

# ROOT-KNOT AND RENIFORM NEMATODE SUPPRESSION WITH SELECTED NEMATOCIDES IN ARKANSAS

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## Abstract

Nematicide studies were conducted on two fields, one infested with root-knot and one with reniform nematodes. One treatment, Temik (aldicarb) applied at a rate of 5.0 lb product per acre with an additional 5.0 lb applied at pinhead square, had a significant yield increase over all other treatments in both tests. Vydate treatments were not significantly greater than all other temik treatments in either test. Admire (imidacloprid) and Di-syston (disulfoton) did not increase yields compared to the untreated check.

## Introduction

Severity of the nematode problem in Arkansas was made apparent in 1998. Many growers experienced a problem for the first time. Growers with a history of root-knot, *Meloidogyne incognita*, or reniform, *Rotylenchulus reniformis*, nematode experienced severe yield losses in this past growing season. Often, in the case of root-knot nematode, these problems were associated with grower fields that had been planted to corn in 1997. Cotton yields were reduced across the state due to environmental stress and nematodes served to exacerbate the problem. The winter of 1997-1998 served to worsen the problem by reducing overwintering mortality of nematodes. The objective of these studies was to evaluate various rates and timings of selected pesticides for suppression of root-knot and reniform nematode in typical grower fields known to have high populations of nematodes.

## Materials and Methods

The studies were conducted on typical grower fields in Desha County, AR (RKN), and Monroe County, AR (reniform). The test design was a randomized complete

block design with four replications. Plot size was four rows 50 ft long on 38 in spacing. The cultivar STV 4740BG was planted May 4 (RKN) and May 11 (reniform). Treatments consisted of: Temik (aldicarb) at product rates of 3.5, 5.0, and 7.0 lb/ A applied in-furrow at planting, an additional treatment of Temik was 5.0 lb in-furrow with an additional 5.0 lb application sidedressed at pinhead square with a coulter rig; Vydate CL-V (oxamyl) applied at third true leaf at a 1.0 pt/ A product rate or at 0.5 pt plus an additional 0.5 pt 12 days later; Vydate CL-V applied at pinhead square at 1.0 pt/ A or at 0.5 pt plus an additional 0.5 pt 12 days later; Admire (imidacloprid) applied at 3.2 oz/ A in-furrow at planting; Admire at 2.4 oz/ A plus Namacur (phosphoramidate) at 1.0 qt/ A applied in-furrow at planting; Di-syston (disulfoton) at 1.0 pt/ A (RKN) or 6.5 lb/ A (reniform) applied in-furrow at planting; and, an untreated check. Nematode samples were collected from all plots at planting, mid-season and harvest. Plots were machine picked and weights recorded. Data was subjected to AOV and mean separation, LSD (0.05).

## Results

Results indicated that the use of temik (aldicarb) at a rate of 5.0 lb/ A in-furrow plus an additional 5.0 lb/ A sidedressed always resulted in a significant yield advantage over all other treatments. The increase in yield response varied from just over 91lb in the reniform study (Table 1) to over 200 lbs lint cotton per acre in the RKN study (Table 2). These differences were corroborated by two additional large block studies where Temik sidedressed increased yield over an untreated check by 200 lbs seed cotton per acre (Table 3). There was considerable variation of performance with the vydate treatments. Admire and di-syston treatments did not differ significantly in yield compared to the untreated check. Nematode counts were inconclusive.

## Discussion

These data indicate that in a stressful growing season, such as 1998, cotton yields may be improved with the addition of a sidedress application of temik at pinhead square when fields have damaging levels of root-knot or reniform nematode. Further studies are warranted to determine if such applications will increase yields across different environmental conditions.

Table 1. Yield of various treatments and timing for suppression of reniform nematode, 1998.

Treatment	Rate/ A <sup>1</sup>	Lint (lb/A) <sup>2</sup>
Temik	5.0 lb IF + 5.0 lb SD	762.9 a
Vydate <sup>3</sup>	0.5 pt PH + 0.5 pt 12 d	671.6 b
Vydate <sup>3</sup>	0.5 pt 3 <sup>rd</sup> TL + 0.5 pt 12 d	661.7 bc
Vydate <sup>3</sup>	1.0 pt PH	658.5 bc
Temik	7.0 lb IF	656.0 bc
Temik	3.5 lb IF	648.2 bcd
Admire	3.2 oz IF	624.5 bcd
Admire + Nemacur	2.4 oz + 1.0 qt	621.6 bcd
Temik	5.0 lb IF	599.9 bcd
Vydate <sup>3</sup>	1.0 pt 3 <sup>rd</sup> TL	590.9 bcd
UTC		581.2 cd
Di-syston	6.5 lb IF	565.8 d

<sup>1</sup>Rate/ A refers to product rate. IF=in-furrow; SD=sidedress; PH=pinhead square, 3<sup>rd</sup> TL=third true leaf.

<sup>2</sup>Means within a column followed by the same letter do not differ significantly (LSD=0.05).

<sup>3</sup>All vydate treatments received 3.5 lb Temik at planting.

Table 2. Yield of various treatments and timing for suppression of root-knot nematode, 1998.

Treatment	Rate/ A <sup>1</sup>	Lint (lb/A) <sup>2</sup>
Temik	5.0 lb IF + 5.0 lb SD	1277.6 a
Vydate <sup>3</sup>	0.5 pt PH + 0.5 pt 12 d	1069.1 b
Vydate <sup>3</sup>	1.0 pt 3 <sup>rd</sup> TL	1058.6 bc
Temik	7.0 lb IF	1035.1 bcd
UTC		1006.8 bcd
Temik	3.5 lb IF	991.1 bcd
Vydate <sup>3</sup>	1.0 pt PH	981.2 bcd
Temik	5.0 lb IF	958.6 bcd
Admire + Nemacur	2.4 oz + 1.0 qt	929.1 cd
Di-syston	6.5 lb IF	924.8 d
Vydate <sup>3</sup>		921.7 d
Admire	3.2 oz IF	624.5 bcd

<sup>1</sup>Rate/ A refers to product rate. IF=in-furrow; SD=sidedress; PH=pinhead square, 3<sup>rd</sup> TL=third true leaf.

<sup>2</sup>Means within a column followed by the same letter do not differ significantly (LSD=0.05).

<sup>3</sup>All vydate treatments received 3.5 lb Temik at planting.

Table 3. Results of large block RKN Sidedress studies, 1998.

Location	Treatment <sup>1</sup>	Yield (lbs SC/ A) <sup>2</sup>
Lonoke County	7.5 lb Temik SD	2014 a
	UTC	1745 a
Pulaski County	7.5 lb Temik SD	1857 a
	UTC	1641 b

<sup>1</sup>Treatment of 7.5 lb product of Temik sidedressed at pinhead square. Both treatments received 3.5 lb Temik in-furrow at planting.

<sup>2</sup>Means within a column at the same location followed by a similar letter do not differ significantly (LSD=0.05).