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1. Cytological studies of "necrotic embryos" line MR 077.

Each plant of the inbred line MR 077 produces regularly a number of aborted or partially necrotic embryos (see MNL 34,117). This line is also partially male-sterile, producing a mixture of good and aborted pollen grains. Therefore we attempted a cytological analysis of the line and some of its hybrids.

Mitosis observed in root tip cells appears constant and normal in the line and in hybrid plants.

Meiosis was studied on the different parts of complete tassels. One anther of both flowers of a spikelet cut out on each branch at three levels (base, middle, summit) was squashed in acetocarmine.

Meiosis begins in the central part of the main rachis and gets its extremities which present usually the same stage. As to the branches, meiosis starts mostly at the base but an inversion of this polarity may occur; apical branches may accomplish meiosis prior to basal ones. Inside a spikelet, the time of a complete meiosis separates the two flowers.

Some abnormalities were observed:

On the line plants, before meiosis, some anthers without P.M.C. and some P.M.C. without nuclei have been observed with a very low frequency. During meiosis, no abnormality in chromosome behaviour was seen but we have to note that well spread pachytene cells were difficult to obtain. Some meioses were blocked at early leptoneма but with a low frequency. In those cases the small flower completed meiosis while the big one remained at leptoneма. This observation suggests that a mechanism prevents meiosis from going on.

After meiosis, young pollen grains were generally normal, full and well coloured, but when the walls and the germ pore appeared, many anthers showed a mixture of good and aborted microspores.

In the hybrid plants, meiosis is perfectly normal and leads to good pollen.

Thus, we may conclude that the partial male-sterility is not due to an abnormal chromosome behaviour at meiosis but to other phenomena

which take place infrequently before or at the beginning of meiosis and to a greater extent after meiosis.

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## 2. Study of the size of mutated sectors in the corn ear.

Mutagenic treatments of maize seeds were used in order to determine the significance of mutated areas on the ear.

For this purpose, plants derived from seeds of inbred line V7 treated with EMS (1.5 g/l) were detasseled and pollinated by  $\underline{sh}_2/\underline{sh}_2$  mutant V7. Observations were made on:

1.  $\underline{sh}_2$  mutated kernels on the ear of treated plants ( $M_1$ )
2. Chlorophyll mutants in  $M_3$  progenies obtained by selfing of  $F_1$  plants.

### Endosperm mutants.

Two ears of 486 harvested showed the mutation  $\underline{sh}_2$ . In the two cases, about 50% of the total kernels were  $\underline{sh}_2$ . Consequently those two ears are believed to be completely included in periclinal chimaeras (mutated area  $\geq$  ear size).

### Chlorophyll mutants.

Several types of mutant seedlings were observed in  $M_3$  progenies. Results from families showing 1, 2 or 3 different phenotypic mutants are summarized in Table 1. All progenies segregate with correct mendelian ratios.

The results indicate that:

1. If we consider the destiny of only one mutation, the frequency of segregating progenies per family (frequency of heterozygous embryos in the initial ear) is not significantly different from 50% in about 7 of the 13 studied families. In 5 families this ratio is significantly lower than 50%.

In the first group (including the two  $\underline{sh}_2/+$  mutated ears found in  $M_1$ ), the mutated sectors seem to be at least equal to the ear size, whereas in the second group they are smaller.

An aberrant case (H family, ratio  $>$  50%) will be the subject of