Inheritance of Resistance to Race 2 of *Cercospora sojina* in Soybeans

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*Cercospora sojina* Hara, the causal fungus of frog-eye leaf spot of Soybean (*Glycine max* (L.), Merrill), was found in Indiana in 1939. Athow and Probst (1) reported resistance to frog-eye leaf spot due to a single major dominant gene. The symbols Cs cs were assigned to the gene pair. Probst and Athow (3) found no evidence that modifying factors act on the resistant gene to condition the inheritance of the intermediate reaction of the varieties Perry and Chief. They observed only one race of *C. sojina* now referred to as race 1. Athow et al., (2) identified another physiological race of *C. sojina* in 1962 and named it race 2.

**MATERIALS AND METHODS**

F2 seeds from crosses of soybean strain C1043 (suscetible to race 2) × 'Kent' (resistant to race 2) and C1270 (suscetible to race 2) × Kent were planted 4 inches apart in rows 36 inches apart at Lafayette, Indiana, in 1962. Progeny of resistant and susceptible F1 plants were advanced to F2 plant rows to verify the F2 segregation. Twenty-five seeds were planted in each 2½-foot F2 row at Lafayette in 1963. Parent varieties were included in each test.

All plants were inoculated by spraying with a mycelial suspension 4 times at about 10-day intervals each year. The fungus was grown on V-8 juice agar in petri plates for 8 to 12 days. The contents of 40 plates was macerated in 2 liters of water with a Waring blender. The inoculum consisted of 2 liters of the macerate added to 2½ gallons of water. Approximately 3 gallons of inoculum were used each time to inoculate the plants in 900 feet of row.

Susceptible plants had many lesions on all leaves after secondary infection. Very few or no lesions developed on resistant plants. Natural infection by *C. sojina* does not occur in the Lafayette area.

**EXPERIMENTAL RESULTS**

F2 segregation is shown in Table 1. Breeding behavior of F3 progenies is shown in Table 2. A satisfactory fit to a ratio of 3 resistant: 1 susceptible was obtained in the F2 progenies of each cross as well as for the total of the two crosses. The progenies of the resistant F2 plants were in a ratio of 1 homozygous to 2 heterozygous resistant for each cross. The progenies of all susceptible F2 plants tested were homozygous susceptible. These data indicate that resistance in the crosses studied is due to a single dominant gene. The symbols Rcs2 rcs2 are suggested to distinguish this gene pair from Rcs1 rcs1 conditioning resistance or susceptibility to race 1. (In compliance with current gene-symbol assignment in soybeans, Rcs1 rcs1 is being substituted for Cs cs for designation of resistance or susceptibility to race 1).

**SUMMARY**

The F2 segregation and breeding behavior of F3 progenies of 2 crosses of susceptible × resistant soybean varieties were determined in the field under conditions of artificial infection to race 2 of *C. sojina*, the causal fungus of frog-eye leaf spot. Resistance was due to a single dominant gene. The symbols Rcs2 rcs2 have been assigned to this gene pair.

**LITERATURE CITED**

