

PENNSYLVANIA STATE UNIVERSITY
University Park, Pennsylvania
Dept. of Botany and Plant Pathology

1. Disease resistant synthetics of corn germ plasm.

The administrative policy of this University makes clear that any maize germ plasm in any stage of breeding may be released to the general public provided that said item of germ plasm is not involved in a station hybrid. In the latter situation a policy of delayed release is adhered to.

You may recall that up to the present, six synthetics carrying genes for disease resistance have been available. Three of these were released from this department in 1954 and were arbitrarily designated, Early, Intermediate and Late. Small lots of seed of these are still available from a renewal planting in 1957.

We wish to announce the following additional ones:

- (a) Sweepstakes synthetic; O.P. 2. (open pollinated twice).
- (b) Early synthetic No. 2; O.P. 1.
- (c) South African-American; O.P. 3.
- (d) " " " ; Stiff stalked selection, O.P. 2.
- (e) In many cases the S_2 and S_3 components of these synthetics are available as individual ear selections. (See description notes and policy notes.)

Description of Synthetics

In general, these recent synthetics have a broader genetic base than the original three. They have been subjected to more diseases over a longer period of time.

Sweepstakes Synthetic

Westbranch Sweepstakes (originated along the West branch of the Susquehanna river) is widely adapted in the northeast, just north of the range of Lancaster Surecrop. It has fairly long ears with flat kernels. The seed has a red pericarp with a yellow or white cap.

About 1000 plants were grown in a mixed planting of the Early, Intermediate and Late Synthetics and detasselled. The whole planting was treated as a disease nursery. The most resistant plants were selected and the seed bulked. Samples were taken of this bulked seed and were planted, in-oculated, selfed and selected for two seasons. The surviving S_2 cultures were reconstituted into a synthetic in an isolation block. To date the Synthetic segregates about two percent yellow ears. It has shown remarkable resistance.

Early Synthetic No. 2.

Strains of "Early Butler", "College Whitecap", "Early Sweepstakes", a longfellow flint and an early yellow dent, were detasselled and top crossed at the same time as the Sweepstakes described above. In the disease nursery particular attention was paid to early maturity. The Synthetic was made up of S_2 and S_3 lines, pollinated 7/25 to 8/3 from a May 12 planting. This has been in isolation one season only and the seed is as variable as the lines which comprise it.

S₂ and S₃ components of this Synthetic are available as individual ears. (See note at end of announcement).

South African-American Synthetic

This Synthetic shows promise as a source of stalk strength as well as disease resistance. It is made up of American breeding material which survived the prolonged drought of 1955 and which remained erect following a subsequent hurricane, crossed with South African inbreds which were selected for their remarkable resistance to Helminthosporium turcicum, the causal agent of Northern leaf blight.

The South African-American Synthetic is somewhat later than the Sweepstakes, which in turn is later than Early Synthetic No. 2.

The stiff stalked selection consists of bulked seed of 94 plants still erect and sturdy Dec. 15, 1959.

Seed of individual ears of these stiff stalked plants is available.

Note regarding requests for disease resistant early generation inbreds

The corn disease nursery at this station consists of about 1000 10-foot rows of early generation inbreds. We seldom keep anything beyond the S₄ generation at which time, the choice selections are turned over to the Corn breeders in Agronomy for agronomic evaluation. (209 such cultures were given the Agronomists in 1958.) We expect an evaluation report on the combining ability of these cultures, when such information becomes available. In that way, disease resistant inbreds already produced can become available to improve germ plasm at some future date.

We expect and ask for this same type of cooperation from any individual outside this station. We are glad to share our material with you, but our program cannot be nurtured unless we in turn receive credit. We really believe we have something worth while sharing.

Furthermore, I am not interested in packeting small numbers of inbreds of specific maturity dates. Unless you want 50-100 items, why not develop your own from the Synthetics available.

-- C. C. Wernham

PIONEER HI-BRED CORN COMPANY
Johnston, Iowa
Department of Plant Breeding

1. Parthenogenesis in 2n x 4n crosses.

In crosses between diploid sugary maternal parents and non-sugary tetraploid males, occasional 2n sugary kernels develop. These have been observed in various cultures over the past four years. It was first assumed that such kernels probably arose as a result of fertilization by contaminating sugary pollen. However, in 1958 two ears containing a nearly full set of 2n homozygous sugary seeds were