

Heterosis studies in *rabi* sorghum

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SUMMARY

The present investigation was undertaken with the object of estimation of heterosis through a line x tester mating design involving 5 lines and 6 testers. Out of 30 crosses 12 crosses showed significant positive heterobeltiosis and standard heterosis over all the checks. Significantly high heterobeltiosis and standard heterosis over M 35-1, CSH 15 R and SPV 655 was exhibited by the crosses SPV 1422 x SPV 1359, SPV 1500 x PVR 524, SPV 1502 x PVR 524, SPV 1422 x SPV 1413 and SPV 1500 x RR 9808

Key words : Line x tester, Heterosis, Heterobeltiosis and Sorghum.

Sorghum [*Sorghum bicolor* (L.) Moench] is an important food and fodder crop of Asia and Africa. Improved varieties and hybrids contributed a lot towards yield increase of sorghum in India. However, to maintain yield level obtained and to improve further yield of the crop so as to meet the increasing food requirement of millions of people in the semi-arid tropics, where sorghum is a major food crop, it is essential to look for developing new sorghum hybrids. A proper choice of parents, identification of superior combination and assessment of degree of heterosis in this regard are therefore, essential. The present study was, therefore, planned to study the extent of heterosis for yield and yield components in *rabi* sorghum.

MATERIALS AND METHODS

The present investigation consisted of a line x tester analysis involving 5 lines and 6 testers and their 30 F₁'s grown during *rabi* season of 2000-2001 with 3 checks. The experiment was conducted at Sorghum Research Station, Marathwada Agricultural University, Parbhani. The 30 F₁'s along with 11 parents (5 lines and 6 testers) and 3 checks (M 35-1, CSH 15 R and SPV 655) were planted in a randomized block design with two replications. Each genotype was sown in a single row in a 3 m plot spaced 45 cm & 15 cm between and within rows, respectively. Recommended package of practices were followed to the crop. Observations were recorded for thirteen quantitative traits viz., days to 50% flowering, days to maturity, number of leaves per plant, leaf area (cm²), plant height (cm), earhead length (cm), earhead girth (cm), earhead weight (g), number of grains per earhead, grain yield per plant (g), 1000 grain weight (g), dry fodder yield per plant (g) and harvest index (%). Mean values of five randomly selected plants of each entry in

each replication were recorded to estimate the percentage of heterosis.

RESULTS AND DISCUSSION

The analysis of variance showed significant differences among the genotypes for all the characters studied (Table 1) which indicated the presence of substantial variability in the experimental material. The percentage of heterobeltiosis and standard heterosis for yield and yield components are presented in Table 2. The cross SPV 1500 x RSSV 8 (-22.16) showed highest negative significant heterobeltiosis followed by cross SPV 1500 x SPV 1359 (-20.10) for days to 50% flowering. The negative significant heterosis over better parent was recorded by the cross combination SPV 1500 x RR 9808 for days to maturity and number of leaves per plant (8.11 and 6.06). The highest significant heterobeltiosis was reported by the cross SPV 1500 x SPV 1359 (18.54) followed by SPV 1491 x SPV 1411 (17.57). In case of plant height highly significant positive heterobeltiosis was recorded by SPV 1500 x RSSV 8 (14.32). with regards to earhead length highest positive significant heterobeltiosis was recorded by the cross SPV 1491 x SPV 1411 (29.47) followed by SPV 1422 x RR 9808 (18.62). The cross combination SPV 1500 x RSSV 8 displayed positive significant heterobeltiosis for earhead girth, earhead weight and 1000 grain weight, respectively (25.32, 65.57 and 27.87). In case of number of grains per earhead the cross SPV 1422 x RR 9808 (54.75) showed positive significant heterobeltiosis. Two cross combinations SPV 1500 x PVR 524 (28.95) and SPV 1500 x RSSV 8 (19.40) displayed highest positive significant heterobeltiosis for dry fodder yield per plant. Significant positive heterobeltiosis for harvest index was recorded by SPV 1500 x RR 9808 (22.93) and SPV 1500

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