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1. Occurrence of two pollen-fertile plants following mitomycin treatment of maize seeds carrying male-sterilizing Texas cytoplasm.

Maize seeds (250) carrying male-sterilizing Texas cytoplasm when treated with 200 µg/ml of mitomycin (MC) for 16 hours, yielded 2 plants that were sectorially male-fertile. One of these had a rudimentary cob and was also out of phase with the testers and therefore could not be tested. The other plant was self-pollinated and also crossed to the male-sterile line. From the latter only pollen-sterile plants were obtained indicating that no change had occurred in any restorer gene. The selfed plant yielded a progeny of 40 male-sterile and 6 pollen fertile plants. Six fertile plants on selfing gave only fertile plants and the 40 sterile plants on being crossed by the sterility maintainer yielded only sterile plants. The observations and interpretations are consistent with the notion that the change had occurred at the cytoplasmic level.

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2. A sequel to note 1.

While this appeared to be an authentic case of induced restoration of fertility, in a recent and a much larger experiment (about 2000 plants treated with MC) no restored plants were observed. The conditions of treatment were similar except that the treatment was given for 24 hours so that the failure in the present experiment was unexpected.

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3. Inhibition of DNA synthesis by MC in germinating maize embryos.

Mitomycin (MC) is a known inhibitor of DNA synthesis. Some success in male-fertility restoration by MC in our early experiments suggested that this might be due to an inhibition of DNA synthesis. We have found that DNA synthesis in germinating embryos is inhibited in the presence of MC. This inhibition is released when the seeds are transferred to MC-free medium (H_2O).

Maize seeds carrying male-sterile cytoplasm (T type) were germinated in the presence of 50 µg/ml, 100 µg/ml and 200 µg/ml concentration of MC and ^{3}H-thymidine (20 µc/ml) for 24 and 48 hours in dark at 32°C. under shaking. Appropriate controls were kept. After the treatment, seeds were washed in cold, embryos were excised, transferred to cold saline-EDTA (0.15M saline - 0.10M EDTA at pH 8.5), homogenized, lysed with lysozyme (100 µg/ml) and sodium lauryl sulphate (final conc. 1%). Samples of the lysates were spotted on filter paper discs, dried, washed