

**CONFIRM™ AND INTREPID™: NEW MAC
CHEMISTRY FOR WESTERN COTTON**

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Abstract

Confirm (tebufenazide) and Intrepid (methoxyfenozide) provided effective control of yellowstriped armyworm (*Spodoptera ornithogalli*) and beet armyworm (*Spodoptera exigua*) in research trials conducted in the San Joaquin Valley, California during the 2000 season. Confirm (0.12 lb ai/a) and Intrepid (0.06 - 0.12 lb ai/a) reduced larvae counts and provided excellent cotton plant protection based on defoliation assessments. In direct comparisons, Confirm and Intrepid efficacy was superior to Dimilin, Asana and Success. Data is also presented to illustrate Confirm and Intrepid safety to key beneficial insects, an important component in an integrated pest management program.

Introduction

Confirm and Intrepid belong to a novel chemical class discovered by Rohm and Haas Company, the diacylhydrazines. These MAC insecticides (molt accelerating compound) are highly selective against Lepidopterous pests. These compounds function in a novel manner by binding to the ecdysone receptor site in Lepidopterous larvae. Intoxicated larvae cease feeding within hours and then undergo a premature, lethal molt. Unlike neurotoxins, Confirm and Intrepid are highly selective against Lepidopterous pests and do not harm beneficial insects, an essential component in integrated pest management.

A Section 3 registration for CONFIRM use in California cotton was granted in January 2000. CONFIRM received widespread usage against an early-season outbreak of yellowstriped armyworm and mid-season infestations of beet armyworm. CONFIRM provided effective control of these important pests in first-year commercial usage in San Joaquin Valley cotton, consistent with results from research and demonstration trials and experience under Section 18 exemptions in other states. Intrepid was utilized against beet armyworm in cotton under EPA Section 18 exemptions in several mid-south states in 2000. Section 3 registration for Intrepid use in California cotton is currently under review by California Department of Pesticide Regulation.

The objectives of the studies reported herein were to develop comparative efficacy data, determine the minimum effective use rate for Intrepid and to demonstrate the crop protection attributes and selectivity of Intrepid and Confirm.

Methodology

Small-plot trials were applied with a backpack, handboom sprayer with drop nozzles (Tables 1-4). Treatments consisted of two row by 35-100 foot plots and were replicated 2-3 times in a randomized complete block design. Application volume was 47 gallons per acre. The large-plot trial (Table 5) was applied by a commercial applicator equipped with a broadcast boom delivering 20 gallons per acre. Treatments were non-replicated, 4 acre blocks. Adjuvant (0.06% v/v) was added to all treatments, Latron B-1956 (Table 1) and Latron CS-7 (Table 2-5).

Treatment efficacy was determined by periodic larvae counts using a sweep net and visual defoliation assessments.

Results and Discussion

Confirm and Intrepid provided excellent yellowstriped armyworm control under moderate pressure (Tables 1 and 2). Intrepid exhibited a shallow dose response curve, i.e., slightly more defoliation and larvae counts at 0.03 lbs ai/a with excellent and equivalent control at 0.06, 0.09 and 0.12 lbs ai/a. Confirm, 0.12 lbs ai/a, results were equivalent to Intrepid at 0.06 lbs ai/a. Both products were superior to Success (spinosad) at 0.089 lbs ai/a, the highest labeled rate. Larvae counts declined dramatically in untreated and treatment plots between 4 and 7 days (Table 1). However, defoliation increased significantly during the same period in Success and control plots while slight increases were observed for Intrepid and Confirm. Intrepid and Confirm provided excellent crop protection in this study.

Early studies with Confirm, 1990 (Table 3) in addition to widespread commercial experience has demonstrated excellent Confirm efficacy and residual activity against beet armyworm. Like Confirm, Intrepid also exhibited effective control of this important cotton pest. In a small-plot study (Table 4), Intrepid, Confirm and Steward treatments provided dramatic reduction in larvae counts at 5 days. In contrast, Asana XL provided approximately 50% control. Intrepid control was similar at both rates tested with the lowest rate (0.06 lbs ai/a) equivalent to Confirm at 0.12 lbs ai/a. These results were similar to yellowstriped armyworm control by Confirm and Intrepid (Tables 1 and 2). Intrepid and Steward also provided effective beet armyworm control when applied to large blocks with commercial application equipment (Table 5).

Confirm selectivity has been well documented (Table 6). Similar selectivity has been observed for Intrepid in field trials conducted by Durant in South Carolina (Tables 7 and 8). Parasitic wasps (*Cotesia*) and predacious insects such as green lacewing (Neuroptera), minute pirate bug (*Orius*), big-eyed bug (*Geocoris*) and lady beetle (Coccinellidae) play an important role in IPM programs against key pests of California cotton such as armyworm, lygus bugs, mites and aphids. Confirm and Intrepid safety to these key beneficial arthropods make these products excellent candidates as integral components of an integrated pest management program.

Table 1. Yellowstriped Armyworm Control with Intrepid and Confirm, Larvae Counts. Small Plot Trial, Five Points, CA - 2000. Expt. 12400027.

Treatment	Lbs ai/a	# Larvae / 20 Sweeps	
		4 Days	7 Days
Intrepid	0.03	18	4
	0.06	10	1
	0.09	9	5
	0.12	6	3
Confirm	0.12	8	4
Success	0.089	25	3
Untreated	---	33	4

Table 2. Yellowstriped Armyworm Control with Intrepid and Confirm, Defoliation Assessment. Small Plot Trial, Five Points, CA - 2000. Expt. 12700027.

Treatment	Lbs ai/a	% Defoliation	
		4 Days	7 Days
Intrepid	0.03	8	13
	0.06	2	5
	0.09	1	5
	0.12	2	4
Confirm	0.12	4	3
Success	0.089	11	20
Untreated	----	17	30

Table 3. Beet Armyworm Control with Confirm. Small Plot Trial, Visalia, CA - 1990. Expt. 219028.

Treatment	Lbs ai/a	Days After Application			
		% Control		% Defoliation	
		5	14	21	28
Confirm	0.12	91	82	84	7
Dimilin	0.12	15	19	16	38
Asana XL	0.05	89	81	49	20
Untreated	---	(7)	(85)	(71)	58

() = # Larvae / 3 Row Feet

Table 4. Beet Armyworm Control with Intrepid and Confirm, Larvae Counts. Small Plot Trial, San Joaquin, CA - 2000. Expt. 12400030

Treatment	Lbs ai/a	# Larvae / 35 Sweeps	
		4 Days	17 Days
Intrepid	0.06	2	0
	0.12	1	0
Confirm	0.12	2	1
Steward SC	0.11	1	0
Asana XL	0.04	12	3
Untreated	----	20	3

Table 5. Beet Armyworm Control with Intrepid and Confirm, Larvae Counts. Large Plot Trial, San Joaquin, CA - 2000. Expt. 12400031

Treatment	Lbs ai/a	# Larvae / 35 Sweeps	
		4 Days	17 Days
Intrepid	0.06	6	1
	0.12	5	0
Steward SC	0.11	6	0
Untreated	----	19	3

Table 6. Impact of Intrepid and Standard Insecticides on Predacious Athropods in Cotton. Pietratonio, Texas, 1996.

Product	Lbs ai/a	% Mortality		
		Orius		Cotesia
		24 Hrs	48 Hrs	24 Hrs
Confirm	0.12	5.3	7.8	4.4
Alert	0.20	28.2	55.9	78.6
Success	0.073	4.6	16.3	43.2
Karate	0.025	86.0	94.8	82.3
Untreated	---	3.6	7.4	0.7

Table 7. Impact of Intrepid and Standard Insecticides on Predacious Athropods in Cotton. Durant, Clemson University, Florence, SC, 1997. Trial Site 1. Expt. 2689704

Product	Mean Number / 100 Row Feet				
	Lbs ai/a	Geocoris	Coccinellidae	Neuroptera	Araneae
Intrepid					
0.35	8.9	10.0	10.0	4.5	
Larvin					
0.25	5.6	3.3	0.0	1.1	
Tracer					
0.06	6.7	13.3	3.3	1.1	
Karate					
0.028	0.0	1.1	0.0	2.2	
Untreated	2.2	8.9	3.3	12.2	

Mean of 2 Evaluations, Following Applications on 7/28, 8/4, 8/8.

Table 8. Impact of Intrepid and Standard Insecticides on Predacious Athropods in Cotton. Durant, Clemson University, Florence, SC, 1997. Trial Site 2. Expt. 2689720

Product	Geocoris	Coccinellidae	Notoxus	Orius	Araneae
Intrepid					
0.35	5.6	5.6	3.3	3.3	4.5
Larvin					
0.25	5.6	0.0	0.0	1.1	2.2
Tracer					
0.06	10.0	7.8	1.1	7.8	3.3
Karate					
0.028	0.0	4.5	0.0	0.0	1.1
Untreated	5.6	4.5	6.7	10.0	3.4

Mean of 2 Evaluations, Following Applications on 7/25, 8/2, 8/8.