

III. REPORTS FROM COOPERATORS

AGRICULTURAL ALUMNI SEED IMPROVEMENT ASSOCIATION, INC.
Romney, Indiana1. Mini-plant, a dominant anther-eared dwarf.

During 1963 through 1965 a synthetic was built up containing the following eight lines, C103 cms^T Rf Rf, C123, H14, Mo17, Oh40B, Oh41, Va20 and Va36. Each of these lines traces wholly or partially to the Pennsylvania variety Lancaster Surecrop and we have designated the synthetic as our Lancaster Synthetic.

In 1966 the synthetic was grown in an isolated plot about one acre in size and seed ears saved from 214 selected plants. Seed from these ears was mixed for a planting in 1967. As C103 cms^T Rf Rf had been the ultimate seed parent in producing the synthetic, the plantings in 1967 contained both fertile and male sterile plants. About 300 desirable fertile plants were self fertilized and about 75 desirable sterile plants were pollinated with pollen from desirable fertile plants.

In 1968 ear-to-row progenies were grown from 245 of the selfs and 68 of the sterile x fertile sib crosses. One of the sib-crossed progenies, row 5670, contained 13 normal (tall) plants and 12 short plants. The short plants were vigorous, 5 to 6 feet tall and produced good sized ears. At harvest it was observed that all of the ears from the short plants were anther-eared.

One of the short plants in row 5670 was selfed and the progeny grown from it contained 84 short plants and 28 normal plants, a perfect 3:1 ratio. Eight normal plants from this progeny were selfed and the progenies grown from them contained only normal plants. Fifteen of the short plants were crossed on plants of a normal single cross as a tester. Progenies from four of these testcrosses contained only short plants indicating the parent was homozygous for the gene concerned. The remaining 11 progenies segregated in 1:1 ratios for short and normal plants. The data from these testcrosses are reported in Table 1.

Table 1
Data on crosses of short plants on a normal single cross tester

Pedigree	Tall	Short	Total
(Oh28 x M14) x Short 1	17	10	27
(" ") x " 2	16	16	32
(" ") x " 3	16	12	28
(" ") x " 5	9	20	29
(" ") x " 6	16	14	30
(" ") x " 7	16	8	24
(" ") x " 8	19	10	29
(" ") x " 9	11	15	26
(" ") x " 11	11	18	29
(" ") x " 14	14	13	27
(" ") x " 15	14	15	29
Total	159	151	310

The data indicate that the character is controlled by a monogenic dominant. Anther-eared plants have not been observed in any of the eight lines used as parents of the synthetic or in the synthetic itself. The ear which furnished the seed for row 5670 did not have anthers. This leads to the conclusion that the plant furnishing pollen for the sib-cross must have been heterozygous for the gene involved and the mutation may have occurred in one of parental gametes of this plant.

Mini-plant is suggested as a timely name for this character with a temporary designation as D5670 (pending allele tests with other dwarfs). Heterozygous mini-plants have been vigorous and productive. Homozygous mini-plants are much reduced in vigor and many are only 2 to 3 feet tall.

Seed carrying the D5670 gene has been supplied to the Maize Genetics Cooperation. Being a dominant the character should be useful as a genetic marker. Although some progenies have been a little difficult to classify on the basis of plant height, the character is readily and definitely classified at silking time or later by the occurrence of anthers on the ears.

M. T. Jenkins