

results are possible:

(1) An Spm-like element could be present in some plants of inbred Al71 which I use as a recurrent parent throughout my genetic stocks. This is quite likely since I reported in 1964 that another breeding line carried an Spm-En like element. The four isolated spotted kernels, then, could more probably be contaminants. Family 2547 which seems to show independence between mosaic and spotted kernels would be explained.

(2) Spm-En occur in many states. (a) Mosaic pericarp might contain a state which does not regulate  $a_1^{m-1}$  ordinarily, but which may change into a regulating state as in family 2547. It might be expected that such a change would also be correlated with a change in pericarp phenotype. However, no difference in pericarp phenotype could be detected in ears with and without spots. (b) Inbred Al71 could contain a non-activating state of Spm which changes to an activating state occasionally.

(3) All spotted kernels could have resulted from Spm contamination either this year or in a previous year.

One last comment - Some states of mosaic pericarp are difficult to distinguish from variegated pericarp. Family 2547 is one of these and it is possible that this family is really  $\underline{P}^{vv}$ . As far as I know, no one has ever determined if variegated regulates  $a_1^{m-1}$  gene action. Or perhaps Family 2547 contains neither  $\underline{P}^{vv}$  nor  $\underline{P}^{mm}$  but another unstable allele which is controlled by an Spm-like element while the controlling element for mosaic pericarp remains unknown.

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## 2. A test for Spm in Diffuse pericarp.

Greenblatt has reported (M.G.C.N.L. 39:120. 1965) that the Diffuse pericarp gene Idf does not substitute for either Spm or Ac. I wish to present data which suggest that Idf may substitute for Spm.

A different tester stock was used in my studies than was used by Greenblatt. His test required the detection of dark purple spots on a dilute purple background if Idf caused instability in  $C_2/c_2^{mt}$  heterozygotes. This may be possible if Idf inhibits only the background pigment, for Greenblatt has shown that Idf does inhibit aleurone pigmentation somewhat. However, I find that  $C_2/c_2^{mt}$  Spm kernels are uniformly purple and so perhaps his test was not adequate to detect instability of  $c_2^{mt}$ .

My test involved the same  $a_1^{m-1} \underline{P}^{pw}$  no Spm stock and crossing scheme described in Note No. 1. The Diffuse stock was also a fourth generation backcross to inbred Al71 ( $\underline{P}^{pw}$ ) and so the Diffuse ears were  $A_1/A_1$  and heterozygous  $\underline{P}^{pr}/\underline{P}^{pw}$  and Idf/idf. It was expected that  $\frac{1}{4}$  the ears from the backcross of the  $F_1$ 's to the  $a_1^{m-1} \underline{P}^{pw}$  tester stock would be Diffuse,  $\frac{1}{4}$  red and  $\frac{1}{2}$  colorless pericarp, and on each of

these ears  $\frac{1}{2}$  the kernels would be  $a_1^{m-1}$  and liable to spotting. The results obtained with three families are shown in Table 2.

This test is far from definitive. The seven Diffuse ears which show strong  $a_1^{m-1}$  spotting and the nine colorless ears which are spotted could constitute the  $\frac{1}{2}$  of the backcross populations expected to carry Idf. On the other hand, if Idf does substitute for Spm, the one Diffuse ear with no spots and the four red ears with  $a_1^{m-1}$  spots would not be expected. The several explanations advanced in Note No. 1 are also applicable here to explain these exceptional ears. In the case of Diffuse pericarp, however, it seems more probable that Idf is substituting for Spm than in the case of P<sup>mm</sup> described previously.

Table 2  
A test of the Diffuse pericarp gene (Idf) to promote gene action at the  $a_1^{m-1}$  locus.

Family number	Pericarp and aleurone phenotypes of backcross ears					
	Diffuse P.		Red P.		Colorless P.	
	spotted	no spots	spotted	no spots	spotted	no spots
2635	3	1	0	1	1	6*
2636	2	0	2	2	2	3
2637	2	0	2	2	6	1
Total	7	1	4	5	9	10 = 36

\*all ears show a few kernels with a few spots.

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### 3. Isoalleles of P<sup>WR</sup>.

The cob color of the Iowa inbred B14 is noticeably darker red than most other red-eared inbreds. This difference is most likely due to modifiers of the P<sup>WR</sup> allele and not to an isoallele of P<sup>WR</sup>.

Inbred B14 with dark red cob color and inbred W-9 with a much lighter red cob color were crossed and carried to F<sub>2</sub>. It was not possible to detect separate classes of red; the F<sub>2</sub> ranged continuously from dark to light red.

The P<sup>WR</sup> alleles from both B14 and W9 have been introduced into the white-cobbed inbred A171 (P<sup>WW</sup>) by backcrossing. By the fourth backcross no difference in cob color could be detected between the two A171 sublimes with different P<sup>WR</sup> alleles.