Tripsacum plant used and others, could account for the high frequency of hybrids. A more detailed study employing a number of different Tripsacum plants and certain maize stocks is being planned in an attempt to answer several questions posed by the results.

R. J. Lambert
E. R. Leng

2. Monogenic resistance to Helminthosporium turcicum extracted from teosinte.

In the 1962 Florida winter nursery plants of Guatemala teosinte were found to be highly resistant to northern leaf blight under natural epiphytotic conditions existing that year. The resistant plants were crossed to the susceptible inbred Oh43. Seedlings of the F_1 hybrid were tested in the greenhouse. All plants showed the typical phenotype for resistant lesions similar to the dominant (Ht) gene reported by Hooker in the 1963 M.N.L. In subsequent generations the material was backcrossed to the susceptible inbred for two generations and resistant progeny selected for backcrossing in each generation. A number of backcross generations were used to make the material more adapted to corn-belt conditions.

During the summer of 1963 backcross-two resistant plants (Ht/ht) were selfed and also backcrossed again to the susceptible recessive parent (Oh43, ht/ht). The backcross plants were also test crossed onto the susceptible inbreds B14 and WF9. The selfed and testcross seedlings were tested in the greenhouse. The limited data, presented in the following table, indicate a single dominant gene will explain the resistance observed. The phenotype of the resistant plants is similar to that found in GE 440 and 'Ladyfinger' popcorn by Hooker. Further tests are necessary to determine if this gene is allelic to the Ht alleles found in these two stocks. Should the gene be nonallelic to the Ht gene of Hooker, it may be possible to incorporate a greater degree of resistance to northern leaf blight than each gene separately.

R. J. Lambert
A. L. Hooker

3. A possible cause for unreduced female eggs in corn-Tripsacum hybrids.

The occurrence of unreduced megasporocytes in the F_1 hybrid between corn x T. dactyloides has been reported by Mangelsdorf and Reeves (Texas Bull. 574). Galinat (M.N.L. 1961) found similar results for corn x T. floridanum hybrids. Several mechanisms could account for the unreduced eggs in these hybrids. One of these could be the failure of cell wall formation in either mitotic or meiotic divisions. Failure of cell wall formation during mitosis should give rise to somatic sectors of tissue carrying the doubled number of chromosomes. This should result in fertile eggs which are either "clustered" on the pistillate inflorescence or occur in a certain pattern.

In backcrossing corn x T. dactyloides hybrids (female parent) with the corn parent, "normal seeds" resulted from 61% of the pollinations.

From the 1089 ovules pollinated, 107 seeds were obtained (9.82%). This is a much higher frequency than would be expected for random assortment of chromosomes. Cytological counts of root tip cells of a limited number of these individuals show them to be the result of unreduced eggs from the female parent. Extra care was taken to insure that all silks of the corn-Tripsacum hybrid were receptive when pollinated by the corn parent. When those pollinations which produced more than one seed are diagrammed, with respect to position of the seeds in spikelets of the rachis, evidence was obtained which may explain the occurrence of unreduced eggs. The following table lists the position of the seeds on the pistillate rachis. The spikelets were numbered consecutively starting at the base of the rachis. All even numbered spikelets will occur on one side of the rachis and odd numbers on the other.

Spikelet Number on Rachis

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Number of seeds
										x	x	x	x					4
					x	x	x	x										4
	x	x																2
		x					x	x	x									4
												x	x	x				3
								x	x									2
		x						x	x									3
		x	x															2
	x				x	x												3
						x	x	x	x				x					5
									x	x	x			x	x			5
															x		x	2
				x		x				x								3
		x		x														2
x		x												x				2
			x		x													2
		x												x				2
	x																x	2
										x		x						2
x								x				x				x		4
											x		x					2
												x		x				2
					x					x								2
x		x				x			x				x		x			6

Eleven pollinations out of twenty-four had seeds which were in adjacent spikelets on a rachis. In addition, eleven pollinations had sseds on only one of the two sides of rachis. Only two pollinations produced seeds on both sides of the rachis and not in consecutive order. If all progeny from these seeds in consecutive order should be the result of unreduced eggs then 45% of the individuals could have occurred as the result of somatic chromosome doubling. This doubling would have resulted in "islands" of tissue carrying 36 Tripsacum and 20 corn chromosomes. These sectors could be expected to produce megasporocytes with 18

Tripsacum and 10 corn chromosomes. If the cases where seeds were set on a specific side of the rachis are also the result of a more "localized" somatic sector, then 91% of the individuals occurred from unreduced eggs resulting from somatic doubling. If further analysis should show that somatic doubling is the cause of unreduced eggs, the event must occur with a high frequency. This mechanism could allow for backcrossing of corn-Tripsacum hybrids to corn parent under natural conditions.

R. J. Lambert
E. R. Leng

4. Maize X Tripsacum lanceolatum (Ruper. ex Fourn.) hybrids.

Attempts to hybridize maize with Tripsacum lanceolatum,* on a limited scale, have been very successful. From five pollinations, using three different maize stocks as female parent, 20 hybrids were obtained. Thirteen of these hybrids were obtained using translocation stock Tl-6c as female. Seven of the hybrids were obtained with inbred W153R as female. Table 1 summarizes the results for the five pollinations.

Table 1

	Number of seeds set	Total number of ovules	Number of hybrids
W153 x T. lanceolatum	31	420	7
Tl-6c x T. lanceolatum	39	700	13
Tl-6c x T. lanceolatum	19	500	--
c sh wx gl_{15} y R x T. lanceolatum	3	526	--
c sh wx gl_{15} y R x T. lanceolatum	35	675	--

The percentage of hybrid plants obtained was similar to that reported by other workers (.07%) for intergeneric crosses of this type. However, the author is not aware of any similar reported crossing experiments where the percentage of hybrid individuals has been as high as 1.85% for an individual pollination.

No special technique was used to obtain the hybrids other than the "shortened silk" technique of Mangelsdorf and Reeves. The seeds obtained appeared poorly developed; however, some germinated after the removal of the pericarp. The seed was germinated about 40 days after pollination.

Cytological analysis of a limited number of microsporocytes of two hybrid plants showed cells with 46 chromosomes. Most of the cells had 18 Tripsacum bivalents and 10 corn univalents; however, some cells did not have this number of chromosomes. No cells were found where pairing occurred between corn and Tripsacum chromosomes. A more detailed cytological analysis is necessary before conclusions on chromosome number or pairing relationships of all hybrid plants are known. Sterility of

*Plant used as pollen parent obtained from seed collected by D. E. Alexander near Taxco, Mexico, in 1959.