

4. Further data on an unstable gametophyte mutant.

In last year's News Letter data were presented which indicated that an unstable gametophyte mutant involving preferential segregation, although usually deleterious to the gametophytes which carry it, may in some instances confer an advantage so that backcross ratios instead of being "high" sugary are "low" sugary. This possibility was tested further in the summer of 1958. Thirteen plants from a stock which originally was "high" sugary and which had become almost "normal" sugary with minor but significant fluctuations in the direction of "high" sugary were backcrossed by and on homozygous sugary with the following results:

	Total Seeds	No. Sugary	Percent Sugary
Backcrosses by sugary	4816	2388	49.6
" on " ; Row 148	4660	2347	50.4
" on " ; Row 347	5596	2703	48.3

The ratios in the first two series of backcrosses do not differ significantly from normal 1:1 ratios but the deviation in the third series is significant at the .01 level. Also one of the plants in the population had 44.5% of sugary seeds when backcrossed on Row 347 and 56.3% when backcrossed on Row 148. Both deviations from 50% are significant and show that the gametophyte factor is still present in the population and indicate that its behavior is governed to some extent by the genotype of the styles in which the pollen tubes grow. Since the gametophyte factor is linked with the Su gene all populations with significantly less than 50% of sugary seeds are presumably the product of the gametophyte factor conferring an advantage upon the gametophytes which carry it.

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5. Cytology of unstable mutants.

Several of the unstable mutants reported by Mangelsdorf in last year's News Letter have been studied cytologically in F_1 hybrids with an inbred strain of Wilbur's Flint. Nonhomologous association between the long arms of chromosomes 2 and 4 was found in the F_1 involving an unstable dwarf, which in tests by Galinat using B-chromosome translocations was found to have its locus on chromosome 4. In this same F_1 the long arms of chromosome 1 folded back on themselves in nonhomologous pairing for a length from the knob position to the end.

One of the stocks involving the unstable defective, de^{t5} , has probably an inversion in the short arm of chromosome 9 comprising about