Asian J. of Bio Sci. (2007) Vol. 2 No. 2 : (196-198)

Research Note :

Heterosis studies in sorghum

R.B.GHORADE AND DIPALI V. GHIVE*
Dr. Panjabrao Deshmukh, Krishi Vidyapeeth, AKOLA (M.S.) INDIA

(Accepted : August, 2007)

The present investigation entitled "Studies on new male sterile lines and restorers in rabi sorghum" was undertaken to assess the *per se* performance of parents, to estimate the amount of heterosis for yield and yield components, to estimate the combining ability and fertility restoration and to identify heterotic combinations for further study. Significant heterosis has been recorded for yield and yield components in most of the crosses. The hybrid ms-104A x AKR-354 recorded highest heterosis and heterobeltiosis for grain yield and also exhibited significant heterosis except leaf area. For grain yield, the hybrid 104A x AKR-354 was followed by ms-104A x AKR-388-1, ms-104A x AKR-368 and AKRMS-69 x AKR-388-1.

Key words : Sorghum, Hetrosis, Heteroeltiosis, Grain Yield.

To achieve these objectives, five cytoplasmic genetic male sterile lines (females) and 10 testers (males) and their 50 possible crosses were sown during rabi 2004-2005 in randomized block design with three replications. Observations were recorded on five randomly selected plants per genotype per replication for days to 50 per cent flowering, plant height, number of leaves per plant, leaf area, panicle length, panicle breadth, number of whorls per panicle, number of primaries per panicle, panicle weight, number of grains per panicle, grain yield per plant, 1000 seed weight and per cent seed setting.

The statistical analysis was based on genetic model suggested by Kempthorne (1957).

Heterosis :

Heterosis is observed in almost every crop species studied. Often the degree of heterosis is considerably high to permit its commercial exploitation. Heterosis is commercially used in the form of hybrid or synthetic varieties. Therefore, exploitation of hybrid vigour has become the important aspect in crop improvement programme in sorghum. The presence of heterosis in rabi sorghum has been studied and pointed out by many scientists; Shivanna and Patil (1988), Biradar *et al*. (2000), Ghorade *et al*. (1997) .

In the present study, moderate to appreciable amount of heterosis is observed. Crosses exhibiting good amount of heterosis over mid parent and better parent are identified. Some promising hybrids are selected on the basis of *per se* performance for grain yield and presented in Table 1 alongwith heterosis and heterobeltiosis for yield and other component characters.

From the Table 1, it can be depicted that ms-104A x AKR-354 recorded maximum and appreciable amount of significant heterosis for yield and also for the characters plant height days to 50 per cent flowering, number of leaves per plant, panicle length, panicle breadth, number of whorls per panicle, panicle weight, number of grain per panicle, 1000 seed weight and per cent seed setting (fertility restoration). Hence, ms-104A x AKR-354 (CSH-19R) was identified as best heterotic cross combination. The tester (Restorer) involved in this cross showed the highest *per se* performance for yield among all the male parents.

The hybrid ms-104A x AKR-388-1 was ranked at second position. It recorded significant heterosis and heterobeltiosis for grain yield. It also showed significant heterosis for plant height, number of leaves, panicle length, number of whorls, number of primaries, panicle weight, number of grains per panicle and 1000 seed weight.

The cross 'ms-104A x AKR-368 which ranked fifth in *per se* performance for yield was found to be on third position in respect of heterosis and heterobeltiosis for grain yield. It showed the significant heterosis in desirable direction for the traits like plant height, number of leaves per plant, panicle weight, number of grains per panicle and 1000 seed weight. It also recorded desirable heterobeltiosis for panicle weight, number of grains per panicle and 1000 seed weight.

The remaining crosses AKRMS-69 x AKR-388-1, AKRMS-80 x AKR-354, ms-104A x AKR-413, AKRMS-66 x AKR-388-1 and AKRMS-47 x AKR-388-1 ranked third, fourth, eighth, ninth and tenth, positions

* Author for Correspondence