

COTTON INSECT LOSS ESTIMATES - 1999
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Abstract

Insects reduced yields by 7.66% across the US in 1999. Cotton fleahoppers at 2.36% were the most damaging pests, boll weevil was second with 2.20% loss and bollworm/budworm were third at 1.04%. Insect losses represent more than 2.0 million bales of cotton and cost plus loss amounts to \$1.26 billion.

Introduction

Losses from across the belt were probably more variable in 1999 than in any year reported. Insect losses were extremely light in general, never amounting to more than 5% in 9 of the 16 reporting states. Only Texas exceeded 10% loss at 13.6% reduction, and that state, alone, accounted for more than half the bales of cotton lost to arthropod pests (Table 2). Weather was once again the biggest factor in losses. Some coordinators estimated more than 65% loss to weather factors. The USDA-NASS (December, 1999) reported that 1,196,000 acres of crop were never harvested in 1999. For the first time ever, cotton fleahopper was the most damaging pest of cotton in 1999 (Table 1). This is in part due to the absence of high numbers of Lepidopterous pests across the entire belt. Surprisingly also, boll weevils remain at number two still infesting 57% of the acreage. The heliothine complex occupy the third ranking as top pests and were heaviest hitters in Oklahoma and North Carolina. Bollworms (*Helioverpa zea*) were by far the predominant species in 1999. Heliothines infest 79% of the acreage. Only early season Thrips at 83% exceed them in crop infested. Lygus are pests of 51% of US cotton acres; they rank 4th for 1999. Another newcomer to the top 5 damaging pests this year are stink bugs. They are pests in about 25% of the US acreage and reduced yields by 0.4 % in 1999. Thrips, aphids and spider mites rank as next highest among pests. The remainder of the pest list were almost incidental in 1999. Table 1 gives insect pests of cotton and the percentage of US acreage which each infested and this years ranking as a pest.

Discussion

Cotton Fleahopper: A New Leader at 2.36%

Cotton fleahopper usually plays a secondary role to Lygus in losses. They have always been a Texas, Oklahoma, and sometime mid-south states pest, but never very high. In 1999, once again the cotton fleahopper is listed as a pest in

Louisiana, Texas and Oklahoma, yet it reduced cotton production by 621,974 bales. Texas lost 619,447 bales to this pest. No other state listed the fleahopper as a pest (Table 3).

Boll Weevil: Continues to Fight - 2.20%

The Boll weevil remains a pest of cotton in Arkansas, Louisiana, Mississippi, Missouri, New Mexico, Oklahoma, Tennessee and Texas. It remains right around the 2% range for losses and lost little ground in acreage infested in 1999. 507,747 bales of cotton were reported lost to this pest in these states in 1998 (Williams, 1999) and 580, 081 were lost in 1999. Texas reported the highest loss to boll weevil at 5.10%. Tennessee estimated 4.39% loss to this pest. Oklahoma, New Mexico, Missouri, and Louisiana reported between 1 and 2% losses, while Mississippi and Arkansas had less than 1% loss to this pest (Table 4).

There were 9.27 million acres of cotton in some phase of boll weevil eradication at a cost of more than \$60 million in 1999. The US cotton industry averaged spending \$6.55 per acre for removing this pest in 1999. We also average spending \$8.35 per acre for cost of control(Williams 2000).

Bollworm/budworm: Ranked Third at 1.04% Loss

In most years this is the nemesis of cotton production, but in 1999 reports of `worms` were isolated and sparse. This complex was dominated by the bollworm as the predominant Lepidopterous species in 1999. Across the US, 76% of the population was bollworm. This trend in species shift continues primarily because of Bt transgenic cotton but also because of eradication and movement of large acreage toward the east coast where bollworm is the predominant species. Over 4.2 million acres of Bt transgenic cotton was planted in 1999. Losses to the heliothine complex amounted to 275,524 bales representing an almost 50% drop in bales lost from 1997 when we lost more than one half million bales to bollworm/budworm (Williams, 1998). Bt use fees and control costs for heliothines was \$14.01 for the US in 1999(Williams, 2000).

Oklahoma reported a 5% loss to bollworm; North Carolina had 4.1% and New Mexico was close behind with 3.7%. Mississippi reported a 2.5% loss, Alabama had 2.0%, South Carolina 1.9%loss and Arkansas 1.3%. All other states, except California with 0.0%, had less than 1% loss to heliothines (Table 5).

Lygus Drops to 4th at 0.92%

Plant bugs infest about 51% of US cotton and are a persistent, hard hitting pest in those areas they occur. 1999 was a light Lygus year resulting in less than 1% loss across the belt. Arizona (3%), Alabama (2.5%), Tennessee (2.1%), Texas (1.2%), and Arkansas (1.1%) reported greater than 1% losses, but all other states had less than 1. North Carolina and Virginia reported no loss from Lygus (Table 6).

Stink Bug Climbs to 5th at 0.37%

Stink bugs have emerged as a serious pest of southeastern US cotton and seems to be following boll weevil eradication in expanding its damaging range. While it is only reported on 25% of the total acres, it enjoys prominence as a pest in South Carolina (2.38%) Georgia (1.66%) and Alabama (1.02%). It is also listed at below the 1% level of damage in most of the other states. Only Virginia, Arkansas, Oklahoma and California fail to list losses to the stink bug, which account for more than 97,000 bales of cotton in 1999 (Table 6).

Thrips Cause 0.27% Loss

1999 was a year of the Thrips. Eighty-three percent (83%) of US acres were infested with this pest. US farmers applied preplant applications of insecticide to 7,5 million acres at a cost of more than \$81 million. Additionally, 2.7 million acres were sprayed with insecticide for management of this annual early season pest. North Carolina, Alabama and Oklahoma report greater than 1% losses in 1999 and all other states report some losses. Across the US, cotton gave up more than 71,000 bales in yield to these pests (Table 7).

Aphids: 0.22% Loss

Only Oklahoma reported higher than 1% loss to aphids in 1999. Virginia, New Mexico and Arizona indicated no losses from aphids and most of the other states ranged around 0.5% loss. These insects are pests of 75% of US cotton and remain an annual threat, especially in the presence of eradication and other intensified spray programs. Aphids reduced US yields by 57,134 bales (Table 8).

Spider Mites: 0.125% Loss

Spider mites returned to Alabama cotton in 1999 reducing yield by 1.01% which amounted to more than 13,000 bales of cotton. Six other states, Arkansas, California, Louisiana, Mississippi, Missouri and Tennessee, lost more than 1000 bales in yield to these 'dry weather' pests. Spider mites infested 29% of US cotton and caused loss of 30,930 bales of cotton in 1999 (Table 9)

Beet and Fall Armyworm: Light Damage at 0.053% and 0.005%

Beet armyworm was almost exclusively a pest of California cotton in 1999 causing 0.6% loss. Both beet and fall armyworms combined reduced production by 15,441 bales (Table 10).

Conclusions

All insects combined across the US reduced yields by 7.66%. This represents more than 2.5 million bales lost. Costs for insect management were \$50.91. When the cost and loss are combined the amount is \$93.68 per acre.

Acknowledgments

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References

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Table 1. Insect pests of cotton in the US, acres, percent loss, rank of pest, and percent of crop infested - 1999

Pest	Acres infested	Percent loss US	1999 pest rank	Percent US crop infested
Boll weevil	7,725,662	2.199	2nd	57
Bollworm/budworm	10,796,934	1.044	3rd	79
Pink Bollworm	276,000	0.034	10th	2
Cotton Fleahopper	5,989,179	2.357	1st	44
Lygus	6,890,961	0.924	4th	51
Cotton Perforator	752,423	0.000	21st	6
Spider Mites	3,879,856	0.117	8th	29
Thrips, early season	11,225,335	0.272	6th	83
Beet Armyworm	2,101,086	0.053	9th	15
Fall Armyworm	447,615	0.005	16th	3
European Cornborer	115,725	0.000	17th	1
Stink Bugs	3,371,290	0.369	5th	25
Grasshoppers	188,639	0.006	15th	1
Saltmarsh Caterpillars	586,323	0.000	18th	4
Aphids	10,217,607	0.217	7th	75
Bandedwing Whitefly	1,865,058	0.009	13th	14
Silverleaf Whitefly	475,330	0.033	11th	3
Soybean Loopers	942,276	0.007	14th	7
Cabbage Loopers	964,167	0.000	19th	7
Western F. Thrips	2,443,259	0.000	20th	18
Cutworms	845,052	0.009	12th	6

Table 2. Cotton losses to all pests in the US - 1999

Area	Percent reduction	Bales lost
US	7.656	2,019,851
Texas	13.646	1,284,970
Tennessee	9.990	120,885
Alabama	8.463	108,849
Mississippi	3.930	99,418
Georgia	3.086	93,234
Arkansas	3.911	75,044
North Carolina	6.400	58,895
California	2.151	49,079
Louisiana	3.232	36,932
Missouri	4.009	31,455
Arizona	4.086	30,519
South Carolina	4.413	24,616
Oklahoma	9.354	21,703
New Mexico	6.083	6,473
Florida	2.159	4,948
Virginia	0.590	1,011

Table 3. Cotton losses to the cotton fleahopper in the US - 1999

Area	Percent reduction	Bales lost
US	2.357	621,974
Alabama	0.000	0
Arizona	0.000	0
Arkansas	0.000	0
California	0.000	0
Florida	0.000	0
Georgia	0.000	0
Louisiana	0.018	206
Mississippi	0.000	0
Missouri	0.000	0
New Mexico	0.000	0
North Carolina	0.000	0
Oklahoma	1.000	2,320
South Carolina	0.000	0
Tennessee	0.000	0
Texas	6.578	619,447
Virginia	0.000	0

Table 4. Cotton losses to the boll weevil in the US - 1999

Area	Percent reduction	Bales lost
US	2.199	580,081
Alabama	0.000	0
Arizona	0.000	0
Arkansas	0.764	14,663
California	0.000	0
Florida	0.000	0
Georgia	0.000	0
Louisiana	1.054	12,051
Mississippi	0.186	4,693
Missouri	1.420	11,140
New Mexico	1.700	1,809
North Carolina	0.000	0
Oklahoma	1.000	2,320
South Carolina	0.000	0
Tennessee	4.387	53,087
Texas	5.101	480,318
Virginia	0.000	0

Table 5. Cotton losses to the bollworm/budworm complex - 1999

Area	% population bollworm	Percent reduction	Bales lost
US	76	1.044	275,524
Alabama	65	1.975	25,404
Arizona	100	0.033	250
Arkansas	81	1.300	24,944
California	0	0.000	0
Florida	80	0.650	1,490
Georgia	50	0.828	25,000
Louisiana	100	0.781	8,927
Mississippi	62	2.467	62,396
Missouri	99	0.732	5,741
New Mexico	100	3.714	3,952
North Carolina	95	4.100	37,728
Oklahoma	75	5.000	11,602
South Carolina	90	1.905	10,625
Tennessee	60	1.576	19,067
Texas	93	0.403	37,918
Virginia	90	0.281	481

Table 6. Cotton Losses to Lygus and stink bugs in the US - 1999

Area	% loss Lygus	Bales lost Lygus	% loss stink bugs	Bales lost stink bugs
US	0.924	243,908	0.369	97,291
Alabama	2.502	32,179	1.022	13,146
Arizona	3.000	22,406	0.011	82
Arkansas	1.114	21,366	0.000	0
California	0.758	17,306	0.000	0
Florida	0.007	16	0.900	2,063
Georgia	0.138	4,167	1.655	50,000
Louisiana	0.738	8,437	0.110	122
Mississippi	0.238	6,013	0.131	3,325
Missouri	0.819	6,425	0.017	130
New Mexico	0.446	475	0.011	11
North Carolina	0.000	0	0.242	2,223
Oklahoma	0.030	70	0.000	0
South Carolina	0.006	35	2.381	13,281
Tennessee	2.077	25,137	0.511	6,186
Texas	1.238	116,570	0.071	6,722
Virginia	0.000	0	0.000	0

Table 7. Cotton losses to thrips in the US - 1999

Area	Percent reduction	Bales lost
US	0.272	71,754
Alabama	1.197	15,394
Arizona	0.025	187
Arkansas	0.300	5,756
California	0.013	294
Florida	0.300	688
Georgia	0.069	2,083
Louisiana	0.290	3,317
Mississippi	0.181	4,581
Missouri	0.253	1,985
New Mexico	0.005	5
North Carolina	2.000	18,404
Oklahoma	1.000	2,320
South Carolina	0.095	531
Tennessee	0.604	7,307
Texas	0.091	8,593
Virginia	0.308	529

Table 8. Cotton losses to aphids in the US - 1999

Area	Percent reduction	Bales lost
US	0.217	57,134
Alabama	0.756	9,727
Arizona	0.000	0
Arkansas	0.300	5,756
California	0.531	12,123
Florida	0.300	688
Georgia	0.138	4,167
Louisiana	0.167	1,913
Mississippi	0.400	10,117
Missouri	0.450	3,533
New Mexico	0.000	0
North Carolina	0.040	369
Oklahoma	1.212	2,813
South Carolina	0.022	120
Tennessee	0.470	5,683
Texas	0.120	11,302
Virginia	0.000	0

US	0.053	0.005	15,440
Alabama	0.000	0.000	0
Arizona	0.031	0.000	234
Arkansas	0.000	0.000	0
California	0.586	0.000	13,371
Florida	0.000	0.000	0
Georgia	0.000	0.000	0
Louisiana	0.010	0.000	114
Mississippi	0.007	0.052	1,474
Missouri	0.000	0.000	0
New Mexico	0.000	0.000	0
North Carolina	0.000	0.012	107
Oklahoma	0.000	0.000	0
South Carolina	0.004	0.000	21
Tennessee	0.000	0.000	0
Texas	0.000	0.000	19
Virginia	0.000	0.000	0

Table 9. Cotton losses to Spider Mites in the US - 1999

Area	Percent reduction	Bales lost
US	0.117	30,930
Alabama	1.011	13,000
Arizona	0.010	78
Arkansas	0.133	2,559
California	0.253	5,766
Florida	0.000	0
Georgia	0.000	0
Louisiana	0.099	1,129
Mississippi	0.181	2,135
Missouri	0.208	1,630
New Mexico	0.000	0
North Carolina	0.000	0
Oklahoma	0.091	211
South Carolina	0.000	0
Tennessee	0.338	4,096
Texas	0.003	325
Virginia	0.000	0

Table 10. Cotton losses to beet and fall armyworms in the US - 1999

Area	Beet	Fall	Beet/Fall
	Armyworm	Armyworm	Armyworm
	Percent loss	Percent loss	Bales lost

Cotton insect losses - 1999

Total losses for all states - 7.66%

