the hybrid maize breeding program. It was found that a plot of about 14 square yards gave a coefficient of variation of about 10%. An increase in the size gave no reduction in the coefficient of variation while smaller plots showed a considerably increased C.V. The shape of the plots had no material effect on the coefficient of variation. Thus, under these circumstances where the plants were spaced 3 ft. x 2 ft., one plant per hill, and where the commercial maize variety "Improved Potchefstroom Pearl" was used, a plot of about 14 sq. yds. was found the most efficient size and nothing was gained by using larger plots.

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1. Linkage studies on chromosome 5 with special reference to ae.

a. v_3 - ae - pr linkage

Five ears of the genotype $\frac{+\ ae\ +}{v_3\ +\ pr}$ were self-pollinated with the following results:

+ + +	+ ae +	v_3 + +	v_3 ae +	+ + pr	+ ae pr	v_3 + pr	v_3 ae pr
544	290	155	12	175	5	124	0

colorless			
+ +	v_3 +	ae +	ae v_3
290	112	102	5

Recombination %

v_3-ae 22 ± 0.02 (colored or colorless)

ae-pr 14 ± 0.03

v_3-pr 34 ± 0.02

The gene order is v_3 - ae - pr. The data indicate the map positions to be

10	32	46
v_3	ae	pr

.

b. bv - ae - pr linkage.

Six ears of the genotype $\frac{+\ ae\ +}{bv\ +\ pr}$ were self-pollinated with the following results:

+ + +	+ ae +	bv + +	bv ae +	+ + pr	+ ae pr	bv + pr	bv ae pr
269	123	41	7	39	4	121	2

colorless			
+ +	+ ae	bv +	bv ae
394	165	170	11

Recombination %

bv - ae 25 (colored + colorless)

ae - pr 20

bv - pr 16

In general, these data agree with the v3 - ae - pr data presented above. There seems to be a high frequency of associated crossovers in these data. It appears that whenever a cross over occurs between bv and ae there tends also to be one between ae and pr. This would result in a reduced recombination percentage between bv and pr as is shown by the 16% recombination.

These data indicate (1) an increase in the total number of double crossovers, as well as (2) an increase in the number of two-strand double crossovers.

c. bm_1 - ae - pr linkages.

A cross of $\frac{+\ ae\ +}{bm_1 +\ pr}$ x $\frac{bm_1\ ae\ pr}{bm_1\ ae\ pr}$ gave the following results:

+ + +	+ ae +	+ + pr	+ ae pr	bm + +	bm ae +	bm + pr	bm ae pr
1	124	27	11	16	10	141	3

Recombination %

bm_1 - ae 12.3

ae - pr 9.3

bm_1 - pr 19.2

Individual Gene Segregation

Ae 185: ae 148*

Bm_1 163: bm_1 170

Pr 151: pr 182

* Significant deviation from 1:1 ratio.

These recombination values appear to be normal in that the bm_1 - pr recombination is what one expects from the bm_1 - ae, ae - pr recombination observed. However, two things are aberrant in these data: (1) the recombination values are smaller than expected when they are compared with the v3 - ae - pr and bv - ae - pr data presented above, and (2) the Ae vs ae segregation deviates from a 1:1 ratio.

These data indicate differential transmission of the ae and Ae alleles through the female. A comparison of the reciprocal crossover classes supports differential transmission rather than misclassification of ae.

Differential transmission would reduce the measurable recombination between the genes and could account for the observed differences between these recombination values and those mentioned above for v3 - ae - pr and bv - ae - pr.

-- J. N. Jenkins

2. A new locus for studying the fine structure of the gene.

A method for studying the fine structure of the ae locus has been developed. By overstaining with an excess of iodine and destaining with 25% alcohol and slight heating, one is able to differentiate wx ae from wx + pollen. The wx ae pollen stains black and the wx + pollen stains red. This technique allows a study of recombination at the ae locus in a wx background when different sources of ae are crossed and the F_1 pollen is observed.

-- Roy G. Creech