Table 2. Frequency of mutations of $\underline{R}^{lst}$ to $\underline{R}^{sc}$ when heterozygous with $\underline{r}^{r}(I)$ and $\underline{r}^{g}$.

Heterozygous combination	Pedigree number	No. of $\underline{R}^{lst}$ kernels	No. of $\underline{R}^{sc}$ mutants	Rate of mutation X 10^{-4}
$R^{lst}/r^{r}(I)^{1}$	R56	7,179	17	23.7
$R^{lst}/r^{r}(I)^{3}$	R58	7,318	26	35.5
Pooled		14,497	43	29.7
R^{lst}/r^{g}	R57	3,366	4	11.9
R^{lst}/r^{g}	R59	4,532	1	2.2
Pooled		7,898	5	6.3

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1. Evidence of heterofertilization in maize.

From one of our projects of corn breeding one interesting finding regarding heterofertilization was accidentally obtained. As part of a project for obtaining a new white flint variety for this area (São Paulo State and neighboring), a planting was made in an isolated plot of white kernels from segregating F_2 ears of a cross yellow x white, involving the local Cateto variety and flints from Colombia. At harvest 61 ears were found to be segregating white and yellow kernels. These ears are considered to be the result of plants from heterofertilized kernels (white endosperm $\underline{y}\ \underline{y}\ \underline{y}$ and embryo $\underline{Y}\ \underline{y}$). It is estimated that the total population was about 60,000 plants. So we had roughly 0.1% of segregating ears due to heterofertilization. If we assume the same proportion of non detected heterofertilized ears (i.e. both embryo and endosperm being recessive white) we come out with an estimate of about 0.2% of heterofertilization in this material.

The proportion of white and yellow kernels in these 61 ears is expected to follow the 1:1 ratio, since the plants should be heterozygous $\underline{Y}\ \underline{y}$ and the bulk of the 60,000 surrounding plants were homozygous recessive $\underline{y}\ \underline{y}$. This was in fact the case, except that two ears had a highly significant X^2 (0.1% level) and one had a X^2 significant at the 5% level. All the others did not deviate significantly from the

expected 1:1 ratio. Excluding the two highly significant ears, the sample was a rather uniform one as can be seen by the breakdown of the X^2:

	D.F.	X^2
Sum of 59 X^2	59	55.16
Pooled X^2	1	0.31
Heterogeneity	58	54.85

All three ears with significant X^2 had an excess of yellow kernels. The two ears with a highly significant X^2 gave a segregation of 0.59 yellow: 0.41 white. Since there is no reason to admit that these plants should have preferential crossing between them, this excess of yellow kernels must be due to some amount of selfing. It can be shown that in order to give that proportion of yellow and white kernels these two plants probably had about 36% of selfing.

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2. Some preliminary results on the effect of inbreeding on viability and variability in corn.

Morton, Crow and Muller (1956) gave a method for estimating the number of deleterious equivalents carried by a zygote in a given population, and we started work with this method in maize making crosses and selfings within a population of the race Cateto, in order to obtain different levels of inbreeding. 52 plants were selfed (F = 0.5) and at the same time outcrossed at random with individuals of the same population (control, F = 0.0). Some preliminary results can be reported:

a) Effect on viability as measured by germination rate - About 89% of the progenies obtained by selfing showed a nearly perfect germination, as did all those obtained by outcrossing, and 11% showed a decrease in germination of about 13%, i.e. a germination rate of 87%.

b) Effect on variability of seedling height

b.1) Seedling height (seedlings one week old) was measured in the greenhouse. In general, those progenies which showed decrease in germination rate, showed also a greater variability in height of the survivors. Thus it can be concluded preliminarily and for this material, that those genes, which act in increasing mortality of seedlings, are polygenes with a general deleterious effect on biological activity, showing cumulative effects.