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1. A new chlorophyll-deficiency mutant.

Among the progeny of a cross between an inbred sweet corn and a strain of South American maize, a chlorophyll-deficiency plant was found. Its leaves and stalk were light green. When this plant grew to two months old, yellow and white stripes appeared on the leaves. These characteristics became more pronounced as the stage of growth advanced. The plant was later in maturing than its sibs.

For a test of the inheritance of this variegated character, this plant was crossed on a standard inbred strain of Wilbur's flint possessing green leaves and stalk. The F_1 plants from this cross were all green. In contrast, plants in the selfed progeny of the mutant showed the similar leaf and stalk characteristics as those of the parent, even though the degree of variegation varied from plant to plant. The F_2 plants from selfing the F_1 of the cross were classified as follows: 5 chlorophyll deficient plants: 77 green. This ratio fits well the F_2 ratio expected for a pair of duplicate genes. A study of the chromosome constitution of this mutant is being carried on.

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2. A preliminary report on the fourth chromosome male gametophyte factor in teosintes.

The fourth chromosome male gametophyte factor (alleles $\underline{ga_1}$, $\underline{Ga_1}$, $\underline{Ga_1}^S$) in maize has been extensively studied but its occurrence in teosintes has not been reported. This factor has assumed an important role in evolution, because it acts as an isolating barrier between individuals or between populations of plants. During the last few years it was noted that a crossing barrier exists between maize and some of the teosintes. When pollen from an inbred strain of Wilbur's flint was applied to the silks of the teosintes, seed set was scant. It seemed possible that the crossing barrier between maize and these teosintes might well be the fourth chromosome male gametophyte factor. During the last two years a preliminary test on this factor in teosintes was made. Three varieties of Guatemalan teosinte and six varieties of Mexican teosinte were employed. From three to five plants of each variety were crossed by the maize tester of genotype $\underline{ga_1}/\underline{ga_1}$. Pollen of each teosinte was crossed to two plants of the maize tester having genotype $\underline{Ga_1}^S/\underline{Ga_1}^S$. The number of female gametes tested for each teosinte variety varied from 42 to 154. Even though these numbers used do not seem large enough to provide adequate evidence for any definite conclusion, they do disclose certain indications concerning

the genetic constitution of these teosintes. Maize testers of the genotypes ga_1/ga_1 and Ga_1^S/Ga_1^S were kindly provided by Dr. O. E. Nelson of Purdue University. Seeds of teosintes were obtained from Professor P. C. Mangelsdorf of Harvard University. It was found that all of the teosintes (except Chilpancingo) possessed Ga_1 (Table 1). Its strength in Florida, Lake Retene, Huizta, Arcelia, Chalco and Xochimilco teosintes appeared stronger than ordinary Ga_1, and it was subsequently designated as Ga_1^S.

Table 1. Results of the tests on the fourth chromosome gametophyte factors in Guatemalan (1-3) and Mexican teosintes ("x" indicates full seed set).

Teosinte	% seed set in X ga_1/ga_1	On Ga_1^S/Ga_1^S	Probable allele
1. Florida	0	x	Ga_1^S
2. Lake Retene	2	x	Ga_1^S
3. Huixta	0	x	Ga_1^S
4. Chilpancingo	0(one plant set seed well)	x	Ga_1
5. Arcelia	0	x	Ga_1^S
6. Chalco	1.8	x	Ga_1^S
7. Xochimilco	7	x	Ga_1^S
8. Chapingo	24	x	Ga_1
9. Nobogame	25	x	Ga_1

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3. Meiosis in a haploid Ga_1^S tester plant.

In a test for the fourth chromosome male gametophyte factor in different varieties of teosinte, a haploid tester plant was identified among a total of 47 plants homozygous for Ga_1^S. At pachytene of the microsporocyte divisions of this haploid plant, univalents like those in the haploid maize - teosinte hybrid (M. G. N. L. 30: 21), always folded back on themselves. Pairing between heterologous chromosomes and univalents unpaired throughout their entire length were seldom observed. At diakinesis, most of the chromosomes remained as univalents. It appears that the amount of duplication for various segments among maize chromosomes is not large, if any.

At metaphase I, a total of 538 randomly chosen sporocytes was studied in polar view. The most frequently observed type of chromosome