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1. Cytoplasmic influence on the inheritance of oil content.

Reciprocal crosses between Illinois High Oil (IHO) and eight lines were made in the summer of 1967 to estimate the differential influence of the maternal and pollen parents on oil content. The results obtained using wide-line nuclear magnetic resonance (NMR) are listed in Table 1.

Table 1  
Mean Oil Content in Parental and Reciprocal  $F_1$  Seed

Parent 1	Oil Content in Per Cent						Parent 2
	$P_1$ Selfed	$P_1 \times P_2$	$P_2 \times P_1$	$P_2$ Selfed			
IHO (1)	11.27 *	6.78 *	1.93 *	.53		ILO	
IHO	12.44 *	10.28 *	6.51 *	4.32		WF9	
IHO	13.79 *	10.27 *	7.90 *	4.64		B37	
IHO	13.49 *	10.32 *	6.40 *	3.70		H49	
IHO	12.63 *	9.22 *	5.06 *	3.62		Oh7A	
IHO	12.60 *	9.79 *	6.72 *	4.51		B14	
IHO	14.35 *	12.20 *	7.47 *	4.83		M14	
IHO	14.34 *	10.43 *	6.92 *	3.61		Oh43	
Average	13.11 *	9.91 *	6.11 *	3.72			

\*Significant difference between all pairs of means listed in each of the two columns,  $P_1$  Selfed vs.  $P_1 \times P_2$ ;  $P_1 \times P_2$  vs.  $P_2 \times P_1$ ; and  $P_2 \times P_1$  vs.  $P_2$  Selfed, at the 5% probability level.

(1) IHO = Illinois High Oil, ILO = Illinois Low Oil

As the  $F_1$  differences are large, this material should give the maximum potential for separating the influence of the female sporophyte from that of the cytoplasm contributed by the female parent, both postulated causes of the observed maternal differences. To test for cytoplasmic effects,  $F_1$  reciprocals were selfed in separate replicated experiments yielding seed born on genetically identical plants with different cytoplasm. The

results are presented in Table 2. Significant differences were found in four of the IHO-line combinations; however, combined analysis for all experiments did not show significance as the IHO did not have a consistent effect.

Table 2  
Number of Reciprocals, Total Number of Subsamples and Per Cent Oil Means for  $F_2$  Seed Representing Both Cytoplasm Sources From Initial IHO By Line Crosses

Line Crossed Reciprocally With IHO	Number of Separate Reciprocals	Total Number of Subsamples	Per Cent Oil	
			IHO Cytoplasm	Line Cytoplasm
ILO	5	473	4.71*	4.81
WF9	2	284	9.24*	9.38
B37	2	284	8.81*	8.70
H49	2	241	8.69	8.75
Oh7A	2	272	7.52	7.60
B14	2	196	9.01	8.97
M14	2	239	9.23	9.17
Oh43	1	164	8.33*	8.29
		Average	8.19	8.21

\*Significant difference between means at the 5% probability level.

It can be concluded from this data that a cytoplasmic effect on oil content exists. However as the magnitude of the  $F_2$  differences is small and sometimes reversed from that expected based on the  $F_1$ , the physiological influence of the maternal parent must be the primary factor causing the observed differences in the  $F_1$ .

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## 2. Lipid and protein characteristics of a Peruvian archaeological specimen.

A well-preserved cache of corn ears 800 to 1,000 years old was uncovered during a road-building operation in the La Rinconada area near LaMolina. According to Alexander Grobman, the sample is representative of the ancestor of the Chilcano and Huachano complexes of early, drought resistant coastal floury corns.