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Report

2016 Soybean Insect Losses in the Southern US

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Abstract Estimated soybean insect costs and losses experienced during 2016 were collected and compiled following the 2016 growing season to provide a record of insect pressure and management practices for the year. This survey has been done annually in all participating states since at least 2011, with Mississippi having data back to 2004. The 2016 survey represents 10.8 million soybean acres across the southern United States. Overall, corn earworm was the most expensive pest in soybean followed closely by soybean looper and stink bugs. Total insect management costs rose slightly to $26.03 per acre during 2016. Estimated crop losses to insects also increased to $20.83 per acre, making the total cost + losses for 2016 reach $46.86 per acre, more than $6 greater than the record low estimated costs + losses in 2015. The average number of insecticide applications per crop ranged from 0.06 in Virginia to 3.2 in Louisiana, while estimated crop loss ranged from 0.7% in Virginia to 6.9% in North Carolina.

Key Words: soybean, yield loss, pest management

Introduction

Soybean losses have been compiled annually since 2004 in Mississippi (MS) (Musser and Catchot 2008), 2008 in Tennessee (TN) (Musser et al. 2009), 2009 in Arkansas (AR) (Musser et al. 2010), and 2011 in Alabama (AL), Louisiana (LA), North Carolina (NC) and Virginia (VA) (Musser et al. 2012). These survey-based losses provide an annual record of insect pressure and management decisions. While the costs and losses estimated for a pest in any given year are somewhat subjective, these losses provide an historical record of pest pressure and management practices and provide an estimate of the economic

impact of the various soybean pests. Over time, the changes in estimated losses and insecticide applications provide a reliable record of shifts in pest spectrums and grower management.

Materials and Methods

An informal telephone or written survey was conducted with numerous crop consultants and extension personnel in the fall of the year. Surveyed people were those who actively scouted soybean fields and those who assisted growers in making soybean pest management decisions. These surveys were compiled and then combined with the author's own experience to estimate the various fields in the table. Acreage, yield and price data were drawn from Agricultural Statistics Service publications (USDA NASS) before final estimates were published, so values in the tables may differ from final NASS values. The estimates were placed in a spreadsheet to make the various calculations. Actual formulas used in the spreadsheet were published by Musser and Catchot (2008). Additional columns were added for the 2013 losses and these are defined in Musser et al (2014).

Results and Discussion

Planted acreage was 10.8 million acres, which represents 13% of the U.S. soybean acreage. Estimated yield lost to insects returned from a low of 3.51% during 2015 to a more typical 4.54% in 2016. Similarly, the number of foliar applications rose from 1.34 to 1.62 per crop, making the 2016 the most sprayed soybean crop since 2011 and halting a four-year trend of annually reducing the number of foliar applications in soybean. While overall data suggests 2016 had more insect pressure than previous years, this was not experienced uniformly throughout the surveyed states. Alabama and Tennessee had the lowest losses in their states since the survey was begun, while Louisiana had the highest losses recorded in their state. Mississippi and North Carolina had near record high losses while Virginia was near its record low. As in previous years, adoption of seed treatments and scouting as insect management strategies varied widely across the region, Virginia had scouts in few of their soybean acres (20%) and rarely used an insecticide seed treatment (10%), while Louisiana has 90% of its acres scouted and seed treatments were widely used (95%). This difference in behavior is logical based on higher insect pressure in the more southern states. Louisiana growers sprayed frequently (3.22 times per crop) and still experienced >4% yield loss while Virginia growers only made 0.06 insecticide applications per crop and had yield losses from insects of <1%. (Table 1).

Corn earworm, *Helicoverpa zea* (Lepidoptera: Noctuidae), was the most expensive insect pest of soybean overall during 2016 in terms of lost yield and control costs. Stink bugs (Hemiptera: Pentatomidae), the most expensive pest during 2015, slipped to the third most costly pest behind corn earworm and soybean looper, *Chrysodeixis includens* (Lepidoptera: Noctuidae). These three pests are generally the three most costly pests in the southern U.S. As has been true every year, the primary stink bug species overall was green stink bug (*Acrosternum hilare*). However, the redbanded stink bug, *Piezodorus guildinii,* comprised more than 15% of the overall complex for the first time during 2016, and it made up more than 25% of the stink bug complex in Mississippi and Louisiana.

State Highlights

Alabama. Insect pressure was light. Soybean looper was the primary pest, costing growers $3.00 per acre, and was the only pest costing more than $1.50 per acre.

Arkansas. Corn earworm was the most costly insect, responsible for 40% of all insect costs + losses. Stink bugs, bean leaf beetle, soybean looper and armyworms all caused similar levels of loss, together responsible for an additional 56% of the total losses + costs.

Louisiana. Insect pressure was high with both stink bugs and soybean looper sprayed on >70% of acreage, and stink bugs often requiring multiple applications. Redbanded stink bug made up 60% of the stink bug complex, which are more damaging and difficult to control than other stink bug species.

Mississippi. Similar to Louisiana, insect pressure from soybean looper and redbanded stink bug was high. In addition, corn earworm and green cloverworm were costly pests during 2016.

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North Carolina. This state had the highest estimated yield loss from insects among those states surveyed. As in previous years, corn earworm was the primary pest, accounting for 58% of insect costs + losses.

Tennessee. The primary use of insecticides (68%) was an automatic application made during reproductive growth with no appreciable quantity of any insects in the field (reported as "Other"). Stink bugs were responsible for most of the yield losses.

Virginia. A very light insect year with 6% of acres sprayed with an insecticide, mostly targeting stink bugs and corn earworm. Total insect costs plus losses were estimated at $4.25/acre.

The complete data for each state and all states combined are in the appendices following this report.

Table 1. Soybean management and losses in surveyed states, 2004-2016.

Year	% soybeans scouted	% soybeans with insect. seed treatment	No. foliar insecticide applications	% yield loss to insects	$ loss + cost/acre[1]
Combined States					
2011-13	59	57	1.60	5.67	43.42
2014-15	65	62	1.36	3.80	30.05
2016	61	64	1.62	4.54	36.50
Alabama					
2011-13	41	20	0.46	3.46	27.12
2014-15	60	30	0.33	1.60	9.25
2016	70	35	0.34	1.01	6.46
Arkansas					
2009-10	63	46	1.36	8.97	46.33
2011-13	72	70	1.41	8.61	63.29
2014-15	81	68	1.61	6.10	44.13
2016	70	70	1.49	6.04	39.41
Louisiana					
2011-13	75	87	3.93	3.04	55.88
2014-15	88	93	2.43	3.01	39.45
2016	90	95	3.22	4.13	58.67
Mississippi					
2004-07	15	1	1.19	6.74	26.16
2008-10	68	62	2.29	4.69	39.79
2011-13	83	83	1.65	4.35	42.88
2014-15	90	90	1.55	3.27	34.20
2016	90	80	2.69	4.85	56.71
North Carolina					
2011-13	14	11	1.50	5.53	39.87
2014-15	15	26	0.86	4.10	24.12
2016	15	55	1.16	6.88	38.98
Tennessee					
2008-10	33	47	0.75	5.40	27.09
2011-13	43	50	0.91	3.88	27.48
2014-15	44	51	0.89	1.94	12.19
2016	42	48	0.70	1.72	10.99
Virginia					
2011-13	46	13	0.30	4.16	23.63
2014-15	25	18	0.08	0.94	4.71
2016	20	10	0.06	0.71	3.05

[1] 1 acre = 0.405 ha

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USDA NASS. National Agricultural Statistics Service Data and Statistics, http://www.nass.usda.gov/Data_and_Statistics/Quick_Stats/index.asp.

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List of Appendices

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Appendix 1. Overall soybean insect losses from seven surveyed southern states, 2016.

Pest	Acres Infested	% Acres Infested	Acres above ET	% Acres above ET	Acres Treated	% Acres Treated	# of apps/acres treated	Cost of 1 Insecticide	% loss per acre infested	# of apps per total soy acres	cost/acre	Overall % reduction	bushel lost per pest	Loss + Cost	Loss + Cost/acre	% Total Loss + Cost
Armyworm complex	4,113,333	38.1%	879,185	8.1%	895,056	8.3%	1.00	$7.37	0.769	0.083	$0.61	0.29%	1,476,794	$21,091,894	$1.95	5.4%
Banded Cucumber Beetle	1,750,000	16.2%	0	0.0%	0	0.0%	0.00	$0.00	0.002	0.000	$0.00	0.00%	1,867	$18,330	$0.00	0.0%
Bean Leaf Beetle	7,649,074	70.8%	1,560,000	14.4%	1,758,122	16.3%	1.17	$8.23	0.563	0.191	$1.57	0.40%	2,009,117	$36,684,425	$3.40	9.3%
Blister Beetle	1,142,444	10.6%	101,500	0.9%	100,000	0.9%	1.00	$3.50	0.000	0.009	$0.03	0.00%	12	$350,115	$0.03	0.1%
Corn Earworm	4,493,333	41.6%	1,952,800	18.1%	2,258,567	20.9%	1.09	$12.21	3.799	0.229	$2.80	1.58%	7,969,025	$108,421,543	$10.04	27.5%
Cutworms	456,333	4.2%	100,000	0.9%	35,000	0.3%	1.00	$5.57	0.044	0.003	$0.02	0.00%	9,336	$286,649	$0.03	0.1%
Dectes Stem Borer	6,490,741	60.1%	0	0.0%	59,000	0.5%	1.00	$3.69	0.111	0.005	$0.02	0.07%	334,885	$3,504,981	$0.32	0.9%
Garden Webworms	210,630	2.0%	0	0.0%	36,222	0.3%	1.00	$8.00	0.071	0.003	$0.03	0.00%	7,002	$358,513	$0.03	0.1%
Grape Colaspis	5,555,741	51.4%	0	0.0%	0	0.0%	0.00	$0.00	0.007	0.000	$0.00	0.00%	18,672	$183,298	$0.02	0.0%
Grasshopper	5,220,741	48.3%	40,556	0.4%	38,500	0.4%	1.00	$6.38	0.088	0.004	$0.02	0.04%	213,828	$2,344,600	$0.22	0.6%
Green Cloverworm	8,811,111	81.6%	1,355,000	12.5%	1,134,056	10.5%	1.00	$8.73	0.273	0.105	$0.92	0.22%	1,123,169	$20,925,824	$1.94	5.3%
Kudzu Bug	2,878,333	26.7%	194,300	1.8%	307,200	2.8%	1.00	$8.82	0.098	0.028	$0.25	0.03%	132,026	$4,005,419	$0.37	1.0%
Lesser Cornstalk Borer	51,926	0.5%	0	0.0%	0	0.0%	0.00	$0.00	2.407	0.000	$0.00	0.01%	58,350	$572,806	$0.05	0.1%
Mexican Bean Beetle	66,667	0.6%	0	0.0%	0	0.0%	0.00	$0.00	0.000	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Potato Leafhopper	5,353,704	49.6%	100,000	0.9%	29,111	0.3%	1.00	$8.00	0.000	0.003	$0.02	0.00%	0	$232,888	$0.02	0.1%
Saltmarsh Caterpillar	3,397,407	31.5%	123,000	1.1%	76,700	0.7%	1.00	$12.88	0.084	0.007	$0.09	0.03%	132,571	$2,289,590	$0.21	0.6%
Soybean Aphid	1,000	0.0%	500	0.0%	500	0.0%	1.00	$4.00	0.000	0.000	$0.00	0.00%	0	$2,000	$0.00	0.0%
Soybean Looper	6,192,352	57.3%	2,854,500	26.4%	3,195,561	29.6%	1.00	$15.03	1.346	0.296	$4.45	0.77%	3,891,560	$86,236,358	$7.98	21.9%
Spider Mites	163,630	1.5%	250	0.0%	0	0.0%	0.00	$0.00	0.093	0.000	$0.00	0.00%	7,102	$69,722	$0.01	0.0%
Spotted Cucumber Beetle	7,303,704	67.6%	0	0.0%	0	0.0%	0.00	$0.00	0.038	0.000	$0.00	0.03%	128,542	$1,261,870	$0.12	0.3%
Stink Bugs (see box below)	8,940,000	82.8%	3,080,000	28.5%	3,263,644	30.2%	1.38	$8.54	0.941	0.418	$3.57	0.78%	3,926,941	$77,156,544	$7.14	19.6%
Threecornered Alfalfa Hopper	9,185,926	85.1%	575,000	5.3%	417,000	3.9%	1.00	$7.38	0.127	0.038	$0.28	0.11%	544,970	$8,414,567	$0.78	2.1%
Thrips	9,690,000	89.7%	0	0.0%	14,000	0.1%	1.00	$5.00	0.009	0.001	$0.01	0.01%	38,744	$450,343	$0.04	0.1%
Trochanter Mealybug	0	0.0%	0	0.0%	0	0.0%	0.00	$0.00	0.000	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Velvetbean Caterpillar	3,784,233	35.0%	1,462,000	13.5%	1,260,000	11.7%	1.06	$6.18	0.503	0.123	$0.76	0.18%	887,695	$16,931,786	$1.57	4.3%
Other	0	0.0%	0	0.0%	790,000	7.3%	1.00	$3.00	0.000	0.073	$0.22	0.00%	0	$2,370,000	$0.22	0.6%
										1.621	**$15.67**	**4.54%**	**22,912,208**	**$394,164,064**	**$36.50**	**100.0%**

SUMMARY DATA

Data Input

State	Combined
Year	2016
Total Acres	10,800,000
Yield/acre	44.56
Price/Bushel	$9.82
% Acres Scouted	61
Scouting Fee/scouted acre	$6.66
% Acres Insect Seed Trt.	64
Seed Trt Cost/treated ac	$9.82

Yield & Management Results

Total Bushels Harvested	481,230,000
Total Bushels Lost to Insects	22,912,208
Percent Yield Loss	4.54%
Yield w/o Insects	46.68
Ave. # Spray Applications	1.621
Seed Treated Acres	6,946,800
Scouted Acres	6,558,700

Economic Results

	Total	Per Acre
Foliar Insecticides Costs	$169,240,438	$15.67
Seed Treatment Costs	$68,242,662	$6.32
Scouting costs	$43,687,015	$4.05
Total Costs	$281,170,115	$26.03
Yield Lost to insects	$224,923,626	$20.83
Total Losses + Costs	$506,093,741	$46.86

Stink Bug Composition

Species	% of SB
Brown	31.5
Brown Marmorated	0.9
Green	41.9
Redbanded	16.9
Redshouldered	0.8
Southern Green	8.0
Total	100

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Appendix 2. Alabama soybean insect losses, 2016.

Pest	Acres Infested	% Acres Infested	Acres above ET	% Acres above ET	Acres Treated	% Acres Treated	# of apps/acres treated	Cost of 1 Insecticide	% loss per acre infested	# of apps per total soy acres	cost/acre	Overall % reduction	bushel lost per pest	Loss + Cost	Loss + Cost/acre	% Total Loss + Cost
Armyworm complex	100,000	21.7%	30,000	6.5%	20,000	4.3%	1	$8.50	1.00	0.043	$0.37	0.22%	31,317	$483,166	$1.05	16.3%
Banded Cucumber Beetle	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Bean Leaf Beetle	100,000	21.7%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Blister Beetle	50,000	10.9%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Corn Earworm	25,000	5.4%	1,500	0.3%	1,000	0.2%	1	$8.50	0.00	0.002	$0.02	0.00%	0	$8,500	$0.02	0.3%
Cutworms	25,000	5.4%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Dectes Stem Borer	100,000	21.7%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Garden Webworms	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Grape Colaspis	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Grasshopper	100,000	21.7%	2,000	0.4%	1,000	0.2%	1	$5.50	0.20	0.002	$0.01	0.04%	6,263	$68,133	$0.15	2.3%
Green Cloverworm	100,000	21.7%	5,000	1.1%	5,000	1.1%	1	$5.50	0.10	0.011	$0.06	0.02%	3,132	$58,817	$0.13	2.0%
Kudzu Bug	100,000	21.7%	2,500	0.5%	2,000	0.4%	1	$8.50	0.10	0.004	$0.04	0.02%	3,132	$48,317	$0.11	1.6%
Lesser Cornstalk Borer	20,000	4.3%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Mexican Bean Beetle	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Potato Leafhopper	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Saltmarsh Caterpillar	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Soybean Aphid	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Soybean Looper	250,000	54.3%	100,000	21.7%	90,000	19.6%	1	$11.00	0.50	0.196	$2.15	0.27%	39,146	$1,381,457	$3.00	46.5%
Spider Mites	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Spotted Cucumber Beetle	150,000	32.6%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Stink Bugs (see box below)	300,000	65.2%	50,000	10.9%	25,000	5.4%	1	$8.50	0.50	0.054	$0.46	0.33%	46,975	$682,249	$1.48	23.0%
Threecornered Alfalfa Hopper	200,000	43.5%	5,000	1.1%	2,000	0.4%	0	$8.50	0.20	0.000	$0.00	0.09%	12,527	$125,266	$0.27	4.2%
Thrips	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Trochanter Mealybug	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Velvetbean Caterpillar	100,000	21.7%	12,000	2.6%	10,000	2.2%	1	$8.50	0.10	0.022	$0.18	0.02%	3,132	$116,317	$0.25	3.9%
Other	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
										0.335	**$3.30**	**1.01%**	**145,622**	**$2,972,220**	**$6.46**	**100.0%**

SUMMARY DATA

Data Input

State	AL
Year	2016
Total Acres	460,000
Yield/acre	31
Price/Bushel	$10.00
% Acres Scouted	70
Scouting Fee/scouted acre	$6.00
% Acres Insect Seed Trt.	35
Seed Trt Cost/treated ac	$10.00

Yield & Management Results

Total Bushels Harvested	14,260,000
Total Bushels Lost to Insects	145,622
Percent Yield Loss	1.01%
Yield w/o Insects	31.32
Ave. # Spray Applications	0.335
Seed Treated Acres	161,000
Scouted Acres	322,000

Economic Results

	Total	Per Acre
Foliar Insecticides Costs	$1,516,000	$3.30
Seed Treatment Costs	$1,610,000	$3.50
Scouting costs	$1,932,000	$4.20
Total Costs	$5,058,000	$11.00
Yield Lost to insects	$1,456,220	$3.17
Total Losses + Costs	$6,514,220	$14.16

Stink Bug Composition

Species	% of SB
Brown	15
Brown Marmorated	1
Green	19
Redbanded	5
Redshouldered	1
Southern Green	60
Total	100

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Appendix 3. Arkansas soybean insect losses, 2016.

Pest	Acres Infested	% Acres Infested	Acres above ET	% Acres above ET	Acres Treated	% Acres Treated	# of apps/acres treated	Cost of 1 Insecticide	% loss per acre infested	# of apps per total soy acres	cost/acre	Overall % reduction	bushel lost per pest	Loss + Cost	Loss + Cost/acre	% Total Loss + Cost
Armyw orm complex	2,750,000	87.3%	315,000	10.0%	315,000	10.0%	1	$5.00	1.00	0.100	$0.50	0.87%	1,375,534	$14,972,703	$4.75	12.1%
Banded Cucumber Beetle	100,000	3.2%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Bean Leaf Beetle	3,150,000	100.0%	500,000	15.9%	650,000	20.6%	1.2	$5.00	1.00	0.248	$1.24	1.00%	1,575,612	$19,246,460	$6.11	15.5%
Blister Beetle	300,000	9.5%	100,000	3.2%	100,000	3.2%	1	$3.50	0.00	0.032	$0.11	0.00%	0	$350,000	$0.11	0.3%
Corn Earw orm	2,200,000	69.8%	900,000	28.6%	1,000,000	31.7%	1.1	$10.50	3.50	0.349	$3.67	2.44%	3,851,496	$49,063,570	$15.58	39.5%
Cutw orms	100,000	3.2%	0	0.0%	20,000	0.6%	1	$3.00	0.00	0.006	$0.02	0.00%	0	$60,000	$0.02	0.0%
Dectes Stem Borer	1,750,000	55.6%	0	0.0%	50,000	1.6%	1	$3.00	0.00	0.016	$0.05	0.00%	0	$150,000	$0.05	0.1%
Garden Webw orms	100,000	3.2%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Grape Colaspis	3,150,000	100.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Grasshopper	3,150,000	100.0%	20,000	0.6%	20,000	0.6%	1	$5.00	0.10	0.006	$0.03	0.10%	157,561	$1,634,646	$0.52	1.3%
Green Cloverw orm	3,150,000	100.0%	20,000	0.6%	0	0.0%	0	$3.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Kudzu Bug	1,000,000	31.7%	500	0.0%	2,000	0.1%	1	$3.00	0.00	0.001	$0.00	0.00%	0	$6,000	$0.00	0.0%
Lesser Cornstalk Borer	1,000	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Mexican Bean Beetle	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Potato Leafhopper	3,150,000	100.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Saltmarsh Caterpillar	2,500,000	79.4%	50,000	1.6%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Soybean Aphid	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Soybean Looper	1,750,000	55.6%	630,000	20.0%	700,000	22.2%	1	$10.50	1.00	0.222	$2.33	0.56%	875,340	$15,875,811	$5.04	12.8%
Spider Mites	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Spotted Cucumber Beetle	3,150,000	100.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Stink Bugs (see box below)	3,150,000	100.0%	630,000	20.0%	800,000	25.4%	1	$5.00	1.00	0.254	$1.27	1.00%	1,575,612	$19,346,460	$6.14	15.6%
Threecornered Alfalfa Hopper	3,150,000	100.0%	0	0.0%	50,000	1.6%	1	$3.00	0.00	0.016	$0.05	0.00%	0	$150,000	$0.05	0.1%
Thrips	3,150,000	100.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Trochanter Mealybug	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Velvetbean Caterpillar	2,000,000	63.5%	700,000	22.2%	700,000	22.2%	1.1	$3.00	0.10	0.244	$0.73	0.06%	100,039	$3,284,378	$1.04	2.6%
Other	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
										1.494	**$10.00**	**6.04%**	**9,511,194**	**$124,140,029**	**$39.41**	**100.0%**

SUMMARY DATA

Data Input

State	AR
Year	2016
Total Acres	3,150,000
Yield/acre	47
Price/Bushel	$9.74
% Acres Scouted	70
Scouting Fee/scouted acre	$7.00
% Acres Insect Seed Trt.	70
Seed Trt Cost/treated ac	$8.50

Yield & Management Results

Total Bushels Harvested	148,050,000
Total Bushels Lost to Insects	9,511,194
Percent Yield Loss	6.04%
Yield w/o Insects	50.02
Ave. # Spray Applications	1.494
Seed Treated Acres	2,205,000
Scouted Acres	2,205,000

Economic Results

	Total	Per Acre
Foliar Insecticides Costs	$31,501,000	$10.00
Seed Treatment Costs	$18,742,500	$5.95
Scouting costs	$15,435,000	$4.90
Total Costs	$65,678,500	$20.85
Yield Lost to insects	$92,639,029	$29.41
Total Losses + Costs	$158,317,529	$50.26

Stink Bug Composition

Species	% of SB
Brown	40
Brown Marmorated	0
Green	44
Redbanded	10
Redshouldered	1
Southern Green	5
Total	100

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Appendix 4. Louisiana soybean insect losses, 2016.

Pest	Acres Infested	% Acres Infested	Acres above ET	% Acres above ET	Acres Treated	% Acres Treated	# of apps/acres treated	Cost of 1 Insecticide	% loss per acre infested	# of apps per total soy acres	cost/acre	Overall % reduction	bushel lost per pest	Loss + Cost	Loss + Cost/acre	% Total Loss + Cost
Armyworm complex	500,000	40.0%	200,000	16.0%	200,000	16.0%	1	$8.00	0.00	0.160	$1.28	0.00%	0	$1,600,000	$1.28	2.2%
Banded Cucumber Beetle	1,250,000	100.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Bean Leaf Beetle	15,000	1.2%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Blister Beetle	5,000	0.4%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Corn Earworm	200,000	16.0%	100,000	8.0%	100,000	8.0%	1	$14.00	0.50	0.080	$1.12	0.08%	52,154	$1,895,463	$1.52	2.6%
Cutworms	8,000	0.6%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Dectes Stem Borer	1,000,000	80.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Garden Webworms	6,000	0.5%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Grape Colaspis	1,250,000	100.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Grasshopper	700,000	56.0%	3,000	0.2%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Green Cloverworm	1,250,000	100.0%	500,000	40.0%	250,000	20.0%	1	$8.00	0.50	0.200	$1.60	0.50%	325,962	$5,096,641	$4.08	6.9%
Kudzu Bug	100,000	8.0%	10,000	0.8%	10,000	0.8%	1	$8.00	0.00	0.008	$0.06	0.00%	0	$80,000	$0.06	0.1%
Lesser Cornstalk Borer	5,000	0.4%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Mexican Bean Beetle	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Potato Leafhopper	1,250,000	100.0%	100,000	8.0%	10,000	0.8%	1	$8.00	0.00	0.008	$0.06	0.00%	0	$80,000	$0.06	0.1%
Saltmarsh Caterpillar	250,000	20.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Soybean Aphid	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Soybean Looper	1,250,000	100.0%	1,000,000	80.0%	900,000	72.0%	1	$18.00	1.25	0.720	$12.96	1.25%	814,906	$23,941,603	$19.15	32.6%
Spider Mites	1,000	0.1%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Spotted Cucumber Beetle	1,250,000	100.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Stink Bugs (see box below)	1,250,000	100.0%	1,250,000	100.0%	1,000,000	80.0%	2	$11.00	1.75	1.600	$17.60	1.75%	1,140,868	$32,838,244	$26.27	44.8%
Threecornered Alfalfa Hopper	1,250,000	100.0%	500,000	40.0%	300,000	24.0%	1	$8.00	0.25	0.240	$1.92	0.25%	162,981	$3,948,321	$3.16	5.4%
Thrips	1,250,000	100.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Trochanter Mealybug	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Velvetbean Caterpillar	750,000	60.0%	500,000	40.0%	250,000	20.0%	1	$8.00	0.50	0.200	$1.60	0.30%	195,577	$3,857,985	$3.09	5.3%
Other	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
										3.216	**$38.21**	**4.13%**	**2,692,448**	**$73,338,257**	**$58.67**	**100.0%**

SUMMARY DATA

Data Input

State	LA
Year	2016
Total Acres	1,250,000
Yield/acre	50
Price/Bushel	$9.50
% Acres Scouted	90
Scouting Fee/scouted acre	$10.00
% Acres Insect Seed Trt.	95
Seed Trt Cost/treated ac	$12.00

Yield & Management Results

Total Bushels Harvested	62,500,000
Total Bushels Lost to Insects	2,692,448
Percent Yield Loss	4.13%
Yield w/o Insects	52.15
Ave. # Spray Applications	3.216
Seed Treated Acres	1,187,500
Scouted Acres	1,125,000

Economic Results

	Total	Per Acre
Foliar Insecticides Costs	$47,760,000	$38.21
Seed Treatment Costs	$14,250,000	$11.40
Scouting costs	$11,250,000	$9.00
Total Costs	$73,260,000	$58.61
Yield Lost to insects	$25,578,257	$20.46
Total Losses + Costs	$98,838,257	$79.07

Stink Bug Composition

Species	% of SB
Brown	29
Brown Marmorated	0
Green	1
Redbanded	60
Redshouldered	1
Southern Green	10
Total	100

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Appendix 5. Mississippi soybean insect losses, 2016.

Pest	Acres Infested	% Acres Infested	Acres above ET	% Acres above ET	Acres Treated	% Acres Treated	# of apps/acres treated	Cost of 1 Insecticide	% loss per acre infested	# of apps per total soy acres	cost/acre	Overall % reduction	bushel lost per pest	Loss + Cost	Loss + Cost/acre	% Total Loss + Cost
Armyworm complex	500,000	24.4%	300,000	14.6%	350,000	17.1%	1	$9.00	0.40	0.171	$1.54	0.10%	105,098	$4,182,063	$2.04	3.6%
Banded Cucumber Beetle	400,000	19.5%	0	0.0%	0	0.0%	0	$9.00	0.01	0.000	$0.00	0.00%	2,102	$20,641	$0.01	0.0%
Bean Leaf Beetle	1,800,000	87.8%	650,000	31.7%	750,000	36.6%	1.2	$11.00	0.20	0.439	$4.83	0.18%	189,176	$11,757,713	$5.74	10.1%
Blister Beetle	25,000	1.2%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	13	$129	$0.00	0.0%
Corn Earworm	600,000	29.3%	350,000	17.1%	400,000	19.5%	1.1	$16.50	3.50	0.215	$3.54	1.02%	1,103,529	$18,096,659	$8.83	15.6%
Cutworms	200,000	9.8%	100,000	4.9%	15,000	0.7%	1	$9.00	0.10	0.007	$0.07	0.01%	10,510	$238,206	$0.12	0.2%
Dectes Stem Borer	1,600,000	78.0%	0	0.0%	0	0.0%	0	$0.00	0.20	0.000	$0.00	0.16%	168,157	$1,651,300	$0.81	1.4%
Garden Webworms	100,000	4.9%	0	0.0%	0	0.0%	0	$0.00	0.15	0.000	$0.00	0.01%	7,882	$77,405	$0.04	0.1%
Grape Colaspis	400,000	19.5%	0	0.0%	0	0.0%	0	$9.00	0.10	0.000	$0.00	0.02%	21,020	$206,413	$0.10	0.2%
Grasshopper	1,000,000	48.8%	10,000	0.5%	12,500	0.6%	1	$8.00	0.10	0.006	$0.05	0.05%	52,549	$616,031	$0.30	0.5%
Green Cloverworm	1,750,000	85.4%	800,000	39.0%	850,000	41.5%	1	$9.00	0.70	0.415	$3.73	0.60%	643,725	$13,971,384	$6.82	12.0%
Kudzu Bug	1,200,000	58.5%	150,000	7.3%	250,000	12.2%	1	$9.00	0.00	0.122	$1.10	0.00%	0	$2,250,000	$1.10	1.9%
Lesser Cornstalk Borer	25,000	1.2%	0	0.0%	0	0.0%	0	$0.00	5.00	0.000	$0.00	0.06%	65,686	$645,039	$0.31	0.6%
Mexican Bean Beetle	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Potato Leafhopper	500,000	24.4%	0	0.0%	1,000	0.0%	1	$8.00	0.00	0.000	$0.00	0.00%	0	$8,000	$0.00	0.0%
Saltmarsh Caterpillar	550,000	26.8%	70,000	3.4%	75,000	3.7%	1	$13.00	0.50	0.037	$0.48	0.13%	144,510	$2,394,086	$1.17	2.1%
Soybean Aphid	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Soybean Looper	1,700,000	82.9%	900,000	43.9%	1,200,000	58.5%	1	$16.00	1.50	0.585	$9.37	1.24%	1,340,000	$32,358,800	$15.78	27.8%
Spider Mites	125,000	6.1%	0	0.0%	0	0.0%	0	$10.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Spotted Cucumber Beetle	1,900,000	92.7%	0	0.0%	0	0.0%	0	$9.00	0.10	0.000	$0.00	0.09%	99,843	$980,460	$0.48	0.8%
Stink Bugs (see box below)	1,500,000	73.2%	750,000	36.6%	850,000	41.5%	1.3	$9.50	0.75	0.539	$5.12	0.55%	591,176	$16,302,853	$7.95	14.0%
Threecornered Alfalfa Hopper	2,000,000	97.6%	10,000	0.5%	25,000	1.2%	1	$8.50	0.01	0.012	$0.10	0.01%	10,510	$315,706	$0.15	0.3%
Thrips	2,000,000	97.6%	0	0.0%	0	0.0%	0	$8.50	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Trochanter Mealybug	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Velvetbean Caterpillar	850,000	41.5%	250,000	12.2%	300,000	14.6%	1	$12.00	1.50	0.146	$1.76	0.62%	670,000	$10,179,400	$4.97	8.8%
Other	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
										2.694	**$31.68**	**4.85%**	**5,225,488**	**$116,252,287**	**$56.71**	**100.0%**

SUMMARY DATA

Data Input

State	MS
Year	2016
Total Acres	2,050,000
Yield/acre	50
Price/Bushel	$9.82
% Acres Scouted	90
Scouting Fee/scouted acre	$6.46
% Acres Insect Seed Trt.	80
Seed Trt Cost/treated ac	$12.00

Yield & Management Results

Total Bushels Harvested	102,500,000
Total Bushels Lost to Insects	5,225,488
Percent Yield Loss	4.85%
Yield w/o Insects	52.55
Ave. # Spray Applications	2.694
Seed Treated Acres	1,640,000
Scouted Acres	1,845,000

Economic Results

	Total	Per Acre
Foliar Insecticides Costs	$64,938,000	$31.68
Seed Treatment Costs	$19,680,000	$9.60
Scouting costs	$11,918,700	$5.81
Total Costs	$96,536,700	$47.09
Yield Lost to insects	$51,314,287	$25.03
Total Losses + Costs	$147,850,987	$72.12

Stink Bug Composition

Species	% of SB
Brown	30
Brown Marmorated	0
Green	30
Redbanded	29
Redshouldered	1
Southern Green	10
Total	100

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Appendix 6. North Carolina soybean insect losses, 2016.

Pest	Acres Infested	% Acres Infested	Acres above ET	% Acres above ET	Acres Treated	% Acres Treated	# of apps/acres treated	Cost of 1 Insecticide	% loss per acre infested	# of apps per total soy acres	cost/acre	Overall % reduction	bushel lost per pest	Loss + Cost	Loss + Cost/acre	% Total Loss + Cost
Armyworm complex	83,333	5.1%	25,185	1.5%	9,056	0.6%	1	$10.00	0.50	0.006	$0.06	0.03%	16,108	$251,642	$0.15	0.4%
Banded Cucumber Beetle	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Bean Leaf Beetle	924,074	56.7%	300,000	18.4%	248,122	15.2%	1	$8.00	0.50	0.152	$1.22	0.28%	178,622	$3,771,200	$2.31	5.9%
Blister Beetle	744,444	45.7%	1,500	0.1%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Corn Earworm	1,408,333	86.4%	600,000	36.8%	744,367	45.7%	1.1	$12.00	5.00	0.502	$6.03	4.32%	2,722,292	$37,048,561	$22.73	58.3%
Cutworms	83,333	5.1%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Dectes Stem Borer	740,741	45.4%	0	0.0%	0	0.0%	0	$0.00	0.01	0.000	$0.00	0.00%	2,864	$28,637	$0.02	0.0%
Garden Webworms	4,630	0.3%	0	0.0%	36,222	2.2%	1	$8.00	0.00	0.022	$0.18	0.00%	0	$289,776	$0.18	0.5%
Grape Colaspis	740,741	45.4%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Grasshopper	190,741	11.7%	5,556	0.3%	5,000	0.3%	1	$8.00	0.10	0.003	$0.02	0.01%	7,374	$113,740	$0.07	0.2%
Green Cloverworm	1,111,111	68.2%	10,000	0.6%	9,056	0.6%	1	$8.00	0.10	0.006	$0.04	0.07%	42,955	$502,001	$0.31	0.8%
Kudzu Bug	28,333	1.7%	300	0.0%	200	0.0%	1	$8.00	0.10	0.000	$0.00	0.00%	1,095	$12,553	$0.01	0.0%
Lesser Cornstalk Borer	926	0.1%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Mexican Bean Beetle	66,667	4.1%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Potato Leafhopper	453,704	27.8%	0	0.0%	18,111	1.1%	1	$8.00	0.00	0.011	$0.09	0.00%	0	$144,888	$0.09	0.2%
Saltmarsh Caterpillar	7,407	0.5%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Soybean Aphid	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Soybean Looper	1,151,852	70.7%	200,000	12.3%	287,061	17.6%	1	$14.00	2.00	0.176	$2.47	1.41%	890,607	$12,924,921	$7.93	20.3%
Spider Mites	29,630	1.8%	0	0.0%	0	0.0%	0	$0.00	0.50	0.000	$0.00	0.01%	5,727	$57,274	$0.04	0.1%
Spotted Cucumber Beetle	853,704	52.4%	0	0.0%	0	0.0%	0	$0.00	0.10	0.000	$0.00	0.05%	33,004	$330,040	$0.20	0.5%
Stink Bugs (see box below)	1,240,000	76.1%	300,000	18.4%	463,644	28.4%	1	$8.00	0.50	0.284	$2.28	0.38%	239,691	$6,106,058	$3.75	9.6%
Threecornered Alfalfa Hopper	925,926	56.8%	0	0.0%	0	0.0%	0	$0.00	0.50	0.000	$0.00	0.28%	178,980	$1,789,804	$1.10	2.8%
Thrips	1,630,000	100.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Trochanter Mealybug	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Velvetbean Caterpillar	83,333	5.1%	0	0.0%	0	0.0%	0	$0.00	0.50	0.000	$0.00	0.03%	16,108	$161,082	$0.10	0.3%
Other	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
										1.163	**$12.38**	**6.88%**	**4,335,428**	**$63,532,178**	**$38.98**	**100.0%**

SUMMARY DATA

Data Input

State	NC
Year	2016
Total Acres	1,630,000
Yield/acre	36
Price/Bushel	$10.00
% Acres Scouted	15
Scouting Fee/scouted acre	$6.50
% Acres Insect Seed Trt.	55
Seed Trt Cost/treated ac	$10.00

Yield & Management Results

Total Bushels Harvested	58,680,000
Total Bushels Lost to Insects	4,335,428
Percent Yield Loss	6.88%
Yield w/o Insects	38.66
Ave. # Spray Applications	1.163
Seed Treated Acres	896,500
Scouted Acres	244,500

Economic Results

	Total	Per Acre
Foliar Insecticides Costs	$20,177,898	$12.38
Seed Treatment Costs	$8,965,000	$5.50
Scouting costs	$1,589,250	$0.98
Total Costs	$30,732,148	$18.85
Yield Lost to insects	$43,354,279	$26.60
Total Losses + Costs	$74,086,428	$45.45

Stink Bug Composition

Species	% of SB
Brown	36
Brown Marmorated	1
Green	55
Redbanded	0
Redshouldered	1
Southern Green	7
Total	100

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Appendix 7. Tennessee soybean insect losses, 2016.

Pest	Acres Infested	% Acres Infested	Acres above ET	% Acres above ET	Acres Treated	% Acres Treated	# of apps/acres treated	Cost of 1 Insecticide	% loss per acre infested	# of apps per total soy acres	cost/acre	Overall % reduction	bushel lost per pest	Loss + Cost	Loss + Cost/acre	% Total Loss + Cost
Armyworm complex	180,000	10.8%	9,000	0.5%	1,000	0.1%	1	$9.00	0.40	0.001	$0.01	0.04%	32,235	$328,125	$0.20	1.8%
Banded Cucumber Beetle	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Bean Leaf Beetle	1,660,000	100.0%	110,000	6.6%	110,000	6.6%	1.2	$9.00	0.20	0.080	$0.72	0.20%	148,639	$2,659,522	$1.60	14.6%
Blister Beetle	18,000	1.1%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Corn Earworm	35,000	2.1%	1,300	0.1%	700	0.0%	1	$11.00	3.00	0.000	$0.00	0.06%	47,009	$473,091	$0.28	2.6%
Cutworms	40,000	2.4%	0	0.0%	0	0.0%	1	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Dectes Stem Borer	1,300,000	78.3%	0	0.0%	9,000	0.5%	1	$7.50	0.30	0.005	$0.04	0.23%	174,606	$1,796,095	$1.08	9.8%
Garden Webworms	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Grape Colaspis	15,000	0.9%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Grasshopper	80,000	4.8%	0	0.0%	0	0.0%	0	$0.00	0.05	0.000	$0.00	0.00%	1,791	$17,729	$0.01	0.1%
Green Cloverworm	1,450,000	87.3%	20,000	1.2%	20,000	1.2%	1	$7.50	0.30	0.012	$0.09	0.26%	194,752	$2,078,048	$1.25	11.4%
Kudzu Bug	450,000	27.1%	31,000	1.9%	43,000	2.6%	1	$8.25	0.60	0.026	$0.21	0.16%	120,881	$1,551,469	$0.93	8.5%
Lesser Cornstalk Borer	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Mexican Bean Beetle	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Potato Leafhopper	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Saltmarsh Caterpillar	90,000	5.4%	3,000	0.2%	1,700	0.1%	1	$7.75	0.10	0.001	$0.01	0.01%	4,029	$53,066	$0.03	0.3%
Soybean Aphid	0	0.0%	0	0.0%	0	0.0%	1	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Soybean Looper	90,000	5.4%	24,000	1.4%	18,000	1.1%	1	$15.00	0.50	0.011	$0.16	0.03%	20,147	$469,453	$0.28	2.6%
Spider Mites	8,000	0.5%	250	0.0%	0	0.0%	0	$0.00	0.05	0.000	$0.00	0.00%	179	$1,773	$0.00	0.0%
Spotted Cucumber Beetle	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Stink Bugs (see box below)	1,300,000	78.3%	75,000	4.5%	100,000	6.0%	1	$7.75	0.60	0.060	$0.47	0.47%	349,211	$4,232,189	$2.55	23.2%
Threecornered Alfalfa Hopper	1,660,000	100.0%	60,000	3.6%	40,000	2.4%	1	$7.50	0.20	0.024	$0.18	0.20%	148,639	$1,771,522	$1.07	9.7%
Thrips	1,660,000	100.0%	0	0.0%	14,000	0.8%	1	$5.00	0.05	0.008	$0.04	0.05%	37,160	$437,880	$0.26	2.4%
Trochanter Mealybug	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.30	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Velvetbean Caterpillar	900	0.1%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Other	0	0.0%	0	0.0%	790,000	47.6%	1	$3.00	0.00	0.476	$1.43	0.00%	0	$2,370,000	$1.43	13.0%
										0.704	**$3.36**	**1.72%**	**1,279,277**	**$18,239,962**	**$10.99**	**100.0%**

SUMMARY DATA

Data Input

State	TN
Year	2016
Total Acres	1,660,000
Yield/acre	44
Price/Bushel	$9.90
% Acres Scouted	42
Scouting Fee/scouted acre	$6.50
% Acres Insect Seed Trt.	48
Seed Trt Cost/treated ac	$7.00

Yield & Management Results

Total Bushels Harvested	73,040,000
Total Bushels Lost to Insects	1,279,277
Percent Yield Loss	1.72%
Yield w/o Insects	44.77
Ave. # Spray Applications	0.704
Seed Treated Acres	796,800
Scouted Acres	697,200

Economic Results

	Total	Per Acre
Foliar Insecticides Costs	$5,575,125	$3.36
Seed Treatment Costs	$5,577,600	$3.36
Scouting costs	$4,531,800	$2.73
Total Costs	$15,684,525	$9.45
Yield Lost to insects	$12,664,837	$7.63
Total Losses + Costs	$28,349,362	$17.08

Stink Bug Composition

Species	% of SB
Brown	18
Brown Marmorated	5
Green	76
Redbanded	0
Redshouldered	0
Southern Green	1
Total	100

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Appendix 8. Virginia soybean insect losses, 2016.

Pest	Acres Infested	% Acres Infested	Acres above ET	% Acres above ET	Acres Treated	% Acres Treated	# of apps/acres treated	Cost of 1 Insecticide	% loss per acre infested	# of apps per total soy acres	cost/acre	Overall % reduction	bushel lost per pest	Loss + Cost	Loss + Cost/acre	% Total Loss + Cost
Armyworm complex	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Banded Cucumber Beetle	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Bean Leaf Beetle	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Blister Beetle	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Corn Earworm	25,000	4.2%	0	0.0%	12,500	2.1%	1	$10.00	1.00	0.021	$0.21	0.04%	9,316	$218,161	$0.36	11.9%
Cutworms	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Dectes Stem Borer	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Garden Webworms	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Grape Colaspis	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Grasshopper	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Green Cloverworm	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Kudzu Bug	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Lesser Cornstalk Borer	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Mexican Bean Beetle	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Potato Leafhopper	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Saltmarsh Caterpillar	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Soybean Aphid	1,000	0.2%	500	0.1%	500	0.1%	1	$4.00	0.00	0.001	$0.00	0.00%	0	$2,000	$0.00	0.1%
Soybean Looper	500	0.1%	500	0.1%	500	0.1%	1	$10.00	1.00	0.001	$0.01	0.00%	186	$6,863	$0.01	0.4%
Spider Mites	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Spotted Cucumber Beetle	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Stink Bugs (see box below)	200,000	33.3%	25,000	4.2%	25,000	4.2%	1	$4.50	2.00	0.042	$0.19	0.67%	149,057	$1,603,071	$2.67	87.6%
Threecornered Alfalfa Hopper	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Thrips	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Trochanter Mealybug	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Velvetbean Caterpillar	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Other	0	0.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
										0.064	**$0.41**	**0.71%**	**158,559**	**$1,830,095**	**$3.05**	**100.0%**

SUMMARY DATA

Data Input

State	VA
Year	2016
Total Acres	600,000
Yield/acre	37
Price/Bushel	$10.00
% Acres Scouted	20
Scouting Fee/scouted acre	$0.00
% Acres Insect Seed Trt.	10
Seed Trt Cost/treated ac	$12.00

Yield & Management Results

Total Bushels Harvested	22,200,000
Total Bushels Lost to Insects	158,559
Percent Yield Loss	0.71%
Yield w/o Insects	37.26
Ave. # Spray Applications	0.064
Seed Treated Acres	60,000
Scouted Acres	120,000

Economic Results

	Total	Per Acre
Foliar Insecticides Costs	$244,500	$0.41
Seed Treatment Costs	$720,000	$1.20
Scouting costs	$0	$0.00
Total Costs	$964,500	$1.61
Yield Lost to insects	$1,585,595	$2.64
Total Losses + Costs	$2,550,095	$4.25

Stink Bug Composition

Species	% of SB
Brown	9
Brown Marmorated	1
Green	90
Redbanded	0
Redshouldered	0
Southern Green	0
Total	100

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