SITE-SPECIFIC ROOT-KNOT NEMATODE MANAGEMENT USING TELONE II IN MISSISSIPPI

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Abstract

Managing root-knot nematodes in cotton field situations has become increasingly difficult following the loss of aldicarb (Temik). However, the application of site-specific technology has reduced the cost associated with a large, farm scale application of costly fumigation products to manage nematodes. Site-specific pest management (insect, nematode) is considered to be an effective management practice in cotton throughout the Mid-southern United States. By creating soil zones by some form of classification using either a single technique or some combination of techniques (e.g., digital elevation modeling (DEM), electrical conductivity (EC), normalized difference vegetative index (NDVI), old yield maps) coupled with nematode sampling have previously been used to effectively create management zones in fields with a history of long-term cotton production in AR, GA, LA, as well as MS. Following zone classification, a nematicide application is conducted within specific zones based on soil electrical conductivity and nematode numbers to produce a positive effect on cotton yield. Verification strips are composed of a similar zone structure to provide comparisons between areas that receive the nematicide and those that do not receive the nematicide treatment.

In 2011 and 2012, a portion of each of two fields (west in 2011, east in 2012) were broken into strips, each strip was composed of 24 rows and measured the length of the field. The field used in 2011 (west) was split into six total strips while the field used in 2012 (east) was split into five strips. In both years the treated strips received 3 gal/A of Telone II while the other strips that did not receive Telone served as nontreated (verification) checks. Telone was applied using a 4-row Yetter coulter (Yetter Manufacturing, Colchester, IL) that placed the nematicide at a desired depth of 15 inches while applying product at a speed of 5 mph. Within each strip 10 nematode samples, consisting of 15 soil cores at each sampling point to an approximate depth of six inches, were collected from georeferenced points across each strip.

In 2011, in the west field, Phytogen 367, a moderately resistant root-knot nematode variety was planted two weeks post-application (Allen et al., 2012). Yield, in pounds of seed cotton per acre, at the end of the 2011 season harvested from west field was 214 pounds greater in the strips that received Telone II compared to the strips that remained untreated. In 2012, two weeks following application, Delta Pine 1133, a root-knot nematode susceptible variety was planted in the east field. In 2012 the root-knot nematode numbers from the east field were low prior to nematicide application and ranged from 0 to 16 per pint of soil (average across treated and nontreated strips = 0.4). Post-harvest nematode samples ranged from 0 to 355 per pint (average across treated and nontreated strips = 5.5). Even though root-knot nematode numbers were considered to be low in the east field in 2012, the harvested yield

was significantly greater in the Telone-treated strips compared to the nontreated strips by approximately 291 pounds/Acre of seed cotton.

The west field did not receive nematicide prior to the 2012 season. However, following the 2011 nematicide application yield was collected following the 2012 season similar to 2011 to determine the potential residual impact of reducing the nematode populations on cotton yield. Statistical analyses was conducted using FRAGSTATS (Backoulou et al. 2011ab; McGarigal et al. 2002) as a covariate in a general linear mixed analysis of covariance model (Milliken et al. 2010), and to segment subsets of data from the strips, to determine the potential likelihood of receiving a benefit to a Telone II application made in the previous year. The analysis conducted determined that in some cases yield continued to be increased in some zonal areas of the strips that had received nematicide compared to the other strips that did not receive nematicide in the prior year.

Literature Cited

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