production, or for the incorporation of earliness genes by standard backcrossing into very late maturing inbreds without delayed planting of the early parent.

D. L. Shaver
C. L. Prior

2. Defective cytoplasm in Zea.

In 1956 an experiment was begun to insert the Wf9 nucleus into a number of exotic cytoplasms, among these, that of perennial teosinte, Zea perennis. Two isolates of perennial teosinte cytoplasm were made. In the 1966 winter nursery at Homestead, Fla. one of these was found to cause defectiveness in plant phenotype: male sterility, chorophyll striping, reduced germination and plant size. This was discovered in the backcross-7 progeny of the transfer process.

Upon reaching the backcross-8 level of recovery of Wf9 with teosinte cytoplasms, each of three Wf9 cytoplasmic types were inserted into two different single cross hybrids in order to evaluate the effects of the defective cytoplasm upon hybrid performance, and these were tested in a 4-replication yield trial at Greenfield, Calif. in 1968.

Entry	Hybrid	Type of cytoplasm	Acre yield	No. days to ½ silk	Inches above ground ear height
1	Wf9xC103	Maize	14,221	102.2	51.2
2	Wf9xC103	Normal teosinte	14,084	101.2	51.0
3	Wf9xC103	Defective teosinte	11,377	104.2	49.0
4	Wf9x644	Maize	14,389	103.2	51.5
5	Wf9x644	Normal teosinte	14,649	103.8	51.0
6	Wf9x644	Defective teosinte	11,432	104.2	46.5

Analysis of variance

Source	D/F	SS	MS	F	5%	1%
Total	23	19.0687				
Hybrids	5	13.7151	2.7430	14.892**	2.90	4.56
Reps	3	2.5904	.8635	4.688*	3.29	5.42
Error	15	2.7632	.1842			

Entry 1 vs. entry 2 = .02
Entry 1 vs. entry 3 = 1.53**
Entry 2 vs. entry 3 = 1.51**
Entry 4 vs. entry 5 = .14
Entry 4 vs. entry 6 = 1.40**
Entry 5 vs. entry 6 = 1.74**

Probability	T	σ MD
5%	2.13	.646
1%	2.95	.895

In both types of single cross hybrids the defective cytoplasm isolate markedly depressed yield in comparison with the same hybrid made with either of the other two cytoplasm types, but hybrids having maize and normal teosinte cytoplasm did not differ from each other.

Since both isolates of perennial teosinte cytoplasm were made from the same original classical clone of teosinte, E16515, it seems apparent that a cyto mutation must have occurred during the process of transferring the Wf9 nucleus, but examination of remnant seeds and field records gives no further information.

Further work is in progress to insert the B37 nucleus into the two teosinte cytoplasm types, and this work has reached the BC-3 level of recovery. Since recoveries of B37 having the defective cytoplasm show essentially the same phenotype noted in Wf9, it is evident that the defective character of the cytoplasm is not restored by association with B37 nuclear factors. However, some differences are evident in the two backgrounds: male sterility and nearly all the chlorophyll striping are relieved in the B37 material. The defective cytoplasm described here differs from the classical S cytoplasm in its drastic reduction of plant size in all environments, and also in its production of partial kernel abortion.

D. L. Shaver

3. Inheritance of resistance to Sugar Cane Mosaic Virus (SCMV) in Calif.

SCMV is a serious threat to corn production in the Great Central Valley. In parts, resistance is a simple necessity. Johnson Grass is the principal alternate host, from which it is transferred to corn by the Green Peach Aphid. It is also easily transferred by mechanical inoculation.

In breeding for resistance, it is found to be fairly easy to develop multigenically resistant strains as derivatives from parents having tolerance and/or partial resistance. Other strains of corn seem to have a single dominant gene type of resistance. An experiment was undertaken to establish data from which to test the single gene idea, and to determine if allelism exists between the presumed single gene types.

On the basis of breeding experience, two susceptible, and four single gene resistant lines were selected: