

Systemic Insecticide Applications at Planting for Early Season Thrips Control

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Abstract

Temik 15G (6 lbs/acre) or Thimet 20G (8.2 lbs/acre) granular insecticides were applied to 40 inch rows in furrow at planting to cotton growing in Parker Valley, AZ. Moderate thrips pressure (0.5-1.5 thrips/plant) was experienced for the first eight weeks after planting and granular insecticide application. Temik provided better thrips control than Thimet for the first seven weeks after planting this study. Thrips control was similar for the two insecticides beyond eight weeks after planting. Temik application resulted in higher fruit retention levels measured up to 10 weeks after planting, compared to Thimet. However, fruit retention levels measured from 12 to 16 weeks after planting were similar for both Temik and Thimet when cotton plants compensated for early season square losses caused by thrips feeding.

Introduction

Temik 15G (aldicarb) and Thimet 20G (phorate) have been widely used in furrow at planting serving as a systemic insecticide for thrip, spider mite, lygus bug, and nematode control. These granular insecticides are water soluble, mobile with soil water, and are generally expected to provide insect control for a period of 4 to 6 weeks post application from planting through first square. Systemic insecticides are used at planting as a preventative measure against potential future thrips, spider mite, or lygus bug pressures.

The actual economic return on systemic insecticides applied at planting depends on actual insect pest pressure during the 4 to 6 week post application period. Comparatively, the approximate cost of Temik 15G applied at 6 lbs/acre is \$21.00, and Thimet 20G applied at 8.2 lbs/acre is \$18.00, both plus the cost of application. Although the Thimet application is cheaper, there is no return on the investment if insect pests are not present in damaging numbers, or if cotton plants compensate for early season square shedding caused by feeding insects.

Materials and Methods

A field experiment was conducted during 1998 at Quail Mesa in Parker Valley (located in southwestern La Paz County) to compare Temik (aldicarb) versus Thimet (phorate) granular insecticides applied in furrow at planting for early season thrips control and cotton plant responses through first square. Deltapine 5415 RR cotton was planted wet into 40 inch rows on April 8 using a John Deere 1700 Maxi-Merge+ eight row air planter. Alternating eight row strips were planted with either 8.2 lbs/acre Thimet or 6.0 lbs/acre Temik injected in furrow across the 1250 foot long 40 acre field.

Four replicates of each treatment were staked for thrips counts and cotton plant growth measurements. Thrips were counted on ten whole plants by placing the cotton plants in a tight plastic container with a wick saturated with methyl ethyl ketone to displace thrips from the plants to the bottom of the plastic container. Thrips collection began three weeks after planting and followed at weekly intervals after cotton seedlings reached the 1-2 leaf stage (May 1) and continued through the 10-12 leaf stage (June 3). Cotton plant populations and damage ratings were determined May 14. Five complete sets of plant measurements (height to node ratios and fruit retention) were collected from June 3 through August 27. Cotton lint yields were not determined.

Results and Discussion

Moderate thrips pressure (0.5-1.5/plant) was encountered during 1998 in the test plots (Figure 1). This pressure was sustained over a six week period from the 1-2 leaf growth stage (May 1) through the 10-11 leaf stage (June 3). However, thrips populations never exceeded the suggested economic thresholds of 1/plant prior to the 4 to 5 true leaf stage and 2/plant thereafter. Thrips populations had no significant effect on cotton plant populations which ranged from 36,500 to 38,000 plants/acre. Plants are considerably less susceptible to thrips feeding damage under the pressure experienced during this study by the first square growth stage when economic treatment thresholds reach 5 thrips/plant. Cotton growing in this study reached first square by seven weeks after planting.

Under the thrips pressure experienced during the first seven weeks after planting this study, Temik provided superior thrips control, compared to Thimet. Thrips control was not significantly different for these two insecticides beyond eight weeks after planting. Cotton plant observations at the 4-5 leaf stage five weeks after planting (May 14) showed fewer thrips damaged plants (25% vs. 41%), lowering of the first fruiting branch by one mainstem node (node 6 vs. 7), and taller plants (12.4 vs. 11.4 inches) for the Temik plots, compared to the Thimet treated plots (Table 1). Thimet treated cotton plants exhibited a higher number of forked main stems resulting from thrips feeding on the terminal bud, therefore they were shorter overall compared to Temik treated plants.

Cotton plant height to node ratios were similar for the two granular insecticide treatments during the growing season (Figure 2). However, at eight to ten weeks after planting fruit retention was higher for the Temik treatment (86-89%), compared to the Thimet treatment (71-83%) as depicted in Figure 3. Fruit retention was not significantly different for these two at planting insecticide treatments from 12 to 16 weeks after planting when cotton plants compensated for early season square shedding caused by thrips feeding. Therefore, final cotton yields should be similar for both the Temik and Thimet treatments.

Since the plots were not harvested, and there were no untreated control plots, the benefits derived from the two granular in-furrow insecticide applications could be determined.

Acknowledgment

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Table 1. Effects of granular insecticides applied in furrow at planting on 40 inch rows on Deltapine 5415 RR cotton plant population, thrips damage, and plant mapping data on May 14.

In-Furrow Insecticide Treatment	Final Plant Population (#/acre)	First Fruiting Branch (node #)	Plant Height (inch)	Percent Thrips Damaged Plants per Plot
8.2 lbs Thimet	36,500 a	5 a	11.4 b	41 a
6.0 lbs Temik	38,000 a	6 b	12.4 a	25 b

Means within columns followed by the same letter are not significantly different at the 0.05 level of probability according to Duncan's Multiple Range Test.

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- Figure 2. Height to node ratios of cotton plants treated with Thimet or Temik insecticides based on heat units accumulated after planting.
- Figure 3. Fruit retention levels of cotton plants treated with Thimet or Temik insecticides based on heat units accumulated after planting.