

4. Linkage relationships of w_1 and w_{8657} with chromosome 6 markers.

The albino mutant w_1 is an off-white mutant that interacts with l_1 to produce yellow seedlings. The w_{8657} mutant is a paper-white albino similar in seedling phenotype to the white endosperm albino mutants but with yellow seed color. Previous studies have indicated that both of these mutants are located on chromosome 6.

The results of two-point linkage studies of w_1 with ms_1 , $ms-si$, $P1$ and su_2 are shown in Table 1. The loose linkage with ms_1 and $ms-si$, which are located within three units of y_1 , indicate that w_1 is some distance from these loci. The linkage with $P1$ and su_2 would indicate that w_1 is located distal to y_1 in the long arm of chromosome 6 probably proximal to $P1$ by about 19 units.

Table 1
Linkage data from testcrosses involving w_1 and ms_1 , $ms-si$,
 $P1$ and su_2 .

Marker gene	Parental classes	Recombination classes	Total	% recombination
ms_1	80	66	146	45.2
$ms-si$	143	77	220	35.0
$P1$	196	45	241	18.7
su_2	212	59	271	21.8

Linkage tests of w_{8657} with several chromosome 6 markers are given in Table 2 and testcross data involving several translocations are given in Table 3. The data from Table 2 indicate that w_{8657} is located in the long arm of chromosome 6, probably about 20 units distal to su_2 . If this location is substantiated by further studies, it would make w_{8657} the most distal marker on chromosome 6. The translocation linkage data from Table 3 are consistent with the placement of w_{8657} well out in the long arm of chromosome 6, probably in the vicinity of the T1-6a breakpoint (L.54).

Table 2
 Testcross data involving w⁸⁶⁵⁷ and chromosome 6
 marker genes.

Marker gene	Parental classes	Recombination classes	Total	% recombination
y_1	158	86	244	35.2
ms_1	132	102	234	43.6
$ms-si$	168	115	283	40.6
Pl	157	49	206	23.8
su_2	93	23	116	19.8

Table 3
 Testcross results involving w⁸⁶⁵⁷ and chromosome 6
 translocations.

Trans- location	Chrom. 6 breakpoint	Parental classes	Recombi- nation classes	Total	% recombi- nation
6-9a	S.79	101	88	189	46.6
6-9c	L.15	174	44	218	20.2
6-9e	L.18	192	46	238	19.3
1-6 ₄₄₅₆	L.30	200	67	267	25.1
1-6a	L.54	217	2	219	0.9

Donald S. Robertson