COTTON INSECT LOSS ESTIMATES - 2008

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Abstract

Cotton losses to arthropod pests reduced yields by 3.80% in 2008. Pest losses were higher in the southeast states. *Lygus* took top ranking for the first time, ever at 1.003% loss. The bollworm/budworm complex was second, reducing yields by 0.764%, a slight decrease from 2007. Stink bugs were number three at 0.747%, Thrips were fourth at 0.516%, cotton fleahoppers were fifth at 0.231% and aphids were sixth at 0.202%. Spider mites were seventh at 0.163%. Total cost and loss for arthropods in 2008 was $543 million. Direct management costs for arthropods were $55.53 per acre.

Introduction

Cotton acreage was significantly reduced in 2008 and weather (hurricanes, as well as drought) were the major factors impacting cotton production. Both of these worked to change the dynamic of the pests of the crop... A shift away from the bollworm/budworm pest complex toward the bugs has been developing since the advent of the *Bt* technology in 1995. But, Bollworms and budworms continue to inflict damage to the crop. Overall losses at 3.80% were up from the 2007 report. Florida was the top loser at 8.2% and Alabama was second at 8.09% loss to arthropod pests in 2008 (Table 1). Management of the *Lygus* has developed into the major problem with insect pests. They captured the number one pest status for 2008 at 1.03% reduction in yield. *Lygus* infested 61% of the cotton acreage in the US. Heliothines infested about 67% of the US cotton crop in 2008. Thrips were found in 88% and aphids in 63% of the US crop (Table 2). Boll weevils infested only 2.8% of the crop (Table 2), and are reported as pests only in Arkansas, Louisiana, and Texas (Table 8). Total arthropod losses across the US (Table 1) - 3.80% translates to 461,500 bales of cotton. Florida's 8.2% loss represented 9,101 bales, Alabama's 8.09% loss represented 78,394 bales and Louisiana at 6.55% lost 38,460 bales. Tennessee (4th) reported losses of 6.24%, South Carolina (5th) had 5.02%, Arkansas (6th) 4.95%, Kansas (7th) 4.9%, North Carolina (8th) 3.95%, Oklahoma (9th) 3.18%, Arizona (10th) 2.96%, California (11th) 2.87%, Mississippi (12th) 2.34%, and Georgia (13th) 2.25%.

All other states reported 2% or less in losses. In descending order they were Virginia (2.0%), New Mexico (1.06%), Texas (0.49%) and Missouri (0.46%). Arkansas reported 78,584 bales lost, Alabama lost 78,305 and Louisiana lost 38.460 to arthropod pests.

Pest status continues to change and pests which were once considered minor now are major players in causing losses. Current technologies are helping to maintain losses below 5%. Bugs continue to increase in importance and overall rank among pests of cotton. *Lygus* spp. was the only pest to exceed 1% loss in 2008. Of the bug complex, cotton fleahoppers and stink bugs continue to remain in the top five among most injurious pests again in 2008. Only four pests: Thrips (86%), aphids (63%), bollworm/budworm (66%), and *Lygus* (61%) infested more than half of the US crop (Table 2).

Discussion

Lygus: most damaging pest in US cotton

In 2003 combined losses in the US to bugs were 1.96%, in 2004 combined losses were 1.84%, in 2005 combined losses were 1.78%, in 2006 the combined losses were 1.14%, in 2007 combined losses were 1.43%.and in 2008 they were 2.03%. *Lygus* (1.003%) infest about 61% of the US crop. Stink bugs (0.75%) infest 45%, Cotton fleahoppers (0.23%) infest 29% and clouded plant bugs (0.05%) infest 8% (Table 2).

This report combines the western species, *Lygus hesperus*, and the eastern species, *Lygus lineolaris*. Louisiana (3.56%), and California (2.7%) and Arizona (2.14%) reported greater than 2% loss to *Lygus*. Arkansas (1.44%),

Tennessee (1.1%) Mississippi (1.06%) and Alabama (1.03%) reported 1% or higher losses. All other state losses were less than 1%: Missouri (0.25%), Kansas (0.2%), New Mexico (0.12%), South Carolina (0.1%), Georgia (0.04%), Florida (0.05%), and Texas (0.001%). Oklahoma, North Carolina, and Virginia reported no loss to *Lygus*. These pests combined to reduce yields by 1.003%, for a loss of 110,440 bales of US cotton while infesting 4,833,188 acres (Table 5).

Heliothines: second most damaging US pest

Bollworms and budworms dropped from being top cotton pests in 2008. Bollworms (*H. zea*) were the dominant species at 76%. There was 0.763% loss to heliothines which infest about 67% of the US crop. Heliothine damages resulted in the loss of 125,089 bales of cotton (Table 3). Alabama (3.79%) reported the highest loss to Heliothines, Florida at 2.0% and South Carolina (1.5%) were second and third. Arkansas (1.37%) and Louisiana (1.04%) rounded out the top 5 states which reported losses to Heliothines. Georgia (0.8%) lost 15,712 bales, and Texas (0.27%) lost 25,147 bales. California, New Mexico, Oklahoma, Kansas and Virginia reported no losses to heliothines.

Bt cotton acreage was 6.278 million acres in 2008 (Table 4). This is almost a million acre drop. This is more reflective of an overall decrease in cotton acreage as the percentage of *Bt* cotton acres was 80%. Heliothines were sprayed on 1.922 million Bt cotton acres in 2008. The cost of *Bt* is estimated at $13.38 per acre of the US crop. This represents about 27% of the cost of arthropod management and is second only to foliar application cost ($18.66) in arthropod management. (Williams, 2009).

Stink bugs: third most damaging pest at 0.748%

Stink bugs reduced the US crop by 0.748% in 2008. Florida (4%), Alabama (2.98%) South Carolina (2.5%) and Tennessee (1.6%) reported problems with this pest. North Carolina (1.39%), Georgia (1.28%), Oklahoma (0.88%), Arkansas (0.82%), Mississippi (0.15%), Louisiana (0.08%), Arizona (0.04%), Texas (0.011%), Missouri (0.003%) reported loss to stink bugs. The stink bug complex infested 3.584 million acres of cotton in 2008 and destroyed 107418 bales of cotton (Table 5). New Mexico, California, Kansas, and Virginia reported no losses to stink bugs.

Early season Thrips reduce US crop by 0.515%

Early season Thrips infested 88% of the US acreage in 2008 and cost US farmers $8.80 per acre in management (Williams, 2009). There were 50,465 bales of US cotton lost to this complex of pests in 2008. Kansas (3.2%) reported the highest losses from Thrips. North Carolina (2.0%), Virginia (2.0%), and Tennessee (1.4%) also reported more than 1% loss. All other states reported l% or less in losses: Louisiana (0.84%), Florida (0.52%), South Carolina (0.5%), Arkansas(0.46%), Arizona (0.27%), Alabama (0.18%), Georgia (0.05%), Texas (0.04%), Mississippi (0.02%), Missouri (0.01%)and Oklahoma 0.001%). California and New Mexico reported no losses from early-season Thrips (Table 6).

Cotton fleahoppers ranks 4th in damage at 0.228%

Cotton fleahoppers (0.228%) infested 2.284 million acres of cotton in 2008 (Table 6). Oklahoma (2.3%), Kansas (1.5%), Arkansas (0.17%), Texas (0.14%) and Arizona (0.024%) reported losses to cotton fleahoppers. All other states reported no loss. Fleahoppers destroyed 18,476 bales of cotton.

Aphids: sixth most damaging pest of US cotton

Aphids infested 63% of US cotton, and yield losses were 0.202%. Florida (1.0%), Louisiana (0.73%), and Tennessee (0.11%) reported heaviest losses to aphids. Alabama (0.07%), California (0.05%), Mississippi (0.04%) Arkansas (0.02%) Texas (0.014%), Arizona (0.004%), Georgia (0.004%) and North Carolina (0.001%) also reported losses to aphids. Six states: Kansas, Missouri, New Mexico, Oklahoma, South Carolina and Virginia reported no losses to aphids (Table 7). Aphids reduced yields by 9,098 bales of US cotton.

Spider mites rank seventh at 0.162%

Spider mites continued to be a resurgent pest in 2008. Mites infested 2.6 million acres of cotton in 2008. Tennessee (1.15%) reported greater than 1% losses to spider mites. Only 4 states reported no losses to spider mites. 20,742 bales of US cotton were lost to spider mites in 2008 (Table 7).

Clouded plant bugs rank 8th

Six states reported infestations of clouded plant bug which reduced cotton yields by 0.05%. 624,462 acres were infested in Tennessee, Arkansas, Mississippi, Alabama, South Carolina and Louisiana. 7,838 bales were lost to this pest, (Table 8).

Silverleaf Whitefly (*Bemesia sp)* .046% loss

Seven states reported infestations of silverleaf whiteflies (*Bemisia* sp) in 2008. The 0.025% reduction in yield places it as the 9th most damaging pest in US cotton. Arizona (0.442%) lost 2,212 bales, California (0.03%) lost 269 bales, and Georgia (0.05%) lost 982 bales. South Carolina and Texas reported infestations, but no loss. *Bemisia* sp were reported in 363,430 acres (Table 11).

Fall armyworm: 10th at 0.041%

Fall armyworm (0.040%) infested about 858,268 acres of cotton and reduced yields by 4,112 bales of cotton. Five states reported losses to this pest: South Carolina (0.238%), Arkansas (0.143%), Georgia (0.02%), Tennessee (0.03%), and Mississippi (0.001%). Seven states reported infestations but no losses to these pests, five states reported no acres infested (Table 9).

Other pests of cotton

Boll weevils infested 2.221 million acres of cotton in 2002 and slightly less at 2.097 million acres in 2003, dropped to 1.572 million acres in 2004, saw resurgence to 1.828 million acres in 2005, infested 1.199 million acres in 2006, infested 612,393 acres in 2007 and were pests in 224,428 acres in 2008. Boll weevils were the number ten ranked pest in the US in 2007 but took only 63 bales of cotton in 2008. Texas, Arkansas, and Louisiana reported infested acres. Eradication costs for boll weevil amounted to $5.74 (Table 8).

Losses from all remaining pests of cotton were almost negligible. Other insects, which included the pale-sided flea beetle and *Creontiades* (green mirid) (Table 13) combined to reduce cotton yields by 0.0001% in 2008. Averaged across the cotton belt, all other pests of cotton reduced yields by less than 0.05% in 2008. European cornborers were not reported as a pest in 2008. Beet armyworms (Table 9), cutworms and loopers (Table 10), bandedwinged whiteflies (Table 11), cotton leaf perforator (Table 12), grasshoppers (Table 13), saltmarsh caterpillars and southern armyworms (Table 14) contributed to the losses from arthropod pests in 2008.

Pink bollworm infested 25,599 acres of US cotton. Texas lost 4 bales and California and Arizona had infested acres, but no losses. Pink bollworm eradication cost US producers about $0.37 per acre in eradication costs (Table 12).

Conclusion

Total losses from insect pests in US cotton in 2008 were 3.80%, another year with low percent losses (Table 1). Losses below 5% continue to reflect the outstanding contribution technology has made to managing pest complexes which long have plagued cotton growers. The boll weevil and tobacco budworm remain a threat, but are no longer the major factors in production they once were. The emergence of new pest complexes has been much slower than many anticipated. The bugs continue to be a concern in much of the cotton belt and as the older insecticide chemistries drop from usage, spider mites, aphids and Thrips will continue to make comebacks. The costs of insect management were $50.53 per acre in 2008; costs plus loss were $68.88 per acre (Williams 2009).

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Table 1. Number of acres, percent reduction in yield by arthropods, cost plus loss and bales lost by state in 2008

	Acres	% reduction	Cost + Loss	bales Lost
US	**7,888,990**	**3.80%**	**$543,368,649**	**461,500**
Florida	67,000	8.20%	$6,566,239	9,101
Alabama	289,267	8.09%	$40,783,830	78,394
Louisiana	313,000	6.55%	$42,207,419	38,460
Tennessee	280,000	6.24%	$36,733,932	45,744
South Carolina	135,000	5.02%	$12,256,102	17,479
Arkansas	640,000	4.95%	$74,509,886	82,329
Kansas	35,000	4.90%	$840,890	2,179
North Carolina	433,000	3.95%	$29,816,793	25,989
Oklahoma	170,000	3.18%	$7,992,028	9,928
Arizona	140,732	2.96%	$4,624,887	14,823
California	268,000	2.87%	$30,279,008	25,707
Mississippi	362,611	2.34%	$45,096,094	20,066
Georgia	940,000	2.25%	$65,154,734	44,117
Virginia	63,000	2.00%	$3,559,780	2,625
New Mexico	41,940	1.06%	$1,860,794	1,233
Texas	3,403,440	0.49%	$241,925,970	40,259
Missouri	307,000	0.46%	$21,691,897	3,067

Table 2. Percent lost, acres infested, rank, and percent of US cotton infested by insect pests in 2008

pest	% Reduction	acres infested	rank	% infested	Cost/acre	Bales lost
Lygus	1.003%	4,833,188	1	61.26%	$6.08	110,440
Bollworm/Budworm	0.764%	5,293,326	2	67.10%	$2.34	125,089
Stink Bugs	0.747%	3,584,448	3	45.44%	$3.40	107,418
Thrips	0.516%	6,921,839	4	87.74%	$1.88	50,465
Cotton Fleahopper	0.231%	2,284,484	5	28.96%	$0.90	18,476
Aphids	0.202%	4,994,710	6	63.31%	$0.72	9,098
Spider Mites	0.163%	2,587,102	7	32.79%	$2.19	20,742
Clouded Plant bugs	0.050%	624,462	8	7.92%	$0.21	7,838
Silverleaf Whitefly *(Bemesia*)	0.044%	363,430	9	4.61%	$0.46	3,466
Fall Armyworm	0.039%	858,268	10	10.88%	$0.09	4,112
Loopers	0.031%	989,737	11	12.55%	$0.05	571
Grasshoppers	0.021%	609,187	12	7.72%	$0.03	1,156
Beet Armyworm	0.007%	1,707,657	13	21.65%	$0.08	1,773
Cutworms	0.0012%	561,868	14	7.12%	$0.20	757
Saltmarsh Caterpillars	0.0006%	460,144	15	5.83%	$0.00	6
Boll Weevil	0.0003%	224,428	16	2.84%	$0.00	63
Pink Bollworm	0.0002%	25,599	17	0.32%	$0.01	5
Other Insects	0.0001%	122,873	18	1.56%	$0.03	25
Banded Winged Whitefly	0.0000%	271,337	19	3.44%	$0.00	0
Southern Armyworms	0.0000%	23,877	20	0.30%	$0.00	0
Cotton Leaf Perforator	0.0000%	18,463	21	0.23%	$0.00	0
European Cornborer	0.0000%	0	22	0.00%	$0.00	0

Table 3. Bollworm and budworm: percent of population, yield reduction, acres infested, bales lost and % *Bt* acres by state in 2008

	Bollworm/ Budworm					
States	% yield Reduction	% crop infested	% bollworm	acres infested	bales lost	% *Bt* acres
US	**0.763%**	**67**	**75.5%**	**5,293,326**	**125,089**	**80**
Alabama	3.785%	100	45.7%	289,267	36,443	89
Arizona	0.023%	19	0.0%	27,442	102	98
Arkansas	1.365%	100	98.0%	640,000	22,692	97
California	0.000%	5	0.0%	13,400	0	0
Florida	2.000%	100	50.0%	67,000	2,220	95
Georgia	0.800%	80	97.9%	752,000	15,712	95
Kansas	0.000%	0	0.0%	0	0	0
Louisiana	1.035%	92	99.0%	286,708	6,075	98
Mississippi	0.600%	66	99.6%	237,760	5,147	96
Missouri	0.005%	5	88.0%	15,350	34	92
New Mexico	0.000%	6	100.0%	2,516	0	83
North Carolina	0.512%	100	75.0%	433,000	3,366	96
Oklahoma	0.000%	0	100.0%	0	0	100
South Carolina	1.500%	100	99.6%	135,000	5,220	96
Tennessee	0.400%	80	98.9%	224,000	2,931	97
Texas	0.269%	62	62.5%	2,125,783	25,147	67
Virginia	0.000%	70	100.0%	44,100	0	95

Table 4. *Bt* cotton acreage, acres sprayed for caterpillars, average number of applications and percent of population which was bollworm from 1995 to 2008

Year	***Bt* cotton acreage**	**Acres *Bt* sprayed**	**Avg. # applications**	**% Population bollworm**
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	0.290	76
2000	5,220,392	1,455,084	0.330	79
2001	5,717,747	2,727,821	0.400	74
2002	4,893,810	3,091,586	0.520	83
2003	6,040,529	3,151,114	0.551	86
2004	6,591,338	2,909,459	0.466	94
2005	7,395,393	3,050,093	0.541	95
2006	8,495,822	3,961,194	0.590	92
2007	7,106,473	2,211,222	0.503	92
2008	6,278,444	1,921,668	0.751	75

nr – not reported * polled entomologists for estimates

Table 5. *Lygus* and stink bugs: percent yield reduction, acres infested and bales lost by state in 2008

	Lygus			**stink bugs**		
	% Reduction	**Acres infested**	**Bales lost**	**% Reduction**	**Acres infested**	**Bales lost**
US	**1.003%**	**4,833,188**	**110,440**	**0.748%**	**3,584,448**	**107,418**
Alabama	1.030%	289,267	10,047	2.980%	289,267	29,073
Arizona	2.144%	122,634	10,727	0.044%	61,309	220
Arkansas	1.438%	640,000	24,149	0.819%	640,000	13,731
California	2.700%	241,200	24,226	0.000%	0	0
Florida	0.050%	3,350	55	4.000%	67,000	4,440
Georgia	0.040%	376,000	786	1.275%	799,000	25,041
Kansas	0.200%	3,500	89	0.000%	700	0
Louisiana	3.560%	313,000	20,893	0.079%	98,282	461
Mississippi	1.064%	340,464	9,122	0.153%	110,737	1,309
Missouri	0.250%	307,000	1,685	0.003%	15,350	17
New Mexico	0.116%	1,426	134	0.000%	0	0
North Carolina	0.000%	433,000	0	1.390%	433,000	9,139
Oklahoma	0.000%	0	0	0.880%	29,920	2,751
South Carolina	0.100%	135,000	348	2.500%	135,000	8,701
Tennessee	1.100%	280,000	8,059	1.600%	280,000	11,723
Texas	0.001%	1,346,339	119	0.011%	596,533	814
Virginia	0.000%	1,008	0	0.000%	28,350	0

Table 6 Thrips and cotton fleahoppers: percent yield reduction, acres infested and bales lost by state in 2008

	Thrips			**cotton fleahoppers**		
	% Reduction	**Acres infested**	**Bales lost**	**% Reduction**	**Acres infested**	**Bales lost**
US	**0.515%**	**6,921,839**	**50,465**	**0.228%**	**2,284,484**	**18,476**
Alabama	0.181%	289,267	1,760	0.000%	17,213	0
Arizona	0.270%	140,732	1,353	0.024%	98,421	122
Arkansas	0.456%	640,000	7,524	0.169%	362,000	2,738
California	0.000%	265,320	0	0.000%	0	0
Florida	1.000%	67,000	1,110	0.000%	0	0
Georgia	0.045%	846,000	884	0.000%	0	0
Kansas	3.200%	14,000	1,423	1.500%	10,500	667
Louisiana	0.842%	310,183	4,944	0.000%	34,743	0
Mississippi	0.018%	290,089	152	0.000%	14,917	0
Missouri	0.010%	30,700	67	0.000%	0	0
New Mexico	0.000%	0	0	0.000%	0	0
North Carolina	2.000%	433,000	13,149	0.000%	0	0
Oklahoma	0.001%	0	2	2.295%	130,050	7,175
South Carolina	0.500%	135,000	1,740	0.000%	135,000	0

Tennessee	1.400%	280,000	10,257	0.000%	0	0
Texas	0.035%	3,017,248	3,475	0.139%	1,481,639	7,774
Virginia	2.000%	63,000	2,625	0.000%	0	0

Table 7. Spider mites and aphids: percent yield reduction, acres infested and bales lost by state in 2008

	spider mites			aphids		
	% Reduction	**Acres infested**	**Bales lost**	**% Reduction**	**Acres infested**	**Bales lost**
US	**0.162%**	**2,587,102**	**20,742**	**0.203%**	**4,994,710**	**9,098**
Alabama	0.041%	69,060	402	0.069%	289,267	670
Arizona	0.010%	16,204	52	0.004%	38,649	18
Arkansas	0.258%	364,000	4,205	0.022%	532,000	379
California	0.090%	241,200	808	0.045%	241,200	404
Florida	0.100%	1,340	111	1.000%	33,500	1,110
Georgia	0.003%	47,000	49	0.004%	705,000	74
Kansas	0.000%	0	0	0.000%	0	0
Louisiana	0.271%	76,998	1,588	0.727%	299,541	4,268
Mississippi	0.359%	181,415	3,074	0.043%	183,259	367
Missouri	0.188%	230,250	1,264	0.000%	0	0
New Mexico	0.000%	0	0	0.000%	1,678	0
North Carolina	0.050%	216,500	329	0.001%	433,000	7
Oklahoma	0.000%	0	0	0.000%	0	0
South Carolina	0.095%	128,250	331	0.000%	135,000	0
Tennessee	1.150%	140,000	8,426	0.113%	210,000	824
Texas	0.002%	869,845	103	0.014%	1,892,616	978
Virginia	0.000%	5,040	0	0.000%	0	0

Table 8. Boll weevil and clouded plant bug: percent yield reduction, acres infested and bales lost by state in 2008

	boll weevil			Eradication	clouded plant bug		
	% Reduction	**Acres infested**	**Bales lost**	**costs/acre**	**% Reduction**	**Acres infested**	Bales Lost
US	**0.000%**	**224,428**	**63**	**$5.74**	**0.050%**	**624,462**	**7,838**
Alabama	0.000%	0	0	$3.16	0.000%	12,250	0
Arizona	0.000%	0	0	$2.29	0.000%	0	0
Arkansas	0.000%	14,000	0	$12.56	0.253%	272,000	4,042
California	0.000%	0	0	$0.00	0.000%	0	0
Florida	0.000%	0	0	$5.00	0.000%	0	0
Georgia	0.000%	0	0	$2.50	0.000%	0	0
Kansas	0.000%	0	0	$0.00	0.000%	0	0
Louisiana	0.000%	15650	0	$6.00	0.000%	47,263	0
Mississippi	0.000%	0	0	$4.44	0.058%	34,198	499
Missouri	0.000%	0	0	$5.00	0.000%	0	0
New Mexico	0.000%	0	0	$5.95	0.000%	0	0
North Carolina	0.000%	0	0	$1.25	0.000%	0	0
Oklahoma	0.000%	0	0	$0.00	0.000%	0	0
South Carolina	0.000%	0	0	$2.00	0.000%	6,750	0
Tennessee	0.000%	0	0	$9.60	0.450%	252,000	3,297
Texas	0.001%	194,778	63	$22.50	0.000%	0	0
Virginia	0.000%	0	0	$3.25	0.000%	0	0

Table 9. Beet and fall armyworms: percent yield reduction, acres infested and bales lost by state in 2008

	beet armyworms			fall armyworms		
	% Reduction	Acres infested	Bales lost	% Reduction	Acres infested	Bales lost
US	0.007%	1,707,657	1,505	0.040%	858,268	4,112
Alabama	0.000%	993	0	0.000%	19,853	0
Arizona	0.003%	28,639	14	0.000%	8,269	0
Arkansas	0.000%	100,000	0	0.143%	284,000	2,435
California	0.000%	134,000	0	0.000%	0	0
Florida	0.000%	3,350	0	0.000%	10,050	0
Georgia	0.000%	0	0	0.020%	18,800	393
Kansas	0.000%	0	0	0.000%	0	0
Louisiana	0.000%	17,528	0	0.040%	24,727	232
Mississippi	0.001%	8,056	6	0.001%	12,898	6
Missouri	0.000%	30,700	0	0.000%	15,350	0
New Mexico	0.000%	3,271	0	0.000%	0	0
North Carolina	0.000%	64,950	0	0.000%	108,250	0
Oklahoma	0.000%	0	0	0.000%	0	0
South Carolina	0.000%	20,250	0	0.238%	128,250	827
Tennessee	0.000%	8,400	0	0.030%	28,000	220
Texas	0.016%	1,287,520	1,753	0.000%	199,821	0
Virginia	0.000%	0	0	0.000%	0	0

Table 10. Cutworms and loopers: percent yield reduction, acres infested and bales lost by state in 2008

	cutworms			loopers		
	% Reduction	Acres infested	Bales lost	% Reduction	Acres infested	Bales lost
US	0.001%	561,868	757	0.031%	989,737	557
Alabama	0.000%	15,440	0	0.000%	13,500	0
Arizona	0.000%	0	0	0.000%	16,563	1
Arkansas	0.026%	160,000	433	0.000%	314,000	0
California	0.000%	0	0	0.000%	26,800	0
Florida	0.000%	0	0	0.050%	3,350	55
Georgia	0.000%	0	0	0.010%	18,800	196
Kansas	0.000%	0	0	0.000%	0	0
Louisiana	0.000%	0	0	0.000%	107,046	0
Mississippi	0.000%	13,679	3	0.037%	78,602	319
Missouri	0.000%	0	0	0.000%	0	0
New Mexico	0.000%	0	0	0.000%	0	0
North Carolina	0.000%	43,300	0	0.000%	0	0
Oklahoma	0.000%	0	0	0.000%	0	0
South Carolina	0.090%	121,500	313	0.000%	33,750	0
Tennessee	0.001%	28,000	7	0.000%	11,200	0
Texas	0.000%	179,948	0	0.000%	366,125	0
Virginia	0.000%	0	0	0.000%	0	0

Table 11. Whiteflies: percent yield reduction, acres infested and bales lost by state in 2008

	bandedwinged whiteflies			*Bemisia* spp		
	% Reduction	Acres infested	Bales lost	% Reduction	Acres infested	Bales lost
US	0.000%	271,337	0	0.025%	363,430	6,441
Alabama	0.000%	9,500	0	0.000%	1,350	0
Arizona	0.000%	28,850	0	0.442%	110,336	2,212
Arkansas	0.000%	82,000	0	0.000%	0	0
California	0.000%	0	0	0.030%	160,800	269
Florida	0.000%	10,720	0	0.000%	5,360	0
Georgia	0.000%	0	0	0.050%	47,000	982
Kansas	0.000%	0	0	0.000%	0	0
Louisiana	0.000%	626	0	0.000%	0	0
Mississippi	0.000%	9,662	0	0.000%	0	0
Missouri	0.000%	0	0	0.000%	0	0
New Mexico	0.000%	0	0	0.000%	0	0
North Carolina	0.000%	0	0	0.000%	0	0
Oklahoma	0.000%	0	0	0.000%	0	0
South Carolina	0.000%	27,000	0	0.000%	27,000	0
Tennessee	0.000%	28,000	0	0.000%	0	0
Texas	0.000%	74,979	0	0.000%	11,581	3
Virginia	0.000%	0	0	0.000%	0	0

Table 12. Cotton leaf perforator and pink bollworm: percent yield reduction, acres infested and bales lost by state in 2008

	cotton leaf perforator			PBW eradication	pink bollworms		
	% Reduction	Acres infested	Bales lost	costs per acre	% Reduction	Acres infested	Bales lost
US	0.000%	19,086	0	$0.37	0.000%	25,599	4
Alabama	0.000%	0	0	$0.00	0.000%	0	0
Arizona	0.000%	785	0	$8.62	0.000%	7,602	0
Arkansas	0.000%	0	0	$0.00	0.000%	0	0
California	0.000%	2,680	0	$5.97	0.000%	10,720	0
Florida	0.000%	0	0	$0.00	0.000%	0	0
Georgia	0.000%	0	0	$0.00	0.000%	0	0
Kansas	0.000%	0	0	$0.00	0.000%	0	0
Louisiana	0.000%	0	0	$0.00	0.000%	0	0
Mississippi	0.000%	0	0	$0.00	0.000%	0	0
Missouri	0.000%	0	0	$0.00	0.000%	0	0
New Mexico	0.000%	0	0	$2.44	0.000%	0	0
North Carolina	0.000%	0	0	$0.00	0.000%	0	0
Oklahoma	0.000%	0	0	$0.00	0.000%	0	0
South Carolina	0.000%	0	0	$0.00	0.000%	0	0
Tennessee	0.000%	0	0	$0.00	0.000%	0	0
Texas	0.000%	14,998	0	$0.48	0.000%	7,277	4
Virginia	0.000%	0	0	$0.00	0.000%	0	0

Table 13. Grasshoppers and others: percent yield reduction, acres infested and bales lost by state in 2008

	grasshoppers			others*		
	% Reduction	Acres infested	Bales lost	% Reduction	Acres infested	Bales lost
US	**0.020%**	**624,243**	**1,156**	**0.0001%**	**122,873**	**25**
Alabama	0.000%	179,478	0	0.000%	0	0
Arizona	0.000%	11,877	0	0.000%	27,900	0
Arkansas	0.000%	192,000	0	0.000%	0	0
California	0.000%	0	0	0.000%	0	0
Florida	0.000%	0	0	0.000%	0	0
Georgia	0.000%	0	0	0.000%	0	0
Kansas	0.000%	700	0	0.000%	0	0
Louisiana	0.000%	31	0	0.000%	0	0
Mississippi	0.007%	34,198	57	0.000%	0	0
Missouri	0.000%	0	0	0.000%	0	0
New Mexico	0.948%	10,191	1,099	0.000%	0	0
North Carolina	0.000%	43	0	0.000%	0	0
Oklahoma	0.000%	17	0	0.000%	0	0
South Carolina	0.000%	121,500	0	0.000%	0	0
Tennessee	0.000%	5,600	0	0.000%	0	0
Texas	0.000%	53,537	0	0.0003%	94,973	25
Virginia	0.000%	0	0	0.000%	0	0

*Other Insects include Pale-sided flea beetle (Arizona) and *Crenotiades* (green mirid) (Texas)

Table 14. Saltmarsh caterpillars and southern armyworms: percent yield reduction, acres infested and bales lost by state in 2008

	saltmarsh caterpillar			southern armyworms		
	% Reduction	Acres infested	Bales lost	% Reduction	Acres infested	Bales lost
US	0.001%	460,144	8	0.000%	23,877	0
Alabama	0.000%	0	0	0.000%	0	0
Arizona	0.000%	12,219	2	0.000%	0	0
Arkansas	0.000%	192,000	0	0.000%	0	0
California	0.000%	0	0	0.000%	0	0
Florida	0.000%	0	0	0.000%	0	0
Georgia	0.000%	0	0	0.000%	0	0
Kansas	0.000%	0	0	0.000%	0	0
Louisiana	0.000%	939	0	0.000%	0	0
Mississippi	0.001%	15,308	5	0.000%	3,626	0
Missouri	0.000%	0	0	0.000%	0	0
New Mexico	0.000%	0	0	0.000%	0	0
North Carolina	0.000%	0	0	0.000%	0	0
Oklahoma	0.000%	0	0	0.000%	0	0
South Carolina	0.000%	13,500	0	0.000%	20,250	0
Tennessee	0.000%	0	0	0.000%	0	0
Texas	0.000%	226,178	0	0.000%	0	0
Virginia	0.000%	0	0	0.000%	0	0