

Molecular Characterization of Genetic Resistance to Soybean Cyst Nematode in soybean line  
SS97-6946

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ABSTRACT

Soybean Cyst Nematode (SCN) (*Heterodera glycine*) is the most damaging pest of soybean and estimated annual yield losses are 1.5 billion dollars in USA. Breeding resistant cultivars is the most efficient means to control SCN but the nematode has adapted and overcomes resistance of developed soybean cultivars due to a narrow genetic base. A study was initiated in summer 2007 to investigate the genetics of resistance to SCN and identify Quantitative Trait Loci (QTL) conferring broad-spectrum SCN resistance in SS97-6946. Leaves of 160 F<sub>2</sub> individuals from the cross PI 567476 X SS97-6946 were collected to isolate DNA in summer 2007. Three hundred forty seven polymorphic Single Sequence Repeat primer pairs out of 547 were used to genotype the F<sub>2</sub> plants. Seeds from 160 F<sub>2:3</sub> families were evaluated against races 1, 2, 3 and 5 for SCN bioassay following standard protocol. The ratio observed between resistant to susceptible F<sub>2:3</sub> families revealed that SCN resistance involved three recessive genes for both race 1 and 2; two dominant and one recessive for race 3; one dominant and two recessive for race 5. Three markers mapped on linkage groups (LG) A2, E, and G and accounted for 33.8% of the total phenotypic variance for resistance to SCN race 1. One resistant QTL was detected on LG A1 accounted for 18.8% of the total phenotypic variance of race 2. Three markers mapped on LGs A2, G, and M to be associated with resistance to SCN race 3 and shared 24.9% of total phenotypic variance. Three markers on LG G alone and four markers on LGs A1, B2, M, and O were mapped and shown to be linked with SCN resistance to race 5 and accounted for 70.8% of the total phenotypic variance.