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Heterosis for seed cotton yield and its contributing characters in cotton (*Gossypium hirsutum* L.)

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SUMMARY

A line x tester crossing programme was taken up with three female lines and ten male parents with a view to obtain best heterotic crosses for seed cotton yield and its attributing traits. Heterosis over better parent and standard check were estimated for yield and its contributing characters in 30 cross combinations. The hybrids *viz.*, GSHV 155 x GSHV 112, G. Cot. 20 x BC 68-2, G. Cot. 20 x 76 IH-20, GSHV 01/1338 x GISV 218, GSHV 155 x Surat dwarf, GSHV 01/1338 x BC 68-2 and GSHV 155 x LRA 5166 showed significant positive standard heterosis as well as heterobeltiosis for seed cotton yield per plant, number of bolls per plant and boll weight. The crosses exhibited highest heterosis due to increase in boll number and boll weight was significantly associated with increase in yield and these crosses could be considered for exploitation of hybrid vigour.

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Key words : Heterosis, Heterobetteosis, Seed cotton yield

Cotton (*Gossypium hirsutum* L.) is an important fibre crop and plays a vital role as a cash crop in commerce of many countries such as USA, China, India, Pakistan, Uzbekistan, Australia and Africa. Cotton crop is mainly cultivated for fibre. Development of new variety with high yield and fibre quality is the primary objective of all cotton breeders. In India, all four species *viz.*, *G. hirsutum*, *G. barbadense*, *G. herbaceum*, and *G. arboretum* are grown whereas; *G. hirsutum* occupies largest area among the four species grown. India is pioneer country for the cultivation of hybrids on commercial scale. Chinnadurai and Rangaswami (1974) studies heterosis in cotton and indicated tremendous potential for improvement of quantitative and qualitative characters by better commercial exploitation of hybrid vigour in cotton is being exploited successfully since the release of commercial *intra- hirsutum* hybrids *viz*., H-4, DCH 32, JKHY 1 and few others. Since galaxy of hybrids has been released in central and southern zone of country. The present investigation was undertaken to find out the extent of heterosis for seed cotton yield and its contributing traits in upland cotton, which is the prominent cultivated species all over the world.

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MATERIALS AND METHODS

Three diverse parents (G. Cot. 20, GSHV 01/1338, GSHV 155) and ten good combiners *viz*., (GSHV 97/612, GSHV 01/26, GISV 218, GISV 103, GSHV 97/13, B.C. 68-2, Surat Dwarf, LRA 5166, GSHV- 122, 76- IH-20) were taken to generate thirty cross combinations by using line x tester mating design. These thirty crosses along with thirteen parents and one check (G. Cot. Hy. 12) were grown in Randomized Block Design with three replications. One row of each hybrid and parents were sown in a spacing 120 x 45 cm during 2009-10 at Main Cotton Research Station, Surat. Five plants were chosen from each row to record data on seed cotton yield, its contributing traits and fibre properties. Heterosis was estimated over the better parent as per the standard procedure of Meredith and Bridge (1972) and useful heterosis as per standard method suggested by Rai (1978) over the standard check hybrid G. Cot Hy 12.

RESULTS AND DISCUSSION

The analysis of variance indicated that the mean squares due to treatments and hybrids were highly significant for all the characters under study. Variances