Introduction

The soybean cyst nematode (SCN) (Heterodera glycines Ichinohe) is an economically important pathogen of soybean throughout the United States (Wang, et al., 2003). This nematode caused annual losses of 152 million bushels in the United States during 1996-2010 (Wrather and Koenning). Phenotypic characterisation of genotypic resistance to SCN is labor intensive. Remote sensing technologies have the potential to characterize plant stress. These technologies may provide powerful tools for monitoring plant growth and development and for detecting plant disease caused by SCN in soybean (Nutter, et al., 2002).

Objective

Characterize differences in soybean cyst nematode (SCN) reproduction on soybean genotypes using remote sensing.

Materials and Methods (Cont.)

Fig. 2 a) Ruptured SCN cyst showing released eggs, b) Hatched J2, c) infrared image of the canopy (QuickReport 1.1, 2007).

Results (Cont.)

Table 5 a) Pearson’s correlation coefficients (r) between principle component scores based on spectral reflectance data in the NIR region and SCN root population densities, Pf, and RF at Rossville in 2012. b) Pearson’s correlation coefficients (r) between principle component scores based on spectral reflectance data in the NIR region and SCN root population densities at Rossville (in red), and Ashland (in blue) in 2013.

Conclusions

• KS5502N was resistance to the SCN root populations in three locations that had a lower cyst/gram and egg/gram.

• In 2012 at Rossville, as canopy reflectance increased in the NIR region (785-945nm), Pf tended to decrease. As CT increased RF tended to increase.

• In the second year of evaluation, SCN root population densities were associated with canopy reflectance and canopy temperature. When canopy temperature increased, SCN root population densities increased. When canopy reflectance decreased in the NIR region (785-945nm), SCN root population tended to increase.

• Results indicate that it may be possible to characterize soybean cyst nematode reproduction in the field using spectral reflectance and canopy temperature measurements.

References


• FLIR Systems QuickReport 1.1. 2007. FLIR Systems Inc., Wilsonville, OR.

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