EVALUATING STRATEGIES FOR MANAGING SOUTHERN ROOT-KNOT NEMATODES IN COLQUITT COUNTY, GEORGIA

J. M. Kichler
University of Georgia Extension
Moultrie, GA
R. C. Kemerait
Department of Plant Pathology, University of Georgia
Tifton, GA

Abstract

Land planted to cotton has ranged from 50,000 to 60,000 acres in Colquitt County, Georgia. *Meloidogyne incognita* is a widespread plant-parasitic nematode affecting cotton production in this area. Bacterial leaf blight has also been a concern for growers here. The objective of this multi-year study was to assess root-knot nematode resistant varieties and nematicides in order to improve management recommendations for the cotton growers. Management with nematicides includes soil fumigation with 1,3-dichloropropene (Telone II), seed treatments AVICTA Complete Cotton and NemaStrike, and in-furrow applications of Velum Total (16 fl oz/A) and aldicarb (AgLogic 15G).

In 2017, an experiment was established in a field naturally infested with *M. incognita*. The field trial included nine treatments. These were: DP 1646 B2RF with and without Telone II (3 gal/A), DP 1558NR B2RF, a 50:50 mixture of DP 1646 B2RF and DP 1558NR B2RF with and without Telone II (3 gal/A), DP 1646 B2RF with AgLogic (5lb/A), and DP 1522 B2XF with and without Nemastrike and Telone II (3 gal/A). DP 1646 B2RF and DP 1522 B2XF are susceptible to the southern root-knot nematode while DP 1558 B2RF is a root-knot nematode resistant variety. Appropriate plots were fumigated with Telone II (3 gal/A) on May 30, 2017 and planted on May 31, 2017. The treatments were replicated 4 times and plots were 4-rows wide (36 in. row spacing). No phytotoxicity was observed from the fumigation with Telone II.

Ratings taken during the season included soil nematode counts (J2/100cc soil), and root-gall damage (0-10 and 0-100 scales). Plots were taken to yield. Generally, a numerical increase in root-knot nematode counts (J2/100cc) was found when comparing DP 1646 B2RF to the 50:50 mixture treatments. The only treatment that significantly decreased root-knot nematode counts (J2/100cc) was DP 1558NR B2RF. Nematode counts were above the UGA Extension economic threshold value (100 J2/100cc soil) for all treatments except where DP 1558NR B2RF was planted.

In 2017, root-gall ratings ranged from 0.0 to 1.9 on a 0-100 scale, indicating that there was very little damage from root-knot nematodes in this study. Inexplicably, a significant increase in root galling occurred in the DP 1646 B2RF treated with Telone II as compared to DP 1646 B2RF without Telone II, DP 1558NR B2RF, the 50:50 seed-mixture treatments, and DP 1522 B2XF with and without Telone II.

Cotton yields reported in 2017 ranged from 531 to 851 lb lint/A. A significant increase in yield occurred where DP 1646 B2RF was treated with Telone II as compared to DP 1646 B2RF without Telone II, DP 1558NR B2RF, the 50:50 mixture without Telone II and all treatments containing DP 1522 B2XF. Bacterial blight was not important and did not affect yield at this site.

In 2018 a field experiment was established that included nine treatments different than those found in the 2017 trial. Treatments were again replicated 4 times and plots were 4-rows wide by the length of the field (36 in. row spacing). Treatments included PHY 440 W3FE, with and without Telone II (3 gal/A), DP 1646 B2RF, with and without Telone II (3 gal/A), DP 1747NR B2XF, NG 3522 B2XF, DP 1646 B2RX with in-furrow applications of Velum Total (16 fl oz/A), DP 1646 B2RF with an in-furrow application of Propulse (13.6 fl oz/A), and DP 1646 B2RF treated with AVICTA Complete Cotton + Bion. Appropriate plots were fumigated with Telone II on June 7, 2018 at the rate of 3 gal/A. PHY 440 W3FE and DP 1747NR B2XF are root-knot nematode resistant varieties. The experiment was planted on June 8, 2018; no phytotoxicity from the fumigation was observed.

In 2018, cotton roots (10 plants per plot) were collected after harvest and rated for root-galling. Root gall ratings ranged from 1.4 to 5.0 (0-100 rating scale), depending on treatment. No statistical differences were noted among treatments; however a numerical decrease in galling between resistant varieties and non-resistant varieties was noticed. Lint yields for this field experiment ranged from 962 to 1259 lb/A. Significant decreases in yield were noted when

comparing DP 1646 B2RF with Telone II to all other treatments including PHY 440 W3FE, DP 1646 B2RF, NG 3522 B2XF and DP 1646 B2RF AVICTA + Bion treatments. Bacterial blight was not a yield limiting factor.

In conclusion, bacterial blight was not yield limiting in either year. Root-knot resistant varieties tended to decrease late-season root-knot nematode populations and root-galling beyond that observed where nematicides were used with non-resistant varieties. However, use of nematicides with DP 1646 B2RF produced the highest yields in both years of this study .