

In working up the data, it became apparent that the greater proportion of dead plants occurred in the dominant parental classes. Frequency distributions for each of the gene classes of the two backcrosses are shown in Table 1. Chi-square tests for independence of dead and living plants in the parental classes yielded values with probabilities of occurrence well beyond the 0.50 per cent point. The data indicate that genes for stalk-rot susceptibility are linked with the dominant alleles of  $o_2$   $ra_1$   $gl_1$  located in or near the short arms of chromosomes 7 of inbreds Mo21A and NC34.

Table 1. Frequency distributions by genetic classes of living and dead plants and the P values for chi-square tests of independence for the backcrosses ( $o_2$   $ra_1$   $gl_1$  x Mo21A) x  $o_2$   $ra_1$   $gl_1$  and ( $o_2$   $ra_1$   $gl_1$  x NC34) x  $o_2$   $ra_1$   $gl_1$ .

Genetic class	Mo21A Backcrosses			NC34 Backcrosses		
	Plants: living	Plants: dead	$x^2$ for independence	Plants: living	Plants: dead	$x^2$ for independence
	No.	No.	P value	No.	No.	P value
$o_2$ $ra_1$ $gl_1$ + + +	356 243	44 161	<0.005	339 209	75 185	<0.005
$o_2$ + + + $ra_1$ $gl_1$	39 34	10 11	$\leq 0.50$	25 45	16 9	<0.05
+ + $gl_1$ $o_2$ $ra_1$ +	4 4	4 0		5 4	10 1	
+ $ra_1$ + $o_2$ + $gl_1$	1 6	0 1		0 0	0 0	

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### 1. Parthenogenesis.

During 1959, 290 plants of the "Pa G-100 Synthetic" were bagged before silk emergence to prevent pollination in an attempt to follow up the report of S. H. Yarnell dealing with parthenogenesis in corn. The "Pa G-100 Synthetic" was constituted from numerous early to extremely early lines, mainly of Ottawa, Canada, and Wisconsin origin.

Seeds per ear developed under the bags varied from 0 to 239. A frequency distribution suggested random development of seeds that might have represented pollen contamination carried by insects or wind.

All seed was planted ear-to-row in 1960. Of the approximately 30 small 'inbred-appearing' plants, 26 were successfully selfed. The seeds from these 26 ears were planted in 1961 for a between plants within ears uniformity test. On the basis of segregation for cob color, kernel color, kernel flintiness, and kernel degree of dent 16 entries were eliminated. During 1961 several selfs of each entry were also made.

The 10 remaining stocks will be more carefully screened in 1962. This will mainly be based on variances within and variances between ears of entries. The lines W D, Co 106, Co 109, Co 110, and W 59E (important components of the original synthetic), the original synthetic, and four single crosses will be used for comparison.

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## 2. A computer method of double cross prediction.

A new program has been devised at the Pennsylvania State University Computation Center to predict the results of double cross hybrids. The program was written in FORTRAN and compiled on the IBM 7074 but is adaptable to any computer for which a FORTRAN compiler is available. The program can accommodate the single cross data of twenty inbred lines for eighteen or fewer variables. It features adjustable limits for each variable so that only prediction values above a chosen limit are included in the output. The table or card output includes a program title, experiment identification, designation of the inbreds and variable designation in addition to the prediction values. The computation time is too brief to estimate. This program is available on request.

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## 1. Segregation for a cyclic hydroxamate in maize seedlings.

Maize contains high concentrations of a phenol-like sweet substance (R. J. Suhadolnik, Ph.D. Thesis, Penn. State Univ. 1957; R. H. Hamilton, Ph.D. Thesis Mich. State Univ. 1960). The structure is now established to be 2,4-dihydroxy-3-keto-7-methoxybenzoxazine [A. I. Virtanen, P. Hietala, and E. Honkanen, Acta Chem. Scand. 114:502-507 (1960); R. H. Hamilton, R. S. Bandurski and W. R. Reusch, Cereal Chem. (in press)]. This cyclic hydroxamate may be a factor in resistance of maize to 2-chloro-s-triazine herbicides. [W. Roth and E. Knüsel, Experientia 17:312 (1961); R. H. Hamilton, and D. E. Moreland, Science 135:373 (1962)]. Also 6-methoxybenzoxazolinone (implicated in resistance to disease and corn borer) is a degradation product of this substance.