

**COTTON INSECT LOSSES - 2001**  
**Michael R. Williams**  
**Entomology and Plant Pathology Department**  
**Mississippi State University Extension Service**  
**Mississippi State, MS**

**Abstract**

Cotton losses to arthropods were very light in 2001. Pests reduced overall yields by 4.53%. The bollworm/budworm complex regained the top ranking as the number one cotton pest by reducing yields by 1.23%. *Lygus* was number two at 0.98% and stink bugs were fourth at 0.77%. Total cost and loss for insects in 2001 was \$1.158 billion. This figure is substantially down from 2000. Direct management costs for arthropods was \$52.33 per acre.

**Introduction**

The face of arthropod losses is changing. For the first time since these reports began in 1979, boll weevil was not one of the top five major pests of cotton in the US (Table 2). It is ranked number seven, below cotton fleahopper and aphid. These changes were also evidenced by new state leaders in insect losses. Alabama reported 9.19% loss which translates into 132,556 bales of cotton to pests. North Carolina reported losses of 8.12%, and Mississippi lost 7.85% of its crop to arthropod pests. Texas, which usually leads the losses percentages, only reported a 3.63% loss in 2001. Ten of the seventeen states reporting had less than 5% losses. Total loss in bales amounted to 1.343 million (Table 1).

**Discussion**

**Heliothines: US Top Arthropod Pest Complex**

The heliothine complex at 1.23% was once more the most destructive pest of cotton. These pests infested about 64% of the US crop, causing the loss of 364,446 bales. Since the advent of transgenic *Bt* cotton in 1995, bollworms have become the predominant species of heliothine pests. Once more in 2001 bollworms were the predominant species making up 72% of the population (Table 3). *Bt* cotton acreage increased from just less than 2,000,000 acres in 1996 to almost 6,000,000 in 2001 (Table 4). North Carolina (3.83%) and Mississippi (3.32%) reported the heaviest losses for the belt. In general, heliothines caused more damage east of the Mississippi River in 2001.

**Lygus spp.: Second most Damaging Pest in US Cotton**

*Lygus* bugs infested about 55% of US cotton. This report combines the western species, *Lygus hesperus*, and the eastern species, *Lygus lineolaris*. The mid-south states: Alabama, Louisiana, Mississippi, Missouri and Arizona in the West reported the highest losses from plant bugs. These pests combined to reduce yields by 0.98%, for a loss of 291,224 bales of cotton (Table 5).

**Early Season Thrips Reduce US Crop by 0.795%**

Early season Thrips are almost omni-present in US cotton. This pest infested 93% of the US acreage in 2001 and cost US farmers \$5.62 per acre in management (Williams, 2002). There were 235,996 bales of US cotton lost to this complex of pests in 2001. South Carolina (1.72%) and Alabama (1.71%) reported heaviest losses from Thrips. Four states, California, Georgia, Kansas, and New Mexico reported no losses from early-season Thrips; California alone reported no acres infested (Table 7).

**Stink Bug: Fourth most Damaging Pest**

Stink bugs reduced yield by 0.77% across the US. North Carolina (3.29%), Alabama (3.09%), Florida (2.97%), Louisiana (1.49%), Georgia (1.34%) and Tennessee (1.33%) were the biggest losers to stink bugs. These insects are increasing in importance as a pest of cotton. The complex infested over 6,000,000 acres of cotton in 2001 (Table 6).

**Aphids: Fifth most Damaging Pest of US Cotton**

Aphids infested 58% of US cotton, and while yield losses were only 0.28%, this pest continues to be of concern because of the potential for rapid reproduction and resistance. South Carolina (1.03%), California (0.9%), and Florida (0.8%) reported the heaviest losses to aphids. Five states, Georgia, Kansas, New Mexico, North Carolina, and Virginia reported no losses to aphids; only Kansas reported no acres infested (Table 9).

### **Boll Weevil falls to Seventh most Damaging Pest in US Cotton**

Less than 20% of the US crop was infested with boll weevil in 2001. This pest reduced US cotton yield by 0.097%. Seven states, Arkansas, Missouri, New Mexico, North Carolina, Oklahoma, Tennessee, and Texas reported acres infested by boll weevil. Only five states Arkansas, Missouri, New Mexico, Tennessee and Texas lost bales to boll weevil. Those losses amounted to 28,644 bales of cotton (Table 10). Boll weevil eradication costs for US cotton was \$11.79 per acre (Williams, 2002).

### **Other Pests of US Cotton**

Cotton fleahopper (0.126%) infested more than 6 million acres of cotton, ranking 6<sup>th</sup> most damaging pest, above boll weevil. All the other pests reduced yield by less than 0.1% and only spider mites (Table 8) and bandedwinged whiteflies infested more than 20% of the crop. Saltmarsh caterpillars (0.013%) were persistent low level pests of more than 2,000,000 acres of cotton in 2001. Cabbage looper, cotton leaf perforator, and European corn borer caused trace or no losses in US cotton (Table 2).

### **Conclusion**

Total losses from insect pests in US cotton was 4.53% in 2001 (Table 2). This was one of the lowest losses reported in modern times and reflects a year of low insect pressure over the Cotton Belt. It also reflects a year in which management technologies were more responsive to needs of production. As the boll weevil fades from the scene via eradication efforts, other pests are arising. Research, development, and management are 'currently' rising to the challenge presented by the new pest species. The costs of insect management were \$52.23 per acre in 2001; costs plus loss were \$78.60 per acre.

### **Acknowledgments**

The Cotton Losses Coordinators from each of the Cotton States are to be commended for their work in collecting and submitting the estimates. Thanks are also extended to Debbie Richter, Frank Carter, Gene Burris, and Dick Hardee for their assistance and patience. The National Cotton Foundation supports this project.

### **References**

National Agricultural Statistics Service, (NASS), Agricultural Statistics Board, U.S. Department of Agriculture. Crop Production Report January, 2002.

Williams, M. R. 2002. Cotton insect losses – 2001. Proceedings Beltwide Cotton Conferences.

Williams, M.R. 2001. Cotton insect losses – 2000. Proceedings Beltwide Cotton Conferences.

Table 1. Percent reduction in yield and bales lost by state in 2001.

<b>Area</b>	<b>Percent reduction</b>	<b>Bales lost</b>
US	4.53	1,343,580
Alabama	9.19	132,556
North Carolina	8.12	130,780
Mississippi	7.85	263,785
Arizona	7.44	68,933
Oklahoma	7.07	22,024
South Carolina	6.98	39,572
Florida	5.31	13,993
Louisiana	4.80	85,344
Missouri	3.93	32,364
Texas	3.63	309,707
Tennessee	3.28	37,187
Georgia	3.17	98,333
Arkansas	2.33	50,918
California	1.82	49,431
Virginia	1.07	2,067
New Mexico	0.97	1,284
Kansas	0	0

Table 2. Acres infested, percent loss, rank and percent of US cotton infested by insect pests.

<b>Pest</b>	<b>Acres Infested</b>	<b>Percent Loss</b>	<b>2001 Pest Rank</b>	<b>Percent crop infested</b>
Bollworm/budworm	9,414,800	1.228	1	64
Lygus	8,111,090	0.982	2	55
Thrips, early season	13,755,469	0.795	3	93
Stink Bugs	6,180,966	0.768	4	42
Aphids	8,590,542	0.275	5	58
Cotton Fleahopper	6,059,642	0.126	6	41
Boll weevil	2692770	0.097	7	18
Silverleaf Whitefly	704,110	0.080	8	5
Pink Bollworm	326,610	0.039	9	2
Beet Armyworm	3,271,953	0.031	10	22
Spider Mites	2,210,135	0.027	11	15
Grasshoppers	1,516,854	0.026	12	10
Fall Armyworm	642,624	0.022	13	4
Salt-marsh Caterpillars	2,030,034	0.013	14	14
Soybean Loopers	830,675	0.008	15	6
Western Flower Thrips	2,543,523	0.006	16	17
Cutworms	1,478,908	0.004	17	10
Bandedwinged Whitefly	3,766,565	0.002	18	26
Cotton Leaf perforator	153,450	0.000	19	1
Cabbage Loopers	1,086,340	0.000	20	7
European Corn Borer	28,755	0.000	21	0.20

Table 3. Bollworm and budworm : percent of population, yield reduction, acres infested and bales lost by state in 2001.

<b>Area</b>	<b>Percent Population Bollworm</b>	<b>Percent of crop infested</b>	<b>Percent Yield Reduction</b>	<b>Acres infested</b>	<b>Baleslost</b>
US	72	64	1.228	9,414,800	364,446
Alabama	49	91	1.091	570,500	15,730
Arizona	63	28	0.050	78,400	462
Arkansas	68	100	1.225	1,000,000	26,797
California	0	0	0.000	0	0
Florida	65	17	0.522	20,000	1,375
Georgia	50	60	1.812	900,000	56,250
Kansas	0	7	0.000	3,000	0
Louisiana	100	88	1.501	755,044	26,699
Mississippi	90	100	3.320	1,669,000	111,614
Missouri	99	39	0.271	153,042	2,232
New Mexico	100	36	0.363	22,785	478
North Carolina	85	100	3.825	955,000	61,647
Oklahoma	78	100	2.000	190,000	6,230
South Carolina	85	97	2.897	280,000	16,415
Tennessee	42	77	0.552	465,649	6,262
Texas	67	47	0.355	2,189,530	30,273
Virginia	75	98	0.000	101,000	0

Table 4. *Bt* cotton acreage, acres sprayed for caterpillars, average number of applications and percent of population which was bollworm from 1995 to 2001.

<b>year</b>	<b><i>Bt</i> cotton acreage</b>	<b>acres <i>Bt</i> sprayed</b>	<b>avg. # applications</b>	<b>% population bollworm</b>
1995	<15,000	nr	nr	30*
1996	1,851,094	nr	nr	40*
1997	2,271,824	nr	nr	50*
1998	2,731,827	nr	nr	60*
1999	4,234,785	1,055,331	0.29	76
2000	5,220,392	1,455,084	0.33	79
2001	5,717,747	2,727,821	0.40	74

\*polled entomologists for estimates.

Table 5. *Lygus*: percent yield reduction, acres infested and bales lost by state in 2001.

<b>Area</b>	<b>Percent reduction</b>	<b>Acres infested</b>	<b>Bales lost</b>
US	0.982	8,111,090	291,224
Alabama	2.812	550,500	40,561
Arizona	4.614	275,220	42,752
Arkansas	0.245	1,000,000	5,359
California	0.375	407,400	10,185
Florida	0.522	40,000	1,375
Georgia	0.000	300,000	0
Kansas	0.000	0	0
Louisiana	1.448	747,711	25,746
Mississippi	3.435	1,669,000	115,467
Missouri	2.453	334,106	20,186
New Mexico	0.000	12,000	0
North Carolina	0.295	955,000	4,755
Oklahoma	0.000	15,000	0
South Carolina	0.172	25,000	977
Tennessee	0.927	536,303	10,507
Texas	0.162	1,167,960	13,833
Virginia	0.249	50,000	481

Table 6. Stink bug: percent yield reduction, acres infested and bales lost by state in 2001.

<b>Area</b>	<b>percent reduction</b>	<b>Acres infested</b>	<b>Bales lost</b>
US	0.768	6,180,966	227,921
Alabama	3.087	345,000	44,531
Arizona	0.004	27,800	34
Arkansas	0.560	1,000,000	12,250
California	0.000	0	0
Florida	2.965	110,000	7,815
Georgia	1.342	1,000,000	41,667
Kansas	0.000	0	0
Louisiana	1.490	700,467	26,490
Mississippi	0.418	800,000	14,063
Missouri	0.000	96,999	0
New Mexico	0.000	0	0
North Carolina	3.294	955,000	53,078
Oklahoma	0.789	150,000	2,459
South Carolina	0.793	115,000	4,495
Tennessee	1.332	526,846	15,093
Texas	0.064	283,154	5,462
Virginia	0.000	5,000	0

Table 7. Thrips: percent yield reduction, acres infested and bales lost by state in 2001.

<b>Area</b>	<b>Percent reduction</b>	<b>Acres infested</b>	<b>Bales lost</b>
US	0.795	13,755,469	235,966
Alabama	1.711	625,500	24,681
Arizona	0.006	278,000	53
Arkansas	0.100	1,000,000	2,188
California	0.000	0	0
Florida	0.435	100,000	1,146
Georgia	0.000	1,200,000	0
Kansas	0.000	2,000	0
Louisiana	0.259	765,136	4,610
Mississippi	0.100	1,669,000	3,362
Missouri	0.300	395,000	2,469
New Mexico	0.000	14,000	0
North Carolina	0.600	955,000	9,669
Oklahoma	0.750	190,000	2,336
South Carolina	1.724	250,000	9,771
Tennessee	0.225	536,303	2,549
Texas	2.005	5,583,530	170,925
Virginia	0.821	103,000	1,586

Table 8. Spider Mites: acres infested, percent yield reduction, and bales lost in US cotton in 2001.

<b>Area</b>	<b>Percent reduction</b>	<b>Acres infested</b>	<b>Bales lost</b>
US	0.027	2,210,135	8,029
Alabama	0.094	100,000	1,354
Arizona	0.014	46,150	129
Arkansas	0.025	400,000	547
California	0.045	733,320	1,222
Florida	0.000	250	0
Georgia	0.000	10,000	0
Kansas	0.000	1,000	0
Louisiana	0.000	109,839	6
Mississippi	0.106	175,000	3,552
Missouri	0.023	27,526	189
New Mexico	0.000	0	0
North Carolina	0.000	9,050	0
Oklahoma	0.004	3,000	12
South Carolina	0.155	15,000	879
Tennessee	0.004	271,000	50
Texas	0.001	300,800	77
Virginia	0.000	1,000	0

Table 9. Aphids: acres infested, percent yield reduction, and bales lost in US cotton in 2001.

<b>Area</b>	<b>Percent reduction</b>	<b>Acres infested</b>	<b>Bales lost</b>
US	0.275	8,590,542	81,649
Alabama	0.395	625,500	5,698
Arizona	0.000	3,725	0
Arkansas	0.023	1,000,000	492
California	0.900	733,320	24,444
Florida	0.800	115,000	2,108
Georgia	0.000	100,000	0
Kansas	0.000	0	0
Louisiana	0.064	573,673	1,141
Mississippi	0.057	473,000	1,913
Missouri	0.105	126,098	867
New Mexico	0.000	8,000	0
North Carolina	0.000	955,000	0
Oklahoma	0.395	100,000	1,230
South Carolina	1.034	150,000	5,863
Tennessee	0.009	486,679	98
Texas	0.442	3,065,437	37,687
Virginia	0.000	50,000	0

Table 10. Boll weevil: percent yield reduction, acres infested and bales lost by state in 2001.

<b>Area</b>	<b>Percent reduction</b>	<b>Acres infested</b>	<b>Bales lost</b>
US	0.097	2,692,770	28,864
Alabama	0.000	0	0
Arizona	0.000	0	0
Arkansas	0.055	1,000,000	1,203
California	0.000	0	0
Florida	0.000	0	0
Georgia	0.000	0	0
Kansas	0.000	0	0
Louisiana	0.000	0	0
Mississippi	0.000	0	0
Missouri	0.132	47,421	1,087
New Mexico	0.541	42,504	714
North Carolina	0.000	20	0
Oklahoma	0.000	100,000	0
South Carolina	0.000	0	0
Tennessee	0.199	470,888	2,253
Texas	0.272	831,937	23,157
Virginia	0.000	0	0