possible to determine whether it was a genetic or cytoplasmic male sterile or a sterile caused by something not readily explained. These explanations of the data do not take into account any restorer genes that might be present in the material.

However, to determine if these sterile plants are genetic male steriles or cytoplasmic male steriles they will be planted out in this next generation ear-to-row.

## References:

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Steffensen, Dale M. (1968) Amer. Jour. Botany 55:354-369.

Stein, Otto L. and Dale M. Steffensen. (1959) Zeitschrift für Vererbungslehre 90:483-502.

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## 1. Nine maize peroxidase loci and their tissue specificities.

We reported previously (1972 MNL 46:29-33) on seven loci governing peroxidase polymorphisms in corn. Two additional loci have been identified and will be reported here, together with observations on the tissue specificities of these and other peroxidases in maize.

Two new peroxidases have also been localized on vertical and horizontal gels since our 1972 report, bringing to a total of 13 the number of peroxidases we have identified. The approximate order of these enzymes is indicated below as they appear on horizontal 7% acrylamide gels at pH 8.1 (O = origin):

Enzymes are currently given numbers in the order in which loci controlling their genetic polymorphisms are recognized, while enzymes designated by alphabetic symbols have not yet shown genetic polymorphisms in our studies. Thus, three locus designations in our 1972 report have been changed, from  $\underline{Px}_8$  to  $\underline{Px}_A$ , from  $\underline{Px}_9$  to  $\underline{Px}_B$  and from  $\underline{Px}_{10}$  to  $\underline{Px}_8$ . The nine loci and their alleles are listed below:

Locus	Alleles	
Px	1,2,3,null	
Px	1,2	
Pxz	1,2,3,4,5,6	( <b>≈1</b> +2)
$Px_h$	1,2,3	
Px5	l, null	
$Px_{\zeta}^{\prime}$	l, null	
$Px_{\alpha}^{O}$	1,2	
$Px_{Q}^{\prime}$	1,2	
$Px_{O}^{O}$	l, null	
9	-	

Px<sub>8</sub> genetic polymorphisms were studied in steles or in young mesocotyls, prior to synthesis of the neighboring Px<sub>3</sub> band, which is restricted to cortex cells (see below). At least four isozymes (or "allozymes") occur in this region in different inbreds, but our present data unequivocally define only two of these as allelic, Px<sub>9</sub> is present in comparatively few inbreds (e.g., AA8, CI64, CI66, H55, Oh51A, R168), and absence segregates as a recessive allele. Px<sub>9</sub> action was also studied in stele of mesocotyl and in the pericarp; it is an exceptionally heat-labile enzyme among the maize peroxidases (band A-5 in Chenchin & Yamamoto, 1973, J. Food Sci. 38:40).

Additional studies of the  $\underline{Px}_7$  locus, aided by electrophoresis at high pH and low gel concentrations, confirm allelism of the fast and slow bands; however, data obtained from progenies with null types (inbreds B37 and CI66) do not presently permit us to distinguish between allelism or separate locus control mechanisms. Further studies have also given no convincing evidence that allele 6 of  $\underline{Px}_3$ , which displays bands identical to both alleles 1 and 2 in homozygotes, is separable by crossing over.

With the exceptions of enzymes A and B, all of the peroxidases of maize have distinct tissue specificities. These specificities are given below, unique among them being the endosperm tissue culture results (T. T. Yu, unpublished data).

Peroxidases of maize

Tissue	Locus known										Locus unknown			
	1	2	3	4	5	6	7	8	9	A	В	D	E	
Leaf Coleoptile Mesocotyl Stele Cortex	+ +* + + +	0 0 0 0	+ +* +* 0 +	+* + + 0 +	0 v v v	+ + + 0 +	+ +* 0 0	0 + + 0	0 + + 0	0 0 0 0	0 0 0 0	0 0 0 0 0	0 0 0 0 0	
Stem apex	0	0	0	+	0	+	+	0	0	0	0	0	0	
Pericarp Embryo Endosperm	+ 0 0	0 0	+ <b>v</b> 0 0	+ + + +	+ 0 +	0 0 0	+ 0 0	+ + 0	+++++	0 0	0 0 0	++++	+ + + +	
Silk	+*	0	0	+	0	o	+	0	0	0	0	0	0	
Pollen	0	+	0	0	+	0	0	0	0	0	0	+	0	
Root Endosperm tissue cult.	+*	0	0	+	0	+	0	<b>v</b> 0	0	+	+	0	0	

<sup>\*</sup> Bands prominent only in mature tissues

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## 2. Aphid resistance under apparent monogenic control.

In the autumn of 1972, aphid resistance was observed among a series of related shrunken-2 inbreds of the general pedigree (RR) AA8sh BC3 S1. There were 18 resistant lines and 21 lines that were susceptible or segregating. Further studies confirmed the homozygosity of resistant lines, and their aphid resistance under a wide variety of infections. Sorghum plants have been used to provide severe aphid infestations, minimizing escapes, and aphids are only rarely seen on the resistant plants.

The origin of the resistance is as yet unclear, with several possibilities. The basic inbred under conversion, a shrunken-2 version of Hawaiian inbred AA8, has no resistance. Conversion was being made

v Expression variable