

## PRESENT STATUS OF THE BREEDING PROGRAM

Holly Sugar Corporation

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### Accomplishments

The Holly Sugar Corporation has maintained a breeding program since 1937. Mass selections within several foreign varieties have produced locally adapted varieties for the several factory areas. Records show that over the nine year period of 1940 to 1948, these mass selections produced on the average about 10 percent more sugar per acre than some of the better foreign varieties used previous to that time. Yield data over that period also showed that additional yield increases from mass reselections were negligible.

Progress has been made in breeding for leaf spot resistance in the Arkansas valley in Colorado. A variety called GH 46, tested for four years in that area, produced an average of 12 percent more sugar per acre than the check. This variety originated as a multiple hybrid of roots from five sources, selected for resistance to leaf spot. A reselection within GH 46, under moderate leaf spot infection, has resulted in a new variety, 8124-0, which on the basis of yield tests for 1949 and 1950 produces 21 percent more sugar per acre than the check and 9 percent more than its parent.

### Problems Yet to be Solved

We must index a large number of plants to find suitable type O pollen producers to be used in making male sterile hybrids.

The monogerm character must be combined with our presently used varieties.

We need to increase cold resistance in our present varieties, both in the germination and seedling stages.

We should combine resistance to curly top with resistance to leaf spot for certain specific areas.

### Immediate Future Objectives

Increase yield and sugar in our northern areas by use of mother line progeny breeding methods.

Combine the monogerm character with these new varieties.

Produce new inbred lines to be used in a male sterility hybridizing program.

### Past and Future Breeding Methods

Mass selection has been the principle method used in the past. Only recently the mother line progeny method of breeding has been used. We plan to continue the use of this method and at the same time increase our work involving inbreeding in conjunction with the use of male sterility for producing hybrids.

Material and Information of Most Value Needed to Meet Objectives

We will need information about a number of important characters for the inbred lines produced in order to most efficiently utilize them in hybrid combinations.

Information concerning the inheritance of many of these characters would be of great value when trying to combine them into commercial varieties.