SEED PRODUCTION OF SPACE-ISOLATED VS. BAGGED MOTHER BEETS AND A DISCUSSION OF SOME FACTORS INFLUENCING THE LATTER

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THE most commonly used method of controlling pollination of sugar beets under Michigan conditions has been by space isolation as described by Down and Lavis (6). The labor cost required to isolate a mother beet in a city garden naturally restricts the number of mother beets that can be used in any one season. The few hundred beets usually isolated in any one year are only a fraction of the number of selfings made by any corn breeder. This difference is still further enhanced by the factor of self-sterility found in many mother beets and by unavoidable losses of individual plants through one cause or another.

Various methods have been used by plant breeders for controlling pollination of beets. Space isolation has proved very satisfactory when care was taken to destroy nearby seed plants of Swiss chard and red garden beets (6, 2). Of the bagging material used, light-weight parchment and light-weight Kraft grocery bags have been the most satisfactory (15, 1, 6, 7, 2, 11, 16, 4). The bags of the heavier weight paper and also of glassine and cellophane seldom have seed set in them (16, 10, 4). Some workers have found that cages made of finely woven cloth have been very satisfactory in some cases (17, 2), but in others a great amount of crossing took place (14, 6).

Lack of success of seed production under bags has been attributed to various causes such as type of isolator (15, 11, 4); high temperature (17, 6, 2); high relative humidity (2); no insects to carry pollen (3, 13); protandrous nature of the beet (13); and inheritance of self-sterility (9, 2, 8).

The factors influencing the set of seed on isolated mother beets appear to be complex and much more intensive study is necessary to determine the effect of each factor and the interaction of the several factors. Seed production studies on mother beets, isolated under paper bags, were begun in 1930 in two widely separated localities and extended to a third locality in 1932. The data obtained in these experiments are for 4 years at East Lansing, 4 years at Burt Lake, and 2 years at Traverse City.

METHODS AND MATERIALS USED

The method of isolation of mother beets by bags and by space was the same as that described by Down and Lavis (6). A number of red garden beets were

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3Figures in parenthesis refer to "Literature Cited," p. 705.

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