

3. Inheritance of corn borer resistance.

A study was made of the segregation of F₂ and first backcross generations of two crosses involving WF9 and M14 as susceptible parents and a resistant gl₇ v₁₇ chromosome 3 linkage tester stock. All plants were hand infested with corn borer egg masses. Notes were obtained on all plants for the glossy and virescent characters in the seedling stage and corn borer leaf feeding rating in late June.

The data for the WF9 x gl₇ v₁₇ cross are presented in Table 1. The range and distribution of borer ratings for the F₁ was very similar to that for the gl₇ v₁₇ parent. Both ranged from 1 to 5 with a mean of 2.5 for gl₇ v₁₇ and 3.1 for the F₁. WF9 was more susceptible with a range from 7 to 9 and a mean of 8.6. Homozygous susceptible plants appeared easy to distinguish from the homozygous or heterozygous resistant plants, but the latter two types were indistinguishable from each other. In the F₂ population 121 of 417 plants rated 7 to 9. If it is assumed that these classes included all plants homozygous for susceptibility and all other classes contain homozygous resistant and heterozygous types, 104 such plants rating 7 to 9 would be expected from the segregation of a single gene pair. In the backcross to WF9 160 of 309 plants rated in the 7 to 9 class. This is very close to the 1:1 ratio expected from a single-locus segregation.

Table 1. Segregation for European corn borer resistance and for glossy and virescent seedlings in the cross WF9 x gl₇ v₁₇.

Entry	Phenotype	Total no. plants	European corn borer rating										Mean
			1	2	3	4	5	6	7	8	9		
WF9	normal	85								2	27	56	8.6
gl ₇ v ₁₇	glossy, virescent	101	20	34	26	19	2						2.5
F ₁	normal	111	5	28	40	31	7						3.1
F ₂	normal	325	27	61	40	50	22	18	11	22	74	4.9	
	glossy, virescent	86	20	11	14	20	6	3	1	3	8	3.7	
	glossy	3	1	1							1	4.0	
	virescent	3	1	1							1	4.0	
	Total	417	49	74	54	70	28	21	12	25	84	4.7	
F ₁ x WF9	normal	309	18	30	31	42	23	5	6	38	116	6.1	