

had previously mutated to defective seeds and which, following out-crossing, gave rise to other mutants, had 18.1 percent of mosaic seeds when crossed with the Ac tester. Several generations of selection have increased this percentage to 100. The stock now resembles some of McClintock's supresser-mutator stocks.

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8. The characteristics of Huixta, Durango, and Nobogame teosinte chromosomes.

Since the summer of 1956 three teosinte varieties, Huixta from northern Guatemala, Durango and Nobogame from northern Mexico, have been studied cytologically in F₁ hybrids with an inbred strain of maize, Wilbur's flint. This strain of maize is characterized by practically knobless chromosomes and by imparting good spreading quality to pachytene chromosomes. Whenever it was possible, an inbred maize strain, Conn. P39, was also used in crosses in order to confirm the findings. Both of these strains of maize were previously studied in many crosses and no chromosome inversions or any other rearrangement were observed. Cytological observations on these teosinte varieties are as follows:

Huixta teosinte showed no inversions in hybrids with maize. It differs from other Guatemalan teosintes previously studied in having the majority of its knobs located internally. Of 585 F₁ microsporocytes examined at diakinesis, 12.3 percent had two univalents, 0.8 percent, four univalents.

The F₁ hybrids of maize and Durango teosinte were heterozygous for two inversions. Since the maize strain employed in the cross did not have any chromosome inversions, the inversions must have been introduced by the teosinte parent. These inversions are located on the short arms of chromosome 8 and 9 and are practically terminal. They represent 59 and 56 percent respectively of the short arms of these chromosomes (Tables 1 and 2). In the microsporocytes of these F₁ hybrids dicentric bridges and acentric fragments were found at both anaphase 1 and anaphase 2. At diakinesis, 0.8 percent of the microsporocytes had two univalents, but microsporocytes having more than two univalents were not observed among 514 cells studied.

Two previously unreported knob positions were found in Durango teosinte; one on the long arm of chromosome 8, the other on the long arm of chromosome 9.

The F₁ hybrids of maize and Nobogame teosinte were heterozygous for three inversions contributed by the teosinte parent. Two of these inversions are practically terminal. One is on the short arm of chromosome 8, the other previously reported (MNL 1957) on the short arm of chromosome 9. The In 8 represents 62 percent of the short arm; while the In 9 represents 59 percent of the short arm (Tables 3 and 4).

Table 1. Length of inversion in chromosome 8 of Durango teosinte.

Cell No.	Length in Microns		Percent of Short Arm
	Short Arm	Inversion	
1	14.0	7.6	54.0
2	16.4	8.8	53.0
3	12.5	9.0	72.0
4	14.2	9.2	64.0
5	9.2	5.0	54.0
Average	13.3	7.9	59.0

Table 2. Length of inversion in chromosome 9 of Durango teosinte.

Cell No.	Length in Microns		Percent of Short Arm
	Short Arm	Inversion	
1	19.6	11.9	60.0
2	16.8	10.8	64.0
3	17.2	9.4	54.0
4	18.8	8.1	43.0
5	14.5	9.0	62.0
Average	17.4	9.8	56.0

Table 3. Length of inversion in chromosome 8 of Nobogame teosinte.

Cell No.	Length in Microns		Percent of Short Arm
	Short Arm	Inversion	
1	16.5	9.2	56.0
2	15.4	9.6	62.0
3	16.5	10.3	62.0
4	14.2	8.8	62.0
5	18.8	13.0	69.0
Average	16.3	10.2	62.0

The third inversion is paracentric and it is on the long arm of chromosome 5. The length of this inversion is equivalent to about one half of the length of the long arm. At both anaphase 1 and anaphase 2, dicentric bridges and acentric fragments were found in the microsporo-cyte divisions of these F₁ hybrids. At diakinesis, among 514 cells examined, 11.8 percent of them had two univalents, 0.4 percent of them, four univalents.

Table 4. Length of inversion in chromosome 9 of Nobogame teosinte.

Cell No.	Length in Microns		Percent of Short Arm
	Short Arm	Inversion	
1	19.6	14.2	72.0
2	19.6	11.6	59.0
3	19.0	11.1	58.0
4	22.7	11.0	48.0
Average	20.2	11.9	59.0

The chromosomes of Nobogame teosinte have only a few knobs. Chromosome 7 has a large terminal knob on the short arm. Internal knobs of medium size occur on the long arms of chromosomes 2 and 4. A small internal knob is present on the short arm of chromosome 1 and a small terminal knob on the short arm of chromosome 6.

9. Spontaneous reciprocal translocations.

In a maize strain used as cytogenetic marker in a cross with a progeny of Durango teosinte-maize derivatives which was homozygous for In 8 a case of spontaneous reciprocal translocation was observed. This translocation is designated as T2-8. At diakinesis of the T2-8 heterozygotes 1.0 percent of the sporocytes showed regular behavior for both bivalents 2 and 8, 54.5 percent of them demonstrated a ring of four chromosomes, 12.5 percent of them demonstrated a chain of four chromosomes, and 31.8 percent of them showed other types of irregular behavior. The points of exchange between the long arms of chromosomes 2 and 8 are shown in Table 5.

Table 5. Chromosomes and the points of exchange of the arms involved in two translocation heterozygotes.

Progeny No.	Chromosomes	Chromosomal Designation
56-68	6 - 7	6L . 17 7L . 23
56-528, 529	2 - 8	2L . 87 8L . 42