RENIFORM NEMATODE SUPPRESSION IN SOUTHEAST ARKANSAS WITH NEMATICIDES

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Abstract

The reniform nematode, *Rotylenchulus reniformis*, has become a problem for many Arkansas cotton growers in recent years. Recent surveys indicate that as much as 30% of the acreage in southeast Arkansas may be infested with the nematode. Two studies were conducted to determine the efficacy of different nematicides and rates for suppression of damage to cotton by the reniform nematode.

Both studies were conducted in Jefferson County, Arkansas on fields with moderate to high levels of reniform nematodes. The first study was an in-furrow nematicide test utilizing a susceptible and tolerant cotton cultivar. Plots were field length with each treatment replicated four times in a randomized complete strip split plot design and were approximately 1.0 acre in size. All applications were made in-furrow at planting except for the 10.0 lb rate in 1994 which had 2.7 lb of Temik (aldicarb) applied at planting followed by 7.3 lb sidedressed at 35 days after planting. Main plot treatments in 1994 consisted of a control and Temik 15G applied at four different rates (3.5, 5.0, 7.0, and 10.0 lb/A) and Nemacur (fenamiphos) at 7.0 lb/A. The control plots were received two foliar applications of Orthene (acephate) at 0.25 lb ai/A, for thrips control. All plots received Terraclor Super X 12.5G fungicide at a rate of 7.0 lb/A in-furrow at planting. Within each main plot two cultivars were planted, 'DPL 50' and 'SureGrow 501'(SG 501), representing susceptible and tolerant varieties. Plots were managed similarly following foliar thrips applications on control. In 1995 changes in the test included dropping the 10.0 lb/A rate of Temik and the Nemacur from the study and using Di-Syston (disulfoton) at 5.0 lb/A in-furrow for thrips control in the check instead of Orthene. Also, the susceptible variety used in 1995 was 'DPL 20'. Nematode counts were taken from each plot at planting and from each split plot at mid-season and harvest for each split plot.

In both years nematode counts at planting were high averaging about 10,000 reniform nematodes per pint of soil with no detectable differences across all plots. In 1994 mid-season nematode counts indicated differences among treatments but by harvest there were no significant differences among plots. In 1995 following harvest, the check/DPL 20 treatment had significantly fewer nematodes than the check and 5.0 lb rate of Temik planted to SG 501 and the 7.0 lb rate of Temik planted to DPL 20. In 1994 no significant yield differences among treatments or between varieties was observed with yields ranging from 740 lb of lint/A in the check to 891 lb/A with the Temik at 10.0 lb/A. However, a trend for higher yields with increasing rates of Temik was seen. In 1995, the untreated check planted to DPL 20 had a significantly lower yield with 813 lb of lint cotton/A, compared to the 3.5 and 5.0 lb rate of Temik planted to SG 501 yielding 935 and 910 lb of lint cotton/A, respectively.

The second study, conducted in 1995, was to evaluate the efficacy of Vydate (oxamyl) for suppression of reniform nematode. The study was designed as a randomized complete block with four replications of each treatment. Plot size was 4 rows 50 ft long. The cotton cultivar 'SG 501 was used in the study and all plots received 7.0 lb/A of Ridomil PC 11G in-furrow at planting. Temik 15G and Di-Syston 15G were applied in-furrow at planting in appropriate treatments. Vydate C-LV was applied in-furrow in one treatment using a single spray nozzle with a 3.0 inch band. Vydate C-LV foliar applications were made at appropriate times using a CO_2 propelled back-pack sprayer and hand-held boom. Treatments were as follows: 1) Temik at 3.5 lb/A; 2) Temik at 3.5 lb/A and Vydate at 0.5 pt/A at pinhead square (PHS) and 10 days later; 3) Di-Syston at 5.0 lb/A and Vydate at 0.5 pt/A at PHS and 10 days later; 4) Vydate (in-furrow) applied at 4.5 pt/A; 5) Temik at 3.5 lb/A and Vydate at 0.5 pt/A applied at second true leaf and 10 days later; and, 6) Temik at 5.0 lb/A. Soil samples for nematode assay were collected at planting, mid-season, and at harvest. Plant measurements were taken on 27 July and 5 October consisting of plant height, number of mainstem nodes, and node above white flower (NAWF). Seedcotton was machine harvested on 5 October and yields were recorded.

Reniform population density did not differ among plots at planting averaging 5,618 reniform nematodes per pint of soil. Greater nematode population density occurred at mid-season following treatment with Temik at 5.0 lb/A than with Temik at 3.5 lb/A or with Temik and Di-Syston with foliar applications made at PHS and 10 days later. At harvest, the Di-Syston plus Vydate at PHS and 10 days later resulted in lower nematode counts than where Temik at 5.0 lb/A were applied. At mid-season no apparent plant height differences were observed among treatments. However, Temik at 5.0 lb/A resulted in more mainstem nodes than with Temik at 3.5 lb/A. The combination of Temik (3.5 lb/A) plus Vydate resulted in a higher NAWF count than Di-Syston plus Vydate. Soil application of Vydate (4.5 pt/A) appeared to delay initiation of the first fruiting branch. The fruiting node was higher with this treatment compared to the Temik plus Vydate treatment. No detectable differences in plant measurements were detected at harvest. Seed cotton yield was similar among all treatments. Although not significant, a slight increase in seedcotton yield occurred where Temik plus Vydate at PHS and 10 days later was applied.

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