

COTTON INSECT LOSS ESTIMATES - 2000

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Abstract

Arthropod pests reduced yields by 9.2% across the US in 2000. Boll weevil at 2.87% ranked as the most damaging pest, beet armyworms at 2.12% were second, and the bollworm/budworm complex at 1.41% was third. Insect losses represent more than 2.6 million bales and cost plus loss for 2000 was \$1.657 billion.

Introduction

Texas ranked highest in losses to all arthropods at 16.2 percent and Kansas a new entry into cotton reported the low of 1.28% (Table 1). Eight states reported less than 5% loss and only Texas exceeded 10%. Texas alone at 1.6 million bales accounted for more than half the cotton lost to arthropod pests. Weather was a major factor in losses in 2000. Most estimators placed weather, as a 50% to 60% factor in reducing yields because drought was extensive across most of the cotton growing area of the US. USDA-NASS (December, 2000) reported that 1,881,000 acres of cotton were never harvested in 2000. Boll weevil became the number one pest again in 2000 mainly because of heavy losses in Texas. Boll weevils infest 44% of the US crop. Beet armyworms were second also infesting 44% of US cotton. Bollworm/budworms were ranked as the third most damaging pest in 2000, infesting 81% of the US acreage. Early season Thrips in 4th place infested 85% of US cotton. Stink bugs jumped to 5th, infesting 37% of the cotton and *Lygus*, at 6th, were reported in 53% of the crop. Aphids at 7th were found on 78% of US cotton in 2000. Spider Mites were the 8th most damaging pest and only infested 22% of the crop. Cotton Fleahopper, the 1999 leader, was the 9th most damaging pest infesting 42% of the US acreage. Western Flower Thrips, at 10th, were found on 46% of the acreage. No other pest infested more than 25% of US cotton in 2000. Table 2 gives arthropod pests of cotton, the percentage of US acreage which each infested, and this year's ranking as a pest.

Discussion

Boll Weevil: Number 1 Again at 2.87%

With eradication almost accomplished east of the Mississippi River, boll weevil seems to be making a bid for a come back in causing damage to the US cotton crop. The High Plains of Texas accounted for 650,000 bales lost to weevil in 2000. Of those states east of the Mississippi River, only Tennessee reported a 3% loss to weevils. Beside Texas at 7.35% loss, Missouri (3.73%) Arkansas (1.93%), New Mexico (1.75%) and Louisiana (0.19%) were the only states west of the Mississippi that reported losses to boll weevil in 2000 (Table 3). Weevil eradication continues to cost US farmers \$6.72 per acre of cotton (Williams, 2001). Total costs for boll weevil exceeded \$388 million in 2000.

Beet Armyworm: A Surprise Second at 2.12%

Again, Texas greatly influenced the presence of beet armyworm (BAW) in the top pests of cotton. Texas reported 3,790,178 acres infested and 729,894 bales lost to beet armyworm. Only three states reported no infestations of beet armyworm, but nine states reported no losses and of those that reported loss (other than Texas) none lost more than 2000 bales (Table 4).

Bollworm/Budworm: Ranked Third Again at 1.41%

Damage from the bollworm/budworm complex was up from 1999's 1.05% loss (Williams, 2000) but the relative rank at 3rd remains. Budworm continues to be a persistent pest in some areas. The overall US estimate that populations were 80% bollworm continues to indicate that the trend toward bollworm is still being affected by the use of GMOs containing *Bt*. There was an increase in *Bt* cotton up to 5.2 million acres in 2000. This is an increase of about 1 million acres of *Bt* transgenic cotton from 1999. The states with the highest percentage loss to bollworm/budworm were New Mexico (5.1%), South Carolina (3.9%), Arkansas (3.3%) North Carolina 3.2%, and Oklahoma (3.0%). The following states lost more than 50,000 bales of cotton to the bollworm/budworm complex in 2000: Texas (93,397), North Carolina (74,972), Arkansas (63,021), and Mississippi (59,850), (Table 5). This pest complex remains one of the most expensive insect pests to manage. While it took only about 1.4% of the US crop, cost plus lost for bollworms/budworms was more than \$305 million in 2000.

Thrips (Early Season) in 4th Place at 0.59% Loss

Thrips are annually the most universal pest in US cotton. They were reported on more than 12 million acres of the crop in 2000. This represents about 85% of the crop and reflects about what is reported each year. Use of 'At planting' treatments for this pest is a common practice over most of the cottonbelt. Almost 8 million acres were treated at planting at a cost of \$10.56 per acre (Williams, 2000). Additionally, US farmers spent an average of \$1.92 per acre for insecticide sprays and lost 172,160 bales of cotton to early season thrips. These pests cause more damage in cool springs. This is reflected by the states that report the largest yield reductions. Arkansas (1.9%), Kansas (1.25%), Missouri (1.2%), North Carolina (1.2%), Tennessee (1.16%), Virginia (1.15%) and Oklahoma (1.0%) reported more than 1% loss to early season Thrips. Table 6 lists 2000 cotton losses to thrips by state.

Stink Bugs (0.525%) and Lygus (0.521%) - 5th and 6th

Stink bugs continue to expand their range for causing serious damage to US cotton. Reported on only 25% of the acreage in 1999, stink bugs were found in 37% of US cotton in 2000. This still seems to be primarily a southeastern pest. Only California and Kansas reported no infestations of stink bugs. North Carolina lost 64,756 bales of cotton to this pest; Georgia lost 37,500. Tennessee and South Carolina reported losses of more than 15,000 bales to stink bugs. Table 7 gives yield reduction, acres infested and bales lost by state.

Lygus were reported as pests in all states except Kansas. They reduced yields in all but five. 53% of US cotton is infested by *Lygus*. These pests are heaviest hitters in California (65,976 bales) and Arizona (19,300 bales). Arkansas (12,344 bales) and Texas (10,748 bales) reported losses of more than 10,000 bales to *Lygus*. Table 7 gives losses by state.

Aphids (0.439%) and Spider Mites (0.221%) Are 7th and 8th

Aphids are pests in 78% of US cotton fields, infesting more than 11 million acres in 2000. Texas reported losses of more than 50,000 bales of cotton to this pest; Alabama and Georgia had greater than 10,000 bales lost. Only Arizona, Kansas, New Mexico and South Carolina reported no losses to aphids (Table 8).

Spider Mites made a comeback in 2000, infesting more than 3 million acres of US cotton. California reported a 1.5% yield loss to spider mites. All but four states reported infestations of spider mites and ten lost yield to spider mites. Table 8 gives infestation, yield reductions, and bales lost by state for 2000.

Cotton Fleahopper and Western Flower Thrips - 9th and 10th

Cotton fleahopper was the top pest in 1999, but fell to 9th in 2000, reducing US yields by 0.152%. It infested almost 6 million acres of cotton, mostly in Texas and Oklahoma. Texas losses were 39,703 bales, and Oklahoma's

were 3,051 in 2000. Other states which reported losses were Alabama (625 bales), Arizona (902 bales), Louisiana (12 bales), Mississippi (29 bales) and New Mexico (16 bales) (Table 9).

Western Flower Thrips (WFT) is another pest that is increasing its range across the cottonbelt. 6.6 million acres (46%) of US cotton were infested with this pest in 2000. More states are reporting control difficulties with WFT and are seeing it become an early season pest, as well. Five states reported no infestations of WFT and only six states reported losses in yield to pest. California reported the greatest loss to WFT with a reduction of 29,029 bales. Table 9 gives the acres infested, percent reduction and bales lost in 2000.

Other Pests in US Cotton in 2000

Fall armyworms (11th), pink bollworms (12th), silverleaf whiteflies (13th) and many others were occasional pests in cotton in 2000 on localized areas. Most of these pests infested less than 20% of the US crop. Cutworms, grasshoppers, loopers, and bandedwinged whiteflies were also occasional pests in 2000. Southern armyworms, saltmarsh caterpillars, and Negro bugs were also reported as pests in some areas.

Conclusion

All insects combined across the US reduced yields by 9.2%. This represents more than 2.6 million bales lost for the more than 14.2 million acres. Average costs for insect management in the US were \$61.91 per acre. When cost and loss are combined, the amount is \$116.28 per acre.

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References

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Table 1. Percent reduction in yield and bales lost by state in 2000.

Area	Percent reduction	Bales lost
US	9.20	2,691,005
Texas	16.20	1,608,986
North Carolina	7.97	186,901
Arkansas	8.79	169,474
California	5.10	149,514
Mississippi	4.53	121,444
Tennessee	9.27	104,943
Georgia	3.46	93,750
Missouri	7.74	66,604
Alabama	4.01	56,940
South Carolina	7.00	38,281
Louisiana	2.86	36,096
Arizona	3.18	30,246
Oklahoma	7.78	23,735
New Mexico	8.42	9,672
Virginia	2.05	3,667
Florida	1.85	2,493
Kansas	1.28	531

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

Pest	Acres Infested	Percent Loss US	2000 Rank	Percent US crop infested
Boll weevil	6,241,872	2.869	1st	44
Bollworm/budworm	11,509,647	1.413	3rd	81
Pink Bollworm	567,400	0.048	12th	4
Cotton Fleahopper	5,988,348	0.152	9th	42
Lygus	7,591,200	0.521	6th	53
Cotton Leaf Perforator	468,058	0.000	21st	3
Spider Mites	3,149,501	0.221	8th	22
Thrips, early season	12,091,338	0.589	4th	85
Beet Armyworm	6,321,506	2.121	2nd	44
Fall Armyworm	1,873,997	0.061	11th	13
European Corn Borer	313,520	0.003	20th	2
Stink Bugs	5,294,862	0.525	5th	37
Grasshoppers	624,271	0.010	17th	4
Saltmarsh Caterpillars	1,139,040	0.004	19th	8
Aphids	11,112,046	0.439	7th	78
Bandedwinged Whitefly	3,298,853	0.018	15th	23
Silverleaf Whitefly	843,962	0.028	13th	6
Soybean Loopers	850,464	0.006	18th	6
Cabbage Loopers	2,625,549	0.023	14th	18
Western Flower Thrips	6,621,131	0.141	10th	46
Cutworms	2,567,303	0.014	16th	18

Table 3. Boll weevil: percent yield reduction, acres infested and bales lost by state in 2000.

Area	Percent reduction	Acres infested	Bales lost
US	2.87	6,241,872	838,923
Alabama	0.00	0	0
Arizona	0.00	0	0
Arkansas	1.93	975,000	37,109
California	0.00	0	0
Florida	0.00	0	0
Georgia	0.00	0	0
Kansas	0.00	0	0
Louisiana	0.19	547,089	2,350
Mississippi	0.00	0	0
Missouri	3.73	311,200	32,116
New Mexico	1.75	41,908	2,014
North Carolina	0.00	0	0
Oklahoma	0.00	0	0
South Carolina	0.00	0	0
Tennessee	3.00	574,897	33,969
Texas	7.35	3,790,178	729,894
Virginia	0.00	0	0

Table 4. Beet Armyworm- percent yield reduction, acres infested and Bales lost in 2000.

Area	Percent reduction	Acres infested	Bales lost
US	2.12	6,321,506	620,271
Alabama	0.00	300	0
Arizona	0.03	246,600	313
Arkansas	0.00	200,000	0
California	0.06	263,904	1,759
Florida	0.00	0	0
Georgia	0.00	20,000	0
Kansas	0.00	0	0
Louisiana	0.15	400,288	1,894
Mississippi	0.07	530,000	1,917
Missouri	0.00	8,830	0
New Mexico	0.47	34,000	545
North Carolina	0.00	10,500	0
Oklahoma	0.35	50,000	1,055
South Carolina	0.00	1,000	0
Tennessee	0.01	380,050	129
Texas	6.16	4,176,034	611,698
Virginia	0.00	0	0

Table 5. Bollworm and budworm percent of population, yield reduction, acres infested and bales lost.

Area	%		Acres infested	Bales lost
	Population	Yield		
US	80	1.410	11,509,647	413,244
Alabama	56	0.650	567,500	9,227
Arizona	88	0.019	151,700	182
Arkansas	50	3.270	1,000,000	63,021
California	100	0.020	87,968	59
Florida	50	0.530	80,000	720
Georgia	50	1.460	950,000	39,583
Kansas	100	0.030	1,000	10
Louisiana	83	1.010	637,571	12,691
Mississippi	57	2.230	1,287,000	59,850
Missouri	99	1.470	347,600	12,630
New Mexico	100	5.100	61,000	5,864
North Carolina	95	3.200	901,000	74,972
Oklahoma	75	3.000	216,970	9,153
South Carolina	85	3.930	295,000	21,510
Tennessee	86	1.500	415,726	16,996
Texas	92	0.940	4,403,612	93,397
Virginia	90	0.860	106,000	1,530

Table 6. Thrips: percent yield reduction, acres infested and bales lost by state in 2000.

Area	Percent reduction	Acres infested	Bales lost
US	0.589	12,091,338	172,160
Alabama	0.760	590,000	10,802
Arizona	0.000	284,000	2
Arkansas	1.900	950,000	36,563
California	0.000	0	0
Florida	0.200	90,000	270
Georgia	0.000	1,100,100	0
Kansas	1.250	10,000	521
Louisiana	0.160	640,759	1,997
Mississippi	0.630	1,287,000	16,790
Missouri	1.230	400,000	10,578
New Mexico	0.310	15,000	360
North Carolina	1.200	901,000	28,156
Oklahoma	1.000	216,970	3,051
South Carolina	0.000	260,000	0
Tennessee	1.160	594,897	13,113
Texas	0.500	4,644,612	50,009
Virginia	1.150	107,000	2,060

Table 7. Stink Bug and *Lygus*: percent yield reduction, acres infested and bales lost by state in 2000.

Area	Percent reduction		Acres infested		Bales lost	
	Stink bugs		Stink bugs		Stink bugs	
	Lygus	Lygus	Lygus	Lygus	Lygus	Lygus
US	0.521	0.525	7,591,200	5,294,962	152,285	153,517
AL	0.500	0.510	440,000	590,000	7,068	7,250
AZ	2.032	0.000	284,000	28,400	19,300	2
AR	0.640	0.020	1,000,000	500,000	12,344	396
CA	2.250	0.000	791,712	0	65,976	0
FL	0.000	0.930	75,000	84,000	0	1,260
GA	0.000	1.380	150,000	900,000	0	37,500
KN	0.000	0.000	0	0	0	0
LA	0.270	0.640	407,141	374,699	3,405	8,049
MS	0.350	0.210	1,287,000	770,000	9,448	5,688
MO	0.550	0.000	352,400	61,600	4,697	0
NM	0.000	0.450	25,000	8,000	0	513
NC	0.410	2.760	901,000	901,000	9,549	64,756
OK	0.030	0.060	30,000	50,000	105	176
SC	0.000	3.000	10,000	225,000	0	16,406
TN	0.800	1.400	594,897	530,348	9,052	15,846
TX	0.110	0.020	1,227,000	270,745	10,748	1,758
VA	0.040	0.000	16,050	1,070	77	0

Table 8. Spider Mites and Aphids: acres infested, percent yield reduction, and bales lost in US cotton in 2000.

Area	Acres infested		Percent reduction		Bales lost	
	Spider Mites		Spider Aphids		Spider Mites	
	Spider Mites	Aphids	Spider Mites	Aphids	Spider Mites	Aphids
US	3,149,501	11,112,046	0.221	0.439	64,628	128,242
Alabama	120,000	590,000	0.230	1.240	3,250	17,537
Arizona	28,400	56,800	0.000	0.000	0	0
Arkansas	450,000	1,000,000	0.220	0.500	4,323	9,635
California	870,833	527,808	1.480	0.300	43,542	8,797
Florida	0	90,000	0.000	0.180	0	243
Georgia	5,000	500,000	0.000	0.380	0	10,417
Kansas	0	0	0.000	0.000	0	0
Louisiana	339,918	602,182	0.070	0.130	841	1,632
Mississippi	480,000	1,287,000	0.060	0.330	1,667	8,845
Missouri	98,400	280,000	0.110	0.570	910	4,936
New Mexico	0	42,000	0.000	0.000	0	0
North Carolina	8,950	901,000	0.000	0.160	0	3,754
Oklahoma	3,000	150,000	0.010	2.070	21	6,328
South Carolina	15,000	150,000	0.050	0.000	273	0
Tennessee	298,500	513,244	0.400	0.200	4,526	2,210
Texas	431,500	4,395,262	0.060	0.520	5,685	51,545
Virginia	0	26,750	0.000	0.000	0	0

Table 9. Cotton Fleahopper and Western Flower Thrips: acres infested, percent reduction and bales lost in US cotton in 2000.

Area	Acres infested		Percent reduction		Bales lost	
	Cotton Flea-hopper		Cotton Flea-hopper		Cotton Flea-hopper	
	Cotton Flea-hopper	Western Flower Thrips	Cotton Flea-hopper	Western Flower Thrips	Cotton Flea-hopper	Western Flower Thrips
US	5,988,348	6,621,131	0.152	0.141	44,321	41,115
AL	60,000	150,000	0.040	0.000	625	0
AZ	269,800	284,000	0.095	0.000	902	0
AR	400,000	400,000	0.000	0.120	0	2,281
CA	0	870,883	0.000	0.990	0	29,029
FL	0	20,000	0.000	0.000	0	0
GA	15,000	0	0.000	0.000	0	0
KN	1,000	0	0.000	0.000	0	0
LA	147,966	243,821	0.001	0.008	12	99
MS	38,800	0	0.001	0.000	29	0
MO	51,200	61,607	0.000	0.000	0	0
NM	2,000	0	0.010	0.000	16	0
NC	400,000	450,000	0.000	0.240	0	5,625
OK	216,970	60,000	1.000	0.140	3,051	422
SC	4,000	20,000	0.000	0.000	0	0
TN	0	458,490	0.000	0.600	0	6,813
TX	4,381,612	3,602,330	0.400	0.000	39,701	10
VA	0	0	0.000	0.000	0	0