Disease resistance may be a major factor responsible for the apparent wide range in adaptability of Pee Dee 0109, Pee Dee 0111, and Pee Dee 0113. Seed (25 g) of these germplasm lines may be obtained from AR-SEA-USDA, Pee Dee Exp. Stn., Florence, SC 29503.

REFERENCES


REGISTRATION OF FERTILITY RESTORER DEMETER II COTTON GERMPLASM

James B. Weaver, Jr.

DEMETER II cotton (Gossypium hirsutum L.) germplasm was developed by the College Experiment Station, Univ. of Georgia and released to scientists in March 1979.

Development of this germplasm was begun in 1973 when a single plant of DES HAF 277 was crossed as the female parent with ‘Pima S-4’ (G. barbadense L.). DES HAF 277 had the genome of G. hirsutum in G. harknessii Brandagee cytoplasm and carried a restorer gene Rf. The Rf gene behaves as an incomplete dominant gene in crosses of cytoplasmic male sterile upland X upland strains that have the restorer gene. However, it behaves as a complete dominant gene in crosses of cytoplasmic male sterile upland X G. barbadense strains with the restorer gene. Sheetz and Weaver found that Pima has a dominant gene, E, that enhances pollen fertility but is not a restorer per se. Field testing of the DES HAF 277 X Pima S-4 were grown at Iguala, Mexico, where the most fertile segregates were selected and backcrossed (BC) as females to upland non-restorer strains. The most fertile plants in the BC1 generation were again backcrossed to non-restorer upland strains (BC2). A third backcross was made in the same manner and the most fertile BC3 plants were self pollinated. Individual plants in the BC3 F2 generation were crossed onto several cytoplasmic male sterile upland strains in 1977. The BC4 test cross generation was grown in 1978 and scored for weak fertile and strong fertile hybrid plants. Demeter II is the open pollinated seed from BC4 progeny rows which has both the Rf gene and the “enhancer factor” E. Approximately 1/16 of the plants in the BC4 F2 generation should be of the genotype Rf Rf E E and all plants should have acceptable agronomic properties.

Our research indicates that the fertility enhancer gene E must be present in order to obtain adequate fertility in cytoplasmic male-sterile upland X restorer upland crosses. Pure lines of

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