

EAST AFRICAN AGRICULTURE AND FORESTRY RESEARCH ORGANIZATION  
Kenya Colony, East Africa

1. Resistance to Puccinia polysora Underw.

Race EA.1 of P. polysora still remains the only race identified in the field in Kenya, Uganda and Tanganyika. Breeding of resistant maizes has been discontinued, and will be reopened only if races appear virulent to present stocks carrying genes Rpp<sub>1</sub> or Rpp<sub>2</sub>.

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1. Pollen restoration system in Peruvian Coastal Flint maize.

The "Texas" (T) source of male sterility, represented by the single cross 203 MS x 61M, was crossed with the Peruvian Coastal Flint variety Amarillo La Molina in 1952. F<sub>2</sub> fertile plants were selfed, and pollen fertile plants from resulting segregating lines selfed to S<sub>2</sub>, where selected pollen fertile plants were simultaneously selfed and crossed to tester male sterile plants. Genetic analysis was carried on 1958 data from 32 F<sub>3</sub> and F<sub>4</sub> families (10 S<sub>2</sub> lines, and 22 S<sub>3</sub> lines), and their respective testcrosses, yielding the following classification:

Restoration:	Complete	Partial			No	
Phenotypic Ratios* (Fertile:Sterile)	All:None	3:1	9:7	3:5 1:3	15:1	None:All
Gene action	---	1 pair	2 complementary pairs (epistasis)		2 dupli- cate pairs	---
No. of lines	11	11	4 2 6		4	0

\*(Semi-fertile plants were pooled with the fertile group)

Chi-square tests conducted on phenotypic ratios gave good fits (P > 0.30) in the respective groups of F<sub>3</sub> or F<sub>4</sub> families, and their testcrosses, to the several ratios noted above.

It may be concluded that the pollen restoration system in the variety *Amarillo La Molina* of the Peruvian Coast is made up of at least two complementary dominant factors. No restoration of male fertility is effected when the zygote carries either one of these two factors in the homozygous recessive state. There is also evidence, that two duplicate dominant factors may be also operating as a substitute pollen restoring system in this variety.

Alexander Grobman

## 2. Pollen restoration in Caribbean and Southern U.S.A. maize.

Nine selected lines derived from parental Cuban varieties or hybrids were crossed to the "T" source of male-sterility. Of these, only one line FF(MS)14-2 proved to be a pollen restorer. Three F<sub>2</sub> families derived by selfing the F<sub>1</sub> of the cross FF(MS)14-2 x M.Sterile, gave the following pooled phenotypic segregation ratio:

	Sterile	Semi-fertile	Fertil
Observed	17	3	36
3:1 Calculated	15.25	44 44.75	

A good fit to the one dominant restorer factor hypothesis was obtained.

The following S<sub>1</sub> line [M.Sterile x FF(MS)14-2]-3 derived from the cross male sterile x homozygous restorer was testcrossed to a male sterile plant, giving a perfect 9 fertile: 7 sterile progeny ratio, pointing to the possibility that the basic restoring system may be also made up in this material of two complementary genes.

A study was conducted to determine the system of restoration of Ky-122, furnished by the North Carolina Expt. Station in the form of MS x (T-115xKy-122) by crossing it with the local form of male sterile AmIM x (203 MS x 61M) and studying segregation in 4 F<sub>2</sub> progenies. The following pooled ratio was obtained that fits closely a 2 complementary genes hypothesis:

	Sterile	Semi-fertile	Fertil
Observed	32	3	32
Calculated (9:7)	29.3	35 37.7	

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