

5. A sensitive assay for T mitochondria.

A manuscript on very sensitive assays for H. maydis race T toxin on T cytoplasm is now in press (Nature, Spring, 1974). These assays require little toxin and mitochondrial substrate, are easy and quick to perform, and do not require materials that are not readily unavailable (example, fertile pollen). They therefore should be of considerable use as assays of Texas cytoplasm and should facilitate identification, purification, and characterization of the pathotoxin.

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1. Linkage data for yellow dwarf 2 on chromosome 3.

In 1963 Dr. Irwin Greenblatt sent me seed of a yellow dwarf seedling mutant. Since a yellow-dwarf mutant has been previously located on chromosome 6, this mutant was called yellow dwarf 2 (yd2). The seedlings of this mutant are a medium yellow and less than half the height of normal seedlings.

F₂ progeny of crosses between yd2 and wxT3-9c (3L.09, 9L.12) gave indication of linkage with wx. Two point linkage tests were made with T3-9c, T3-9 (8447) (3S.44, 9L.14), T3-9 (020-5) (3 ctr., 9 ctr.), and T3-9g (3L.40, 9L.14). The results of these tests are shown in Table 1. Closest linkage is shown with T3-9g which has a breakpoint at 3L.40. This would suggest that the gene was located in the long arm of chromosome 3.

Crosses with TB-3a (L.1) resulted in the segregation of yellow dwarf seedlings in the F₁, thus confirming the location of the gene in the long arm of chromosome 3.

Table 1

Linkage data involving crosses of yd2 with T3-9c, T3-9 (8447), T3-9 (020-5) and T3-9g

Translocation	Parental classes		Recombination classes		Total	% recombination
	T +	+ yd	T yd	+ +		
T3-9c	179	209	12	32	432	10.2
T3-9 (8447)	155	136	30	35	356	18.3
T3-9 (020-5)	124	135	32	29	320	19.1
T3-9g	127	99	1	0	227	0.4

The results of a three-point testcross involving ra2 and lg2 are given in Table 2. In this testcross ra2 lg2 plants were frequently weak and failed to set ears, which accounts for the low frequency of this class. The data indicate close linkage with lg2, which is known to be in the long arm of chromosome 3. However, because of the low crossing over with lg2, it is impossible to place yd2 to the left or right of this locus.

Table 2

The result of the testcross of $\frac{ra2\ lg2}{+ + yd2}$ plants

Parental classes		c.o. region 1		c.o. region 2		c.o. region 1 & 2		Total
ra lg +	+ + yd	ra + yd	+ lg +	ra lg yd	+++	ra + +	+ lg yd	
66	121	23	28	1	0	0	0	239
%		21.3		0.4				

If yd2 is close to lg2 it should show fairly loose linkage with a. Table 3 shows the result of a linkage test with this gene that confirms the expectations of loose linkage. Since a small population is involved

in this cross, the observed recombination value of 40.6% is probably not too reliable.

Table 3

Two point testcross linkage data involving a and yd2

Parental classes		recombinations		Total	% recombination
A yd	a +	A +	a yd		
53	42	29	36	160	40.6

In sum, the data indicate that yd2 is located on the long arm of chromosome 3 in the vicinity of the lg2 locus.

Donald S. Robertson

2. Placement of luteus*-1106 on the chromosome 4 linkage map.

In 1960 an apparently spontaneous luteus mutant occurred in one of my stocks. The phenotype of this mutant is somewhat variable. Seedlings are not intensely yellow but tend to be on the pale side and some develop a little chlorophyll.

F₂ data from a cross with wxT4-9g (4S.27, 9L.27) indicated linkage. The testcross results given in Table 1 involve the following translocations: T4-9g, T4-6 (4447) (4S.28, 6L.14), T4-6b (4S.80, 6L.16), and T4-6 (8380) (4S.47, 6L.18). Although translocation linkage data are unreliable, the results in Table 1 are in agreement with the location of l*-1106 in the short arm of chromosome 4 between the breakpoints of T4-6 (4447) and T4-6b in the close proximity of the breakpoint of T4-6 (8380) (4S.47).

Pollination of stocks heterozygous for l*-1106 by plants carrying TB-4a (4S.25) resulted in ears segregating for luteus seedlings, thus confirming the placement of the gene in the short arm of chromosome 4.

Three-point testcross data involving su and gl4 are given in Table 2. These data place l*-1106 in the short arm of chromosome 4 to the left of su about two crossover units.