AN ECONOMIC ANALYSIS OF TELONE II (1,3-D) AND TEMIK 15G (ALDICARB) TO MANAGE RENIFORM NEMATODE (*ROTYLENCHULUS RENIFORMIS*) IN COTTON

D. Zimet, J.R. Rich and A. LaColla
University of Florida
Quincy, FL
R.A. Kinloch
University of Florida
Jay, FL

Abstract

The abilities of aldicarb (Temik 15G) and 1,3-D (Telone II) to control reniform nematodes (*Rotylenchulus reniformis)* were tested over three growing seasons, 1995, 1997, and 1998. Phorate (Thimet 15G) was applied at a rate of 6.7 pounds per acre in conjunction Telone II in order to control thrips. Four rates of each of the primary chemicals was applied each year and a treatment of Thimet only was the control or check. In 1997 and 1998 a combined Temil 15G - Telone II treatment was included. That treatment did not include Thimet 15G. A randomized block design was used in all years. Net returns based upon $0.60 and $0.70 per pound of lint were estimated for each of the treatments in terms of yield and net returns. The responses of the other treatments were somewhat erratic. Generally with prices at $0.70, the Telone II treatments had greater net returns than the Temik treatments. The net returns for $0.60 were not as consistent.

Introduction

It was only recently recognized that reniform nematodes cause economic damage in cotton production. Reniform nematodes are generally more uniformly distributed through a field than are root knot nematodes and the damage caused by the former is less dramatic. Thus, the damage was often unnoticed to many producers during the production season. It was only at harvest that they noticed that something was not right. This experiment was initiated in 1995 to learn how to limit the damage caused by reniform nematodes in cotton. Although planting occurred in 1996, no data is available from that year because of poor yields caused by other factors. The results presented in this report are based upon data from three experimental tests -- one each in 1995, 1997 and 1998. The report is oriented towards economics, not production information alone. The authors wish to acknowledge Cotton, Inc. for partially funding this research.

Reprinted from the *Proceedings of the Beltwide Cotton Conference*
Volume 1:111-112 (1999)
National Cotton Council, Memphis TN

Materials and Methods

This section is divided into two parts: 1) technical, relating to the actual experiment and 2) economic.

Technical

A randomized plot design was used throughout to test the efficacy and economic efficiency of two ways of controlling reniform nematodes. Temik 15G (aldicarb) was the basis for one means of control and Telone II (1,3-D) + 6.7 pounds per acre of Thimet 15G (phorate) was the other. Thimet was used to control thrips. Its use was unnecessary with Temik treatments. Temik 15G and Telone II were each applied at several rates (Table 1) to determine which was to be preferred regarding yields and economic return. Different rates of Temik were used in the 1995 test as compared to the 1997 and 1998 tests. Furthermore, in the 1997 and 1998 tests there was a treatment of 3.0 gallons of Telone II plus 3.0 pounds of Temik 15G. As in all yield tests the experimental levels were compared to a control or check. In this case the control received a treatment of Thimet to prevent damage by thrips. No Thimet was applied to the combined Telone II - Temik treatment. Telone II was applied with a single chisel in the row to 12 inches deep two - three weeks prior to planting. Temik 15G was applied in the furrow at planting in all tests. Cotton lint yield is the only physical result utilized for this report. Other reports will contain the information concerning nematode populations.

Economic

Costs and returns based upon the procedures used in the tests – fertilization rates, use of herbicides, etc. – were synthesized or estimated. Because of recent volatility and downward pressure on the price of cotton lint, cotton prices of $0.70 and $0.60 were used in the analysis. The price for Temik 15G was $3.40 per pound, that of Telone II $11.15 per gallon, and of Thimet $4.00 per pound.

Results

Because a different cotton variety was used in the 1995 from the 1997 and 1998 tests, and because the treatment rates of Temik 15G in 1995 were different from those used in 1997 and 1998, the results of the 1995 test are separated from those of 1997 and 1998. The latter two are reported jointly. Cotton lint yields for all treatments were greater than control in all tests. In 1995 and in 1997, the yields obtained from Telone II treatments and those obtained from the Temik 15G treatments were statistically equal. The yields of the Telone II treatments, however, were consistently greater. In 1998, only one Temik treatment (5.0 pounds) was significantly equal to the 1.5 gallon Telone II treatment. The other Telone treatments were significantly greater than only the 3.0 Temik treatment and the control. Only the joint Telone-Temik treatment was actually, not significantly, greater than any of the Telone-Thimet treatments (3.0 gallons). The per acre costs for the

Telone II plus Thimet treatments were greater than those for Temik 15G, including the Temik 15G plus Telone II. Thus, net return per acre for the treatments is a critical variable.

Net Return, Cotton Price at $0.70 per Pound of Lint

When yields were greater yields (1997 and 1998) net returns more or less followed the yield pattern. Net returns for the Telone II treatments for the summary of the 1997 and 1998 trials than for the Temik 15G treatments. In 1995, when yields were modest, losses from the Temik treatments were less than those for the Telone treatments. Net return was greatest, and net loss was least with the joint Telone II (3.0 gallons per ace) and Temik 15G (3.0 pounds per acre). The control (Thimet only) exhibited the greatest loss with low yields, but a modest gain with higher yields (summary 1997 and 1998).

Net Return, Cotton Price at $0.60 per Pound of Lint

The pattern at $0.60 per pound of lint was similar as for that of $0.70. Net returns for the Telone treatments were greater than those for the Temik treatments when yields were greater (summary 1997 and 1998), but losses were greater for Telone treatments than for Temik treatments when yields were modest. The joint Telone-Temik treatment had the greatest net return for 1997-1998.

Discussion

Overall, the results show consistently greater yields for Telone II treatments than for Temik 15G treatments. Because thrips must be controlled separately when Telone II is used, however, the cost of using Telone II may be excessive compared to the returns unless Temik is used for thrips control. The results imply that it is best to try to maximize yields when price is strong, but control cost when price is reduced.

Summary

Thrips control has a major impact on the cost for the treatment of reniform nematodes in cotton. Thrips control, however, is insufficient to assure economic returns when reniform nematodes are present. The combination of relatively modest rates of Temik 15G and Telone II seems to be the most advantageous and least risky in an economic sense. If Temik cannot be used, however, a less costly method of thrips control than 6.7 pounds of Thimet 15G should be utilized.

Table 1. Yields and Costs per Acre for Various Temik 15G and Telone II-Thimet 15G Treatments, and One Thimet 15G only Treatment, 1995.

Treatment[1]	Yield (lb/a)	Cost ($/a)
Telone II 1.5 gallons	516	476.60
Telone II 3.0 gallons	564	493.30
Telone II 4.5 gallons	565	510.10
Telone II 6.0 gallons	599	526.80
Thimet 15G 6.7 pounds	460	459.20
Temik 15G 3.0 pounds	550	442.60
Temik 15G 6.0 pounds	517	452.80
Temik 15G 9.0 pounds	514	463.00
Temik 15G 12.0 pounds	549	473.20

[1]All Telone II treatments include 6.7 pounds of Thimet 15G.

Table 2. Yields and Costs per Acre for Various Temik 15 G and Telone II Treatments, One Treatment of Thimet 15G, One Temik-Telone II, 1997,1998.

Treatment	Yield (lbs/a)	Cost ($/a)
Telone II 1.5 gallons	911.5	523.50
Telone II 3.0 gallons	929	540.20
Telone II 4.5 gallons	883	556.90
Telone II 6.0 gallons	919.5	573.70
Thimet 6.7 lbs	599	506.00
Temik 3.0 lbs	642	489.40
Temik 6.0 lbs	724.5	496.20
Temik 9.0 lbs	722	503.00
Temik 12.0 lbs	707	509.80
Telone 3.0 lbs + Temik 3.0 lbs	945	523.60

Table 3. Net Return per Acre for Various Temik 15G and Telone II Treatments and One Treatment of Thimet 15G Only, 1995 and Summary of 1997 and 1998 Test, Price of $0.70 per Pound of Lint.

	1995	1997 & 1998
Treatment	Net Return $0.70 ($/a)	Net Return $0.70 ($/a)
Telone II 1.5 gallons	-115.40	114.60
Telone II 3.0 gallons	-98.50	110.10
Telone II 4.5 gallons	-114.60	62.20
Telone II 6.0 gallons	-107.50	70.00
Thimet 15G 6.7 pounds	-137.20	21.40
Temik 15G 3.0 pounds	-57.60	-40.00
Temik 15G 6.0 pounds	-90.90	10.90
Temik 15G 9.0 pounds	-103.20	2.40
Temik 15G 12.0 pounds	-88.90	-14.90
Telone II 3.0 Gallons + Temik 3.0 lbs		137.90

Table 4. Net Return per Acre for Various Temik 15G and Telone II Treatments and One Treatment of Thimet 15G Only, 1995 and Summary of 1997 and 1998 Test, Price of $0.60 per Pound of Lint.

	1995	1997 & 1998
Treatment	Net Return, $0.60 ($/a)	Net Return, $0.60 ($/a)
Telone II 1.5 gallons	-167.00	23.40
Telone II 3.0 gallons	-154.90	17.20
Telone II 4.5 gallons	-171.10	-27.10
Telone II 6.0 gallons	-167.40	-22.00
Thimet 15G 6.7 pounds	-183.20	53.90
Temik 15G 3.0 pounds	-159.40	-104.20
Temik 15G 5.0 pounds	NA	61.50
Temik 15G 6.0 pounds	-142.60	NA
Temik 15G 7.0 pounds	NA	-69.80
Temik 15G 9.0 pounds	-154.60	-85.60
Temik 15G 12.0 pounds	-143.80	NA
Telone II 3.0 gallons + Temik 3.0 pounds	NA	43.40