

3. Waxy corn hybrids utilizing waxy versions of standard U. S. lines.

Several white- and yellow-endosperm waxy corn single crosses were introduced in the early part of 1960 thru Dr. A. M. Brunson. Three-way crosses were made using the introduced single crosses as seed parents and selected high combining local inbred lines as pollen parents. These three-way crosses were tested for yield and other agronomic characters in the 1960 Wet Season. The highest-yielding three-way cross, (wx 33-16 x wx K41) x CG1 yielded 6.9 tons of marketable ears per hectare. CG1 is a local waxy line developed from Central Luzon Glutinous variety. Most of the hybrids outyielded the highest-yielding commercially grown varieties and were more uniform than the latter in maturity but were more susceptible to corn earworm.

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4. Resistance to downy mildew disease (*Sclerospora philippinensis* Weston).

The downy mildew disease (*Sclerospora philippinensis* Weston) is the most destructive disease of corn in the Philippines. Search for inbreds resistant to the disease has been under investigation since 1956. Since then, outstanding sources of resistance have been identified. Ten yellow and 4 white flint inbred lines were found definitely resistant in three-season tests under epiphytotics of the disease.

In the course of screening resistant inbred lines, a setback in time and the burden of maintaining susceptible segregates has been experienced. This is due to the fact that the causal organism being an obligate parasite cannot be grown in artificial media. In addition, abundant inocula for artificial inoculation can be gathered only when there is a favorable environment for the development of the causal organism. Thus, the efficiency of selecting resistant lines has been largely dependent upon the natural occurrence of the disease.

All the resistant lines obtained so far, unfortunately, are of local origin. Due to lack of genetic diversity among the lines, efforts are being exerted in selecting genetically diverse resistant lines from among newly introduced inbreds and also among lines developed locally from introduced varieties.

Meanwhile, the F_1 between resistant and susceptible inbred lines, their F_2 and F_3 , and backcrosses to the resistant and to the susceptible parent are being produced for the study of the mode of inheritance of reaction to the disease.

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