

**COMPARISON OF VARIOUS INSECTICIDES  
IN THE CONTROL OF THE COTTON BOLL  
WEEVIL (*ANTHONOMUS GRANDIS*)**

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**Abstract**

Carbamate, Organophosphate, and Pyrethroid insecticides were compared for efficacy and yield in Lonoke county, Arkansas. Baythroid at low and high rates provided superior control compared to Vydate C-LV at 0.25 lb ai/A. A greater residual by Pyrethroids may be responsible for the better control.

**Methods and Materials**

Tests were conducted in 1993 through 1996 in Lonoke county, Arkansas. Plots were 12 rows wide by 50 feet long and were on 38" centers. Tests were replicated four times. A single mowed row separated each plot to hamper migration from plot to plot. This has been observed to be an effective deterrent to migration until late season populations swell to higher levels. Long season varieties, DPL 5690 and DPL 5415, were used to insure adequate fruit for evaluation during late season peak weevil populations. Insecticide treatments began when damage to squares and terminals reached an average of 12-20 percent. Treatments were applied on a 3-5 day schedule. Evaluations for boll weevil damage occurred two days after each treatment. Twenty five squares in each plot were inspected for feeding and oviposition damage. Insecticides were applied using a John Deere Hi-Cycle 6000 equipped with a CO2 mounted spray system, with TSX-6 hollowcone nozzles at 30 PSI and 9.65 GPA.

**Results and Discussion**

In 1993 boll weevil damage to cotton was significantly reduced by pyrethroids with Baythroid having the best control (Table 1). Other pyrethroids, such as Asana XL at 0.033 lb ai/A and Karate at 0.25 lb ai/A performed better than the standard treatments of Guthion and Vydate which were not significantly different from the untreated check. Although weevil pressure was heavy in 1994. Baythroid (low and high rate) and Karate were very effective after five applications (Table 2). Vydate C-LV and Guthion 2L considered standard treatments were significantly different from the untreated Check. Boll weevil damage in 1995 exceeded the 20% damage level at which treatments are normally initiated. After five applications, the high rate of

Baythroid was significantly superior to all other treatments (Table 3). While Vydate C-LV and Guthion 2L allowed damage to occur and were not significantly different from the untreated check. Only Baythroid and Fury significantly reduced the number of boll weevils after the fourth application. All insecticides, with the exception of Guthion, provided good control after the last application. As in previous years, Karate at 0.025 lb ai/A and Asana XL at 0.03 lb ai/A performed better than the standard treatments, but not as good as Baythroid. In 1996, Baythroid (low and high rate) and Karate showed superior control compared to other standard treatments such as Vydate C-LV (Table 4). All treatments provided significant control compared to the untreated check.

**References**

- Williams, M. R., 1993. Cotton insect losses. Proc. Beltwide Cotton Conference, National Cotton Council, Memphis, TN. pp. 743-762.
- Rummel, D. R. and Carroll, S. C., 1993. Biological basis for a boll weevil winter survival and spring emergence model. Proc. Beltwide Cotton Conference, National Cotton Council, Memphis, TN. pp. 932-934.
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Table 1. Efficacy of insecticides for control of boll weevils, Lonoke County, 1993

Treatment Form.	Rate lb. AI Acre	Damaged Squares /25 Examined					
		19 Aug	23 Aug	25 Aug	31 Aug	3 Sept	
Untreated		17.3 ab	17.8 ab	20.0 a	18.8 a	19.3 a	
Baythroid 2.0 EC	0.03	14.8 ab	9.5 e	7.0 f	10.3 b	14.3 a	
Decis	.2 EC	0.02	18.5 a	12.5 b-e	12.5 cde	18.5 a	18.8 a
	2.0 EC	0.25	15.8 ab	16.0 abc	17.0 abc	20.3 a	15.3 a
Penncape							
Asana	.66 EC	0.033	16.3 ab	11.0 cde	14.3 bcd	17.5 a	18.8 a
Vydate	3.77 SL	0.25	12.0 b	15.8 a-d	18.0 ab	18.8 a	19.3 a
Guthion	2.0 L	0.25	20.0 a	15.0 a-e	17.3 abc	19.5 a	18.0 a
Fury	1.5 EC	0.034	18.5 a	10.0 de	15.3 abc	17.0 a	16.0 a
Karate	1.0 EC	0.025	17.0 ab	9.8 e	9.3 ef	17.5 a	16.3 a
Imidan	50 WP	0.75	19.8 a	20.5 a	16.3 abc	19.3 a	17.0 a
Baythroid 2.0 EC	0.022		15.3 ab	13.0 b-e	9.5 def	16.8 a	15.0 a

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

Table 2. Efficacy of insecticides for control of boll weevils, Lonoke County, 1994

Treatment	Form.	Rate lb. AI/Acre	Damaged Squares /25 Examined					
			4 Aug	8 Aug	11 Aug	15 Aug	22 Aug	25 Aug
Untreated			5.00 ab	9.00 ab	5.75 a	13.3 a	20.25 a	15.3 a
Phaser	3.0 EC	0.25	3.75 ab	3.75 de	1.50 b	7.5 b	13.75 b	12.5 abc
Phaser	3.0 EC	0.375	5.25 ab	4.75 cde	2.50 b	6.0 bc	14.50 b	15.0 ab
Phaser	3.0 EC	0.50	6.00 ab	4.25 cde	2.50 b	4.3 bcd	11.25 b	12.3 abc
Guthion	2.0 L	0.25	7.50 a	5.50 cde	2.00 b	3.0 bcd	9.75 bc	11.5 a-d
Baythro	2.0 EC	0.028	3.25 b	2.50 e	1.75 b	1.0 d	2.25 d	3.8 e
Karate	1.0 EC	0.025	5.75 ab	4.75 cde	1.75 b	1.3 cd	5.00 d	8.8 cd
Methyl	4.0 EC	0.5	5.25 ab	9.75 a	2.50 b	2.5 cd	3.50 d	6.8 de
Fipronil	80 WG	0.05	6.25 ab	7.25 abc	2.00 b	5.3 bcd	6.25 cd	10.0 bcd
Fipronil	80 WG	0.068	7.00 ab	5.75 b-e	2.25 b	3.5 bcd	4.75 d	9.3 cd
Vydate	3.77 EC	0.25	5.00 ab	6.25 bcd	2.75 b	2.8 bcd	11.25 b	13.3 abc
Baythro	2.0 EC	0.022	6.00 ab	6.75 a-d	2.50 b	2.0 cd	3.00 d	6.8 de

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

Table 3. Efficacy of insecticides for control of boll weevils, Lonoke County, 1995

Treatment	Form.	Rate lb. AI/Acre	Damaged Squares /25 Examined				
			14 Aug	22 Aug	25 Aug	29 Aug	1 Sept
Untreated			7.75 ab	17.50 a	9.25 ab	5.25 a	10.50 a
Fury	1.5 EC	0.0375	2.50 d	12.75 abc	7.50 abc	1.75 b	1.75 b-e
Karate	1.0 EC	0.028	3.25 cd	7.25 de	6.00 bcd	2.50 ab	0.25 e
Baythro	2.0 EC	0.028	2.50 d	4.25 e	3.00 d	1.75 b	1.25 de
Regent	80 WG	0.050	3.50 cd	9.25 cde	6.75 abc	3.25 ab	2.25 b-e
Regent	80 WG	0.068	2.75 cd	6.50 de	7.75 abc	4.25 ab	1.50 cde
Pennacp	2 E	0.25	8.25 ab	15.50 ab	9.25 ab	4.00 ab	4.25 bcd
FCR4545	1 EC	0.014	1.75 d	5.50 e	4.50 cd	3.00 ab	1.00 de
Guthion	2 L	0.250	8.75 a	16.25 ab	10.00 a	5.25 a	9.50 a
Guthion	2 L	0.250	5.75 a-d	14.00 abc	8.75 ab	4.00 ab	5.00 bc
Orthene	90 SP	0.500					
Vydate	3.77EC	0.250	6.75 abc	14.25 abc	8.00 ab	5.00 a	5.25 b
Vydate	3.77EC	0.250	4.50bcd	11.00bcd	6.75 abc	3.00 ab	11.00 bcd
Orthene	90.SP	0.500					

Table 4. Efficacy of insecticides for control of boll weevils, Lonoke County, 1996

Treatment	Form.	Rate lb. AI/Acre	Damaged Squares /25 Examined					
			8 Aug	12 Aug	16 Aug	21 Aug	26 Aug	30 Aug
Untreated			4.0 ab	9.0 a	14.3 a	18.3 a	15.5 a	19.5 a
Asana	0.66 EC	0.03	4.8 ab	6.3 ab	6.0 b	2.8 bc	5.0 c	6.8 def
Asana	0.66 EC	0.036	3.8 ab	3.5 bc	3.3 bc	0.5 c	2.5 c	4.3 ef
Asana	0.66 EC	0.042	2.3 b	0.8 c	2.8 bc	0.8 c	4.3 c	4.3 ef
Vydate	3.77 EC	0.250	1.8 b	1.0 c	0.8 c	3.5 bc	5.8 c	8.0 cde
Orthene	90 SP	0.5	2.8 ab	1.8 c	4.8 bc	4.3 bc	7.0 bc	12.0 bc
Vydate	3.77EC	.25						
TD2344	0.83 EC	0.025	1.8 b	1.0 c	1.3 bc	3.0 bc	6.8 bc	4.8 ef
TD2344	0.83 EC	0.035	5.5 a	2.5 bc	3.3 bc	1.8 bc	3.5 c	4.0 ef
Bidrin	8 EC	0.5	3.3 ab	0.8 c	4.5 bc	5.3 bc	11.8 ab	14.3 b
Baythro	2.0 EC	0.03	4.0 ab	3.0 bc	2.5 bc	1.3 bc	2.8 c	4.5 ef
Pennacp M	2.0 EC	0.35	4.0 ab	1.5 c	3.5 bc	7.5 b	8.5 bc	10.5 bcd
Baythro	2.0 EC	0.025	3.0 ab	2.0 c	1.8 bc	5.5 bc	2.8 c	2.5 f

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

Table 5. Efficacy of insecticides for control of boll weevils, Lonoke County, 1996

Treatment	Form.	Rate lb. AI/Acre	Damaged Squares /25 Examined					
			8 Aug	12 Aug	16 Aug	21 Aug	26 Aug	30 Aug
Untreated			2.75 a	4.0 a	5.3 a	8.8 a	16.0 a	13.8 a
Fury	1.5 EC	0.037	3.25 a	3.0 a	1.3 ab	0.0 b	4.3 b	1.8 d
Karate	1.0 EC	0.025	4.00 a	2.0 a	2.5 ab	2.0 b	3.0 b	3.0 cd
Baythro	2.0 EC	0.028	2.25 a	1.5 a	1.0 b	0.0 b	1.5 b	0.3 d
Decis	1.5 EC	0.23	3.50 a	1.8 a	2.5 ab	1.5 b	1.0 b	2.8 cd
Decis + Phaser	1.5 EC	0.23	1.25 a	2.0 a	1.0 b	0.5 b	1.5 b	1.5 d
FCR4545	1.0 EC	0.014	4.00 a	0.8 a	0.0 b	0.8 b	1.0 b	1.3 d
Fipronil	2.5 EC	0.05	2.25 a	1.3 a	2.0 ab	3.0 b	2.0 b	5.5 bc
Fipronil	2.5 EC	0.068	2.25 a	1.8 a	1.3 ab	2.3 b	4.0 b	6.8 b
Fipronil	2.5 EC	0.038	1.50 a	1.5 a	2.0 ab	3.0 b	3.3 b	2.3 cd
Fipronil	80 WG	0.05	1.50 a	1.8 a	1.3 ab	3.0 b	2.0 b	2.8 cd
Karate	2.09 C	0.025	4.00 a	2.5 a	1.8 ab	1.0 b	4.0 b	3.8 bcd

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