

FUNK SEEDS INTERNATIONAL

Bloomington, Illinois

Cytoplasmic male sterility research: M₃ generation from streptomycin treatments — Since the initial report (MNL 47:35-37) on treating maize seeds with streptomycin, there has been a generation-to-generation report. The principal objective of this research was to induce cytoplasmic male sterility in an inbred line. As reported last year (MNL 48:32-35), male sterile plants were obtained. The sterile plants were sibbed within the row, and these progeny were grown out this past summer. Many of the rows had plants that segregated for sterile:fertile plants. Some rows had plants that were all fertile. No rows had plants where all plants were sterile. The best genetic ratio to explain the results seems to be 1:1 for sterile:fertile plants since from the rows that segregated for sterile plants, the overall average was 45% steriles. This could be due to at least two things:

(1). A nuclear gene for male sterility in the heterozygous condition was present in some of the seeds that were initially treated with streptomycin. This gene segregated after selfing, and these plants were sibbed within the row by fertile plants which were either homozygous or heterozygous for genic male sterility. Homozygous plants used as the pollen source produced rows that were all fertile, and plants heterozygous for the male sterile gene used as the pollen source gave progeny segregating approximately 1:1 for sterility:fertility. If this is the case, it assumes that no cytoplasmic male sterile mutants were induced and only that spontaneous genes for male sterility were occasionally in the heterozygous condition in the seeds that were initially treated with streptomycin.

(2). Cytoplasmic mutants for male sterility could have been induced but the inbred population was segregating for restorer genes, which allowed the 1:1 ratio for sterility:fertility (MNL 47:35-37). To examine this theory further, as many as possible of the male sterile plants in each row were each crossed by pollen from any inbred in our field laboratory that had pollen available. Also, as many inbred pollen parents as possible were used on the sterile plants in each row. This was done in an attempt to bring in some non-restorer genes. This material will be grown in the next generation to observe for male sterile progeny.

This work has been continued using treatment procedures basically similar to the original report (MNL 47:35-37). In addition to streptomycin we are using erythromycin, acroflavine and ethidium bromide on maize seeds in an attempt to induce cytoplasmic male sterility.

Robert W. Briggs

Chemical pollen control by DPX 3778 — This compound is being evaluated for its ability to prevent pollen shed and thus facilitate hybrid corn production.