Our studies of fertility restoration of the male sterile cytoplasms demonstrate the 3 groups (C, S & T) of cytoplasms described by Dr. Jack Beckett at the University of Illinois. In addition, we have identified several cytoplasms that don't fit into any of the groups (Table 3). We have also detected a diversity of fertility reactions within the S group. Certain cytoplasmic sources previously included in this group give the opposite fertility reactions of other members of the group in certain inbred backgrounds (Table 3). Additional groups or subgroups could be developed if partially fertile reactions are considered. Further studies of the genetic and physiological diversity of these cytoplasmic sources of male sterility are in progress.

Table 3

Groups of male sterile cytoplasmic sources with similar fertility restoration reactions

C group:	C,RB
T group:	HA,P,Q,RS,T
S group:	F,H,I,IA,J,MY,R,SD,VG,W
	- cytoplasms similar to S group but which give differential reactions in some inbred backgrounds:
	CA,EK,G,K,L,M,ME,ML,PS,TA
Other male sterile cytoplasms:	B,CH,D,EP,LF
Probably non-male sterile cytoplasms:	NT,OY,SG,181,234

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2. Heat induced autotetraploids of maize.

A series of maize inbreds homozygous for endosperm mutants were exposed to heat and cold shock in an attempt to duplicate their basic chromosome complement. Crosses with known tetraploid stocks indicate the treatment was successful.

Inbreds W64A $\underline{fl_2}\underline{fl_2}$ and W153R $\underline{fl_2}\underline{fl_2}$ were exposed to 42°C for 30 minutes, 48 hours after pollination. The heat shock was followed by

packing the treated ears in ice for 15 minutes. The offspring from the treated ears were grown out, selfed, and crossed to Syn B. Several of the cross pollinations were successful. These tetraploid stocks are being expanded.

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1. Cryptic earliness in maize.

To produce an early maturing hybrid, one commonly uses at least one very early inbred as a parent in the cross. The degree of difference between maturities of parental inbreds is often limited by the ability of the breeder to provide for adequate "nick" of anthesis and silk extrusion. The concept of using "cryptically early" germplasm to bring earliness to the progeny of a cross was proposed in the 1972 Maize Genetics Cooperation News Letter. The term "cryptic earliness" describes a latent genetic potential for earliness which is masked by the id/id genotype. An id/id plant without effective earliness genes is vegetatively indeterminant and barren, but with proper selection of earliness and fertility genes in the id/id background, adequate fertility has been obtained in the inbred line B37 id/id. B37 id/id is taller and later than B37 +/+. However, the cross of B37 id/id x A619 is shorter and earlier than B37 +/+ x A619. The data presented here demonstrate the effect of the id gene in masking extreme genetic earliness and associated agronomic characters so that those genes for earliness can be utilized without the usual wide divergence in maturity of the parental inbreds. Earliness, shortened plants, and lowered ears are unmasked in heterozygous +/id offspring. Any effect of cryptic earliness conversion on yield remains to be established in replicated trials, but the effect on maturity and ear and plant height appears evident in this pilot study. Cryptically early inbreds may prove useful in producing hybrids in a location with longer growing season than the area of intended