

## Hybrid Sugar Beets Made by Utilizing Both Cytoplasmic and Mendelian Male Sterility

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Cytoplasmically inherited male sterility enables the breeder to produce a population with all individuals effectively emasculated. Mendelian male sterility is less attractive for large scale hybridization work because 50 percent male sterile individuals is the maximum which is normally expected. This 1:1 ratio of normal pollinators to male steriles is obtained *in* backcross populations. In F<sub>2</sub> or succeeding generations after selfing, 3:1 ratios may be expected. The necessary roguing work during the bud stage to eliminate pollen producers in these segregating populations seemed at first to preclude the use of Mendelian male sterility in the production of commercial hybrid sugar beets. For several years, however, the writer has been utilizing Mendelian male sterility as a means of emasculation for several types of genetic and breeding investigations where extensive roguing has not been necessary (1) -

In 1951 the discovery of a gene for Mendelian male sterility in the high-sugar curly-top-resistant variety U. S. 35/2 excited interest in wider applications. A backcross population of U. S. 35/2 was produced which segregated for 50 percent male sterility in 1953. Roguing out the pollen producers proved an easier task than anticipated. Consideration can now be given to production of a 4-way hybrid (A x B) x (C x D) in which A and A.B carry cytoplasmic male sterility. The male sterile grandparent C must be obtained by roguing out pollen producers in segregating populations. This leaves a wide latitude in selection of the D pollinator. For the production of one acre of hybrid seed, one pound of CD seed (for the pollinator) should be ample for a mixture with 15 pounds of the male sterile A.B (for use as the female parent). If there is real merit in such 4-way hybrids, the scheme should be entirely practical.

### Literature Cited

- (1) OWEN, F. V.  
1952. Mendelian male sterility in sugar beets. Proc. Amer. Soc. of  
Sugar Beet Tech. pp 371-376."

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<sup>2</sup>Numbers in parentheses refer to literature cited.