

## COTTON INSECT LOSS ESTIMATES - 1997

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### Abstract

Insects reduced yields by 9.42% across the US in 1997. Boll weevil was the most damaging pest at 4.02% loss, bollworm/budworm were second with 2.01% loss and *Lygus* were third at 0.91%. These losses represent more than 2.5 million bales of cotton and cost plus loss amounts to \$1.495 billion.

### Introduction

With the initial Insect Loss Estimates in 1979 until 1997, insect damage to the US cotton crop has been both extremely variable, yet extremely predictable. The variability comes with the degree of damage and with other factors, like weather, which more drastically affect both the crop and the arthropod complex which subsists upon it. The predictable nature of the losses are the insects which rank as the most severe pests of the crop. Boll weevil has always been one of the most damaging. In 1997, even though it is not a pest in 9 cotton growing states (including Kansas) infesting 58% of cotton acres, it still is the most damaging pest in US cotton. The Heliiothine complex and early season Thrips infest about 80% of all cotton acres. The Heliiothine complex also perennially ranks among the top 5 pests of cotton. *Lygus* are pests of about 50% of US cotton acres and also rank annually in the top 5 in bales lost. Other pests are more cyclic, yet can be found on some acres in most years. Included in this group are the fall and beet armyworms, spider mites, stink bugs and whiteflies. Some of these pests, stink bugs and fall armyworms, seem to be emerging as more damaging pests in areas where boll weevil and tobacco budworm are in decline. The sweet potato whitefly may also be expanding its range from the far west into other cotton growing areas of the US. Table 1 gives insect pests of cotton and the percentage of US acreage which is infested.

### Discussion

#### **Boll Weevil is Still King at 4.02% Loss**

The Boll weevil remains a pest of cotton in Arkansas, Louisiana, Mississippi, Missouri, New Mexico, Oklahoma, Tennessee and Texas. Over 1 million bales of cotton were lost to this pest in these states in 1997. Texas attributed 11.15% loss to boll weevil (Table 2). Oklahoma estimated 7.58% loss to this pest. In addition there are 4.6 million acres of cotton in some phase of boll weevil eradication at a cost of \$35.8 million in 1997. These costs must also be

added to the cost of control which amounted to more than \$8 per acre across the US.

#### **Bollworm/Budworm are Ranked Second Most Damaging at 2.01% Loss**

This complex was dominated by the bollworm as the predominant Lepidopterous species in 1997. Across the US, 78% of the population was bollworm. This shift may be due partially to the removal of the boll weevil but can also be attributed to the more than 2.27 million acres of *Bt* transgenic cotton which was planted in 1997. Losses still amounted to more than one half million bales of cotton and cost of control was \$12 per acre for the US. New Mexico and North Carolina reported greater than 5% loss to bollworm; South Carolina was close behind with 4.74% and Florida reported 4.32% loss (Table 3). Only Arizona, California, and Virginia escaped with very little or no damage from these pests.

#### **Lygus Holds a Third Place Ranking at 0.91% Loss**

Plant bugs and cotton fleahopper destroyed more than 300,000 bales of cotton across the US in 1997. Alabama and Arizona estimated more than 2.5% loss to *Lygus*, while California and most of the midsouth states estimated slightly less than 2% loss. Texas (1.28%) and Oklahoma (0.75%) estimate greater losses from fleahopper than plant bug (Table 4).

#### **Aphids, Thrips, Fall Armyworms, and Stink Bugs also Damaging Pests**

Aphids continue to remain a pest on about 68% of US cotton acres reducing yield by more than 200,000 bales. They were a major problem for California in 1997 causing a 3.4% loss in yield. Oklahoma also reported a 1.3% loss to aphids (Table 5). Thrips are pests of cotton every year in all states. In 1997 they are estimated to have reduced yield by 125,000 bales. North Carolina reported a 1.5% loss to this early season pest (Table 6). Fall armyworms were almost exclusively an eastern pest in 1997. Only 19% of US cotton was infested, all east of Texas and Oklahoma. Arkansas, Louisiana and Missouri reported less than 0.1% loss, North Carolina had the most loss at 1.03% (Table 7). This is one of those emerging pests which are coming behind elimination of the boll weevil. Stink bugs are another general pest which moves into cotton when pesticide inputs are lowered. In 1997 they appeared as pests in Alabama reducing yields by 1.6%. Georgia also reported a loss of 0.9% (Table 8).

### Conclusions

All insects combined across the US reduced yields by 9.42%. This represents more than 2.5 million bales lost. Costs for insect management were \$52.69. When the cost and loss are combined the amount is \$111.05 per acre.

## Acknowledgments

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## References

Williams, M. R., 1998. Cotton insect losses - 1997. Proceedings Beltwide Cotton Conferences.

Table 1. Insect pests of cotton in the US and the percent of crop infested

Pest	Acres infested	Percent of US crop infested
Boll weevil	7762858	57.7
Bollworm/budworm	10590368	78.7
Pink Bollworm	483724	3.6
Cotton Fleahopper	5115466	38.0
Lygus	6881843	51.1
Cotton Leaf Perforator	171000	1.3
Spider Mites	1728186	12.8
Thrips, early season	10642753	79.1
Beet Armyworm	2005770	14.9
Fall Armyworm	2563416	19.0
European Cornborer	524020	3.9
Stink Bugs	2716879	20.2
Grasshoppers	825910	6.1
Saltmarsh Caterpillars	215295	1.6
Aphids	9135666	67.9
Bandedwing Whitefly	1022243	7.6
Sweet Potato Whitefly	750595	5.6
Soybean Loopers	899148	6.7
Cabbage Loopers	564330	4.2
Western Flower Thrips	1004233	7.5
Cutworms	796538	5.9

Table 2. Cotton losses to the boll weevil in the US - 1997

Area	Percent reduction	Bales lost
US	4.020	1074651
Alabama	0.000	0
Arizona	0.000	0
Arkansas	1.560	36260
California	0.000	0
Florida	0.000	0
Georgia	0.000	0
Louisiana	2.997	36474
Mississippi	1.425	31896
Missouri	3.389	24812
New Mexico	0.500	726
North Carolina	0.000	0
Oklahoma	7.581	19723
South Carolina	0.000	0
Tennessee	3.426	32140
Texas	11.151	892621
Virginia	0.000	0

Table 3. Cotton losses to the bollworm/budworm complex - 1997

Area	% population bollworm	Percent reduction	Bales lost
US	78	2.007	536618
Alabama	51	3.154	30260
Arizona	75	0.043	438
Arkansas	93	2.670	62078
California	100	0.000	0
Florida	60	4.320	8460
Georgia	40	2.452	73294
Louisiana	66	1.870	22758
Mississippi	67	2.400	53712
Missouri	95	1.286	9418
New Mexico	100	5.526	8024
North Carolina	99	5.300	92088
Oklahoma	85	3.000	7805
South Carolina	95	4.741	27214
Tennessee	85	1.041	9768
Texas	87	1.629	130390
Virginia	90	0.470	914

Table 4. Cotton Losses to *Lygus* and cotton fleahopper in the US -1997

Area	% reduction <i>Lygus</i>	Bales lost <i>Lygus</i>	% reduction fleahopper	Bales lost fleahopper
US	0.905	241801	0.393	105150
Alabama	2.854	27385	0.000	0.00
Arizona	2.630	27040	0.000	0.00
Arkansas	1.195	27779	0.000	0.00
California	1.798	56934	0.000	0.00
Florida	1.940	3799	0.000	0.00
Georgia	0.209	6250	0.000	0.00
Louisiana	1.612	19621	0.030	360
Mississippi	1.301	29119	0.015	329
Missouri	1.329	9729	0.000	0.00
New Mexico	0.220	319	0.000	0.00
North Carolina	0.500	8688	0.000	0.00
Oklahoma	0.000	0	0.750	1951
South Carolina	0.007	40	0.000	0.00
Tennessee	1.960	18388	0.000	0.00
Texas	0.084	6710	1.281	102509
Virginia	0.000	0	0.000	0.00

Table 5. Cotton losses to aphids in the US - 1997

Area	Percent reduction	Bales lost
US	0.751	200845
Alabama	0.517	4964
Arizona	0.000	0
Arkansas	0.029	677
California	3.425	108440
Florida	0.400	783
Georgia	0.000	0
Louisiana	0.131	1594
Mississippi	0.788	17640
Missouri	0.057	420
New Mexico	0.500	726
North Carolina	0.100	1738
Oklahoma	1.297	3375
South Carolina	0.131	752
Tennessee	0.038	361
Texas	0.742	59376
Virginia	0.000	0

Table 6. Cotton losses to thrips in the US - 1997

Area	Percent reduction	Bales lost
US	0.470	125538
Alabama	0.869	8336
Arizona	0.000	0
Arkansas	0.991	23042
California	0.000	0
Florida	0.400	783
Georgia	0.000	0
Louisiana	0.691	8407
Mississippi	0.074	1658
Missouri	0.449	3283
New Mexico	0.118	172
North Carolina	1.500	26063
Oklahoma	0.250	650
South Carolina	0.966	5542
Tennessee	0.502	4706
Texas	0.524	41924
Virginia	0.500	972

Table 7. Cotton losses to fall armyworms in the US - 1997

Area	Percent reduction	Bales lost
US	0.195	52118
Alabama	0.626	6008
Arizona	0.000	0
Arkansas	0.041	946
California	0.000	0
Florida	0.701	1372
Georgia	0.448	13383
Louisiana	0.006	69
Mississippi	0.456	10212
Missouri	0.044	324
New Mexico	0.000	0
North Carolina	1.026	17825
Oklahoma	0.000	0
South Carolina	0.345	1979
Tennessee	0.000	0
Texas	0.000	0
Virginia	0.000	0

Table 8. Cotton losses to stink bugs in the US - 1997

Area	Percent reduction	Bales lost
US	0.233	62156
Alabama	1.568	15044
Arizona	0.030	313
Arkansas	0.000	0
California	0.000	0
Florida	0.240	470
Georgia	0.923	27594
Louisiana	0.001	16
Mississippi	0.013	291
Missouri	0.049	360
New Mexico	0.682	990
North Carolina	0.470	8166
Oklahoma	0.000	0
South Carolina	0.776	4453
Tennessee	0.194	1816
Texas	0.032	2546
Virginia	0.050	96