

RESEARCH ARTICLE

Study of combining ability analysis for seed cotton yield, yield contributing and fibre quality traits in *Desi* cotton (*Gossypium arboreum* L.)

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SUMMARY

The present investigation entitled “Study on heterosis and combining ability for yield, its components and fibre characters in *Desi* cotton (*Gossypium arboreum* L.)” was undertaken to estimate general combining ability effects (GCA) of the parents and specific combining ability effects (SCA) of the crosses. The experimental material comprised of 24 F₁ hybrids obtained by crossing 4 lines with 6 testers in line x tester mating system. Sum total of 36 treatments consisting of 24 crosses, 10 parents and three standard checks were sown in Randomized Complete Block Design. The analysis of variance for combining ability revealed significant general combining ability effects (GCA) and specific combining ability effects (SCA) for all the traits. Among ten parental lines, most of the lines were found to be best general combiner, which had significant general combining ability (GCA) effect for seed cotton yield and its contributing characters including fibre quality traits. Analysis of variance for means revealed significant differences for all the eighteen characters studied. Among females, PA 741 was found to be the best general combiner for 3 characters viz., days to 50 per cent flowering, days to 50 per cent boll bursting and days to maturity had significant GCA effects. The female PAIG 77 was the best general combiner for three characters viz., number of bolls per plant, number of seeds per plant and boll weight. The female PA 809 was the best general combiner for 2.5 per cent span length, fibre fineness/ micronaire, fibre strength, uniformity ratio and short fibre index. Among males, AKA 2004-29 found to be best general combiner for days to 50 per cent flowering, days to 50 per cent boll bursting, days to maturity and ginning outturn. Male parent ARBAS 1301 was also found to be best general combiner for number of sympodia per plant, number of bolls per plant, number of seeds per boll, seed cotton yield per plant, lint index, seed index, plant height, 2.5 per cent span length, fibre fineness, short fibre index and fibre strength. Male parent GAM 162 found to be best general combiner for ginning outturn, 2.5 per cent span length and short fibre index whereas, CNA 1016 for boll weight. There was close agreement between *per se* performance and GCA as well as SCA effects for most of the characters. Observations on various characters indicated that the crosses showing high heterosis and high SCA effects had high *per se* performance and they involved at least one high combining

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parent. The combinations PAIG 77 x ARBAS 1301, PA 734 x ARBAS 1301, PA 734 x CNA 1016, PA 809 x ARBAS 1301 and PA 741 x JLA 0614 showed significant and desirable SCA effects for most of the yield and fibre quality traits studied, indicating potential for exploiting hybrid vigor in breeding programme.

Key Words : General combining ability (GCA), Specific combining ability, Cotton (SCA), Yield