

EFFICACY OF SELECTED INSECTICIDES FOR PLANT BUG CONTROL IN ARKANSAS, 2003

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Abstract

The Tarnished Plant Bug (*Lygus lineolaris* (Pialisot de Benuvois)) is a major pest of cotton. The insect causes damage by feeding on plant tissue and can reduce yields if left uncontrolled. They can build to high numbers if left untreated. The purpose of this experiment one was to test the effectiveness of 17 different treatments in controlling the Tarnished Plant Bug. Significant data was obtained concerning the effectiveness of the various treatments. Test two had 12 treatments in which the efficacy of various insecticides were tested for control of Tarnished Plant Bug. Significant differences were observed in the performance of the various treatments

Introduction

Tarnished Plant Bugs are troublesome pest in cotton (Hollingsworth et. al, 1995; Kharboutli et. al, 1998; Robbins et. al 1998). Plant bugs feed on a variety of plant fruiting structures such as squares, blooms and bolls. Typically they damage young squares by puncturing and feeding on the tissue. In white flowers the damage will leave the bloom with a dirty appearance and will feed on the the anther of the bloom. On young bolls they will puncture the boll and will damage lint and seed. This feeding of bolls will leave wart like scars and causes off color lint. Because of the risk of damaged lint quality and the tendency for the Tarnished Plant Bug to cause multiple damage single bolls and their ability as adults to move from plant to plant in a field makes the insect an important pest. There has been a great need to check the validity of known chemicals that control the Tarnished Plant Bug and to test the validity of other chemicals as possible means of control. The purpose of the experiments was to see how well various chemicals would perform with regard to plant bug control.

Methods and Materials

Experiment one was conducted on Brantley Farms in Coy, Lonoke County, Arkansas, USA. The plots used were planted with Paymaster 1218 BG/RR in 50 foot sections with 5 rows spaced 38 inches apart. Each main plot was given a 5 foot alley. Each 50 foot section was subdivided into 25 foot sections with no alley in between. On 11 July the plots were mowed and allowed to re-grow. Each plot was sprayed with a one person boom at 9 gallons an acre using compressed air. The test was sprayed on 9 September. There were two untreated checks. Observations were made on 12 September and 16 September. Observations were made using a beat cloth. Each plot was sampled twice for a total of 12 row feet.

Experiment two was conducted at Marianna Cotton Research Station, Lee County, Arkansas, USA. The plots were planted with Sure-Grow 521RR and Sure-Grow 215BR and were divided into 50 foot sections with 8 rows spaced 38 inches apart. Each plot was sprayed with a John Deere Hi-Cycle 6000 at 9.7 gpa using compressed air. The test was sprayed on 8 August and 22 August. Observations were conducted on 18 August and 28 August. Observations were made using a beat cloth. Each plot was sampled twice for a total of 12 row feet.

Results and Discussion

In Lonoke Co., data varied greatly from 3 DAT and 7 DAT. Observing total live nymphs and adults data fell into six distinct statistical tiers at 3 DAT. The low rate (0.09 lb ai/a) of experimental compound KN-128 performed statistically best. The second tier consisted of Steward at 0.09 lb ai/a, Steward at 0.104 lb ai/a, the high rate of KN-128 at 0.104 lb ai/a, Bidrin at 0.33 lb ai/a, Diamond at 6 fl oz/a, and Diamond at 9 fl oz/a. The next tier consisted of Vydate C-LV tank mixed with Asana XL (at .25 lb ai/a and 0.036 lb ai/a, respectively), Karate Z at 0.03 lb ai/a, one of the untreated checks, Intruder mixed with Vydate C-LV (at 0.018 lb ai/a and 0.25 lb ai/a respectively), Vydate C-LV at .25 lb ai/a, Centric at 0.05 lb ai/a, Intruder at 0.037 lb ai/a, and Centric at 0.031 lb ai/a. The next tier consisted of only Centric at 0.05 lb ai/a. The next tier consisted of only Curacron at 0.25 lb ai/a. The last tier consisted of the other untreated check. At 7 DAT data fell into 8 distinct tiers. The top tier consisted of the 9 fl oz/a rate of Diamond. The next tier consisted of the 0.09 lb ai/a rate of Steward, the 0.09 lb ai/a rate of KN-128, and the 0.104 lb ai/a rate of KN-128. The next tier consisted of the Vydate C-LV and Asana XL tank mix, and Centric at 0.05 lb ai/a. The next tier consisted of Curacron at 0.25 lb ai/a, and Vydate C-LV at 0.25 lb ai/a. The next tier consisted of Intruder at 0.05 lb ai/a. The next tier consisted of Intruder at 0.018 lb ai/a tank mixed with Vydate C-LV at 0.25

lb ai/a. The next tier consisted of Karate Z at 0.03 lb ai/a, Intruder at 0.037 lb ai/a, and Centric at 0.031 lb ai/a. The last tier consisted of both untreated checks.

In Lee Co., as observed, Bidrin had the greatest control of plant bugs at 4DAT and 7DAT. Bidrin performed statistically better than all other treatments. Treatment #6 (Intruder @ 0.025 lb ai/a + Vydate @ .25 lb ai/a + Crop Oil @ 1 pt/a) had the least amount of control, 4 DAT, versus all other treatments not including the untreated check, however at 7DAT that was not the case. All other treatments at 4DAT performed statistically significantly similar. Treatment #4 (Vydate C-LV @ .25 lb ai/a), Treatment #5 (Intruder @ 0.025 lb ai/a + Vydate @ .25 lb ai/a), Treatment 6 (Intruder @ 0.025 lb ai/a + Vydate @ .25 lb ai/a + Crop Oil @ 1 pt/a), Treatment #8 (Centric @ 0.05 lb ai/a), Treatment #9 (Orthene @ 0.5 lb ai/a), and Treatment #10 (Tri-max @ 1.5 oz a/a) all performed statistically similar at 7DAT, however this grouping had less control than Bidrin but more than Treatment #1 (Intruder @ 0.05 lb ai/a), Treatment #2 (Intruder @ 0.038 lb ai/a + Crop Oil @ 1 pt/a), Treatment #3 (Intruder @ 0.05 lb ai/a + Crop Oil @ 1 pt/a), and Treatment #7 (Vydate @ .33 lb ai/a followed by Intruder @ 0.05 lb ai/a).

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References

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Table 1. Summary of results of test one per 12 row feet, Lonoke County, AR, 2003.

Treatment/Form	Rate lb (AI/acre)	Plant Bug nymphs (3DAT)	Plant Bug adults (3DAT)	Plant Bug TOTALS (3DAT)	Plant Bug nymphs (7DAT)	Plant Bug adults (7DAT)	Plant Bug TOTALS (7DAT)
Steward 1.25SC + Crop Oil Concen- trate 99SL	0.09 + 1.00 PT/A	12.6 c	2.4 b	14.96 cd	13.5 ef	3.5 a	16.91 de
Steward 1.25SC + Crop Oil Concentrate 99SL	0.104 + 1.00 PT/A	16.3 c	4.8 ab	21 cd	19.8 def	3.0 a	22.75 cde
KN-128 1.25EC + Crop Oil Concen- trate 99SL	0.09 + 1.00 PT/A	11.8 c	2.5 b	14.25 d	9.8 f	4.3 a	14 de
KN-128 1.25SC + Crop Oil Concen- trate 99SL	0.104 + 1.00 PT/A	16.8 c	3.3 ab	20 cd	16.8 ef	3.5 a	20.25 de
Vydate C-LV 3.77SL + Asana XL 0.66EC	0.25 + 0.036	31 bc	6.8 ab	37.8 bcd	23 def	4.3 a	27.25 cde
Bidrin 8EC 6 FL	0.33 OZ/A	14.3 c	5.8 ab	20 cd	13.8 ef	3.0 a	16.75 de
Diamond 0.83EC 9 FL	23.5 bc	2.3 b	25.75 cd	11.3 ef	3.3 a	14.5 de	
Diamond 0.83EC Curacron 8EC	0.25	24 bc	2.3 b	26.25 cd	7.3 f	2.8 a	10 e
Karate Z 2.08CS	0.03	63.8 b	7.3 ab	71 b	40.8 c-f	3.0 a	43.75 b-e
UTC		42.3 bc	7.8 a	50 bcd	73 abc	4.8 a	77.75 ab
Intruder 70WP + Vy- date 3.77SL + Crop Oil Concen- trate 99SL	0.018 + 0.25 + 1.00 PT/A	51 bc	6.5 ab	57.5 bcd	93.3 a	5.0 a	98.25 a
Vydate 3.77SL	0.25	50.5 bc	6.3 ab	56.8 bcd	56.3 bcd	4.8 a	61 abc
Centric 40 WG + Sur- factant 90SL	0.05 + 0.25	40.3 bc	6.8 ab	47 bcd	43 c-f	4.3 a	47.25 b-e
Intruder 70WP + Crop Oil Concentrate 99SL	0.037 + 1.00 PT/A	23.8 bc	7.3 ab	31 bcd	22 def	4.5 a	26.5 cde
Intruder 70WP + Crop Oil Concentrate	0.05 + 1.00 PT/A	48.3 bc	6.3 ab	54.5 bcd	68.8 abc	4.0 a	72.75 ab
Centric 40WG + Sur- factant 90 SL	0.031 + 0.25	51.5 bc	7 ab	58.5 bc	49.3 b-e	3.5 a	52.75 bcd
UTC		44.8 bc	6.3 ab	51 bcd	71.3 abc	5.8 a	77 ab
		100.5 a	7.3 ab	107.75 a	85.8 ab	5.5 a	91.25 a

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 2. Summary of results of test two, Lee County, AR, 2003.

Treatments	Plant Bug Totals 4DAT	Plant Bug Totals 7DAT
#1 Intruder @ 0.05 lb ai/a	40.5 bc	10.75 b
#2 Intruder @ 0.038 lb ai/a + Crop Oil @ 1 pt/a	46.5 bc	11.5 b
#3 Intruder @ 0.05 lb ai/a + Crop Oil @ 1 pt/a	37.25 bc	12.0 b
#4 Vydate C-LV @ .25 lb ai/a	23.75 bc	8.25 bc
#5 Intruder @ 0.025 lb ai/a + Vydate @ .25 lb ai/a	26.25 bc	7.75 bc
#6 Intruder @ 0.025 lb ai/a + Vydate @ .25 lb ai/a + Crop Oil @ 1 pt/a	51.25 b	7.5 bc
#7 Vydate @ .33 lb ai/a + Intruder @ 0.05 lb ai/a	37.5 bc	11.75 b
#8 Centric @ 0.05 lb ai/a	35.75 bc	6.25 bc
#9 Orthene @ 0.5 lb ai/a	24.5 bc	5.5 bc
#10 Trimax @ 1.5 oz a/a	37.25 bc	4.5 bc
#11 Bidrin @ 0.4 lb ai/a	19.0 c	2.0 c
#12 Untreated Check	101.25 a	23.5 a

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.