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1. Recombination in the  $a_1sh_2$  region.

Backcross data on recombination rate in three different genetical backgrounds, having in common the "Texas" male sterile cytoplasm, are reported for  $a_1 sh_2$  markers in coupling in the following table:

| Genetical background | No. of ears | Total no. of seeds | $A_1sh_2$ seeds | $a_1Sh_2$ seeds | % of recombination |
|----------------------|-------------|--------------------|-----------------|-----------------|--------------------|
| A158                 | 36          | 21386              | 9               | 14              | 0.107              |
| W22                  | 33          | 9632               | 3               | 4               | 0.072              |
| WF9                  | 31          | 12215              | 8               | 6               | 0.114              |
| Totals               | 100         | 43233              | 20              | 24              | 0.101              |

The crossover value is clearly lower than that previously reported (0.27%). However, it is undecided whether this is due to different environmental conditions (including the T type cytoplasm) or to a difference in nuclear genotypes, although the latter interpretation appears less likely because of the uniform behavior of the different backgrounds of the inbred lines used. It is interesting that this value is of the same order of magnitude as at least one intracistron recombination rate:  $wx^{90}/wx^C$  produces, according to our data, about 1%  $wx$  pollen grains, mainly as a result of the recombination process.

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2. Effect of storage on x-rayed pollen.

By applying Everett's technique it has been possible to prolong the pollen life-span and to study the effect of storage on x-rayed pollen (1750 roentgen in about 7').

The data appearing in the following table are roughly in agreement with those obtained with storage of dry irradiated seeds:

| Temperature and relative humidity | Storage periods (in hours) | Chromosome and markers                    | Kernels scored | % of germless kernels | % of endosperm mutations |
|-----------------------------------|----------------------------|---|----------------|-----------------------|--------------------------|
| 3°±1°C 70-90%                     | 1                          | 3,5<br>a <sub>1</sub> sh <sub>2</sub> ,pr | 988            | 9.6                   | 14.6                     |
|                                   | 4                          |   | 1130           | 16.6                  | 19.6                     |
|                                   | 60                         |   | 980            | 9.1                   | 17.6                     |
|                                   | 121                        |   | 498            | 13.2                  | 13.6                     |
| 20-30°C 60-70%                    | 1                          | idem                                      | 663            | 11.7                  | 10.2                     |
|                                   | 4                          |   | 587            | 19.2                  | 19.0                     |
|                                   | 22                         |   | 153            | 17.9                  | 22.2                     |
|                                   | 30                         |   | 136            | 22.0                  | 18.2                     |
| 3°±1°C 70-90%                     | 1                          | idem*                                     | 716            | 15.5                  | 13.7                     |
|                                   | 48                         |   | 193            | 18.6                  | 19.8                     |
|                                   | 78                         |   | 340            | 19.1                  | 11.9                     |
|                                   | 96 1/2                     |   | 68             | 19.1                  | 14.0                     |
| 3°±1°C 70-90%                     | 148                        | 9<br>C sh bz wx                           | 217            | 23.9                  | 16.4                     |
|                                   | 1 1/2                      |   | 493            | 4.2                   | 2.6                      |
|                                   | 52                         |   | 558            | 6.6                   | 4.3                      |
|                                   | 148                        |   | 212            | 6.6                   | 3.3                      |

The data marked with an asterisk refer to a hybrid type, homozygous nevertheless for the appropriate markers involved: the radio-sensitivity of the hybrid appears somewhat greater as compared with that obtained from an inbred line.

The recovery following the initial increase of damage could partially be ascribed, either to the active metabolism of pollen and/or to aplontic selection. The types of mutations detected are of the kind common in maize, and interpretable as chromosomal deletions.

G. Gavazzi

### 3. Mutagenic activity of nebularine and ethyl methane sulphonate.

Mutagenic activity of such chemicals has been studied on the basis of endosperm mutations, following treatment of mature pollen. Solutions are administered with a vial applied to tassels newly shedding pollen 24 hours before a first pollination, which was, then, repeated for 2 more successive days.