

## Evaluation of heterosis in pearl millet under rainfed condition

■ B. K. DAVDA, K. K. DHEDHI AND C. J. DANGARIA

### SUMMARY

Eight CMS lines were crossed with 10 male parents in a line x tester design to study the extent of heterosis in pearl millet under rainfed condition. Heterosis was observed in both directions for most of the characters. The high standard heterosis was obtained for grain yield, harvest index, days to 50 per cent flowering, days to maturity and length of protogyny; medium level of heterosis was found for plant height and threshing index, and low for number of nodes per plant. The highest positive heterobeltiosis and standard heterosis for grain yield per plant was 262.15 and 41.05 per cent, respectively. The heterosis in grain yield might be contributed by the traits like number of nodes per plant, plant height, days to maturity and harvest index. Early hybrids viz., ICMA-98333 x IPC-1518, JMSA-2005 x IPC-1501 and ICMA-00777 x IPC-1518 were the best heterotic hybrids for grain yield and its three or more component traits. Hence, these early maturing high yielding hybrids can be utilized further for commercial exploitation of hybrid vigour especially in rainfed area.

**Key Words :** Grain yield, Heterosis, *Pennisetum glaucum*, Line x tester, Rainfed condition

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Pearl millet [*Pennisetum glaucum* (L.) R. Br.] is predominantly grown as the dual purpose crop, grain as well as fodder in marginal lands under erratic and poor rainfed conditions, and is amazingly tolerant to adverse environmental conditions. The phenomenon of heterosis is proved to be the most important genetic tool in enhancing the yield of self as well as cross pollinated crop species in general and pearl millet in particular. The exploitation of heterosis on commercial scale in pearl millet is regarded as one of the major breakthroughs in the improvement of its productivity. Development of Tift-23A male sterile source by Burton (1965) opened new vistas for the exploitation of heterosis on commercial scale in pearl millet. In genetic improvement, selection of better parents is one of the important steps for development of superior hybrids. The information on magnitude of heterosis, combining ability and

gene action for grain yield and its components involved in inheritance is more helpful in selecting appropriate parents and desirable cross combinations for commercial exploitation of hybrid vigour. The present study was, therefore, undertaken to determine the extent of heterosis in pearl millet and to identify heterotic hybrids under rainfed condition.

### MATERIALS AND METHODS

Eight male sterile lines viz., JMSA-2005, Pb-214A, JMSA-20021, Pb-409A, ICMA-98333, ICMA-00777, ICMA-98777 and ICMA-99111 were crossed with 10 diverse restorer lines viz., J-2340, J-2290, J-2439, J-2454, IPC-655, IPC<sub>4</sub>R-873, IPC-1518, IPC<sub>5</sub>R-873, IPC-1501 and H-77/833-2 in a line x tester mating design during summer-2002. The resultant 80 cross combinations alongwith fertile counter parts of eight male sterile lines, 10 pollinators and the standard check, GHB-558 were grown in a randomized block design with three replications during *Kharif*-2002 at Pearl millet Research Station, Junagadh Agricultural University, Jamnagar (Gujarat), India. Each entry was represented by a single row of 5.0 m length spaced at 60 cm x 15 cm. All the recommended cultural practices were followed for raising the good crop. Observations were

#### MEMBERS OF THE RESEARCH FORUM

##### Author to be contacted :

K. K. DHEDHI, Pearl millet Research Station, Junagadh Agricultural University, JAMNAGAR (GUJARAT) INDIA  
E-mail: kkdhedhi@rediffmail.com

##### Address of the co-authors:

B. K. DAVDA AND C. J. DANGARIA, Pearl millet Research Station, Junagadh Agricultural University, JAMNAGAR (GUJARAT) INDIA