

UNIVERSITY OF THE PHILIPPINES
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1. Corn breeding report from the Philippines.¹

a. Philippine Hybrids - Four locally developed hybrids, three yellow flint and one white flint were approved by the Philippine Seed Board for distribution to Filipino farmers in 1956. These hybrids outyielded significantly the best open-pollinated variety in the country by about 30% or yielding on the average 60 to 70 cavans per hectare. Last year two farmer cooperators were approved by the Seed Board to produce commercially hybrid corn seed for distribution.

Five new outstanding experimental yellow flint hybrids will be recommended soon to the Philippine Seed Board. The results of four seasons of regional tests indicated a highly significant difference when compared with the best open-pollinated yellow flint variety (College Yellow Flint).

b. The Search for Downy Mildew Resistant Lines - Downy mildew, a fungus disease caused by two species of Sclerospora of the family Peronosporaceae is causing serious damage to corn crops in some regions of the Philippines. It decreases considerably corn yields and in many cases virtually wipes out corn fields. The morphological characteristics and pathogenicity of the organism has been studied thoroughly but no successful control measure has been found effective in combating the disease.

All of the available inbred lines, single crosses and double crosses of yellow and white flint corn of the College of Agriculture were tested for resistance to downy mildew (Sclerospora philippinensis Weston for Luzon Island and S. spontanea Weston for the Visayan Islands) in the wet season of 1956. Artificial inoculation was done to supplement the natural infestation of the fungus. Two replications were used.

Disease observations were arbitrarily classified into seven groups, namely:

<u>Group</u>	<u>Description</u>	<u>Per cent infection</u>
I	Totally free	0
II	Very slightly infected	1 - 9
III	Slightly infected	10 - 29

¹The corn breeding program is being undertaken with the assistance of the Cornell visiting professor at the College of Agriculture, University of the Philippines.

<u>Group</u>	<u>Description</u>	<u>Per cent infection</u>
IV	Moderately infected	30 - 69
V	Highly infected	70 - 89
VI	Very highly infected	90 - 99
VII	Totally infected	100

Six inbred lines (five white flint inbreds and one yellow flint inbred) were found totally free from downy mildew infection. Similar results were obtained for two seasons. It seems that "near immunity" is easier to get among white-endosperm lines than among yellow-endosperm inbred lines.

The test for specific combining ability of the resistant lines is the next step to be undertaken. This season these inbred lines will be crossed with the high combining parental single crosses that are involved in the Philippine hybrids.

Crosses between resistant and susceptible inbred lines were being made this season to study the mode of inheritance of resistance to downy mildew.

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1. Characterization of sterility-inducing cytoplasm.

The WF9 genotype has been transferred by backcrossing to 12 separate isolations of sterile cytoplasm. WF9 is sterile, or nearly so, in all of these cytoplasm. Each type of sterile WF9 was crossed to 4 inbred lines: BH2, CE1, F5DD1 and C25-13. Pollen fertility of these F₁ hybrids at Johnston, Iowa in 1957 is shown in the table on the next page.

On the basis of these results it would seem that each of the new sources of sterile cytoplasm is identical either to the USDA or to the Texas type of sterile cytoplasm. It is possible, of course, that crosses with some other inbred may differentiate some of these cytoplasm from the type with which they now seem to be identical. If they cannot be so differentiated, however, it would seem that (1) only two possible types of "mutation" of normal cytoplasm to a sterility inducing type have been found, among 12 separate isolations, or (2) the two types of sterile cytoplasm trace back to two separate introductions of foreign cytoplasm (as from closely related species) into the maize genotype.