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Report

2017 Rice Insect Losses in the United States

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Abstract Estimates of the costs and losses associated with multiple insect pests of rice were compiled for 5 rice-producing states. Participating states included Arkansas, California, Louisiana, Mississippi, and Texas, accounting for approximately 90% of the rice grown in the US. Overall, insects accounted for more than $133 million in costs and losses during 2017, averaging $60.40 per acre. Rice water weevil caused more yield loss than all other insect pests across all participating states, followed by rice stink bug and true armyworm.

Key Words: rice, yield loss, pest management

Introduction

Rice is an important crop in some areas of the US that can be negatively impacted by multiple insect pests. Pests such as rice water weevil and rice stink bug have been documented to cause major yield losses when high populations are observed (Bowling, 1959, and Swanson and Newsom, 1962). Currently there are no annual records on the economic impact these insect pests have on rice production. The objective of this project was to document how the pest complex changes throughout rice-producing states, along with reporting the cost of control and yield losses associated with rice insect pests. These estimates will be made annually to document changes in pest populations, control tactics, and impacts throughout the rice-growing regions of the US.

Material and Methods

During the fall of 2017 impacts of insect pests in rice were estimated. Rice growers, crop consultants, university specialists, and retailers were informally contacted by an author about their experiences with rice insect pests for the 2017 growing season. Acreage, yield, and price values were obtained from the National Agriculture Statistical Survey (NASS USDA 2017). An estimate of pure line, or inbred rice, and hybrid rice, a cross between two rice varieties that are genetically different, acres was also included. All data were processed in an Excel spreadsheet similar to Musser et al. (2008).

Results and Discussion

Seed treatments were used on 66% of rice acres in 2017 for the reporting states, with either CruiserMaxx (Thiamethoxam, Syngenta Crop Protection, Greensboro, NC) or NipsIt Inside (Clothianidin, Valent USA

Corporation, Walnut Creek, CA) being the predominant seed treatments used. Over 100% of the hybrid rice acres were treated with insecticide seed treatments. This was due to growers over treating extra insecticide seed treatment on top of the seed treatment package that was already on the seed. Of the 2.2 million acres of rice grown in 2017, 79% were scouted by either a private consultant, university specialist, or retailer. Rice water weevil caused the greatest amount of yield loss (2.77%/acre). However, rice stink bug received the most foliar insecticide applications at 1.27 applications/acre. Overall, an estimated yield loss of 3.8% was attributed to insect pests with an average cost of $23.01/acre, leading to a loss plus cost estimate of over $130 million for rice growers in the US (Table 1, Appendix 1).

State Highlights

Arkansas. Rice water weevil caused the most yield loss in Arkansas during 2017 with a 3% per infested acre yield reduction. Rice stink bug received the most foliar insecticide applications at 1.2 applications per acre.

California. Tadpole shrimp infested more acres than all other insect pests in California during 2017, however armyworm caused the most yield loss.

Louisiana. Louisiana had high infestations of rice water weevil, rice stink bug, and the stem borer complex. Dermacor X100 is the predominant seed treatment in Louisiana because of its efficacy against stem borers. Acres infested with rice stink bug received the most foliar applications averaging over 1 application per treated acre, but only 20% of total acreage was treated due to incompatibility of insecticides with crawfish production. Approximately 20% of the rice acres were also infested with South American rice miner.

Mississippi. Infestations of rice water weevil, rice stink bug, and fall armyworm were observed in Mississippi during 2017. An estimated 40%, 70%, and 70% of the infested acres were treated for rice water weevil, rice stink bug, and fall armyworm, respectively.

Texas. Rice water weevil and rice stink bug infested more acres than all other insect pests. An average of 1.5 applications per acre were required to control rice stink bug costing growers $20 per application. A higher percentage of the acres were also infested with Mexican rice borer.

Table 1. Insect management practices for multiple rice growing states in the US for 2017.

State	Scouted*	Insecticide Seed Treatment*	Total Foliar Applications/acre	Costs+Losses†
Arkansas	85%	83%	1.01	$66.78
California	90%	0%	0.56	$17.34
Louisiana	85%	83%	0.29	$69.74
Mississippi	100%	65%	2.07	$70.92
Texas	50%	95%	2.02	$70.07
Average (weighted by acreage)	79%	66%	0.66	$60.40

*Percent of acreage

†Dollars per acre

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List of Appendices

Appendix 1. Overall rice insect losses from 5 surveyed states, 2017.

Appendix 2. Arkansas rice insect losses in 2017.

Appendix 3. California rice insect losses in 2017.

Appendix 4. Louisiana rice insect losses in 2017.

Appendix 5. Mississippi rice insect losses in 2017.

Appendix 6. Texas rice insect losses in 2017.

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Appendix 1. Overall rice insect losses from 5 surveyed states, 2017.

Combined in the year 2017

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 rice acres	cost/acre	Overall % reduction	bushel lost per pest	Loss + Cost	Loss + Cost/acre	% Total Loss + Cost
Aphids	344,200	15.5%	0	0.0%	0	0.0%	0.00	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Chinch Bug	343,668	15.5%	29,880	1.3%	57,480	2.6%	1.00	$9.90	0.00	0.026	$0.26	0.00%	1,509	$577,509	$0.26	0.5%
Fall Armyworm	768,368	34.7%	175,400	7.9%	383,354	17.3%	1.00	$9.34	0.13	0.173	$1.62	0.05%	181,082	$4,590,262	$2.07	4.3%
Grape Colaspis	602,507	27.2%	149,507	6.8%	0	0.0%	0.00	$0.00	0.93	0.000	$0.00	0.25%	984,300	$5,484,740	$2.48	5.1%
Grasshoppers	1,372,300	62.0%	12,180	0.6%	12,640	0.6%	1.00	$10.30	0.01	0.006	$0.06	0.00%	19,114	$236,748	$0.11	0.2%
Leafhoppers	403,600	18.2%	0	0.0%	0	0.0%	0.00	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Mexican Rice Borer	378,643	17.1%	16,000	0.7%	16,000	0.7%	1.00	$3.40	0.38	0.007	$0.02	0.07%	254,150	$1,470,578	$0.66	1.4%
Rice Delphacid	0	0.0%	0	0.0%	0	0.0%	0.00	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Rice Seed Midge	220,800	10.0%	0	0.0%	0	0.0%	0.00	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Rice Stalk Borer	400,243	18.1%	0	0.0%	0	0.0%	0.00	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Rice Stink Bug	1,757,671	79.4%	679,614	30.7%	854,014	38.6%	1.28	$11.77	1.60	0.493	$5.80	1.27%	4,963,503	$40,504,834	$18.29	37.6%
Rice Water Weevil	1,773,521	80.1%	581,686	26.3%	150,825	6.8%	1.00	$10.92	2.64	0.068	$0.74	2.11%	8,255,762	$47,650,030	$21.52	44.3%
Sugarcane Borer	326,557	14.7%	58,661	2.6%	0	0.0%	0.00	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Tadpole Shrimp	210,950	9.5%	125,034	5.6%	125,034	5.6%	1.00	$20.00	0.00	0.056	$1.13	0.00%	0	$2,500,680	$1.13	2.3%
True Armyworm	255,704	11.5%	89,000	4.0%	89,000	4.0%	1.00	$40.00	0.44	0.040	$1.61	0.05%	196,348	$4,654,096	$2.10	4.3%
										0.870	**$11.24**	**3.80%**	**14,855,768**	**$107,669,478**	**$48.63**	**100.0%**

SUMMARY DATA

Data Input

State	Combined
Year	2017
Total Acres	2,214,071
% Pureline	70%
% Hybrid	30%
Avg. Variety Seeding Rate	93
Avg. Hybrid Seeding Rate	19
Yield (bushels/acre)	170
Price/Bushel	$5.57
% Acres Scouted	80%
Scouting Fee/scouted acre	$8.01
% Acres Insect Seed Trt.	66%
Avg. Seed Trt Cost/treated ac	$8.15

Seed Treatment Breakdown

	% of Treated Acres	# of Acres	Price/Acre
Pureline			
NipsIt Suite	9%	143,542	$8.88
CruiserMaxx	25%	396,115	$14.38
Dermacor X-100	22%	338,508	$19.91
Untreated	57%	885,991	$0.00
Hybrid			
NipsIt Suite	100%	659,701	$3.86
CruiserMaxx	1%	4,220	$5.63
Dermacor X-100	10%	67,850	$12.67
Untreated	0%	0	$0.00

Yield & Management Results

Total Bushels Harvested	375,911,721
Total Bushels Lost to Insects	14,855,768
Percent Yield Loss	3.80%
Yield w/o Insects	176.49
Ave. # Spray Applications	0.870
Seed Treated Acres	1,459,009
Scouted Acres	1,767,543

Economic Results

	Total	Per Acre
Foliar Insecticides Costs	$24,889,821	$11.24
Seed Treatment Costs	$11,896,412	$5.37
Scouting costs	$14,156,735	$6.39
Total Costs	$50,942,968	$23.01
Yield Lost to insects	$82,779,657	$37.39
Total Losses + Costs	$133,722,625	$60.40

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Appendix 2. Arkansas rice insect losses in 2017.

Arkansas in the year 2017

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 rice acres	cost/acre	Overall % reduction	bushel lost per pest	Loss + Cost	Loss + Cost/acre	% Total Loss + Cost
Aphids	331,200	30.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Chinch Bug	220,800	20.0%	27,600	2.5%	55,200	5.0%	1	$10.00	0.00	0.050	$0.50	0.00%	0	$552,000	$0.50	1.0%
Fall Armyw orm	552,000	50.0%	110,400	10.0%	276,000	25.0%	1	$10.00	0.00	0.250	$2.50	0.00%	0	$2,760,000	$2.50	4.9%
Grape Colaspis	552,000	50.0%	110,400	10.0%	0	0.0%	0	$0.00	1.00	0.000	$0.00	0.50%	959,497	$4,970,196	$4.50	8.9%
Grasshoppers	1,104,000	100.0%	11,040	1.0%	11,040	1.0%	1	$10.00	0.00	0.010	$0.10	0.00%	0	$110,400	$0.10	0.2%
Leafhoppers	220,800	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%
Mexican Rice 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%
Rice Delphacid	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%
Rice Seed Midge	220,800	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%
Rice Stalk Borer	165,600	15.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Rice Stink Bug	1,104,000	100.0%	441,600	40.0%	552,000	50.0%	1.2	$10.00	1.00	0.600	$6.00	1.00%	1,918,995	$16,564,393	$15.00	29.6%
Rice Water Weevil	1,104,000	100.0%	331,200	30.0%	110,400	10.0%	1	$11.45	3.00	0.100	$1.15	3.00%	5,756,984	$31,085,259	$28.16	55.5%
Sugarcane 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%
Tadpole Shrimp	55,200	5.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
True Armyw orm	66,240	6.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
									TOTAL	**1.010**	**$10.25**	**4.50%**	**8,635,476**	**$56,042,248**	**$50.76**	**100.0%**

SUMMARY DATA

Data Input

State	AR
Year	2017
Total Acres	1,104,000
% Pureline	59%
% Hybrid	41%
Avg. Variety Seeding Rate	75
Avg. Hybrid Seeding Rate	24
Yield (bushels/acre)	166
Price/Bushel	$5.18
% Acres Scouted	85%
Scouting Fee/scouted acre	$10.00
% Acres Insect Seed Trt.	83%
Avg. Seed Trt Cost/treated ac	$9.06

Seed Treatment Breakdown

	% of Treated Acres	# of Acres	Price/Acre
Variety			
NipsIt Suite	19%	123,758	11.00
CruiserMaxx	54%	351,734	15.00
Dermacor X-10(	0%	0	22.80
Hybrid			
NipsIt Suite	100%	452,640	5.00
CruiserMaxx	0%	0	7.00
Dermacor X-10(	0%	0	14.40

Yield & Management Results

Total Bushels Harvested	183,264,000
Total Bushels Lost to Insects	8,635,476
Percent Yield Loss	4.50%
Yield w /o Insects	173.82
Ave. # Spray Applications	1.01
Seed Treated Acres	916,320
Scouted Acres	938,400

Economic Results

	Total	Per Acre
Foliar Insecticides Costs	$11,310,480	$10.25
Seed Treatment Costs	$8,303,790	$7.52
Scouting costs	$9,384,000	$8.50
Total Costs	$28,998,270	$26.27
Yield Lost to insects	$44,731,768	$40.52
Total Losses + Costs	$73,730,038	$66.78

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Appendix 3. California rice insect losses in 2017.

California in the year 2017

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 rice acres	cost/acre	Overall % reduction	bushel lost per pest	Loss + Cost	Loss + Cost/acre	% Total Loss + Cost
Aphids	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%
Chinch 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%
Fall Armyworm	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%
Grasshoppers	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%
Leafhoppers	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 Rice 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%
Rice Delphacid	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%
Rice Seed Midge	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%
Rice Stalk 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%
Rice Stink 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%
Rice Water Weevil	4,450	1.0%	2,225	0.5%	2,225	0.5%	1	$20.00	0.00	0.005	$0.10	0.00%	0	$44,500	$0.10	0.6%
Sugarcane 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%
Tadpole Shrimp	155,750	35.0%	125,034	28.1%	125,034	28.1%	1	$20.00	0.00	0.281	$5.62	0.00%	0	$2,500,680	$5.62	32.4%
True Armyworm	111,250	25.0%	89,000	20.0%	89,000	20.0%	1	$40.00	1.00	0.200	$8.00	0.25%	218,596	$5,173,242	$11.63	67.0%
									TOTAL	**0.486**	**$13.72**	**0.25%**	**218,596**	**$7,718,422**	**$17.34**	**100.0%**

SUMMARY DATA

Data Input

State	CA
Year	2017
Total Acres	445,000
% Pureline	100%
% Hybrid	0%
Avg. Variety Seeding Rate	180
Avg. Hybrid Seeding Rate	0
Yield (bushels/acre)	196
Price/Bushel	$7.38
% Acres Scouted	90%
Scouting Fee/scouted acre	$0.00
% Acres Insect Seed Trt.	0%
Avg. Seed Trt Cost/treated ac	$0.00

Seed Treatment Breakdown

	% of Treated Acres	# of Acres	Price/Acre
Variety			
NipsIt Inside	**No seed treatments in California**		
CruiserMaxx			
Dermacor X-100			
Hybrid			
NipsIt Inside			
CruiserMaxx			
Dermacor X-100			

Yield & Management Results

Total Bushels Harvested	87,220,000
Total Bushels Lost to Insects	218,596
Percent Yield Loss	0.25%
Yield w/o Insects	196.49
Ave. # Spray Applications	0.486
Seed Treated Acres	0
Scouted Acres	400,500

Economic Results

	Total	Per Acre
Foliar Insecticides Costs	$6,105,180	$13.72
Seed Treatment Costs	$0	$0.00
Scouting costs	$0	$0.00
Total Costs	$6,105,180	$13.72
Yield Lost to insects	$1,613,242	$3.63
Total Losses + Costs	$7,718,422	$17.34

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Appendix 4. Louisiana rice insect losses in 2017.

Louisiana in the year 2017

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 rice acres	cost/acre	Overall % reduction	bushel lost per pest	Loss + Cost	Loss + Cost/acre	% Total Loss + Cost
Aphids	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%
Chinch Bug	97,768	25.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Fall Armyworm	97,768	25.0%	0	0.0%	19,554	5.0%	1	$10.00	0.00	0.050	$0.50	0.00%	0	$195,536	$0.50	0.9%
Grape Colaspis	39,107	10.0%	39,107	10.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Grasshoppers	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%
Leafhoppers	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 Rice Borer	234,643	60.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Rice Delphacid	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%
Rice Seed Midge	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%
Rice Stalk Borer	234,643	60.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Rice Stink Bug	391,071	100.0%	78,214	20.0%	78,214	20.0%	1.2	$10.00	3.50	0.240	$2.40	3.50%	2,198,734	$12,350,001	$31.58	59.7%
Rice Water Weevil	391,071	100.0%	58,661	15.0%	0	0.0%	0	$0.00	2.50	0.000	$0.00	2.50%	1,570,524	$8,151,022	$20.84	39.4%
Sugarcane Borer	312,857	80.0%	58,661	15.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Tadpole Shrimp	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%
True Armyworm	58,661	15.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
South American Rice Miner	78,214	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%
									TOTAL	**0.290**	**$2.90**	**6.00%**	**3,769,259**	**$20,696,559**	**$52.92**	**100.0%**

SUMMARY DATA

Data Input

State	LA
Year	2017
Total Acres	391,071
% Pureline	85%
% Hybrid	15%
Avg. Variety Seeding Rate	60
Avg. Hybrid Seeding Rate	25
Yield (bushels/acre)	151
Price/Bushel	$5.19
% Acres Scouted	60%
Scouting Fee/scouted acre	$8.50
% Acres Insect Seed Trt.	83%
Avg. Seed Trt Cost/treated ac	$14.12

Seed Treatment Breakdown

	% of Treated Acres	# of Acres	Price/Acre
Variety			
NipsIt Inside	0%	0	0.00
CruiserMaxx	5%	16,621	11.00
Dermacor X-10(	81%	269,252	18.00
Hybrid			
NipsIt Inside	100%	58,661	6.00
CruiserMaxx	0%	0	6.00
Dermacor X-10(	20%	66,482	12.00

Yield & Management Results

Total Bushels Harvested	59,051,721
Total Bushels Lost to Insects	3,769,259
Percent Yield Loss	6.00%
Yield w/o Insects	160.64
Ave. # Spray Applications	0.290
Seed Treated Acres	324,589
Scouted Acres	234,643

Economic Results

	Total	Per Acre
Foliar Insecticides Costs	$1,134,106	$2.90
Seed Treatment Costs	$4,583,358	$11.72
Scouting costs	$1,994,462	$5.10
Total Costs	$7,711,926	$19.72
Yield Lost to insects	$19,562,453	$50.02
Total Losses + Costs	$27,274,379	$69.74

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Appendix 5. Mississippi rice insect losses in 2017.

Mississippi in the year 2017

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 rice acres	cost/acre	Overall % reduction	bushel lost per pest	Loss + Cost	Loss + Cost/acre	% Total Loss + Cost
Aphids	11,400	10.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Chinch Bug	17,100	15.0%	2,280	2.0%	2,280	2.0%	1	$7.50	0.05	0.020	$0.15	0.01%	1,470	$24,642	$0.22	0.4%
Fall Armyworm	102,600	90.0%	57,000	50.0%	79,800	70.0%	1	$7.50	1.00	0.700	$5.25	0.90%	176,428	$1,503,577	$13.19	22.7%
Grape Colaspis	11,400	10.0%	0	0.0%	0	0.0%	0	$0.00	0.50	0.000	$0.00	0.05%	9,802	$50,282	$0.44	0.8%
Grasshoppers	108,300	95.0%	1,140	1.0%	0	0.0%	0	$0.00	0.10	0.000	$0.00	0.10%	18,623	$95,536	$0.84	1.4%
Leafhoppers	22,800	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%
Mexican Rice 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%
Rice Delphacid	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%
Rice Seed Midge	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%
Rice Stalk 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%
Rice Stink Bug	102,600	90.0%	79,800	70.0%	79,800	70.0%	1.5	$8.50	1.75	1.050	$8.93	1.58%	308,749	$2,601,334	$22.82	39.3%
Rice Water Weevil	114,000	100.0%	45,600	40.0%	34,200	30.0%	1	$9.50	2.00	0.300	$2.85	2.00%	392,063	$2,336,182	$20.49	35.3%
Sugarcane Borer	5,700	5.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Tadpole Shrimp	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%
True Armyworm	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%
									TOTAL	**2.070**	**$17.18**	**4.63%**	**907,135**	**$6,611,553**	**$58.00**	**100.0%**

SUMMARY DATA

Data Input

State	MS
Year	2017
Total Acres	114,000
% Pureline	40%
% Hybrid	60%
Avg. Variety Seeding Rate	70
Avg. Hybrid Seeding Rate	23
Yield (bushels/acre)	164
Price/Bushel	$5.13
% Acres Scouted	100%
Scouting Fee/scouted acre	$8.50
% Acres Insect Seed Trt.	65%
Avg. Seed Trt Cost/treated ac	$6.81

Seed Treatment Breakdown

	% of Treated Acres	# of Acres	Price/Acre
Variety			
NipsIt Inside	39%	17,784	10.50
CruiserMaxx	60%	27,360	11.50
Dermacor X-10	1%	456	14.82
Hybrid			
NipsIt Inside	100%	68,400	3.45
CruiserMaxx	5%	3,420	3.77
Dermacor X-10	2%	1,368	14.27

Yield & Management Results

Total Bushels Harvested	18,696,000
Total Bushels Lost to Insects	907,135
Percent Yield Loss	4.63%
Yield w/o Insects	171.96
Ave. # Spray Applications	2.070
Seed Treated Acres	74,100
Scouted Acres	114,000

Economic Results

	Total	Per Acre
Foliar Insecticides Costs	$1,957,950	$17.18
Seed Treatment Costs	$504,741	$4.43
Scouting costs	$969,000	$8.50
Total Costs	$3,431,691	$30.10
Yield Lost to insects	$4,653,603	$40.82
Total Losses + Costs	$8,085,294	$70.92

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Appendix 6. Texas rice insect losses in 2017.

Texas in the year 2017

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 rice acres	cost/acre	Overall % reduction	bushel lost per pest	Loss + Cost	Loss + Cost/acre	% Total Loss + Cost
Aphids	1,600	1.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Chinch Bug	8,000	5.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Fall Armyworm	16,000	10.0%	8,000	5.0%	8,000	5.0%	1	$3.40	0.00	0.050	$0.17	0.00%	0	$27,200	$0.17	0.3%
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%
Grasshoppers	160,000	100.0%	0	0.0%	1,600	1.0%	1	$12.40	0.00	0.010	$0.12	0.00%	0	$19,840	$0.12	0.2%
Leafhoppers	160,000	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%
Mexican Rice Borer	144,000	90.0%	16,000	10.0%	16,000	10.0%	1	$3.40	1.00	0.100	$0.34	0.90%	256,560	$1,208,921	$7.56	14.3%
Rice Delphacid	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%
Rice Seed Midge	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%
Rice Stalk 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%
Rice Stink Bug	160,000	100.0%	80,000	50.0%	144,000	90.0%	1.5	$21.30	1.00	1.350	$28.76	1.00%	285,067	$5,883,601	$36.77	69.7%
Rice Water Weevil	160,000	100.0%	144,000	90.0%	4,000	2.5%	1	$3.40	1.00	0.025	$0.09	1.00%	285,067	$1,296,401	$8.10	15.4%
Sugarcane Borer	8,000	5.0%	0	0.0%	0	0.0%	0	$0.00	0.00	0.000	$0.00	0.00%	0	$0	$0.00	0.0%
Tadpole Shrimp	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%
True Armyworm	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%
									TOTAL	**1.535**	**$29.47**	**2.90%**	**826,694**	**$8,435,964**	**$52.72**	**100.0%**

SUMMARY DATA

Data Input

State	TX
Year	2017
Total Acres	160,000
% Pureline	50%
% Hybrid	50%
Avg. Variety Seeding Rate	70
Avg. Hybrid Seeding Rate	20
Yield (bushels/acre)	173
Price/Bushel	$4.50
% Acres Scouted	50%
Scouting Fee/scouted acre	$15.00
% Acres Insect Seed Trt.	90%
Avg. Seed Trt Cost/treated ac	$10.94

Seed Treatment Breakdown

	% of Treated Acres	# of Acres	Price/Acre
Variety			
NipsIt Inside	3%	2,000	3.00
CruiserMaxx	1%	400	20.00
Dermacor X-100	86%	68,800	24.00
Untreated	10%	8,000	0.00
Hybrid			
NipsIt Inside	100%	80,000	1.00
CruiserMaxx	1%	800	5.75
Dermacor X-100	20%	202	10.00
Untreated	0%	0	0.00

Yield & Management Results

Total Bushels Harvested	27,680,000
Total Bushels Lost to Insects	826,694
Percent Yield Loss	2.90%
Yield w/o Insects	178.17
Ave. # Spray Applications	1.535
Seed Treated Acres	144,000
Scouted Acres	80,000

Economic Results

	Total	Per Acre
Foliar Insecticides Costs	$4,715,840	$29.47
Seed Treatment Costs	$1,574,820	$9.84
Scouting costs	$1,200,000	$7.50
Total Costs	$7,490,660	$46.82
Yield Lost to insects	$3,720,124	$23.25
Total Losses + Costs	$11,210,784	$70.07

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