institute for Semi Arid Tropics funded project at Department of Agricultural Botany, M.K.V., Parbhani.

Key Words : GCA, SCA, Line x tester, Pigeonpea

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INTRODUCTION

Pigeonpea [*Cajanus cajan* (L.) Millsp] is a predominant pulse crop of Indian subcontinent and constitutes a very important source of protein in the vegetarian diets. It ranks second to chickpea in area and production. Combining ability studies are very useful for the breeders as it helps in the selection of parents and hybrids which can provide the superior inbreds for the characters(s) under consideration. It also furnishes the information on gene effects of genetic variances present in material for the characters under study. The main objective of this investigation was to identify good general and specific combiners for yield and yield attributing traits in pigeonpea.

MATERIALS AND METHODS

Four CGMS based male sterile lines were crossed with 23 testers in a line x tester mating design in *Kharif* 2009-2010 to generate crosses for this study. The present study

comprised of four lines *i.e.* ICPA-2043, ICPA-2047, ICPA-2078 and ICPA-2092 and 23 testers *i.e.* ICP-7192, ICP-9939, ICP-12320, ICP-12057, ICP-1482, ICPL-20108, ICPL-20120, BSMR-846, BSMR-736, BDN-2, BSMR-198, BSMR-571, BSMR-243, BSMR-174, BSMR-175, BSMR-253A, BWR-153, BSMR-539, BSMR-528, BWR-133, BWR-154, BWR-553 and BWR-123. All the twenty seven parents (four lines and 23 testers) together with 92 crosses and a standard check BSMR – 736 and one promising hybrids ICPH – 2671 were evaluated during *Kharif* 2010-2011 at Department of Agricultural Botany. Each genotype was grown in one row of three meters length at 75cm x 30cm spacing adopting randomized block design and replicated twice. The recommended fertilizer dose of 25:50:00 NPK kg/ha was applied. Cultural practices like weeding and plant protection measures were followed as and when required. The data were recorded on days to 50 per cent flowering, days to maturity, plant height, number of primary branches per plant, number of secondary branches per plant, number of pods per plant, number of seeds per plant, 100 seed weight,

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