

UNIVERSITY OF MISSOURI
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1. Pollination with liquid suspensions.

Paraffin oil and the aqueous pollen germination medium of Cook and Walden (News Letter 39: 170; Can. J. Bot. 43: 779) were used to suspend pollen before pollination; both media allowed successful fertilization. Paraffin oil was best of the two in seed set; pollen stored in oil as long as overnight (in the refrigerator) was also successful. Either medium can include Tween detergent. An emulsion of paraffin oil-Tween-aqueous medium can also be used. One cc of pollen (estimated to contain well over 2×10^6 grains) per 1 to 6 cc of medium was used. Sequential dilution of suspensions with the aqueous medium or aqueous-Tween decreased seed sets. A manuscript is in preparation.

"Enrichment" should be possible with these media, parallel to the use of selective agents and conditions in micro-organisms.

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(in collaboration with D. B. Walden
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2. Endosperm losses following exposure to an intermittent DC electrical field.

Three plants of $++/a sh_2$ were used in a test of effects of exposure to an intermittent DC field, in collaboration with D. L. Waidelich (Electrical Engineering Dept., U. of Mo.). The three plants were uniform in developmental stage at the time of treatment (meiosis to post-meiosis). Plant No. 1 was untreated. Plant No. 3 was exposed in the tassel region to 30,000 volts DC across a 5 cm insulated gap (6,000 volts/cm) for 40 minutes, intermittently and irregularly (1 to 10 min. on, briefly off, 1 to 10 min. on, etc.). Plant No. 11 was exposed to the same 40-minute pattern as No. 3 and then continued for a total of 3.5 hours, on a regular pattern (1 minute on, briefly off, 1 minute on, etc.). No adverse effects other than localized searing (connected with corona discharge) were apparent; pollen of treated plants appeared to have slightly decreased fertility.

Pollinations on $a sh_2$ were made daily. Fractional losses of $A Sh_2$ were scored; pooled data for all pollination dates are presented in Table 1. Judging by Poisson limits, fractionals were definitely more frequent for treated males. Further experiments of better design will be needed to determine whether the effect is real.

Table 1
 Fractional losses of $A Sh_2$ following electric-field treatments of $++/a sh_2$ males.

Male	Fractional category					Total	No. $A Sh$ kernels
	1/2	1/4	1/8	1/16	limit		
1 (Control)		1	4	3	8	16	991
3 (40 min)		3	3	8	5	19	686
11 (3.5 hr)	5	7	3	15	23	53	1359
Total	5	11	10	26	36	88	3036

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1. Preferential pairing in trisomic plants containing an irradiated chromosome.

Pollen from plants with normal chromosomes 3 containing the A_1 allele was given 1000 r and used to fertilize standard trisome 3 plants which were homozygous for a_1 . The gene segregation from the resulting trisome 3 plants ($A/a/a$) when used as the pollen parent is given in Table I. Corresponding control data are given in Table 2.

The control data in Table 2 indicate that the theoretical ratio of 1 A : 2 a is held to very closely. There is only one progeny out of twenty-five in which the percentage of A gametes is significantly higher than 33.3%, but this may be expected at the .05% level. The interaction chi square of 32.7 with 24 degrees of freedom is not significant. The data are homogeneous.

In the case of the trisomes with an irradiated chromosome, it is an entirely different situation. Six of the 26 plants had transmission frequencies of A gametes significantly lower than 33.3% and six others had rates which were significantly higher than 33.3%. The former was