Table 2

Transmission of mutants under ultraviolet selection[1]

Pedigree	Mutant	Treated		Control		X_h^2	X_C^2
		Nor.	Mut.	Nor.	Mut.		
7453	White seedling	23	31	38	26	2.67	6.31*
"	Pale green	18	4	29	9	0.03	0.37
7456-57	Luteus	6	6	6	8	-	0.12
"	Virescent	92	30	65	23	0.01	0.15
"	Pale Aleurone	54	75	40	56	0.03	0.00
7458-59	Virescent	24	16	46	15	2.03	5.12*
"	Viviparous	20	18	35	15	2.09	5.46*
"	Etched	30	8	37	13	0.08	0.48

*Significantly higher (5% level) transmission of mutant in the treated than in the control.

[1] X_h^2, Chi-square for heterogeneity; X_C^2, Chi-square for the control ratio.

E. H. Coe, Jr.

2. Genetic analysis of effects of an electrostatic field.

A pilot experiment was reported in the 1966 Newsletter (40:108). Fractional events (losses of A Sh_2) were more frequent in kernels from pollen that had been exposed to an intermittent field than in controls. A subsequent test by S. F. Starling (M. S. thesis, University of Missouri) indicated that fractional losses of C^I Sh Bz Wx were increased by exposure to either a steady or intermittent field; unfortunately, his analysis of the data showed very wide variations among families of tester females, and the event data were confounded with this effect. A large-scale test with a uniform tester was conducted in 1969, and progeny tests of cases have been completed. The new data do not support a substantial effect of treatment, either with steady or intermittent fields.

Treatments were carried out on tassels of C Sh Wx R^r plants ranging in development from meiosis to nearly mature pollen stages. The tassel region of the plant (wrapped and taped into a cylinder) was placed

between two foil plates separated by 6 cm of plexiglass. The plates were connected to an automatically switched DC power supply at 30 kV (i.e., intensity was 5,000 V/cm) for 18.5 hours, from mid-afternoon to early morning. The intermittent treatment was switched to ground at 40 cycles per minute. The steady treatment was continuously applied for the entire time period. Current flow was very low, averaging 5 microamperes per pair of foil plates. The plates were about 12x40 cm, and exposed to air over their entire flat surface, so that discharge flow of this magnitude is moderate. Twelve plants were given intermittent treatment, 4 steady, and 9 control. Pollinations were made onto c sh wx R^g testers. Pollen was collected each day that the tassel shed, and complete records were kept of the number of days from treatment to day of shedding, with the intent of identifying "sensitive" stages. Progeny ears were coded at random; events were identified and verified by progeny testing where necessary, and the ears were decoded for tabulation. The event classes were (1) whole-endosperm loss of C; (2) half-endosperm loss; (3) quarter-endosperm loss; (4) breakage-fusion-bridge cycles over the whole endosperm; (5) cycles over a fraction of the endosperm, down to one eighth.

The breakdown of data for two series of treated plants pollinated across a spread of 20 days (from shedding dates 4 days post-treatment to 23 days post-treatment) showed no apparent clusters of events, so only the totals for all dates are tabulated here (Table 3). The data show a significant increase in only the quarter-endosperm losses following intermittent exposure. The increase is not notable in the steady-field series. If there is any effect of the treatment it is at the sub-chromatid level and is of disappointingly small magnitude.

Table 3

Mutational losses of C following exposure of post-meiotic tassels to an intense electrostatic field

	Control	Intermittent field	Steady field	Total
Examined No.	62,175	74,867	22,190	159,232
Losses per 10^4				
Whole endosperm	0.8	0.7	1.4	0.8
Half	0.8	1.5	2.3	1.3
Quarter	12.1	17.1**	14.4	14.8
BFB cycles per 10^4				
Whole endosperm	3.1	1.6	1.4	2.1
Fractional	5.0	4.4	2.3	4.3
All events	21.7	25.2*	21.6	23.4

*,** Significantly higher than control at 5% and 1% level, respectively.

E. H. Coe, Jr.

3. Location of new mutants by A-B translocation method.

A collection of 116 chlorophyll mutants, produced either by treatment of pollen with chemical mutagens ethylmethanesulfonate or nitrosoguanidine or from experiments with the controlling elements (Ac, Dt or Spm), was prepared for linkage tests using a series of A-B translocations according to the method suggested by Roman (Genetics 32:391-409).

The collection included 75 mutants induced by EMS, 8 induced by NG and 33 derived from cultures with controlling elements. They were classified at seedling stage as w (white), wl (yellowish white), l (yellow), v (virescent), pg (pale green), yg (yellow-green) and pb (piebald). A number of unusual types, such as mutables, temperature or light sensitives, and atypical virescents, were grouped in the above categories for this report.

The procedure consisted of planting selfed seed of a known heterozygote for each mutant (since many were homozygous lethal), crossing