mutability of an_{6923} has been carried out. In the cross + bz_2/6923; M m X + +/6923; m, 3/8 are stable bz, and 1/8 are mutable. Thus the bronze "component" of an_{6923} is not mutable.

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9. A crossover analysis of some mutable alleles of A_1.

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 A_1 locus because of its compound nature and because of the closeness of the sh_2 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:

	Pairing type	Reg	Crossover type
A.	α ¹ a ² sh (over) a^m Sh	1	α a^m Sh
		2	α a Sh
		2	a^m sh
		1	a sh
B.	α ¹ a ² sh (over) a^m Sh	1	α – Sh
		2	α a Sh
		2	a^m sh
		1	a^m a sh

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 dottable 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.

Table 1. Frequency of crossovers from type cross α a sh/a^m Sh, dt, ac X a^s sh, Dt.

Ear parent	Total number	α a^m Sh	α a Sh	α - Sh	a^m sh	a sh	a^m a sh	Trisomic	A Sh
α - a sh/a^m - 1: Cache	15,163	1	2	4	6	--	--	4	0
α - a/a^m - 1: D5	12,733	3	6	8	5	--	1	5	1
α a sh/a^s	42,120	--	13	27	--	3	--	6	0
Cases not yet tested									
α a sh/a^{m-3}	131,448	1	17	14	--	23	--	--	0
α a sh/a^{m-4}	40,507	4	20	7	--	18	--	--	1

Trisomics: A number of the supposedly dilute dotted non-shrunken seeds turned out on test to be trisomics. The number was not extremely high but they were easily obtained because the experimental design was ideally suited for picking up such cases since they resemble two of the crossover types (α a^m Sh and α a Sh) that we were looking for.

a^m-a-sh segment: This unique combination of two Dt responding alleles on the same segment is recognized only when the Dt gene induces the more mutable of the two (a^m) to mutate to a^s leaving a sector of a^s a tissue that permits the expression of the less mutable of the two original alleles (a). There are perhaps several others among the a^m sh class which will not be recognized until further tests are made.

10. Grouped crossovers.

In examining the ears for the above described experiment it was noted that a number of examples of a sector that included two or more crossovers were found. In one case for example, three α a Sh crossovers were found in a single row within the distance of six seeds. Their order on the ear was α a Sh, a^m Sh, α a Sh, a^m Sh, a^m Sh, and α a Sh. The crossovers have double underlining. This same ear had two α a Sh cases on the other side of the ear which were separated by one non-crossover seed. The possibility of contamination has been excluded for these cases and since there were no mutator factors such as Dt or Ac present it is very unlikely that they arose by mutation. Several cases, as yet unconfirmed, of complementary crossover types in pairs have been observed, for example α a Sh and a^m sh. There also was found in the progeny from the α a sh/a^s Sh material, one case of three a^s sh seeds in a single sector. Their order on the ear was α a sh, a^s sh, α a sh, a^s sh, a^s Sh, a^s sh, and α a sh. A total of 341,421 seeds have been examined and at most 450 crossover cases have been found (later confirmation tests will give an accurate figure). Thirty-six of these were found in 17 sectors of two or more essentially adjacent seeds. This suggests something more than coincidence. Among the possibilities being investigated are somatic crossing over and a pre-disposition to high frequency of crossing over in certain sectors of the developing ear.

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11. High amylose starch.

It was reported in the Maize Genetics News Letter #30 that the cross between ha_1 and one of the Missouri high amylose strains (ha_m 123) gave an amylose content of 27%, indicating the two factors were not allelic. When grown in Missouri, ha_1 and ha_m 123 gave amylose contents of 49% and 37%, respectively. Selected samples of kernels from the F_3 ears gave amylose contents from 60% to slightly more than 70%. It is possible