

MANAGING NEMATODES IN MISSISSIPPI COTTON PRODUCTION SYSTEMS WITH TELONE II**T. W. Allen****P. J. English****Delta Research and Extension Center – Mississippi State University****Stoneville, MS****J. L. Willers****USDA-ARS****Starkville, MS****K. B. Hood****Kenneth Hood Farms****Gunnison, MS****Abstract**

Site-specific pest management (insect, nematode) has proven to be an effective management practice in cotton in the Mid-southern United States (Burris et al., 2010; Willers and Riggins, 2010). Soil zone classification using available techniques or a combination of techniques (e.g., digital elevation modeling (DEM), normalized difference vegetative index (NDVI), yield maps, etc.) coupled with nematode sampling have previously been used to create nematode management zones. Within a management zone a nematicide application is then conducted based on nematode populations to quantify the effect on cotton yield. Verification strips that do not receive the nematicide and are composed of a similar zone structure and serve as non-treated controls for yield comparison purposes.

The specific objectives of this trial were to determine the effect of Telone II on the nematode population and overall yield in a location with a continuous history of cotton production. More specifically, combining zone classification methods with treatment combinations potentially will garner insight to more clearly define site-specific management practices.

A field near Perthshire, MS was selected based on historical cotton production. Prior to Telone II application, zones were created in ArcMap based on NDVI and digital DEM. Ten soil sampling locations were overlayed in a field shape file within each 24 row treatment block and staggered so as each sampling location was placed in the middle of a picker pass. Non-treated, 24-row buffer zones were included between all blocks. In all, 5 treated blocks and 5 non-treated blocks were implemented. Soil samples, consisting of a composite sample of 15 to 20 soil cores were collected prior to Telone application (May) and approximately 8 weeks following Telone application (July) to determine the numbers and specific nematodes present.

Telone was applied using a 4-row Yetter coultter (Yetter Manufacturing, Colchester, IL) at 3 gallons/Acre at an approximate speed of 5 mph and approximate depth of 15 inches. Two weeks following application, Stoneville 4946 was planted. Wind erosion within the field required replanting. Change detection methods were utilized to adjust for the effects of replanting for this experiment. Yield data were analyzed using PROC MIXED and PROC GLIMMIX. Two different analyses were performed, one where the yield data was analyzed as an entire block regardless of specific zone properties and one where topography zones were established and other covariates were utilized (Milliken et al., 2010).

Cotton yields were analyzed from four different zones within the field based on digital elevation and NDVI. Digital elevation had a significant effect on the cotton yield from all four of zones. In addition, significant elevation by treatment effects were observed from three of four zones. Site-specific management of nematodes is a complex problem requiring the consideration of multiple agricultural effects and potential inputs in order to develop optimal procedures for best management practices.

References

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