Green plants in the F_1 families were backcrossed as seed parents by the standard iojap stocks. One backcross progeny contained 7 green or slightly striped plants and 7 plants with a moderate number of stripes. The second backcross progeny had 2 green, 2 slightly striped plants and 7 plants judged to be typical iojap like the recurrent male parent. A second backcross generation stemming from both green and striped female parents consisted of 6 families all of which contained only striped plants. The intensity of variegation in the BC2 progenies was not obviously correlated with the degree of variegation of the BC1 females (pollen from the same plant was used in making all backcrosses), all 6 BC2 progenies showing about the same degree of variegation whether derived from green or striped seed parents.

The expression of the iojap phenotype in the BC2 families was much more pronounced than in the original ij ij, teosinte cytoplasm stock from Mazoti, but was probably somewhat less pronounced than in the standard ij ij recurrent parents. The teosinte cytoplasm may thus be interacting with the ij genotype in our stocks, but if so the resultant modification of the iojap phenotype is less dramatic than in Mazoti's stocks. If one rules out pollen transmission of maize plastids and cytoplasm, the results to date might suggest, among other things, differences in iojap alleles or differences in modifiers of the iojap gene in the different stocks. Our standard iojap stocks (with maize cytoplasm) are considerably more variegated than the standard stocks received from Mazoti, and it appears that these differences are also manifest by the degree of expression of the two genotypes in teosinte cytoplasm.

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1. Conversion of inbreds to Texas-sterile cytoplasm by androgenesis in a tetraploid-diploid cross.

A Texas-sterile cytoplasm, tetraploid version of the "Emerson Brown" marker, a B Pl, was used as the female parent in a cross by the Purdue inbred H52. Among the progeny, there was one individual, diploid and paternal in phenotype. This individual was partially fertile and set some seed upon self pollination. In the second generation, field grown, most individuals were completely sterile; a few were partially fertile; all were phenotypically indistinguishable in other characteristics from normal H52. Apparently an unreduced gamete from the male functioned androgenetically and, as expected, acquired the cytoplasm of the female parent. This gamete, presumably, was heterozygous for partial fertility; or, possibly, the greenhouse environment in which the androgenetic individual was grown favored pollen formation.

A number of other inbred lines were used as males on the tetraploid cyto-sterile marker stock last summer. Among the progeny now in the seedling stage a number of paternal monoploids and several diploids have been recognized. The expectation is that these individuals carry the Texas-sterile type of cytoplasm. (See Goodsell: Crop Science Vol. 1, No. 3, p. 227, 1962)

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1. Associations between chromosome knobs and plant characters.

Cytological and morphological analyses of a Maiz chapalote population has revealed statistically significant associations between specific chromosome segments marked by knobs and certain plant characters. Six knobs (positions 1L, 4S, 4L, 6a, 6b, and 8L) were segregating in the population to the extent that their presence or absence could be compared with 21 commonly-used plant characters. Only knobs 4L and 6b showed significant association with any of the characters used. These associations are listed in the following table:

Table 1

Knob--plant character association	Knob condition	N	X	S^2	P value
Small stem diameter and knob 4L (mm.)	KK and KO	13	24.7	2.20	.05
	OO	5	26.9	4.25	
Many tillers and knob 4L	KK	9	2.7	0.50	.001
	OO	5	1.4	0.30	
	KO	4	2.0	0.66	.01
	OO	5	1.4	0.30	
Late pollen shedding and knob 6b (days)	KK and KO	27	71.14	11.97	.01
	OO	3	64.33	6.33	
Many stem internodes and knob 6b	KK and KO	27	14.14	1.20	.02
	OO	3	12.33	1.33	
Narrow leaves and knob 6b	KK and KO	27	9.27	0.71	.02
	OO	3	10.50	0.00	