

Study of heterosis for seed cotton yield and related characters in intra-specific (*Gossypium arboreum* L.) cotton hybrids

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Forty-five hybrids from 10 x 10 diallel of *Gossypium arboreum* L. genotypes were tested with their parents at Anand in *kharif*, 2006 for Heterobeltiosis and Standard heterosis. The heterobeltiosis for seed cotton yield ranged from -32.48 to 154.2 per cent and the value of standard heterosis ranged from -39.05 to 41.89 per cent. The hybrid CINA-343 x *Jawahar Tapti* (higher economic heterosis) and hybrids CINA-333 x CINA-344 and CINA-329 x DLSA-17 (high Heterobeltiosis) were the promising hybrids identified in this study for seed cotton yield per plant. The desirable heterosis was also observed in the cross combinations *viz*; CINA-344 x 824 for boll weight, number of sympodia per plant and number of bolls per plant; CINA-333 x CINA 344 for number of sympodia per plant and number of bolls per plant.

Key words : Heterosis, Seed cotton yield, Diploid cotton, Diallel.

INTRODUCTION

Cotton, the king of fibre, is one of the momentous and important cash crops exercising profound influence on economics and social affairs of the world. It is also called as "White Gold". Out of total growing area in the Gujarat state, about 15 per cent is under diploid cottons. *i.e.* *Gossypium herbaceum* and *G. arboreum*. The farmer's attraction to this group of cotton is because of some of their outstanding characteristics such as, high ginning out turn and considerable resistance to insect, pest and drought. India is the pioneer country in the world for commercial exploitation of heterosis in cotton. The evolution of Hybrid-4 from Main Cotton Research Station, Surat is a splendid example for successful utilization of hybrid vigour in cotton on commercial scale for the first time in the world. Attempts made at various research stations in the country for development of desi hybrids resulted in the release of few desi hybrids *viz.* G.Cot.DH-7 in 1984 and G.Cot.DH-9 in 1989 in Gujarat, DDH-2 in 1992 from Karnataka, MDCH-201 by Mahyco from Maharashtra and LDH-11 from Punjab. However, these hybrids were conventional and could not spread over wide area in the country. This is because of small and tender flower buds that make emasculation difficult in conventional seed production resulting in low seed production. The present study was carried out with the objectives of finding out the extent of heterosis over better parent and standard check (G. Cot. MDH-11) for seed cotton yield and related characters.

MATERIALS AND METHODS

Ten parental lines, *viz.*, CINA-315, CINA-316, CINA-318, CINA-329, CINA-333, CINA-334, CINA-344, DLSA-17, *Jawahar Tapti* and 824 and their 45 F₁s along with the standard check G.Cot.MDH-11 were evaluated during *kharif*, 2006 at Regional Research Station Farm, Anand Agriculture University, Anand in a randomized block design, replicated thrice. Each entry was represented by a single row plot of ten plants, spaced 120 x 45 cm.

All the agronomic and plant protection measures were followed as per the recommended package of practices. Observations were recorded on five plants for the characters, *viz.*, yield per plant, bolls per plant, boll weight, sympodia per plant, seed index and ginning percentage. Statistical analysis of the data was conducted as per Panse and Sukhatme (1967).

RESULTS AND DISCUSSION

The results of analysis of variance of parents and their hybrids for various traits are given in the Table 1. Mean squares due to genotypic differences were found significant for all the traits studied. This indicated that experimental material under study had sufficient genetic diversity for different traits. Further, partitioning of sum of squares due to genotypes indicated that the differences among parents were significant for all the characters. In case of hybrids, significant differences were obtained for all the characters except yield per plant. However, mean

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