

\underline{R}^r Source	Percent Colored Cells			Colored Cells
	Dark	Medium	Light	Frequency in Percent
$\underline{R}^r \underline{R}^r$	69.93	9.47	20.43	52.90
$\underline{R}^r \underline{R}^{st}$	51.13	17.27	31.59	13.24
$\underline{R}^{r''''} \underline{R}^{r''''}$	44.52	12.43	43.04	0.037
$\underline{R}^{r''''} \underline{R}^{st}$	49.79	13.59	36.61	0.037

There was a significant rise in the proportion of medium and light colored cells in $\underline{R}^{r'}$ and $\underline{R}^{r''''}$ compared to \underline{R}^r , while the frequency of colored cells dropped significantly from \underline{R}^r to $\underline{R}^{r'}$ to $\underline{R}^{r''''}$.

The \underline{R}^r allele showed a distribution very different from that for \underline{R}^{st} (Fig. 1), but all of the \underline{R} alleles were similar in distribution of sector size. Their most frequent sector type was single cell; the distribution drops rapidly and tapers. Small peaks were notable at 4, 8, and 16-cell size.

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2. Effects of extractables from whole pollen on pollen function.

Toward analysis of the "population effect" found earlier for pollen suspended in aqueous media (see 1969 Newsletter), a test for effects of rapidly extractable substances was conducted in 1969. The control series used one ml of pollen suspended in 25 ml of aqueous medium, held for 40 seconds and then applied to ears with a brush at 10 second intervals. The treated series used the same proportions and timings, but the aqueous medium was derived by first mixing 25 ml with 10 ml of pollen; this mixture was held for 5 minutes and filtered. The clear filtrate was then brought to 25 ml with aqueous medium and used for the experimental pollen. Figure 2 shows the changes in seed set with time, as a running average of 5 ears. The effects of extractables are in agreement with those reported last year for the "population effect"--namely, that long-term survival is influenced, though not

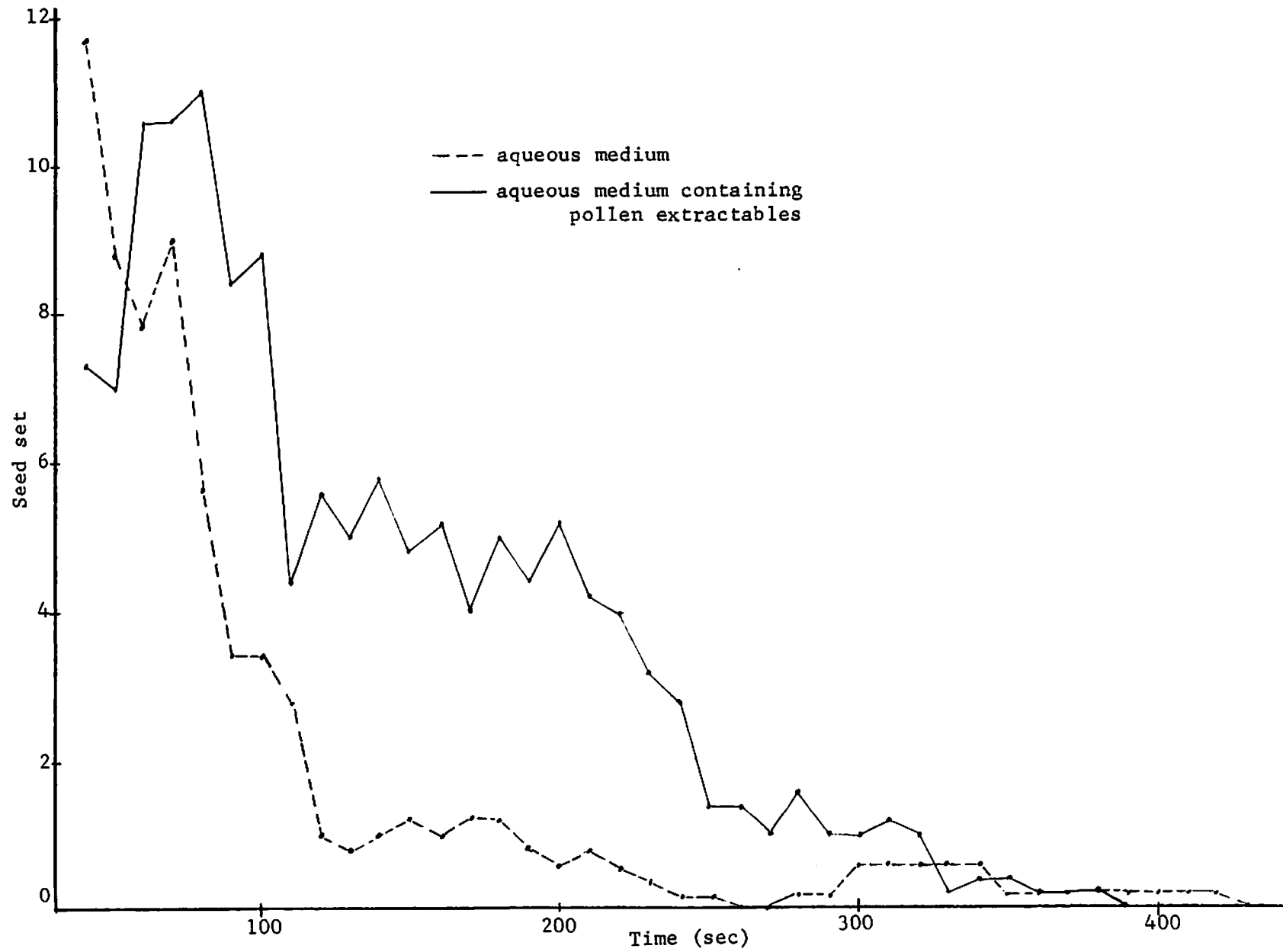


Fig. 2. Seed set (running average of 5 ears) in relation to time in medium.

permanently augmented, by the presence either of more pollen or of pollen extractables.

In the control series 67 kernels were obtained from one ml of pollen, while 208 were obtained in the experimental series. The overload requirement (thousands more pollen grains were applied than kernels obtained) was still not greatly altered, and remains puzzling.

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3. Tests of selection for pollen resistance to exposure to aqueous media.

Repeated trials have failed to support the idea that heritable variation might exist among pollen grains in respect to their ability to withstand exposure, brief or prolonged, to aqueous media. The current data are presented here as examples. Three lines (W23; N, a purple-seeded standard; K55) have been tested by simply planting the kernels that resulted from pollinations with exposed pollen, and selfing the plants with again-exposed pollen. In the following table are data for the third or fourth exposure for each of four media (Y is the aqueous medium; YD contains 5% dimethyl sulfoxide, YSC saline citrate, and YT 2% Tween 80).

Medium	Line	Selection Cycles	No. retested plants with seed set of				
			0	1	2	3	5
Y	W23	2	19	1			
	N	3	2				
	K55	2	4				
YD	W23	2	1				
	N	3	21	6		1	1
	K55	2	4				
YSC	W23	3	1				
	K55	2	2				
YT	W23	2	21				
	N	2	24	3	1		
	K55	2	11	1			

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