in the cytoplasms being evaluated. The cytoplasms of EK, M, MY, G, IA, SD, and PS appear to fall into an almost identical pattern. This pattern is different from that of the other 17 cytoplasms. The ML, TC, VG, and J cytoplasms appear to fall into a second group. The H, CA, and W cytoplasms fall into yet a third group. There is additional variation among the remaining cytos. Further evidence secured by additional backcrossing should substantiate, or possibly disprove, the comprehensive data obtained thus far.

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4. Precautions for use of "normal" 33-16 inbred.

In the reversion from ear parent inbreds which are T sterile back to so called normal versions, a review of what is normal must be considered. This is especially true in the case of 33-16.

Prior to the extensive knowledge and use of sterile and restorer inbreds in production, a case of scattergrain fill was reported with a hybrid which used 33-16 as its female parent. It was later learned that 33-16 had a special cytoplasm, which in some instances could be sterile.

With this knowledge, the inbred 33-16 was delegated for use as a male parent, either in making seed of the single crosses for hybrid production, or as the male parent in the production of the final hybrid.

During the time T cytoplasm material was being used, the 33-16 inbred was converted from its "normal" cytoplasm to the T cytoplasm version. Here the use of blending, or restorers for T cytoplasm, was relied on. Hence there was little or no concern of ample pollination in the farmers' field.

With the outdating of the T cytoplasm, 33-16 with its regular cytoplasm was brought back into production. Recently the 33-16 inbred has been classified as having the J type cytoplasm. The indiscriminant use of 33-16 could again cause problems.

In the use of regular 33-16 as the ear parent inbred either in a three way cross or in a 4 way hybrid, the following condition might exist, assuming that H21, K55, and Ky27 or similar inbreds might not restore fertility to a J sterile:

33-16 x W21 = Rf rf (all fertile)

(33-16 x H21) x K55 " x Ky27 " x (K55xKy27)	1 Rf rf (fertile) 1 rf rf (sterile)

Under ordinary conditions, and assuming that the 33-16 inbred fertility is brought about by full restoration of the J cytoplasm, one would expect 50% of the plants would be fertile and the remaining would be sterile. However, assume that the 33-16 inbred is more of a heavy partial type fertility, and in our judgment, this may be the case. Further, assume that environmental conditions, especially in the white corn growing area, are not ideal at pollination time. It would then be easily possible to have far less than 50% of the viable abundant pollen which would be expected. This might well have been the case in the scattergrain fill, as previously reported.

Realizing the seriousness of the situation in regards to 33-16, Illinois Foundation Seeds has taken the following three precautionary steps in preventing pollination problems from arising:

(1) The bulk of the foundation single cross production was made reciprocally. Both versions will be available for seed production. As an example, both 33-16 x Ky201 and Ky201 x 33-16 are available, thereby assuring that not all seed sold farmer customers needs to have the J cytoplasm.

(2) J cytoplasm crosses are being studied so that combinations can be recommended in which other inbreds can contribute a higher degree of restoration, or fertility, in case it is necessary to use only 33-16 J as the female parent.

(3) A 33-16 which has the cytoplasm of B37 has been increased and will be used in future production. This will thereby eliminate the concern of the J type cytoplasm. This 33-16 strain came about, and was possible, through the program in which 33-16 was being converted to a floury endosperm type. (The normal kernels rather than floury were selected and increased.)

Caution also might be advisable in the use of new cytoplasms where fertility might be the result of heavy partial restoration rather than full restoration. A case in question could be the restoration of the S type cytoplasm. Even though some testcrosses appear to have a great amount of fertility, much of this fertility does have more of a semblance of heavy partial rather than actual full and positive restoration.

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1. Translocations generated by monosome X diploid crosses in Zea mays.*

It is well documented that certain regions of the genome are present in duplicate in maize as well as in other organisms. If a given monosomic chromosome bears a region which is also present on another chromosome, these two regions might occasionally pair in the monosome and recombination might take place between the duplicate regions. If this happens, reciprocal translocations would be found in the progeny of monosome X diploid crosses.

Plants confirmed to be monsomic for chromosomes 2, 4, 6, 7, 8, or 10 have been used successfully as males and monosomes 4, 6, 7, 8, and 10 as females in our cultures. Large numbers of progeny from crosses between specific monosomes and diploid inbreds are being analyzed for plants with about 50% ovule and pollen abortion. Three translocations have been cytologically confirmed from such crosses and 20 additional lines carrying transmissible semisterility have been isolated. Thus, translocations are obtained in the progeny of monosome X diploid crosses.

Through the use of a given monosome, a specific chromosome is tested against the entire genome for redundant segments; thus such segments can be determined chromosome by chromosome. If a specific translocation were repeatedly found this would indicate homology between two chromosome segments. However, if a random array of translocations is

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