

EVALUATION OF NEMATOCIDES FOR MANAGEMENT OF SOUTHERN ROOT-KNOT NEMATODES (*MELOIDOGYNE INCOGNITA*)

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Abstract

Southern root-knot nematodes (*Meloidogyne incognita*) are a continuing threat to cotton production in Georgia and there are only a few proven nematicides available to control crop losses. The objective of these trials was to compare new nematode seed treatments that are easier and safer to apply against standard cotton nematicides. There was no yield increase in four trials over two years (2004-05) with the nematode seed treatments compared to plots with no nematicide applied. However, most trials in Georgia saw a yield increase comparable to five pounds of Temik 15G applied in-furrow with these new seed treatments. There also was a significant yield increase associated with the standard cotton nematicides.

Introduction

The southern root-knot nematode is the most widespread pathogenic nematode of cotton in Georgia and accounts for severe losses each year. Management of the southern root-knot nematode involves a combination of crop rotation with non-susceptible host crops such as peanuts, cultural practices such as sub-soiling and irrigation to reduce stress on the cotton plant, and the use of nematicides. The objective of this study was to evaluate the effectiveness of new nematode seed treatments, abamectin, the active ingredient for nematode control in Avicta and Bayer's seed treatment, and N-Hibit, marketed as a plant growth enhancement which activates a defense response in the cotton plant against nematodes. These products were evaluated against standard cotton nematicides, Temik 15G (aldicarb) and Telone II (1,3 dichloropropene).

Materials and Methods

Two trials in both 2004 and 2005 were established at the Mike Nugent farm in Coffee County, Georgia to evaluate nematicides for management of southern root-knot nematode in cotton. The field had been planted annually to cotton and had a history of severe losses to nematodes. The field site contained Fuquay and Clarendon fine sands. The field was irrigated and cotton was strip-tilled into a killed rye cover crop. Poultry litter was applied to meet most of the nutrient needs of a fall cover crop that was grazed and again in the spring before the cotton was planted. The experimental design was a randomized complete block with three replications. Plots were two or four 36 inch rows by the length of the field (approximately 750-900 feet).

Trial 1 was planted on May 13, 2004 and consisted of six treatments of DPL 555B/RR. In treatment 1 Telone II was applied at 3 gallons per acre with a single chisel in-row 12 inches deep on April 29 and followed with 3.5 pounds per acre of Temik applied in-furrow at-planting. Treatment 2 was 3.5 pounds per acre of Temik applied in-furrow at-planting. Treatment 3 was STAN (active ingredient abamectin) and Cruiser treated seed. Treatment 4 was 5 pounds per acre of Temik applied in-furrow at-planting and 5 pounds per acre of Temik incorporated into the soil at pinhead square with a colter 6-8 inches on either side of the cotton plants at a depth of 2-3 inches. Treatment 5 was 5 pounds per acre of Temik applied in-furrow at-planting. Treatment 6 was untreated seed and no nematicide treatment.

Trial 2 planted on May 13, 2004 compared the performance of DPL 555B/RR with either Cruiser treated seed with Cruiser + STAN treated seed with 5 pounds per acre of Temik applied in-furrow at-planting to ST 5599 B/RR with the same treatments.

Trial 3 planted on May 10, 2005 consisted of seven treatments of DPL555B/RR. In treatment 1 Telone II was applied at 3 gallons per acre with a single chisel in-row 12 inches deep on April 20 and followed with 3.5 pounds per acre of Temik applied in-furrow at-planting. Treatment 2 was 3.5 pounds per acre of Temik applied in-furrow at-

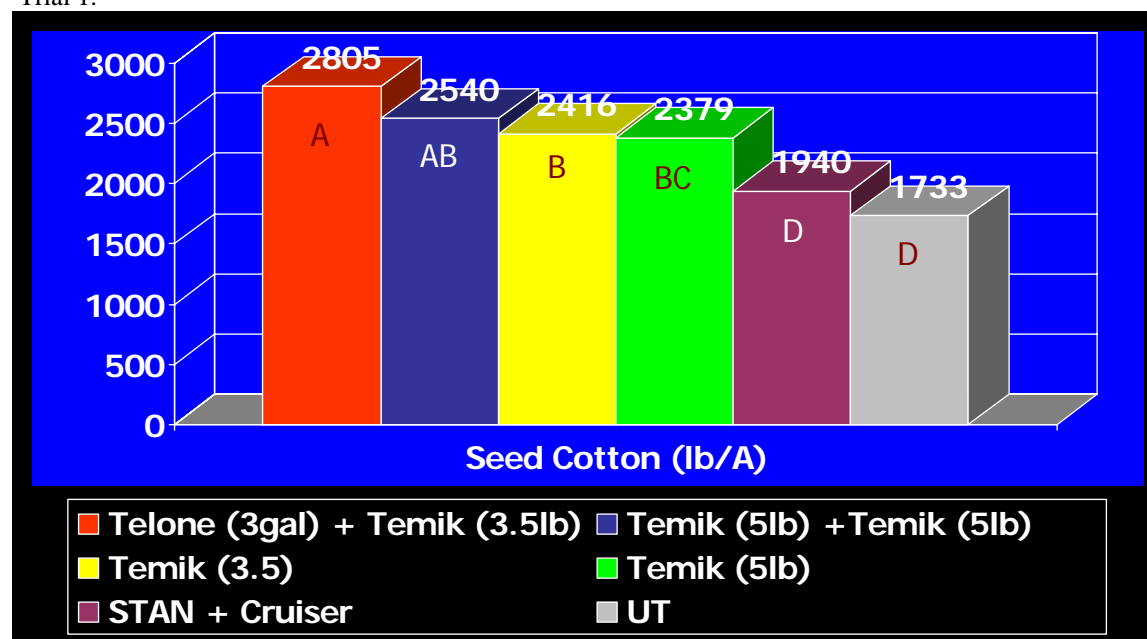
planting. Treatment 3 was 5 pounds per acre of Temik applied in-furrow at-planting and 5 pounds per acre of Temik incorporated into the soil at pinhead square with a colter 6-8 inches on either side of the cotton plants at a depth of 2-3 inches. Treatment 4 was 5 pounds per acre of Temik applied in-furrow at-planting. Treatment 5 was untreated seed and no nematicide treatment. Treatment 6 was Avicta treated seed and treatment 7 was Cruiser treated seed.

Trial 4 planted on May 10, 2005 consisted of six treatments of DPL 555B/RR. Treatment 1 was N-Hibit + Cruiser treated seed, treatment 2 was N-Hibit + Cruiser treated seed with 5 pounds per acre of Temik applied in-furrow at-planting, treatment 3 was Cruiser treated seed with 5 pounds per acre of Temik applied in-furrow at-planting, treatment 4 was Cruiser treated seed, treatment 5 was seed treated with the Bayer seed treatment and treatment 6 was Avicta treated seed.

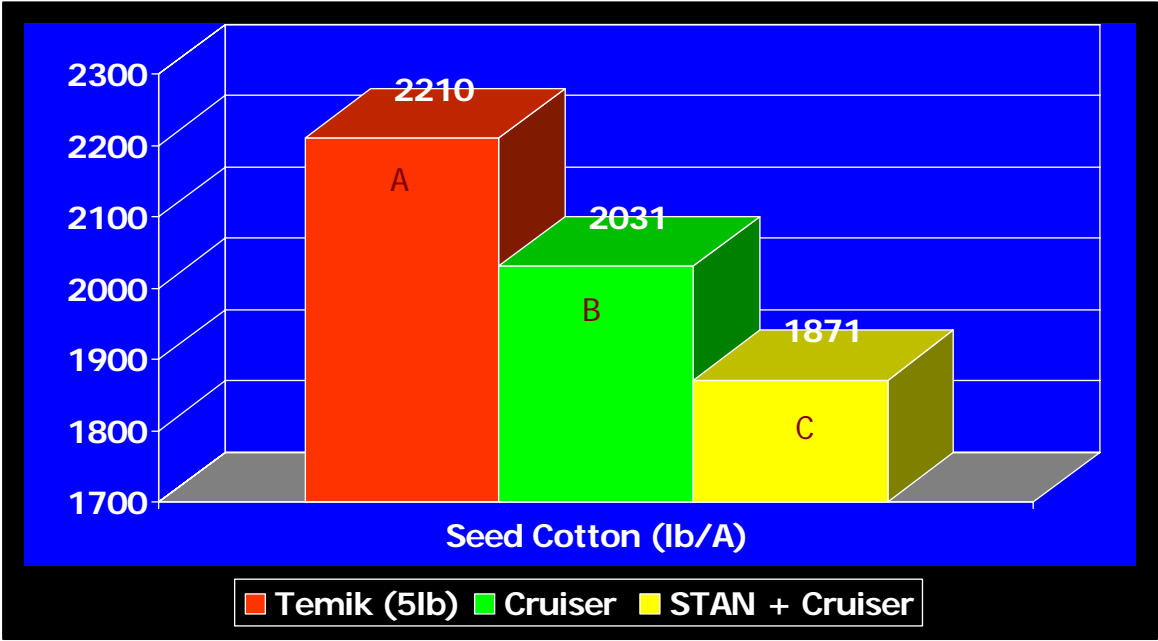
Results and Discussion

There was no benefit from the abamectin (the active ingredient for nematode control in STAN, Avicta and the Bayer seed treatment) treated seed or N-Hibit in the 4 trials in Coffee County over treatments where no nematicide was applied. However, in other trials in Georgia in 2004-05 a benefit was noted with these seed treatments. Our speculation is that the benefits to these seed treatments might have been masked by the grower's use of poultry litter. There was a significant yield increase in the trials where Telone II and/or Temik were applied compared to the untreated seed or nematicide seed treatments. This research confirms our current recommendations that if a cotton grower has a southern root-knot nematode problem the two best proven options would be Telone II with an application of Temik in-furrow or Temik applied in-furrow + a sidedress application of Temik. The results from the four trials are in the following charts. In trial 2 the interaction between variety and nematicide was insignificant and therefore data is presented across varieties and across nematicide treatments. Southern root-knot nematode juveniles ranged from 76-723 per 100 cm³ of soil taken at harvest. University of Georgia recommends a nematicide be applied when a threshold level of 100 juveniles per 100 cm³ of soil is exceeded. These thresholds were reached in 95% of the plots.

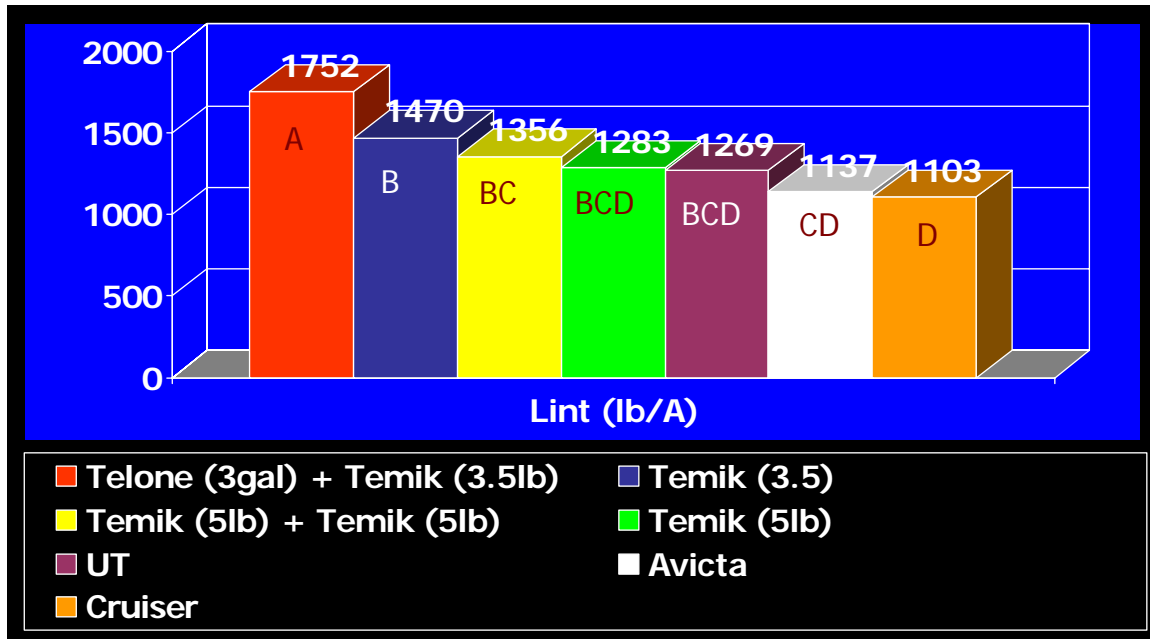
Trial 1.



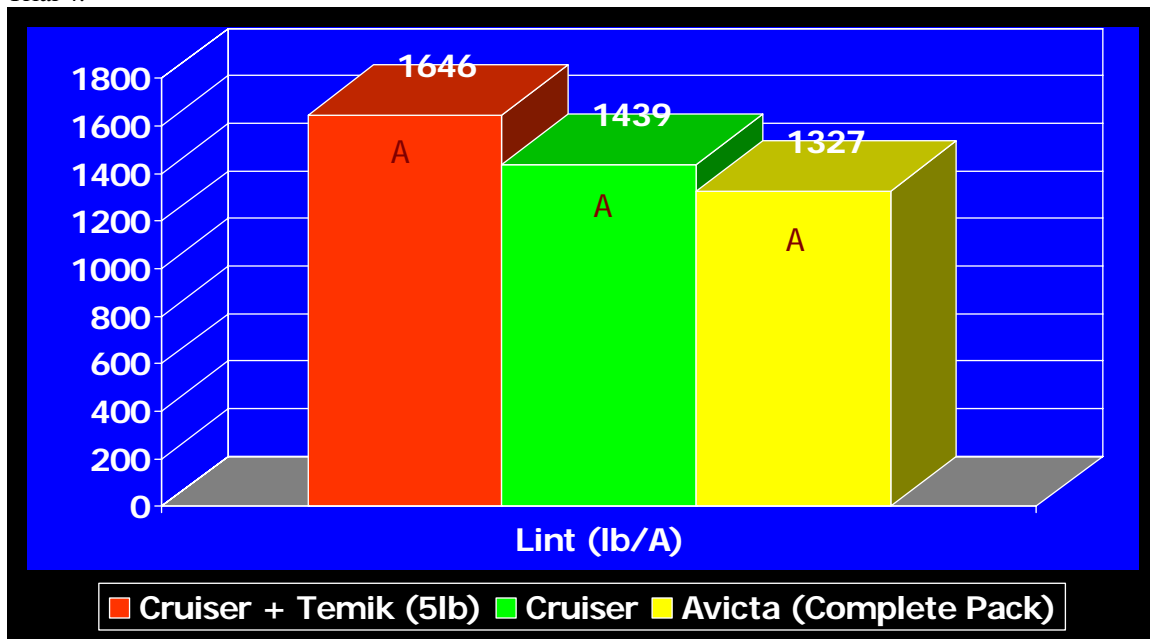
Trial 2.



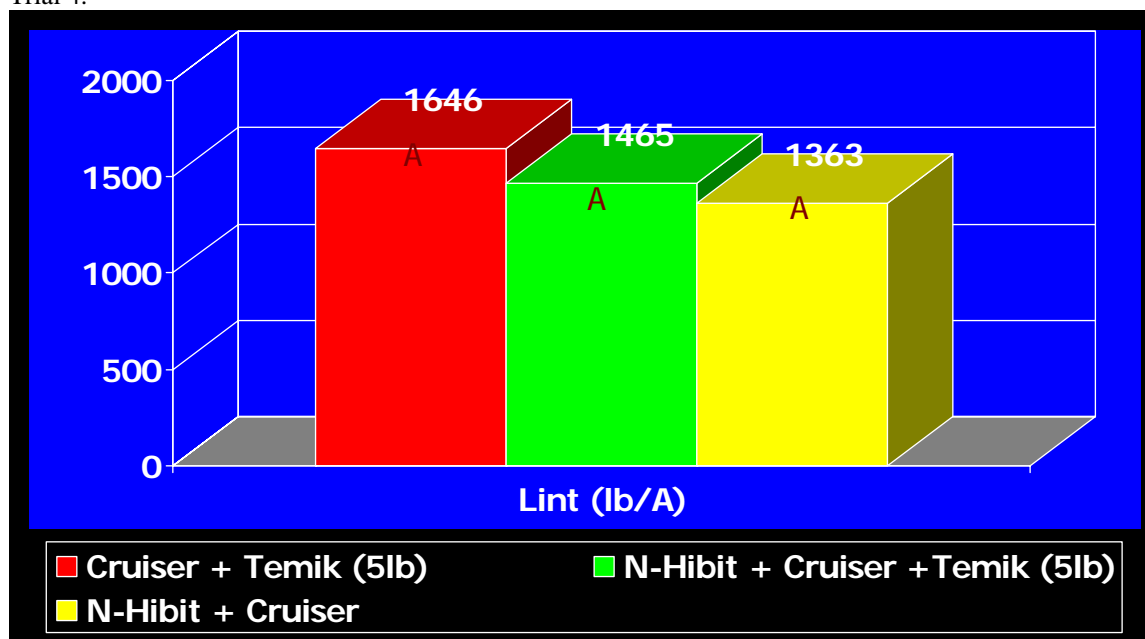
Trial 3.



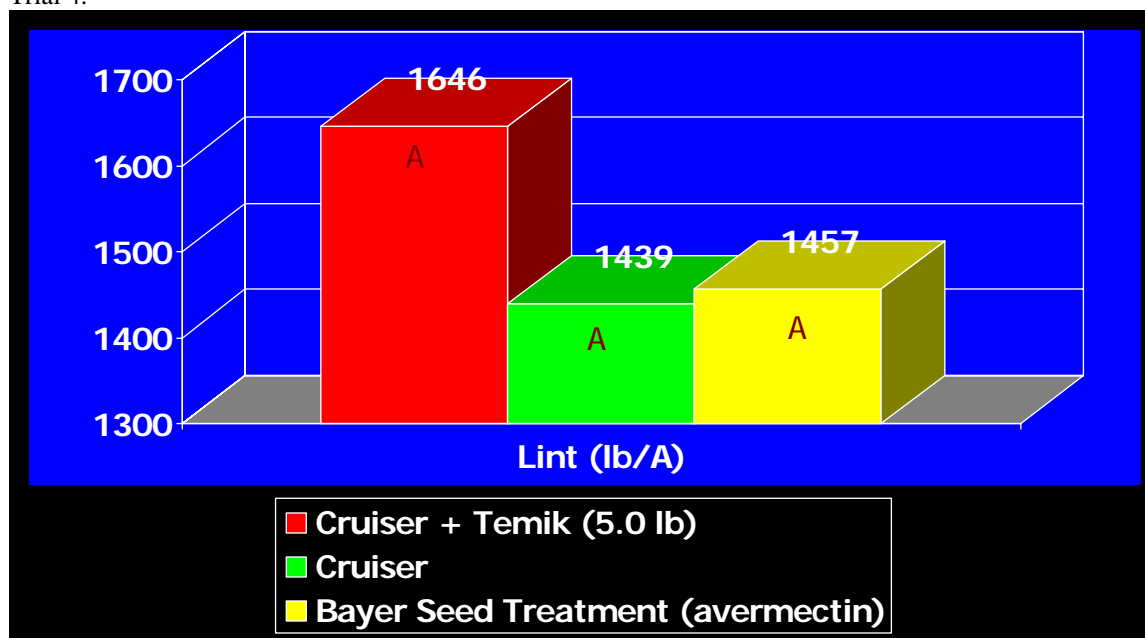
Trial 4.



Trial 4.



Trial 4.



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