BEET ARMYWORM: RESULTS OF BELTWIDE PHEROMONE TRAPPING, 1994-95

Richard K. Sprenkel and Tracey A. Austin
North Florida Research and Education Center
University of Florida
Quincy, FL

Abstract

Cyclic outbreaks of the beet armyworm, *Spodoptera exigua* (Hubner) (Lepidoptera, Noctuidae), on cotton have been recognized since at least 1977 (Mitchell, 1979). These outbreaks were thought to be the result of increased adaption to cotton, resistance to many of the registered insecticides and a combination of favorable in-season environmental factors. During the past twenty years, outbreaks on cotton have been noted in 1980, 1981, 1988, 1990 and 1993 (Smith and Freeman, 1994). Following the 1993 outbreak, the first Uniroyal Beet Armyworm Information Exchange Seminar (Point Clear, AL) was held to summarize research and stimulate interest in cooperative projects addressing the problem. One of these projects, a wide-area pheromone trapping program, was initiated in 1994 and continued in 1995. This paper summarizes the results of this program.

The pheromone trap used in the program was the Universal Moth Trap (Unitrap) (Great Lakes IPM, Vestaburg, MI). Traps were baited with beet armyworm pheromone (Trece, Salinas, CA) and placed in an area with known hosts of the beet armyworm. Generally, the host was cotton. Pheromone was replaced at two-week intervals and traps were checked, beet armyworm moths counted and recorded one to two times per week. Cooperators located in eight states (Table 1) participated in the program.

1994 Program

Results of the 1994 program are summarized in Figure 1. Cumulative number refers to the total number of beet armyworm moths caught in a single trap located in each of the thirty-six counties and parishes. For this figure, trap catches were totaled for the May 26 through August 31 period when cotton fruiting was heaviest. During this three month period in 1994, Autauga and Elmore Counties in central Alabama reported the highest cumulative catches with more than 3500 beet armyworm moths per trap. The next highest cumulative catches for the period were reported in Desha County, Arkansas, Tensas Parish, Louisiana and Washington County, Mississippi. Catches at these sites ranged from 2000 to 3500 moths per trap. Somewhat lower trap catches of 1000 to 2000 moths per trial were reported in East Carroll Parish, Louisiana and Tuskaloosa County, Alabama. The remainder of the sites trapped in 1994 had cumulative beet armyworm moth catches of less than 1000 moths per trap for the fourteen week period. Although there is good evidence that an additional generation after August added to the cumulative 1994 population, Figure 1 provides a good repre-sentation of location of the highest fall populations in the mid-south and southeast.

1995 Program

In 1995, all sites had cumulative catches of less than 1000 moths per trap for the month of June. The locations of the highest cumulative catches for the period of June 1 through July 26 were in Tift County, Georgia and in Autauga and Elmore Counties, Alabama (Figure 2). Tift County was not included in the 1994 program so the size of the fall population is not known. However, Tift County is the center of a large winter and spring vegetable production area in south central Georgia. Overwinter survival on these hosts and early spring increases may have contributed to the observed catches.

High populations in 1994 in Autauga and Elmore Counties apparently resulted in higher numbers of individuals surviving the winter and a more rapid increase in the population in the spring of 1995. Although several locations in east Arkansas and Louisiana and in west Mississippi had high cumulative populations through August 1994, none of these sites reported more than 1000 total moths for the June-July period 1995.

Rainfall in June and July 1995 were below normal over much of the southeast. Since dry weather is generally recognized as a contributing factor to beet armyworm problems, the cumulative moth catches for the 13 week period of June 1 through August 30 (Figure 3) appear to show some of the effects of this weather pattern. In the month of August, cumulative moth catches in Autauga and Elmore Counties, Alabama increased from fewer than 2000 moths to more than 6000 beet armyworm moths per trap. Autauga County recorded more than 11,500 moths for the 13 week period. Somewhat lower cumulative catches (4000 to 6000 moths) were recorded in Berrien and Tift Counties, Georgia, Escambia County, Florida and Tensas Parish, Louisiana. Five sites recorded populations ranging from 2000 to 4000 moths per trap for the 13 week period. These were Limestone and Tuskaloosa Counties, Alabama, Yazoo County, Mississippi and Franklin and Bossier Parishes, Louisiana.

Comparison of 1994 and 1995

Although some trapping sites changed during the two years of the program, many counties were trapped both years. In fact, many traps were kept at the same physical location during the two years. Comparing the cumulative trap catches for the June-August period of the two years (Figure 4) shows that a vast majority (28 of 36) of the sites

Reprinted from the *Proceedings of the Beltwide Cotton Conference*
Volume 2:842-843 (1996)
National Cotton Council, Memphis TN

recorded more beet armyworm moths in 1995 than in 1994. The most notable exceptions were in Mississippi where two of the five counties had lower catches in 1995 and in South Carolina where four of the six counties had lower catches in 1995. All sites in Alabama, Georgia, Louisiana and Tennessee had higher catches in 1995 than in 1994. The only site in Florida having a lower catch in 1995 compared to 1994 was in Lake County which is located south of the cotton production area. Those sites having a greater than 1000% increase in trap catches in 1995 over 1994 are Jefferson and Miller Counties, Arkansas, Escambia County, Florida, Berrien County, Georgia, Union County, Mississippi and Fayette County, Tennessee.

Outlook for 1996

Based on the trap catches in 1995 what is the prognosis for problems in 1996? Last year at the Beltwide Cotton Conferences in San Antonio, Texas, Dr. Ron Smith, Auburn University, summarized the factors that contribute to the beet armyworm problem (Smith, 1995). These factors are:

1. Mild winters
2. Presence of beet armyworms early
3. Delayed plantings
4. Delayed crop maturity
5. Heavy, early-season insecticide use
6. Prolonged hot, dry weather conditions

Although it is impossible to predict the effects of temperatures during the 1995-6 winter or conditions during the 1996 growing season, the early presence of the beet armyworm in at least some of the areas with high populations during 1995 is very likely. The timing, occurrence, and severity of the other factors listed above will determine the extent of beet armyworm problems in 1996.

References

Mitchell, E.R. 1979. Migration by *Spodoptera exigua* and *S. frugiperda*, north American style. Proceedings from a symposium entitled Movement of Highly Mobile Insects: Concepts, Methodology and Research. R.L. Rabb and G.C. Kennedy ed. University Graphics, North Carolina State University, Raleigh, North Carolina. Chapter 32, pp 386-93.

Smith, R.H. 1995. Beet armyworm update. Proceedings of the Beltwide Cotton Conferences January 4-7, 1995 San Antonio, TX pp. 144-5.

Smith, R.H. and B.L. Freeman 1994. Alabama plan for the management of beet armyworms. Alabama Cooperative Extension Service, Auburn University Circular ANR-842,4 pp.

Table 1. Cooperators participating in the mid-south and southeast beet armyworm pheromone trapping program.

Alabama	Louisiana
Wheeler Foshee, Ron Smith	Gene Burris, RogerLeonard,
Arkansas	Steve Micinski
Don Johnson	Mississippi
Florida	Ben Harlow, Blake Layton
Phebe Cox, Tracey Austin	South Carolina
Georgia	Mitch Roof
Bill Lambert, John Ruberson	Tennessee
	Philip Roberts

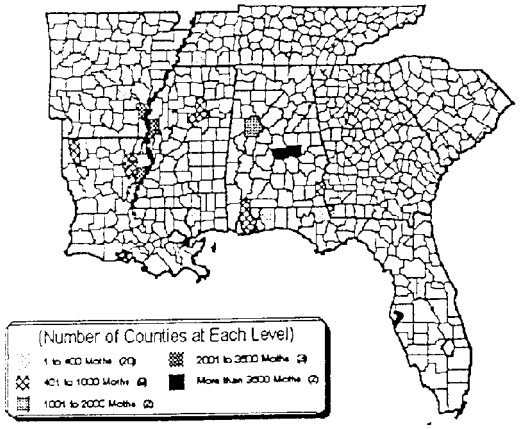

Figure 1. Distribution and cumulative beet armyworm pheromone trap catches for the period of May 26 through August 31, 1994 (fourteen week summary).

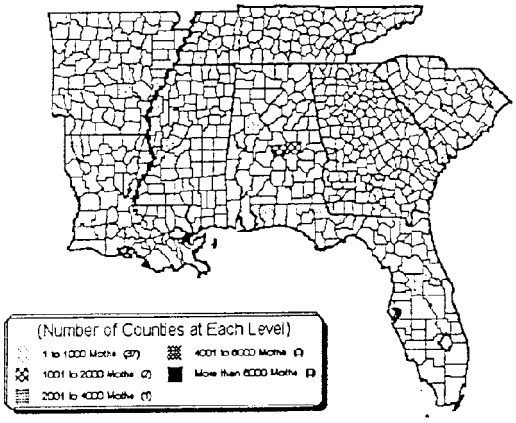

Figure 2. Distribution and cumulative beet armyworm pheromone trap catches for the period of June 1 through July 26, 1995 (eight week summary).

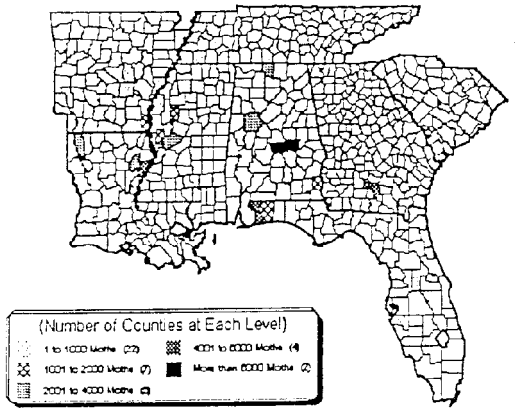

Figure 3. Distribution and cumulative beet armyworm pheromone trap catches for the period of June 1 through August 30, 1995 (thirteen week summary).

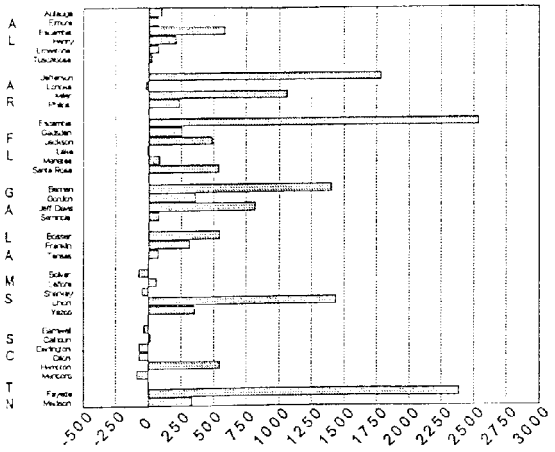

Figure 4. Percent change in cumulative beet armyworm pheromone trap catches between 1994 and 1995 for the period of June through August.