male-sterility observed and to search for fertility restorers, these male-sterile F$_1$'s of the cross, (556 × 23) × 23, were hybridized during the summer of 1956 with 41 well established inbred lines representing a rather wide array of germ plasm. F$_2$'s of these crosses carried characters leaving no doubt but that they were hybrids. Six of these crosses demonstrated the male-sterility of the female parent, proving quite conclusively that a cytoplasmic male-sterile Pearl millet had been found. These lines may then serve as sterility maintainers. Eight crosses showed partial male-sterility and the other 27 appeared to be completely male-fertile. If these lines are representative of Pearl millet germ plasm, it may be concluded that nearly two-thirds of it carries complete fertility restorers for the cytoplasmic male-sterile described here.

Georgia hybrid No. 1 Pearl millet has outyielded common millet in clipping tests conducted in a number of Southern and Eastern states. In these tests, it has produced up to 50% more forage than the commercial check. The seed planted in these tests has been produced by harvesting all seed from a field planted to a mixture of equal numbers of live seeds of Pearl millet inbreds 13, 18, 23, and 26. Although one might expect the seed from such a field to contain 75% of hybrid seed and 25% of selfed and sibbed seed, it has contained only about 65% of hybrid seed. Such a mixture should yield about as well as pure hybrid seed if planted at a rate of 10 pounds per acre in 30- to 36-inch rows. If planted at 2½ to 5 pounds per acre in such rows, the yield increase over the check would be only about 65% of that obtained from pure hybrid seed. Poor stands due to drouth, faulty seedbed preparation, etc., would probably respond much the same as the lighter seeding rates, since approximately three seedling plants per inch of row are required for the more vigorous hybrid seedlings to crowd out the less vigorous inbreds and give full hybrid effect.

Preliminary data suggest that seed of a Pearl millet hybrid produced as outlined for Georgia hybrid No. 1 will give a yield performance equal to the average yield of the 6 possible singlecrosses involving the 4 inbreds used in producing the hybrid. Experience has shown it is very difficult to find four inbreds that give high-yielding single crosses in all possible combinations. Experimental singlecrosses yielding appreciably more than Georgia hybrid No. 1 have been produced. Use of the cytoplasmic male-sterile could permit the commercial production of high-percent hybrid seed of such singlecrosses.

Fertility restorers would not be needed in countries like the United States where Pearl millet is used only as a forage plant. Sterility in the commercial hybrid would prevent the farmer from saving seed from the F$_1$ and would save him the yield losses resulting when F$_2$ generations are grown. Sterility would also help maintain the hybrid in a vegetative condition.

Other advantages and some disadvantages could conceivably result from substituting the cytoplasmic male-sterile method of producing hybrid millet seed for the method being used in the production of Georgia hybrid No. 1. Although it is too early to accurately appraise these two methods of producing commercial hybrid seed, the possible advantages resulting from the use of the cytoplasmic male-sterile warrant further study.—GLENN W. BURTON, Geneticist, A.R.S., U.S.D.A. and University of Georgia, Agr. Exp. Sta., Tifton, Ga.