Few samples showed clear centromeres, possibly, as a result of the not very deeply staining quality of the heteropycnotic adjacent regions.

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Anna M. Moa
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5. T Cytoplasm male-sterility in Italy.

To valuate the environmental influence on the T type cytoplasmic male sterility the following inbred strains obtained from Dr. D. F. Jones, have been carefully scrutinized during the flowering period in Piacenza, Italy.

Inbred	No. of plants
WF 9T	40
WF 22T	36
A 158T	46
Multiple tester for chromosome 2	10

The male sterility was complete in all the plants, since no pollen shedding has been observed, and the tassel usually showed no exserted anthers.

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1. Separation of S and T pollen restoring genes.

In previous publications it was reported that S sterile inbreds restored to normal pollen production by crossing and backcrossing with Ky21 and selfing gave good restoration when tested on a number of S sterile lines but did not restore T sterile inbreds in all crosses. The same inbreds sterilized by T cytoplasm and restored to normal pollen production by restoring genes from the same Ky21 source have now been tested on both T and S sterile lines. In every case these T sterile lines restored to normal fertility give good restoration in some plants of all T sterile lines tested but fail to restore some S sterile inbreds of the same genotypes. This is further evidence that the fertility restoring genes in Ky21 are different for S and T cytoplasm and can be separated and fixed in the homozygous condition in different lines.

It has been shown that I153 and W22 can also be used to differentiate S and T cytoplasm. When I153 was crossed on to five other sources of cytoplasmic sterility, differing from the S and T sources, but all converted by backcrossing to the same inbred genotype, all of the progenies were either completely sterile or showed only a few anthers with little or no normal pollen. When crossed by W22 more pollen was produced but none were completely restored. This would indicate that none of these new sources of sterile cytoplasm are the T type. Some of them may be of the S type but the evidence is not conclusive. These five sources and several additional new sources are being put into the same genotypes by backcrossing and will be tested further.

2. Inhibitors of pollen restoring genes.

Previously all crosses of I153 and related lines (W153R, A344, A293) on T sterile inbreds have given completely normal pollen production on all plants in the F_1 hybrids. Last year a few combinations on HyT and W22T were either completely sterile or segregated into fertile and sterile plants. Pollen from the same I153 line on other T sterile lines produced all normally fertile plants. This is an indication that there may be pollen inhibitors that operate only in T sterile cytoplasm but not in normal cytoplasm to prevent the action of T restoring genes. This may account for some of the variable results with pollen restoring inbreds.

3. Universal seed parents.

These inhibitors of pollen restoration may also make possible sterile seed parents that can be used with non-restoring pollinators to give adequate pollen production in the final hybrids. This will be brought about by the normal segregation of restoring genes and inhibitors brought in solely from the seed parent. Such sterile universal seed parents could be produced and maintained with little more difficulty than present sterile seed parents and would be available for use with any pollinator, not carrying inhibitors, without incorporating pollen restoring genes.

D. F. Jones

4. Non-segregation in restoration of cytoplasmic male sterility.

A number of cases have been found where cytoplasmic male sterile (S type) plants crossed by plants carrying sterile cytoplasm and heterozygous for fertility restoring genes have given all-fertile progenies (S x SF → all SF). (The nomenclature is that proposed by the Northeastern Corn Conference /Maize News Letter 31: 2_/). All of