Table 2. Types and frequencies of mutants in the seedling stage of S_2.

	No. of ears tested	No. of ears producing mutant seedlings			
		poor germination*	chlorophyll type**	narrow leaf	dwarf
Control	450	12 (2.66%)	10 (2.22%)	3 (0.66%)	1 (0.22%)
X-Ray	232	15 (6.46%)	21 (9.05%)	4 (1.72%)	3 (1.29%)
UV	160	9 (5.62%)	15 (9.37%)	3 (1.87%)	1 (0.62%)

*Germination below 50%. Normal is 83%.
**Both white and virescent seedlings are included.

Most of the mutants found did not give a clear 3:1 ratio, but instead had a deficiency of the recessive class. Again, in the F_2 there was a complete lack of vigorous seedling or desirable mutant types. It should be pointed out, however, that recognition of desirable types is a quite arbitrary choice.

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3. The effect of EDTA on the frequency of crossing over.

It is thought that the failure to obtain an increase in crossing over in corn that has been grown on calcium-deficient soil comparable to that obtained in Drosophila and other organisms that were treated with EDTA is due to the fact that corn has a very critical calcium requirement for growth, and therefore does not survive at a level low enough to affect crossing over. To overcome this a special treatment was devised to provide a very low concentration of metallic ions in the flowering parts of the plant during a short period of time just prior to meiosis.

Vigorous F_1 plants of the constitution $\underline{a}$ $\underline{a}$ $\underline{sh}/\underline{a}^m$ $\underline{Sh}$, $\underline{dt}$, no $\underline{Ac}$ were treated with a .001 molar solution of chelating compound, (ethylene dinitrilo tetracetic acid). The method of treatment consisted of feeding through the cut end of the sixth or the seventh leaf. The leaf was cut about four inches from the auricle and the cut end was placed in a vial containing the above solution for a period of twelve to twenty-four hours. The treatment was applied when the most advanced region of a tassel was just premeiotic. The plants were pollinated by $\underline{a}^s$ $\underline{sh}$, $\underline{Dt}$ and the ears were examined for crossovers between $\underline{a}$ and $\underline{sh}$. The results shown in the following table, though of a preliminary nature, clearly show significant increase in cross-over types in the treated material.

Frequency of crossovers from the cross $\underline{a}$ $\underline{a}$ $\underline{sh}/\underline{a}^m$ $\underline{Sh}$ x $\underline{a}^s$ $\underline{sh}$.

	Total No.	a a^m Sh	a a Sh	a-Sh	a^m sh or a sh	a^s sh	T co	%
Control	3628	0	0	0	2	0	2	.00055
EDTA	4035	0	4	3	3	3	13	.0032

4. Response of 2 alleles of an_1 to gibberellic acid.

Plants that are homozygous $\underline{an}_1$ normally do not shed much pollen because the anthers remain encased in the glumes. Several an individuals were treated at a stage comparable to shedding in a normal plant, by rubbing a spot at the base of the tassel with a glass rod coated with a lanolin paste containing 1.25% gibberellic acid. Within less than twenty-four hours that portion of the tassel immediately above the region touched with the paste appeared as a sector of normally expressed anthers that shed normal pollen. The remainder of the tassel continued to have tightly-closed florets and produced no pollen. The effect of the treatment appeared to be that of lengthening of the filaments and opening of the glumes. Similar treatment was applied to plants that were homozygous for another allele $\underline{an}_{6923}$ (a radiation induced mutant associated with $\underline{bz}_2$). The treated plants showed an elongation of tassel parts but failed to extrude any anthers. Careful examination showed that the anthers were empty and beginning to degenerate.

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5. Chromosome 9 mapping.

Data has been accumulated for incompletely placed factors as follows:

Genes XY	Phase	XY	Xy	xY	xy	Total	Recombination
Ar Bk_2	RS	227	130	110	1	468	9
Ar Bm_4	RS	222	60	69	24	369	55
Ar Ms_2	RS	100	46	44	0	190	<15
Ar Wx	CS	477	32	41	121	671	12
Au Cr	CS	32	7	1	9	49	12
Bf Bk_2	RS	141	41	60	8	250	39
Bf Bm_4	RS	117	65	68	0	250	<11
Bf Ms_2	RS	157	55	46	7	265	38
Br Wx	CS	171	48	38	18	275	43
Bk Gl_{15}	RS	85	24	32	0	141	<22