

2. Genetic resistance to a mosaic-stripe virus transmitted by *Peregrinus maidis*.

A devastating disease of corn in Hawaii and Central America is corn mosaic, transmitted by the leafhopper, *Peregrinus maidis*. Epiphytotics maintained at the University of Hawaii stunt all commercial sweet corn hybrids to non-flowering dwarfs under two feet in height. The mosaic, known as corn stripe in Central America, is distinguished also by clearing immediately above the veins.

Resistance to corn mosaic was found to characterize most plants of three tropical sweet corns -- Hawaiian Sugar (bred by Al Mangelsdorf from USDA34), Pajimaca (Cuba), and Maiz Chiripo Dulce (Mexico), as well as some plants among a dozen other tropical and field pop corn varieties. Over 200 other accessions were wholly susceptible.

Resistance of Hawaiian Sugar was shown to be under monogenic control with dominance lacking (full data to be published). Hybrids of resistant x susceptible inbred lines varied widely in mosaic severity, ranging from symptom-free plants to severely-stunted plants. Mosaic scores of 14,207 plants on a 1 (resistant) to 6 (severely stunted) scale averaged as follows:

Resistant Parent	1.25	F ₂	3.44
Susceptible Parent	2.46	Backcross to Res.	1.92
F ₁	2.46	Backcross to Susc.	4.07

Monogenic control was determined from a semi-quantitative approach to these data. The data represented ten different combinations of 6 susceptible and 6 resistant inbreds; no genetic differences were observed within the two groups of inbreds.

The mosaic resistant locus has been designated RM/RM (resistant to mosaic). Since the field reaction of heterozygotes appeared more like that of the resistant parent, the RM allele has been used to designate resistance, without inferring dominance of this allele.

Crosses were made of a resistant inbred to the WX translocation stocks (mosaic susceptible) from the Maize Genetics Coop. Unfortunately, the waxy tester (McClintock's) used for backcrosses later proved to have some resistance, obscuring segregations; nonetheless, crosses with both Chromosome 1 and Chromosome 6 testers were aberrant enough to warrant further study.

Resistance does not involve reduction of leafhopper oviposition. Rather, it appears to involve the suppression of viral development in relation to dosage of the rM allele.

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1. Female fertility of maize x *Tripsacum dactyloides* (4N) hybrids.

In last year's newsletter (38) results were reported on hybrids between certain maize translocation stocks and certain *Tripsacum dactyloides* plants collected in Illinois. All F₁ hybrids obtained were grown in the nursery and backcrossed to maize. Female fertility of some of the F₁ hybrid plants was greater than expected. The hybrid plants with exceptional female fertility all involved 4N *Tripsacums* as the male parents. Hybrids of this type have 10 corn and 36 *Tripsacum* chromosomes, and as a result of this high degree of chromosome imbalance a large percentage of female sterility should result.

The number of seeds set on these exceptional F₁ hybrid plants is presented in the following table:

	No. Plants	No. Seeds Set	Total No. Ovules	Mean % Set	Range in Percent High Low
1. T ₁ -6c x T.d. Horseshoe Lake E-11 (4N)	22	250	1466	17.05	48.31-0
2. T ₁ -6c x T.d. Horseshoe Lake E-10 (4N)	3	78	157	49.68	71.43-0
3. T ₁ -6c x T.d. Horseshoe Lake N-15 (4N)	8	118	706	16.71	83.33-0