

**BEET ARMYWORM UPDATE:  
MID-SOUTH AND SOUTHEAST**  
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The beet armyworm, *Spodoptera exigua*, (Hubner) (Lepidoptera, Noctuidae) was first reported in the United States in 1876 from Oregon (Harvey, 1876). From the west coast, it gradually spread eastward, reaching Florida in 1924 (Wilson, 1934). From that time until the early 1960's, populations arising from overwintering individuals in the extreme southern part of the state increased and spread northward each year causing sporadic outbreaks which occurred roughly every 2-5 years (Mitchell, 1979). During the next decade, the beet armyworm was observed to have increased its adaption to cotton and developed resistance to many of the insecticides in use during the period (Poe, et al., 1973). These adaptations plus a combination of environmental factors led to a major outbreak of the beet armyworm on cotton in 1977. Since then, outbreaks have been noted in cotton in 1980, 1981, 1988, 1990 and 1993 (Smith and Freeman, 1994)

#### **Pheromone Trap Survey**

In 1995, the beet armyworm once again caused widespread damage in the mid-south and southeast. Although not necessarily indicative of the actual losses in cotton, pheromone trapping data from this past year provide information on the distribution of the moth activity and the locations of highest moth catches. In the Wide-area Beet Armyworm Pheromone Trapping Program, one Universal Moth Trap (Unitrap) (Great Lakes IPM, Vestaburg, MI) at each site was baited with a beet armyworm pheromone (Trece, Salinas, CA) which was replaced biweekly throughout the trapping period. When possible, traps were in a habitat containing cotton (Sprenkel and Austin, 1994). Traps were checked one to two times weekly.

Figure 1 presents the cumulative number of beet armyworm moths caught for a 13 week period between June 1 and August 30 in each of 39 counties and parishes. Traps located in Autauga and Elmore Counties in central Alabama caught more than 6000 beet armyworm moths per trap during the three-month 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 Tuscaloosa Counties, Alabama, Yazoo County, Mississippi and Franklin and Bossier Parishes, Louisiana. The distribution

of the high moth catches (>2000 moths per trap) clearly indicates that the 1995 outbreak was widespread extending from Georgia to Louisiana.

Seven locations extending from Franklin Parish, Louisiana in the west to Allendale County, South Carolina in the east caught between 1000 and 2000 beet armyworm moths for the period. The remainder of the trapping sites (22) caught fewer than 1000 moths per trap between June 1 and August 30.

#### **Estimated Losses in 1995**

Beet armyworm-related losses across the cotton belt were compared over a six-year period (1990-5). Table 1 shows the percent reduction in yield and loss in bales of cotton attributed to the beet armyworm. These data from the Cotton Insect Loss Reports show a trend that the beet armyworm outbreaks (1990, 1993 and 1995) are becoming more severe in the percent yield reduction. Estimated losses during the 1995 outbreak greatly exceeded the damage of any outbreak during the past six years.

Using data from the 1995 Cotton Insect Loss Report (Table 2) it is possible to geographically identify the location of the losses at the state level. States in the mid-south and southeast reporting more than 50% of the acreage infested with the beet armyworm include Alabama, Arkansas, Florida, Louisiana and North Carolina. This supports pheromone trap data which showed the widespread nature of the 1995 beet armyworm outbreak on cotton.

States with more than 20% of the harvested acreage requiring treatment for the beet armyworm were Alabama, Florida, Louisiana and Mississippi. Not surprising, states located further north in the cotton belt (Missouri, North Carolina, Tennessee and Virginia) reported the lowest percent of the acreage treated for the beet armyworm. Presumably this is due, in part, to a later initial infestation in the spring of 1995.

Yield losses for 1995 in the mid-south and southeast are summarized in Table 3. The greatest percent yield reduction (>0.5%) was reported in Alabama, Florida, Mississippi and South Carolina. The lowest percent yield reduction was reported in Arkansas, Missouri, North Carolina, Tennessee and Virginia.

#### **Field Problems in 1995**

These summaries provide an insight into beet armyworm field infestations and treatments at the state level. To identify beet armyworm problems in 1995 at a county and parish level, entomologists across the mid-south and southeast were asked to characterize problems according to the following criteria:

- Situation #1. Beet armyworms present at a level requiring remedial treatment. No measurable yield loss.
- Situation #2. Similar to Situation #1 but with some yield loss.
- Situation #3. Considerable yield loss despite multiple applications of insecticides.
- Situation #4. Despite multiple insecticide applications, damage severe enough to cause fields to be abandoned.

Although each of the above situations could be present in different fields within a county or parish, respondents were asked to identify the situation which best described the beet armyworm in the area. Responses of the entomologists were used to generate a map showing the beet armyworm problem in 1995 (Figure 2). From this map, it is evident that most of the mid-south and southeast was characterized as having a beet armyworm severity rating of 1 (populations at treatable levels but no measurable yield loss). Several areas in Louisiana, Mississippi, Florida, Georgia and South Carolina had populations that required treatment and caused some yield loss (Situation #2). Areas having high populations of beet armyworms that despite multiple treatments still experienced substantial yield loss (Situation #3) were reported in central Mississippi, west Florida, southwest Georgia, southeast South Carolina and an area extending from south central to central Alabama. The most severely affected counties (Situation#4) were in Alabama in an area extending from the southeast to the central part of the state. In these counties, severe damage by the beet armyworm and, in some cases, by other pests coupled with adverse weather conditions frequently led to the abandonment of the crop.

### **Causes of 1995 Outbreak**

Smith (1995) summarized the conditions which are generally considered to favor beet armyworm outbreaks. These conditions 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

For the pattern of high adult and larval populations and field damage to have occurred this past season the above factors would presumably have come together in various combinations forming a mosaic of favorable conditions in the mid-south and southeast in 1995. At the same time the damage survey was conducted, entomologists were asked to identify the factor or factors which, in their opinions, led to the observed beet armyworm problems in 1995. The following list summarizes the responses received:

1. Hot and dry weather particularly in July (AL, FL, LA and NC)
2. High insecticide use during early and mid-season for tobacco budworm (AL, FA and GA) and boll weevil (AR)
3. Mild winter(s) (AR, FL and MO)
4. Late cotton/thin stand (AL and LA)
5. Strong southerly and southwesterly winds (MO)

### **Summary**

Although the beet armyworm has been described as a sporadic pest, the increasing frequency and severity of outbreaks suggest that it is continuing to adapt to cotton and is becoming a more common pest. The geographic distribution of severe problems in 1995 suggests that the overwintering success of the beet armyworm is widespread enabling it to colonize much of the mid-south and southeast early in the season. These early-season populations have led to outbreaks in those areas experiencing high early-season insecticide use, hot, dry weather conditions, delayed crop maturity, etc. Because of the beet armyworm's improved adaptation to cotton and overwintering capabilities, future widespread, severe outbreaks are likely. To minimize the severity of the outbreaks, crop management should be directed at reducing the conditions which favor beet armyworm development particularly early in the season.

### **References**

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**Table 1.** Beltwide cotton losses caused by the beet armyworm. (Summarized from Cotton Insect Loss Reports.)

Year	Yield Reduction (%)	Bales Lost
1990	0.29	43,318
1991	0.02	3,657
1992	<0.01	658
1993	0.57	94,521
1994	0.05	8,996
1995	1.41	287,261

**Table 2.** Beet armyworm infestations and treatments in mid-south and southeastern cotton\*. (1995)

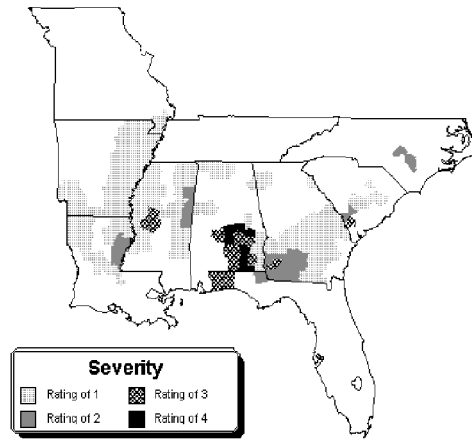
State Acres	Harvested (X1000)	%	
		Infested	Treated
Alabama	585	66.7	46.1
Arkansas	1,100	100	5.8
Florida	109	82.6	55.0
Georgia	1,490	23.5	10.1
Louisiana	1,065	72.6	24.7
Mississippi	1,420	49.2	22.0
Missouri	450	2.2	0
North Carolina	780	89.7	0.1
South Carolina	335	22.4	9.0
Tennessee	660	3.8	0.3
Virginia	107	0	0

\*Summarized from the 1995 Cotton Insect Loss Report.

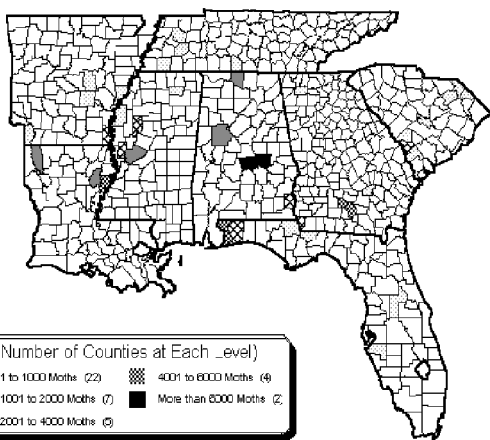
**Table 3.** Beet armyworm losses in mid-south and southeastern cotton\*. (1995)

State	Yield Reduction (%)	Bales Lost
Alabama	1.82	8,156
Arkansas	<0.01	18
Florida	3.80	4,872
Georgia	0.20	4,025
Louisiana	0.38	5,291
Mississippi	0.58	10,403
Missouri	0	0
North Carolina	0	0
South Carolina	0.90	3,969
Tennessee	0.01	48
Virginia	0	0

\*Summarized from the 1995 Cotton Insect Loss Report.



**Figure 2.** Distribution of beet armyworm problems in the mid-south and southeast in 1995 (see text for description of rating system).



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