EVALUATING AVICTA, AERIS, AND KAPAM FOR NEMATODE MANAGEMENT IN LOUISIANA COTTON

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Introduction

Each year nematodes impact lint yield and quality. Root-knot and reniform are the two most common nematodes affecting cotton grown in Louisiana. Of these two, reniform has emerged as the most important in Louisiana (Overstreet 2007). From 2005 to 2007 losses due to nematodes in cotton ranged from 6.5% to 8.0% (Blasingame and Patel 2005, Blasingame 2006). These estimates rank higher than any other disease affecting cotton.

Traditionally, nematodes are managed using crop rotation and chemical nematicides. Until recently, nematicides were applied prior to planting as a fumigant or in-furrow as granules at planting. While these products are effective, they are highly toxic and time is required to calibrate and load equipment before and during planting. More recently, seed treatment nematicides have been developed for use in cotton. These treatments are particularly attractive to producers for a number of reasons. Seed treatments require no equipment calibration and there is minimal contact. Therefore, producers can save time. However, these treatments may not be suited for every situation. This concern has spawned research to determine: 1. How effective are the seed treatments for managing nematodes? and 2. Where do they fit in cotton production systems?.

Materials and Methods

Two on-farm studies were conducted in Morehouse Parish, Louisiana to evaluate the effects of AVICTA (Syngenta Crop Protection), Aeris (Bayer Crop Science), and K-PAM HL (AMVAC) on reniform and root-knot development, as well as cotton development. In test one, DynaGro 2510 was planted May 9 and in test two Delta & Pine Land 445 was planted April 27. Treatments evaluated in test one were a non-treated, K-PAM HL (3 gal/A), AVICTA Complete Pak (ACP), and Aeris Seed-applied System (ASAS). K-PAM HL was knifed-in prior to planting as directed on the label. In test two, treatments evaluated were a non-treated, ACP, and ASAS. Each treatment was arranged in 1/3 acre strips in the field with 3 to 4 replicates per treatment. To quantify nematode populations at planting (May 25), mid season (June 22), and late season (November 13) soil samples (25 per plot) were taken from each plot to a depth of 6 to 8 inches. Cores were mixed for each plot and sent to the laboratory on the LSU campus for examination. Plant heights at mid-season and yields were taken to monitor plant development. Tests one and two were machine picked on Octorber 6 and 20, respectively.

Results and Discussion

Test 1: Based on results from soil samples, at-plant populations of root-knot nematodes were non-detectable and reniform ranged from 1125 adults / 500 cc soil (K-PAM HL) to 8045 adults / 500cc soil (ACP) (Table 1). By mid-season, root-knot and reniform populations increased in all treatments. While no significant differences were detected, there were trends toward higher populations in non-treated cotton. Plant heights taken mid-season ranged from 30.6 to 32.7 inches and did not differ among treatments (Figure 1). However, yields taken from ACP, ASAS, and K-PAM HL were greater than the non-treated (Figure 1).

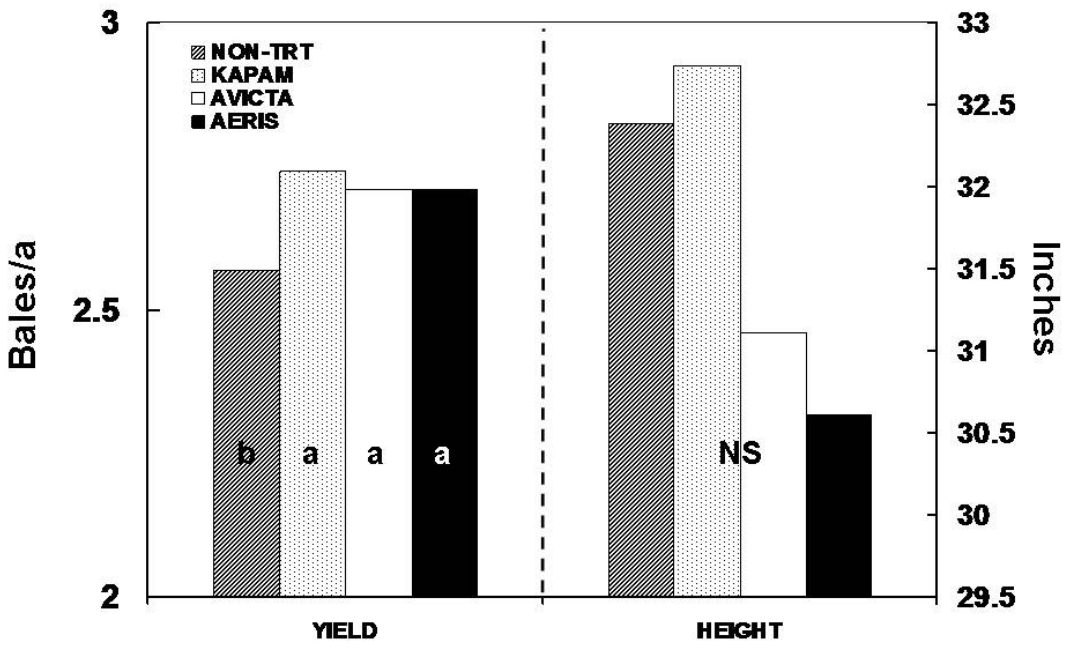

Figure 1. Seedcotton yields (bales/a) and plant heights (in), Test 1, Morehouse Parish, Louisiana.

Test 2: Early-season nematode populations of root-knot were not detected, but by mid-season ranged from 45 adults / 500cc soil (non-treated) to 720 adults / 500 cc soil (ASAS) (Table 1). Reniform populations increased substantially from planting to mid-season, but no differences were detected among treatments. Plant heights and yields were similar among all treatments (Figure 2). Heights ranged from 35.2 inches to 36.2 inches and yields ranged from 2.44 bales/A to 2.53 bales/A.

Table 1. Root-Knot and Reniform nematode populations in Morehouse Parish Trials, 2007

	Root-Knot[1]		Reniform[1]	
Treatment	**25-May**	**22-Jun**	**25-May**	**22-Jun**
Test 1				
Nontreated	**0**	**800**	**6200**	**25920**
K-PAM HL	**0**	**9800**	**1125**	**12920**
AVICTA	**0**	**160**	**8045**	**18680**
Aeris	**0**	**960**	**7065**	**16040**
LSD (P=.05)	**NS**	**NS**	**NS**	**NS**
Test 2				
Nontreated	**0**	**45**	**9805**	**38240**
AVICTA	**0**	**160**	**5200**	**16545**
Aeris	**0**	**720**	**6570**	**27120**
LSD (P=.05)	**NS**	**NS**	**NS**	**NS**
[1]**# Adults / 500 cc Soil.**				

The impact of these products on yield varied between locations. This is similar to other studies conducted in the Southern and Southeastern United States (Kemerait et al. 2007, Lawrence and Lawrence 2007, McGriff et al. 2006, Phipps 2007). This suggests that the scenarios where seed-treatment nematicides are used may be limited. In test one, yields from nematicide-treated cotton seed or cotton treated with K-PAM HL were greater than the non-treated yield, whereas no yield differences were detected among treatments in test two. However, there were no apparent correlations between nematode numbers and yield or plant height. It appears seed-treatment nematicides have a fit, but more research will be needed to define where these treatments fit.

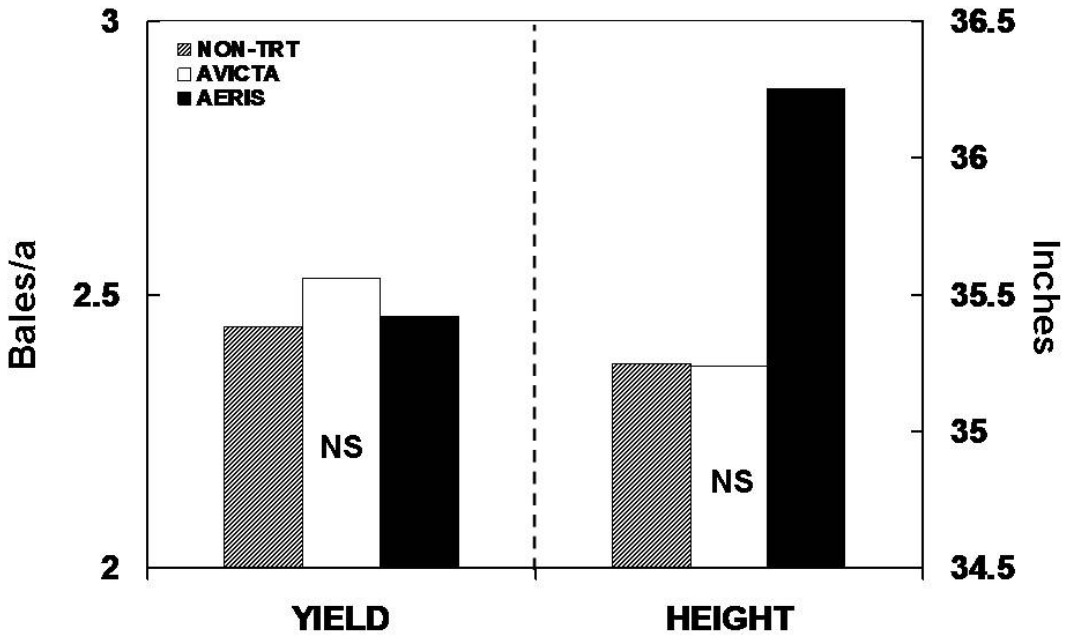

Figure 2. Seedcotton yields (bales/a) and plant heights (in), Test 2, Morehouse Parish, Louisiana.

References

Blasingame, D. 2006. 2005 cotton disease loss estimate. pp. 155-157. in: Beltwide Cotton Conferences. New Orleans, LA, January 4-7. National Cotton Council, Memphis, TN.

Blasingame, D., and Patel, V. 2005. Cotton disease loss estimate committee report. pp. 259-262. in: Proceedings Beltwide Cotton Conferences. San Antonio, TX, January 3-6. National Cotton Council, Memphis, TN.

Kemerait, R., Jost, P.H., Davis, R.F., Brewer, C.L., Brown, S.N., Beard, G.H., Mitchell, B.R., McGriff, D.E., Spaid, D.G., Mickler, K.D., and Rucker, K. 2007. Efficacy of seed-treatments for management of nematodes on cotton in Georgia. pp. 1378-1384. in: Beltwide Cotton Conferences. New Orleans, LA, January 9-12. National Cotton Council, Memphis, TN.

Lawrence, K.S., and Lawrence, G.W. 2007. Performance of the new nematicides seed treatments on cotton. pp. 602-605. in: Beltwide Cotton Conferences. New Orleans, LA, January 9-12. National Cotton Council, Memphis, TN.

McGriff, D.E., Kemerait, R.C., and Von Waldner, M.D. 2006. Evaluation of nematicides for management of southern root-knot nematodes (*Meloidogyne incognita*). pp. 132-136. in: Beltwide Cotton Conferences. San Antonio, TX, January 3-6. National Cotton Council, Memphis, TN.

Overstreet, C., and Wolcott, M. 2007. Diagnosing reniform nematode problems.

Phipps, P.M., and Eisenback, J.D. 2007. Comparative performance of AVICTA Complete Pak and Temik in control of southern root-knot nematode on cotton in Virginia. p. 1377. in: Beltwide Cotton Conferences. New Orleans, LA, January 9-12. National Cotton Council, Memphis, TN.

Phipps, P.M. 2007. Comparative performance of AVICTA Complete Pak and Temik in control of southern root-knot nematode on cotton in Virginia. p. 1377. in: Beltwide Cotton Conferences. New Orleans, LA, January 9-12. National Cotton Council, Memphis, TN.