

# CONTROL OF BOLLWORM /TOBACCO BUDWORM COMPLEX IN ARKANSAS COTTON IN 2002

Glenn E. Studebaker, Donald R. Johnson, and Doug Walsh

Cooperative Extension Service University of Arkansas

Keiser, AR

## Abstract

Two studies were conducted to determine the efficacy of new chemistries and experimental compounds on bollworm/tobacco budworm complex. Populations in both studies were 85% tobacco budworm and 15% cotton bollworm. The synthetic pyrethroids and carbamates in the studies did not perform well. Spinosad (Tracer) alone or in combination with other products gave the highest levels of control in both studies. Emamectin benzoate (Demin) also did well after 2 applications. Yields were again highest in the spinosad treatments.

## Introduction

The tobacco budworm, *Heliothis virescens* (Fabricius), resurged as a predominant pest in cotton in 2002 after being quiet for several years. This pest is often found with the cotton bollworm, *Helicoverpa zea* (Boddie), as a complex. The bollworm/tobacco budworm complex has been reported to cause yield losses in cotton in the range of 1.05% to 3.97% (Williams 2002). Northeast Arkansas was hit hard by this pest due to low levels of Bt cotton being planted in this area in 2002. Numbers of tobacco budworm moths caught in pheromone traps were much higher than had anyone had seen in recent years (Fig 1). The tobacco budworm has historically not been a problem pest in this area of the state. Even in 1995, when the rest of the state was experiencing a heavy outbreak, many growers in Northeast Arkansas escaped damaging populations of this pest. The bollworm and tobacco budworm may feed on many parts of the plant, but are most damaging by their feeding on squares, bolls and on the terminal of the plant. Eggs of both these pests are often laid in the terminal area of the cotton plant, with larvae moving down the plant as they grow, feeding on squares and bolls. Historically, the tobacco budworm has shown heavy resistance to many of the older insecticide chemistries, particularly the synthetic pyrethroids. However, many of the newer products available, such as spinosad (Tracer), indoxacarb (Steward) and emamectin benzoate (Denim) have shown much higher levels of control of this pest. Also, new experimental synthetic pyrethroids (F070, XR225, Baythroid X) are making their way into the market and may show some promise in suppressing this pest. Two bollworm/tobacco budworm efficacy studies were conducted at the Cotton Branch Station, Marianna, AR, to evaluate these new chemistries.

## Materials and Methods

Two bollworm/tobacco budworm efficacy studies were conducted at the Cotton Branch Station, Marianna, AR. Plots of DP 436 R cotton were planted in plots 8-rows wide by 65 feet long on 38-inch row spacings on 19 Jun. Each test was arranged in a RCB with 4 replications. Plots were maintained with conventional tillage practices. Plots were irrigated and maintained according to University of Arkansas Cooperative Extension Service recommendations for weed and insect control with the exception of bollworm/tobacco budworm. Plots were sprayed with a John Deere Hi-Cycle 6000 equipped with 12 separate booms, 8-rows wide. Pesticides were mixed and sprayed from 5-gallon stainless steel cans pressurized to 70 psi with a gas powered air compressor. Booms were fitted with TX-6 hollowcone nozzles calibrated to deliver 14.5 gpa through 2 nozzles per row. Plots were sprayed on 23 and 29 Aug. Plots were evaluated on 27 Aug and 3 Sep by counting the number of larvae per 25 squares and terminals in each plot. Larvae were collected from untreated areas during each sampling date to determine the makeup of the population at the time of spraying. On both dates the complex turned out to be 85% tobacco budworm and 15% cotton bollworm. Data were analyzed with Agricultural Research Manager.

## Results and Conclusions

None of the synthetic pyrethroid materials show any control at the rates tested based on larval counts. Tracer or insecticide mixtures containing Tracer outperformed other products in both tests, reducing the number of larva significantly below that of the untreated control. Due to the late planting date, yields were low across each test. However, even with low yields there was some separation of means, indicating some aspect of control was also being expressed as increased yield. Tracer had the highest yields in both tests with yields 324 to 336 lbs higher than the untreated check. Although the other non-pyrethroid products in the tests did not give high levels of control, they did show some increase in yield. This was particularly evident with the experimental compound F0570 and Baythroid X at the higher rate tested.

## References

Baldwin, F.L., J. W. Boyd and K. L. Smith. 2002. Recommended Chemicals For Weed and Brush Control. University of Arkansas Coop. Ext. Service Publication MP-44.

Johnson, D.R. 2002. Insecticide Recommendations for Arkansas. University of Arkansas Coop. Ext. Service Publication MP-144.

Williams, M. R. 2002. Cotton Insect Losses, 2001. *In* Proceedings Beltwide Cotton Conf. Memphis, TN.

Table 1. Larval Counts and Yields from Test 1.

Treatment /Formulation	Rate lb ai /acre	No. Larvae/ 25 squares, terminals		Yield Lint lb/acre
		27 Aug	3 Sep	
Untreated		9.00 ab	6.50 a	150.14 g
XR-225 1.25CS	0.015	7.50 abc	5.00 abc	223.93 fg
Karate Z 2.08CS	0.03	9.75 a	7.50 a	216.20 fg
Steward 1.25SC	0.09	7.25 abc	5.25 ab	387.79 a-d
Denim 0.16EC	0.01	6.00 a-d	2.50 bcd	368.92 bcd
Capture 2EC	0.05	9.75 a	8.50 a	199.47 fg
Double Threat	0.025 units/ac	5.25 bcd	1.25 cd	443.35 ab
Tracer 4SC	0.067	4.25 cd	1.50 cd	474.23 a
Steward 1.25SC	0.09	6.25 a-d	5.00 abc	328.17 de
+ Penetrator	1% v/v			
Steward 1.25SC	0.104	8.00 abc	6.75 a	268.97 ef
+ Penetrator	1% v/v			
Tracer 4SC	0.057	4.00 cd	1.10 d	434.34 abc
Tracer 4SC	0.057	2.75 d	2.25 bcd	344.90 cde
+ Karate Z 2.08CS	0.03			
LSD (P=0.05)		4.07	3.77	98.27

Means within a column followed by the same letter do not significantly differ (P<0.05).

Table 2. Larval Counts and Yields from Test 2.

Treatment /Formulation	Rate lb ai /acre	No. Larvae/ 25 squares, terminals		Yield Lint lb/acre
		27 Aug	3 Sep	
F0570 0.8EC	0.015	8.25 a	4.00 cd	338.46 cd
F0570 0.8EC	0.018	10.25 a	8.50 a	338.89 cd
Tracer 4SC	0.07	3.00 b	2.00 d	528.28 a
Steward 1.25SC	0.11	10.00 a	3.25 bcd	350.69 cd
Fury 1.5EC	0.033	10.50 a	5.75 abc	247.95 de
Fury 1.5EC	0.045	7.00 ab	5.75 abc	332.88 cd
Karate Z 2.08CS	0.025	8.25 a	8.25 ab	306.93 cde
Baythroid X 1EC	0.015	8.50 a	8.25 ab	251.38 de
Baythroid X 1EC	0.018	8.50 a	5.25 bc	405.81 bc
Larvin 3.2SC	0.9	6.75 ab	3.50 cd	506.41 ab
Lannate 2.4EC	0.45	6.00 ab	5.00 cd	351.76 cd
LSD (P=0.05)		5.16	3.24	122.03

Means within a column followed by the same letter do not significantly differ (P<0.05).