

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

1. More disease resistant maize at Penn State--1960.

Last spring we announced (Maize Synthetics for Disease Resistance, Plant Disease Reporter 44: 498-500, 1960) the availability of disease resistant synthetics and early generation inbreds to corn breeders and pathologists desiring seed. The demand for the synthetics cleaned out our departmental supply of some items. Fortunately 3 + pounds of seed of each synthetic is deposited with the National Seed Storage Laboratory, Fort Collins, Colorado.

Since 1957 we have been operating on an "alternate" year basis. The reasons are two; (1) introduction of new material and an enthusiastic crossing program therewith led to a somewhat bewildering amount of work to be evaluated, and (2) there was both a need and desire to develop in a parallel fashion two lots of unrelated material that could be tested against each other in a breeding program.

The following lots represent our first public distribution of breeding material unrelated to last year's offerings.

1. The International Synthetic - A few years ago we set out to develop disease resistant maize with outstanding root systems. Tropical or near tropical inbreds proved to be outstanding for root systems but day length effects, high ear, unusual height, a pronounced conical ear shape, flinty grains and other morphological variations made outcrossing to American material a necessity. (We know now that one such outcrossing or back crossing is adequate. We have seed of selfed S_0 plants from such crosses available for future line breeding). Seed of the original local x tropical crosses was made in the greenhouse and unfortunately the bulk of it was made on the double cross Pa. 602A. It was necessary to diversify this base in the outcrossing. To further dilute this relatedness, seed of these 3-way crosses were pooled and planted in an isolation block and detasseled in 1960. The male parent consisted of S_1 plants of new unrelated crosses made in 1957 and grown for the first time in 1959. These were grouped according to 1959 pollen dates into six maturity classes: (A) 7/10 - 7/20; (B) 7/21 - 7/25; (C) 7/26 - 7/31; (D) 8/1 - 8/5; (E) 8/6 - 8/10 and (F) 8/11 - 8/20. The female portion of the International Synthetic was planted in five rows between C and D. The whole plot was harvested. Some 100 individual ears were selected and passed on to Agronomy for individual ear testing. One hundred-ten ears were selected for bulk seed for the synthetic. For breeders interested in strong root systems this synthetic should act as a source unrelated to the South African-American stiff stalked selection distributed last spring. It should be of the 500-600 maturity classes.

2. The male parent for 1 (above) is available as bulked seed of the different maturity classes mentioned above; A, B, C, D, E, F.

The seed of F is somewhat chaffy due partly to its inherent lateness and partly to local lack of rain from August 7 to September 10. That we have seed at all is the result of a very mild fall with unusually late frosts.

3. Miscellaneous lots to be labelled M-1, M-2, etc.

Certain lots of seed representing local open-pollinated varieties, remnant seed of crosses made for specific purposes, and other specific collections were planted adjacent to the male parent block. These were detasselled, the pollen source was from a mixture of seed A, B, C, D, E, F, planted as male rows.

These miscellaneous lots of 2 - 6 lbs. each, may present some specific traits which are likely to be diffused throughout the more general seed lots previously mentioned.

A. M-1. Top crossed (Turkish flints x WF9 derivatives).

These Turkish flints were obtained from the Plant Introduction Station at Geneva and crossed with WF9 and WF9 derivatives. This lot should offer an opportunity to isolate early lines in the 200-400 maturity classes.

B. Pennsylvania open-pollinated varieties selected at least one season under blight, smut and stalk rot conditions.

M-2. Top crossed 1958 selection from Clarage.

M-3. Top crossed 1959 selection from Clarage.

These two Clarage selections differ chiefly in ear size and length. M-2 has a tendency toward long thin ears whereas M-3 has shorter ears with higher kernel row number.

Top crossed:

M-4. Ranker selection - reselected 1959.

M-5. Wright selection - reselected 1959, tall, heavy eared, high kernel row number.

M-6. Bradley selection - reselected 1959, deep kernels, at least 20% plants have red pericarp.

M-7. Roadman - non selected material received in 1960.

M-8. Ullstrup A Synthetic-planted between Ranker and Bradley 1959.

M-9. Ullstrup B Synthetic-planted between Bradley and Clarage 1959. M8 and M9 should be 1/4 to 1/2 Synthetic. In 1959 we failed to get Ullstrup's Synthetics detasselled.

- M-10. Pioneer Synthetic (Early, Medium, Late) seed received in 1955. Only a few plants of each emerged so seed was bulked.
- M-11. Dekalb - long eared bronze composite; long ears, long shank, high kernel row number. Top crossing should increase number of yellow and white derivatives.
- M-12. U.S.D.A. - double-double. Used to gauge maturity of male (F): 800-900 maturity - seed slightly chaffy like F.

Last spring the big demand was for seed of the Synthetics. We have not received any word of their performance but it is still rather early for anything but disease appraisal.

Three breeders took advantage of our offer of early generation inbreds. We are looking forward to hearing how these turned out.

Our offer of early generation inbreds still stands on the same basis as last year. (We furnish seed, you furnish yield test data when and if you test).

We have early generation disease resistant inbreds of:

- (a) WF9 material - varying percentages of Wf9 or Cl29. Pure line material must be obtained from the originators.
- (b) M-14 material - earlier and later than M14.
- (c) Osl20 material - earlier and later than Cl 40.
- (d) Tr material - A source of resistance to Helminthosporium maydis. We hope we have improved on its smut and H. turcicum reaction.
- (e) Flints of various types - Some of these are 12 and 14 rowed flints of the long fellow-type whereas others are flinty isolations of tropical flint x dent-crosses. Some of these are long-seeded types, quite resistant to disease.

Why have the flints vanished? Are these worth keeping?

- P.S. 1. We are interested in maize material with
- 1. extra wide leaves
 - 2. extra long leaves
 - 3. long and extra long ears
 - 4. any arguments and statements for or against flints. The Pennsylvania Dutch used to raise 6-10 rows flint corn to make corn meal. Any other regional uses?

- P.S. 2. If you are interested in any of these offerings, how about sending this department a Postal Money Order for \$2.00 to cover the cost of mailing?

C. C. Wernham