BWACT™ TEST RESULTS FROM ISOLATED BOLL WEEVIL INFESTED COTTON ZONES IN NORTHWEST LOUISIANA FROM 1994 - 1995

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Abstract

Two years of **BWACT** evaluations in isolated cotton zones in Northwest Louisiana have demonstrated that the **BWACT** program can be an economical and effective component in IPM cotton insect control programs to reduce large boll weevil populations. In these 1994 and 1995 tests, boll weevil insecticide applications were significantly delayed and reduced; additionally, the average percent weevil damaged squares were kept below threshold and lint production was substantially increased. These benefits translated into important operating profits enhancements. The **BWACT** program has been demonstrated for a second year to provide positive results in a heavily infested zone.

Introduction

During the 1995 Beltwide Cotton Conference, Plato Industries, Inc. (PII) reported on Boll Weevil Attract and Control Tube (**BWACT**) test results from an isolated production zone in Northwest Louisiana. The zone is unique due to its isolation from other cotton plantings, historically damaging boll weevil populations, accessibility by LSU Researchers and long history of cotton production. This paper reports on a continuation of the 1994 Northwest Louisiana **BWACT** field test, with similar data collected in 1995 from these heavily infested fields.

In 1994 and 1995, the protocol for the field test was mutually developed with LSU personnel, in accordance with recommended label directions on the **BWACT**. The PII "recommended **BWACT** program" was followed in both years and appropriate criteria were employed to measure performance. The lead LSU researcher was Dr. Steve Micinski, the crop consultants were Richard Twyman (1994) and Steve Schultz (1995); the cotton producer was Mike Sanders of Minden, LA. PII sincerely appreciates these individuals and the progress which has been made in demonstrating the value of the **BWACT** for use in IPM, suppression and eradication programs for boll weevils. As 2 years of valuable base line data have been collected, PII and the cooperators will probably continue certain test work in this zone during 1996.

PII's objectives in this multi-year study and collaboration with the LSU system were:

To demonstrate the value of the **BWACT** to reduce boll weevil populations and to control overwintered, migrating and diapausing cotton boll weevils in Louisiana,

To evaluate the effectiveness of the **BWACT** for use by cotton producers, the Louisiana Boll Weevil Eradication Commission and the LSU System,

To obtain LSU endorsements or use recommendations on **BWACT** at some time in the future, and

To achieve the collaboration of governmental and cotton producer groups in deploying the **BWACT** in the boll weevil control, suppression, maintenance, eradication and barrier programs.

Materials and Methods

The **BWACT** used in 1994 and 1995 were all manufactured in the same manner as commercial product and had insecticidal coatings, which after 55 days of weathering provided a residual control of 40 to 45 days in 1994 and 50 to 55 days in 1995. Malathion was the insecticidal toxicant in the control tube coating. The color attractant component of the coating was the same in 1994 and 1995.

The pheromone dispensers used in the 1995 test contained 60 mg of grandlure pheromone and those in 1994 had 40 mg. The grandlure amount in the **BWACT** was increased by 50% in 1995; according to the USDA-ARS, this should have resulted in an approximate 50% increase in boll weevil attraction. The pheromone dispenser was modified to provide a "release time" increase from an approximate 35 days in 1994 to 50 days in 1995.

The field placement of **BWACT**s in the tests were predominantly the same, i.e. outside of the planted cotton, around the field perimeter:

Ten or more yards outside of the cotton planted rows,
On the "off side" of a turn row,
Between fence posts in the top three strands of a fence line,
On the water free, "high side" of a ditch, canal or levee bank,

In areas free of grass and weeds with good visibility, air flow and sun light (this was accomplished more in 1995 than 1994),

Out of the way of farm equipment, i.e. in fence lines, between light/telephone poles and

Alongside "in field" trees, ditch banks, well heads, culverts buildings, any and all "in field" over-wintering sites.

The spacing during both years was predominantly 100 feet when installed "pre-plant" and "at planting"; the fall diapause installation was predominantly at 200 feet spacing.

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Results and Discussions

The test was conducted on about 868 acres in 3 separate, but similar zones (Minden - 270 acres, Doyline - 325 acres and Goodwill - 273 acres); the zones were isolated individually by 10 to 15 miles and as a group by at least 15 miles from the nearest cotton field. There were 6 to 14 fields per zone, ranging from 4 acres to 105 acres in size. Four data fields were selected without bias as representative of each zone; boll weevil traps were installed and maintained 4/28 to 11/17 in 1994 and 3/23 to 10/26 in 1995. Data was collected from traps at least 100 yards away from the nearest **BWACT**. The **BWACT** installations (450 **BWACT**s on Minden), "pre-plant" (30 days before planting) and "post-plant" (45 to 50 days after the first installation), were made on 4/15 and 6/1 in 1994 and 4/12 and 5/26 in 1995. Minden was considered by the producer to be historically his most severe weevil zone. The Conventional treatment (Goodwilll) was considered by the producer to be the 2nd most severe weevil zone. The "at planting" **BWACT** treatment (400 **BWACT**s on Doyline) was installed on 4/21 in 1994 and 5/2 in 1995; Doyline was considered to be in the 3rd most severe zone. All three zones have a history of requiring 10 or more boll weevil control sprays per crop. From a production standpoint, each year at the "six true leaf" stage to "match head" stage, all 3 zones were considered by the cotton producer to be agronomically equal in potential for the crop. Early season trap data was collected from traps situated 100 yards inside the fields from the end of April through June and mid season data from July to mid August. Average percent damaged square data was taken from the 4th week of June to the 3rd week of August. A summary of results is reported in Table 1 for 1994 and Table 3 for 1995.

In general the **BWACT** Program benefits were measurable in 1994 and 1995; early, mid season and late season spray criteria for weevils, bollworms, budworms and beet armyworms were based on LSU threshold levels.

See TABLE 1

The Minden data illustrates that compared to the Conventional Program at Doyline, the BWACT Program resulted in:

52% less boll weevils in "infield" traps,

52 % less boll weevil damaged squares,

60 % less boll weevil sprays,

At least a 12% lint increase, and

At least a 16% operating profit increase.

The 1994 results at Minden were considered by the producer and the crop consultant an exceptional benefit; the **BWACT** Program helped to produce a good and profitable crop. Also, the indirect benefits of not having to commit people and equipment to make 9 additional applications at Minden was well received.

At crop termination, a **BWACT** diapause control program was conducted on the 2 **BWACT** treatment zones, Minden and Doyline; the results of the diapause installations as measured with 1995 trap counts, "pre BWACT installation", are in Table 2.

See TABLE 2

The trap results show an approximate 30% population reduction; PII considers this too low. Probably, the sampling method was not appropriate to determine the real effect; other studies by the USDA-ARS have consistently shown reductions of 90% to 97%.

1995 was a difficult year to get the crop started and too dry after it got started. As illustrated in Table 3, the **BWACT** program for the second time worked very well at Minden; results from the single "at planting" installation at Doyline were better than in 1994. At Minden, pin head sprays were eliminated and the first weevil spray did not occur until early August. According to the cotton producer, this was the first time in recent history that weevil sprays were delayed into August.

See TABLE 3

The Minden data illustrates that compared to the Conventional Program at Doyline, the **BWACT** program resulted in:

61% less weevils in "infield" traps,

42% less boll weevil damaged squares,

42% less boll weevil sprays,

At least a 35% lint increase, and

At least a 33% operating profit increase.

The dry weather caused an estimated 75 to 100 lbs. lint loss at Goodwill when compared to the Minden yield. Overall the **BWACT** program provided the benefits of delayed sprays, reduced insecticide usage, lower costs, yield and operating profit increases during both years.

Conclusion

At the 1995 and this 1996 Beltwide, PII has posed the questions "Is the glass half full of water?" or "Is the glass half empty of water?" "Is the **BWACT** one of the most effective, environmental friendly and cost efficient products available to cotton producers, crop consultants, grower organizations, state and federal agencies in boll weevil control, eradication and prevention programs?" Or "Is it not?"

The results from this Louisiana test, and other papers presented at this Conference, help to answer the aforementioned questions. They demonstrate that the **BWACT**s, when used in conjunction with proven IPM cotton insect control programs and cultural practices, provide significant biological and economical benefits for the cotton producer. The glass is half full and keeps on filling!

Table 1: N. W. Louisiana bwact field evaluation summary of trap counts, square damage, spray regime, Cost/acre and yield data - 1994

Treatment	**BWACT** Pre + Post Plant -Minden	BWACT At Plantin -Doyline	Conventional -Goodwill
Early Season trap counts/wk (4/29 - 6/30)	5.73	5.75	9.90
Mid Season trap counts/wk (7/1 - 8/11)	4.21	12.88	10.78
Avg. sq. damage (6/24 - 8/23)	7.28	17.90	15.0
Boll Weevil Applications	6.25	15.0	15.75
Cost per Acre Chemical + **BWACT**	28.13 + 16.67	67.50 + 6.15	70.88
Yield per Ac. lbs. lint / $	900/$603	819/$549	807/$541
$ Difference / Acre		(82.85)	(88.08)

Table 2: Mean # of boll weevils per trap* per week in 1995 Relating to diapause control by BWACT in 1994.

Site	1994 BWACTs	3/23	3/30	4/06	4/13	Total	Avg./wk
Minden	3	234	136.5	107.5	100.7	587.0	146.8
Doyline	2	290.8	228.8	60.3	65.9	645.8	161.5
Goodwill	0	378.9	238.5	102.4	97.9	817.7	204.4

* Trap catches are the mean from 4 fields per site with 3 traps / field, 1 outside of the field, 1 on the perimeter and 1 at 100 yards inside the field.

Table 3: N. W. Louisiana BWACT field evaluation Summary of trap counts, square damage, spray regime, Cost/acre and yield data - 1995

Treatment	BWACT Pre + Post Plant -Minden	BWACT At Planting - Doyline	Conventional -Goodwill
Early Season trap counts/wk (4/27 - 6/28)	6..22	10.25	8.75
Mid Season trap counts/wk (7/6 - 8/10)	2.79	11.13	14.42
Avg. sq. damage (6/22 - 8/17)	13.54	15.46	23.31
Boll Weevil Applications	4.2	8.0	7.2
Cost per Acre All Chem + BWACT	$16.89+$10.83	$33.45+$8.00	$44.37
Yield per Ac. lbs. lint / S	500/$375	400/$300	280/$210
$ Difference/ Acre compared to Minden		($88.73)	($182.15)