Texas Agricultural Extension Service

The Texas A&M University System

Result Demonstration Report

Evaluation of New Insecticides for Cotton Aphid Control

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Summary

Assail® 70WP (0.05 lb ai/ac) provided the highest level of control at both three and seven days after treatment. Actara® 25WG and Centric® 40WG provided comparable percent control at same rate and rating date. Leverage® 2.7SE percent control improved to 50% at seven days after treatment.

Problem

The cotton aphid an occasional pest in the southern Blacklands. The exact cause of the rise of the cotton aphid as a key pest is unknown but scouting has shown that the two peaks usually occur; one peak occurs after insecticide application for overwintered boll weevils and the other peak usually occurs the second or third week of bloom and is usually triggered by insecticide applications. The damage caused by aphids has been well documented in other areas. Aphids not only feed on leaves and deposit honeydew on leaves and lint but can also reduce boll size and yield.

Four insecticides currently provide adequate control of the cotton aphid. Three of these products are either organophosphates (OP's) or carbamates and one, Furadan®, requires a special label for foliar applications in cotton. The other OP's are under review with the Food Quality Protection Act (FQPA) and their continuation is not guaranteed . New products need to be evaluated to test their efficacy and determine their impact on natural enemies.

Objective

The cotton aphid is considered a secondary pest of cotton that routinely infest fields of cotton in the Southern Blacklands. Depending on the duration of infestation and growing conditions, treatment may be justified. Whether or not to treat for aphids is a topic that is debated by growers and consultants each year across the Southern Blacklands.

The objective of this project was to evaluate some of the new aphid products that have recently been registered or will potentially be registered for cotton aphid management.

Materials and Methods

The field was planted to Suregrow 125 RR on May 8, 2000 in a field on the Southern edge of Taylor. No insecticides were applied to the field prior to establishment of the trial. The treatments were applied on July 7, 2000. Plot size was four rows wide (38" rows) and fifty feet in length, replicated 4 times in a randomized complete block design. The trial consisted of 13 insecticide treatments. The plots were sprayed with a small plot sprayer with nozzles spaced every 19 inches. The nozzles between the row were Teejet® TXVS-6 conejet, the nozzles over the row were Teejet® 8002 VS and the total volume sprayed was 12 gallons per acre using approximately 30 psi.

Insect counts were made by counting the number of aphids on 5 individual leaves from the top of the plant and from the middle of the plant. Numbers for each leaf were recorded separately. Beneficial counts were made by taking 10 samples from each plot. Each sample consisted of beating 3 cotton plants in a beat bucket and then recording the number of each beneficial present.

Results and Discussion

No differences were found between the different plots prior to insecticide treatments (Table 1.). Actara® (0.05 lb ai/ac) provided 63.5% control at 3 DAT. Both rates of Assail® 70WP (0.0375 lb ai/ac and 0.05 lb ai/ac) provided good control at 3 DAT, 51.1% and 66.0%, respectively. At 7 DAT, Assail® 70WP (0.05 lb ai/ac) still provided great control at 67.5%. Leverage® 2.7 SE percent control increased to 49.7% at 7 DAT.

Differences where observed in mean number of beneficial insects per plant at 3 and 7 DAT (Tables 2-5). Predator counts seemed associated with aphid control. For example, Assail® had the lowest natural enemy counts, especially lady beetles; however, it provided the highest level of control. In other words, a reduction in beneficial counts seemed to be a secondary effect to the reduction in aphids.

Variability among the test plots affected the percent control results. The first replication had the highest aphid numbers, and from there numbers dropped off considerably. Overall, Assail® provided the highest aphid control. There was a rate response with Actara® and Centric® both performing somewhat better at the higher rate. In addition, percent control increased with Leverage® at 7 DAT.

Table 1. Mean aphids per leaf and percent aphid control at 3 and 7 DAT. Williamson Co., TX. 2000.

Treatment	Rate (lbs ai/ac)	Aphids per leaf [1]	% aphid control [2]	% aphid control
		July 7	3 DAT	7 DAT
Untreated		120.5 a	0.0 c	0 c
Actara	0.025	118.5 a	36.8 ab	49.2 ab
Centric	0.025	119.3 a	24.8 bc	46.7 ab
Actara	0.05	126.5 a	63.5 a	44.7 ab
Centric	0.05	117.0 a	32.5 abc	35.0 abc
Fulfill	0.086	128.3 a	18.6 bc	25.5 bc
Assail	0.0375	110.5 a	51.1 ab	48.7 ab
Assail	0.05	117.3 a	66.0 a	67.5 a
Furadan	0.25	124.3 a	38.2 ab	24.7 bc
Provado	0.047	116.8 a	21.4 bc	29.0 bc
Calypso	0.047	123.0 a	49.5 ab	25.0 bc
Calypso	0.025	125.5 a	22.8 bc	28.7 bc
Leverage	3.75 oz/ac	117.3 a	22.8 bc	49.7 ab
LSD		24.9	308.3	20.4

[1] Means within a column followed by the same letter are not significantly different (p=0.05) lsd.
[2] Percent control is based on Abbot's Formula.

Table 2. Mean lady beetles per 10 plants. Williamson Co., TX. 2000.

Treatment	Rate(lbs ai/ac)	Lady Beetle Larva per 10 plants[1] 3 DAT	Lady Beetle Adults per 10 plants 7 DAT	Lady Beetles per 10 plants 3 DAT	Lady Beetles per 10 plants 7 DAT
Untreated		7.8 a	2.0 ab	9.8 a	5.0 ab
Actara	0.025	7.5 a	0.8 ab	8.3 ab	3.0 a-d
Centric	0.025	5.0 ab	2.0 ab	7.0 abc	5.5 a
Actara	0.05	2.8 ab	1.5 ab	4.3 bcd	4.0 abc
Centric	0.05	2.5 ab	2.8 ab	5.3 a-d	2.0 bcd
Fulfill	0.086	4.0 ab	3.0 a	7.0 abc	2.8 a-d
Assail	0.0375	0.5 b	0.3 b	0.8 d	1.5 cd
Assail	0.05	0.5 b	0.8 ab	1.3 d	1.5 cd
Furadan	0.25	2.8 b	1.0 b	3.8 bcd	5.8 a
Provado	0.047	1.0 b	0.3 b	1.3 d	0.8 d
Calypso	0.047	0.5 b	0.8 ab	1.3 d	0.8 d
Calypso	0.025	1.5 b	1.0 ab	2.5 cd	1.3 cd
Leverage	3.75 oz/ac	1.3 b	0.3 b	1.5 d	0.8 d
LSD		5.3	2.5	5.5	3.0

[1] Means within a column followed by the same letter are not significantly different (p=0.05) lsd.

Table 3. Mean *Scymnus* lady beetles per 10 plants. Williamson Co., TX. 2000.

		Scymnus Lady Beetle Larva per 10 plants	Scymnus Lady Beetle Adults per 10 plants	Scymnus Total Lady Beetles per 10 plants	Scymnus Total Lady Beetles per 10 plants
Treatment	**Rate(lbs ai/ac)**	**3 DAT**	**3 DAT**	**3 DAT**	**7 DAT**
Untreated		0.0	0.0	0.0	1.0
Actara	0.025	0.0	0.0	0.0	0.0
Centric	0.025	0.0	0.0	0.0	0.0
Actara	0.05	0.0	0.0	0.0	0.0
Centric	0.05	0.0	0.0	0.0	03
Fulfill	0.086	0.0	0.0	0.0	0.5
Assail	0.0375	0.3	0.3	0.5	0.8
Assail	0.05	0.0	0.0	0.0	0.0
Furadan	0.25	0.0	0.0	0.0	0.8
Provado	0.047	0.0	0.0	0.0	0.8
Calypso	0.047	0.0	0.0	0.0	0.0
Calypso	0.025	0.0	0.0	0.0	0.0
Leverage	3.75 oz/ac	0.0	0.0	0.0	0.3
LSD		0.2	0.2	0.4	1.05
P>F		0.4685	0.4685	0.4685	0.4359

Table 4. Mean big-eyed bugs and pirate bugs per 10 plants. Williamson Co., TX. 2000.

		Big-eyed Bugs per 10 plants[1]	Big-eyed Bugs per 10 plants	Minute Pirate Bugs per 10 plants	Minute Pirate Bugs per 10 plants
Treatment	**Rate(lbs ai/ac)**	**3 DAT**	**7 DAT**	**3 DAT**	**7 DAT**
Untreated		1.0	0.5	3.5 a	4.0 ab
Actara	0.025	1.0	0.8	1.8 ab	1.5 bc
Centric	0.025	0.8	0.8	2.3 ab	.8 abc
Actara	0.05	0.8	1.0	1.8 ab	2.5 abc
Centric	0.05	1.0	1.3	1.5 ab	3.0 abc
Fulfill	0.086	0.5	0.5	2.8 ab	4.3 a
Assail	0.0375	0.8	1.5	1.3 ab	2.3 abc
Assail	0.05	1.0	1.0	3.0 ab	2.5 abc
Furadan	0.25	1.8	1.0	0.8 b	3.8 abc
Provado	0.047	0.5	0.5	2.5 ab	2.5 abc
Calypso	0.047	1.0	0.0	0.5 b	1.5 bc
Calypso	0.025	0.5	1.3	2.0 ab	1.3 c
Leverage	3.75 oz/ac	0.3	0.8	3.8 a	1.5 bc
LSD		1.5	1.6	2.6	2.7

[1] Means within a column followed by the same letter are not significantly different (p=0.05) lsd.

Table 5. Mean damsel bugs and spiders per 10 Plants. Williamson Co., TX. 2000

		Damsel Bugs per 10 plants[1]	Damsel Bugs per 10 plants	Spiders per 10 plants	Spiders per 10 plants
Treatment	**Rate(lbs ai/ac)**	**3 DAT**	**7 DAT**	**3 DAT**	**7 DAT**
Untreated		0.0	0.0 b	3.8 ab	7.0 a
Actara	0.025	0.0	0.3 ab	2.3 b	4.0 a
Centric	0.025	0.0	0.0 b	3.0 ab	4.3 a
Actara	0.05	0.0	0.5 a	2.8 ab	5.3 a
Centric	0.05	0.0	0.0 b	5.3 ab	4.0 a
Fulfill	0.086	0.0	0.5 a	3.8 ab	5.8 a
Assail	0.0375	0.0	0.0 b	5.8 a	5.8 a
Assail	0.05	0.0	0.0 b	3.0 ab	6.0 a
Furadan	0.25	0.0	0.0 b	3.8 ab	4.0 a
Provado	0.047	0.0	0.3 ab	4.0 ab	3.3 a
Calypso	0.047	0.0	0.0 b	3.5 ab	5.8 a
Calypso	0.025	0.3 a	0.0 b	2.8 ab	3.0 a
Leverage	3.75 oz/ac	0.0	0.0 b	2.5 ab	3.5 a
LSD		0.2	0.4	3.3	4.2

[1] Means within a column followed by the same letter are not significantly different (p=0.05) lsd.

Acknowledgments

Appreciation is expressed to Jay Jaecks for his support of this project, and to Allied Industry who provided material for this study.