

The 1958 results suggest that irradiation of seeds reduced the average cold resistance of both S.D.5 and B8 selfed progenies in comparison to the checks, although the range of variation indicates that some lines exceeding the cold resistance of the parent inbreds might be selected from the irradiated and selfed population.

It had been hoped that dominance effects in the single cross might limit unfavorable or deleterious mutation effects in the irradiated parent. The 1958 yield test which showed no significant differences among 136 single crosses involving an irradiated inbred, or of the inbreds in comparison with the yield of the check single cross, indicates that this has not been disproved. Cold tests and the appearance of visible mutants suggest that irradiation had been effective, and if yield were largely due to additive gene action, differences between checks and irradiated singles might have been expected.

This work is being continued with one additional inbred, so that three single crosses will be tested in 1959.

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1. "Tassel ear" mutation.

A mutant which produces only staminate flowers in the lateral inflorescences was found in selection F735 in 1955 by Mr. B. Stead in the Union of South Africa who sent me seed of the stock. Out of 21 plants grown in 1956, one plant developed a chlorophyll deficiency in the upper half of the plant following tasseling, two plants had japonica striping and one plant had the lateral inflorescences made up entirely of staminate flowers. All abnormal plants were late flowering and were pollen sterile. A cross of a late inbred on a heterozygous plant segregated 8 "tassel ear" plants to 29 normal plants in F₂ in 1958. "Tassel ear" plants tillered profusely and five or six lateral inflorescences developed on the more vigorous tillers. Normal length shanks with husk leaves from the nodes were produced but fully developed tassels replaced the ears. Usually the central spike, and often one or two branches, emerged beyond the husks. These staminate flowers produced an abundance of fully viable pollen, as did the terminal tassel.

In 1949 Eyster reported (News Letter 23:4) a "tassel-like" ear mutant that had a framework which was similar to the framework of a tassel. Limited numbers of seeds were formed on the basal portions of the branches. In 1951 he reported (News Letter 25:10) the character to be associated with bright green color and that homozygous strains were available.

The present mutant has so far proved to be completely staminate.

L. M. Josephson

2. New "Teopod" mutations.

Four new independent sources of Teopod or similar characters have occurred in different locations the past eight years. The first occurrence was in a nursery row of the double cross (T8xCI.21E)(L317xOb7B) growing at the Kentucky Agricultural Experiment Station in 1951. An abnormal plant in T8xCI.21E that tillered and had pod-type ears had served as the seed parent of this progeny the year previous. This source was not grown again until 1957 following the finding of other sources. It differs from the teopod of Lindstrom (Maize Coop. stock) in tillering more profusely and having longer and more slender culms. The two were crossed in 1958 to determine whether they are the same mutation.

In 1954 a farmer found a typical teopod plant growing in a field planted with second-generation seed of the topcross K61xPotchefstroom Pearl in the Union of South Africa. Crosses with Tp (Maize Coop stock) have shown it to be a repeat mutation. This source has segregated plants with all the variations described for Cg, as has also the Tp obtained from the Maize Coop. stock. No crosses for associations with other characters have been made.

A mutation related to teopod occurred in a nursery row of inbred K41 at Knoxville in 1955. The main culms of mutant plants are considerably shortened with numerous brace roots developed at the lower nodes, while tillers are usually of normal length. No seed has been produced on the main culms and only occasionally will they terminate in a single spike tassel. Tillers may have a normal tassel, may terminate in an ear, a combination of both, or may be similar to the main culm. Ears produced on normal tillers have been normal and only occasionally produce mutant plants. Axillary ears produced on tillers that terminate in an ear are generally podded at the base. Seed from either the podded axillary ear or the terminal ear will generally produce half normal plants and half mutant plants. No apparently homozygous plants have been obtained.

A typical teopod plant occurred in hybrid Funk G-711 growing in a yield trial on the Jackson, Tennessee Experiment Station in 1956. Only 11 open-pollinated seed were obtained from the plant, none of which produced plants the following year.