

No cases of activation of Ds by st were found in 1,818 kernels, where 1/16 are observable for concurrent losses of C Sh Wx on st kernels. Thus st does not carry Ac, and its effect of increasing stickiness in chromosomes does not result in massive activation. Whether this may be significant to the concept of Ds as consisting of modified heterochromatin is difficult to judge, but should be considered, in view of the "sticky" property of heterochromatin.

On one ear of the control cross, unusually strong st expression (pitted kernels) was found. Here, there were numerous non-concurrent losses of C and Wx, demonstrating clearly that st can result in endosperm mosaics.

7. High-amylose factors.

The ha gene reported by Kramer, and the ha_m gene (to be designated ha₂) both interact strongly with wx, giving highly collapsed kernels, variably translucent, very similar to bt₁ kernels. The effect of ha₁ is much greater than that of ha₂; in fact ha₁ wx kernels have a small amount of blue-staining starch, while ha₂ wx kernels do not. This property of ha₁ wx is similar to that reported for ae wx (News Letter 26: 5, 1952). The phenotypic effect of ha wx combinations suggests that new ha factors might best be sought on a waxy background, where their effects are easily distinguished phenotypically.

Using this interaction, the linkage of ha₁ with chromosome 5 has been confirmed, where wx T5-9c/Wx ha₁ X wx ha₁ shows very few collapsed kernels (4-5%). Linkage of ha₂ with chromosome 10 is also clear. Chromosomes 1, 2, 3, 4, 5, 6, and 8 show independence ratios with waxy translocations, but wx T9-10b/Wx ha₂ X wx ha₂ shows the following:

	<u>Normal</u>	<u>Waxy</u>	<u>Tarnished</u>	<u>Collapsed</u>
ear 1	(1)	53	(60)	1
ear 2	(5)	140	(122)	2
	(6)	193	(182)	3

$9/384 = 2.3\%$ crossing over, wx-ha₂, across translocation. Anderson (Genetics, 1938) reports wx-T as 5.7 units. The Ha Wx and ha Wx kernels are difficult to distinguish with certainty.

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8. Allelism and mutability of anther-ear 6923.

The an6923 mutant discussed last year has been tested and found allelic to an₁, as suggested (News Letter 30: 100, 1956). Since it is also allelic to bz₂^m, which responds to Ac (or M), a test of the

mutability of an⁶⁹²³ has been carried out. In the cross * bz₂/6923; M m X + +/6923; m, 3/8 are stable bz, and 1/8 are mutable. Thus the bronze "component" of an⁶⁹²³ is not mutable.

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9. A crossover analysis of some mutable alleles of A₁.

An experiment has been conducted to determine whether crossing over immediately adjacent to a mutable locus can change its state of mutability (in the absence of a mutator factor) or can remove that unknown agent which according to the prevailing view of mutable loci, is suppressing the dominant allele to give the mutable recessive effect. Only those crossovers that occur immediately adjacent to the mutable locus can be expected to give the answer to this question. It is possible to make such a test using the A₁ locus because of its compound nature and because of the closeness of the sh₂ marker. The experiment was designed as follows: Plants of α a sh/a^m Sh, dt, ac were crossed by a^s sh, Dt Dt, ac pollen and the ears produced were examined for recombinants and unusual seed types. The following diagram shows the possible types of crossovers:

	<u>Pairing type</u>	<u>Reg</u>	<u>Crossover type</u>
A.	<u>α</u> 1 <u>a</u> 2 <u>sh</u>	1	<u>α a^m Sh</u>
	<hr/>	2	<u>α a Sh</u>
	<u>a^m</u> <u>Sh</u>	2	<u>a^m sh</u>
		1	<u>a sh</u>
B.	<u>α</u> 1 <u>a</u> 2 <u>sh</u>	1	<u>α - Sh</u>
	<hr/>	2	<u>α a Sh</u>
	<u>a^m</u> <u>Sh</u>	2	<u>a^m sh</u>
		1	<u>a^m a sh</u>

Four different mutable alleles and one stable allele were used. Two were Dt responding, a^m-1:Cache and a^m-1:D5 and one was stable, a^s. These have had a complete test. The other two were Ac responding alleles, a^m-3 and a^m-4. They have had only a preliminary test. The a in the α a sh segment is the standard dotted a found by Emerson.

The data listed in table 1 indicate that the Dt responding alleles pair with either α or a as expected. The occurrence of α a^m Sh cases proves pairing type A while the α - Sh and a^m a sh cases prove type B. The only unusual crossover type found was a single colored non-shrunken case which had normal A phenotype and proved to have brown pericarp. It is not known, however, whether this pericarp is dominant or recessive. If it turns out to be dominant this would be an α A Sh case or the type expected from a crossover removal of an agent suppressing A phenotype.