

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 <sup>2</sup>	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	
	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	

Genetic experiments are now in progress to validate cytological observation and to possibly reveal the existence of knob-linked genes having some control on the expression of quantitative plant characters.

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1. Fatty acid composition of corn oil of certain inbred lines and their F<sub>1</sub> hybrids.

Two groups of inbred lines (selected for high oil content in the kernel) were grown at Experiment, Georgia, in 1961. One group (I) of inbred lines which had been developed by a number of experiment stations was selected from the breeding nursery at the Georgia Experiment Station. A second group (II) of inbred lines was selected from inbreds developed at the Pee Dee Agricultural Experiment Station, Florence, South Carolina. Selfed seed of these inbred lines were analyzed for oil content and fatty acid distribution. All possible single crosses within groups I and II were also made in 1961. During the winter of 1961-62, these single crosses were grown in Florida and 5 to 7 selfs were made in each cross. Fatty acid analyses were made on the selfed seed of F<sub>1</sub> progeny from crosses of inbreds of high x high, high x low, and low x low composition for each of the five important fatty acids in corn oil. The results of fatty acid analyses of the inbred parents and their F<sub>1</sub> hybrid single crosses are given in Table 1.

The F<sub>1</sub> hybrids had less palmitic acid than the average of the parents for all types of crosses in groups I and II. The cross of two inbred lines low in palmitic acid resulted in F<sub>1</sub> hybrids with less palmitic acid than the low parent. The F<sub>1</sub> hybrids were lower in stearic acid than the average of the parents in crosses of high x high and low x high. Crosses of low x low resulted in a slight increase of stearic acid in the F<sub>1</sub> as compared to the average of the parents. For oleic acid, the high x high cross gave F<sub>1</sub> hybrids with less oleic acid and the low x low cross had more oleic acid as compared to the parental averages. The low x high cross had less oleic acid in F<sub>1</sub> hybrids of group I and more in group II as compared to the average of the parents. Linoleic acid content of the F<sub>1</sub> hybrids was slightly increased over the parental average in the high x high cross, moderately increased in the high x low cross, and considerably increased in the low x low cross. F<sub>1</sub> hybrids had lower linolenic acid contents than the average of the parents in all types of crosses except the low x low cross in group II.