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# Agricultural Chemical Usage 2007 Field Crops Summary

## May 2008

# USDA





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## Overview

This publication is a summary of pesticide and fertilizer usage on Field Crop and continues the series of **"Agricultural Chemical Usage"** reports issued by the United States Department of Agriculture's National Agricultural Statistics Service (USDA-NASS). This report contains statistics for on-farm use of commercial fertilizers, agricultural chemicals, and pest management practices from producers of targeted field and fruit crops for the 2007 crop year. The agricultural chemical use estimates in this report focus on the acreage treated with herbicides, insecticides, fungicides, and other pesticides. Chemical application rates listed by active ingredient are also featured in this publication. Other publications that have statistics for on-farm agricultural chemical usage have focused on pesticide chemical usage for nursery and floriculture crops (December 2007) and the restricted chemical usage report (May 2008). More details about these publications and others may be found on the USDA website at [http://www.nass.usda.gov/Statistics\\_by\\_Subject/Environmental/index.asp](http://www.nass.usda.gov/Statistics_by_Subject/Environmental/index.asp).

Information in this report is collected from a survey compiled from the Agricultural Resources Management Survey (ARMS). The ARMS survey is conducted in cooperation with the Economic Research Service (ERS). The information from the ARMS survey enables NASS to publish chemical use statistics and to provide ERS the ability to conduct economic analyses relating to field crop chemical usage.

Data collection occurred during the months of October-December of 2007. The targeted crops were cotton, apples, and organic apples. The States surveyed were: Alabama, Arkansas, California, Georgia, Louisiana, Michigan, Mississippi, Missouri, New York, North Carolina, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, and Washington. An example of the survey instrument used in data collection is included in the back of this publication

The Active Ingredient and Publication Status tables are provided to show all active ingredients reported in the Program States. The publication status is determined by confidentiality rules. In order to publish data for an active ingredient, there must be a minimum of 5 reports for the specific active ingredient at the summary level (by crop, by State, or all Program States). If there are 5 or more reports, then the active ingredient data are published and designated as a "P" in the table. In cases where there are fewer than 5 reports of an active ingredient, an "\*" appears in the table. This means the active ingredient was reported, but there were an insufficient number of reports to publish the data. If the publication status is blank, there were no reports for the active ingredient for that Program State.

Some pesticides are labeled for control of more than one type of pest, i.e., used as an insecticide and as a fungicide. In these instances, the active ingredient is listed under the pesticide class for which it was predominantly used. This report excludes pesticides used for seed treatments and postharvest applications to the commodity.

## Program States Surveyed for 2007 Field and Fruit Crops

State	Cotton	Apples	Organic Apples
Alabama	X		
Arkansas	X		
California	X	X	X
Georgia	X		
Louisiana	X		
Michigan		X	X
Mississippi	X		
Missouri	X		
New York		X	X
North Carolina	X	X	
Oregon		X	X
Pennsylvania		X	X
South Carolina	X		
Tennessee	X		
Texas	X		
Washington		X	X

Agricultural Chemical Use Survey Coverage, 2007 and 2005						
Crop	2007			2005		
	States Surveyed	Reports Summarized	U.S. Acreage Included in Survey	States Surveyed	Reports Summarized	U.S. Acreage Included in Survey
	-- Number --		Percent	-- Number --		Percent
	Cotton	11	1,542	94		
Apples	7	1,060	79	8	1,287	80
Organic Apples	6	180	N/A			

## Highlights

**Cotton:** Nitrogen was applied to 92 percent of the 2007 cotton planted acreage in the 11 Program States: Alabama, Arkansas, California, Georgia, Louisiana, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, and Texas. Cotton growers applied an average of 91 pounds of nitrogen per acre per crop year. Phosphate was applied to 67 percent of the cotton planted acreage in the Program States at an average rate of 43 pounds per acre per crop year. Potash, applied at 70 pounds per acre per crop year, was applied to 52 percent of the acreage planted to cotton. Sulfur was applied to 42 percent of the planted acreage, at an average rate of 13 pounds per acre per crop year.

Herbicides were applied to 97 percent of the Program States' cotton planted acreage in 2007. Glyphosate isopropylamine salt was the most commonly applied herbicide, applied to 85 percent of the planted acreage at a rate of 1.900 pounds per acre per crop year. The next two most commonly applied herbicides on a per acre basis were Trifluralin and Diuron, at 29 and 26 percent with average application rates of 0.921 and 0.499 pounds per acre per crop year, respectively.

Insecticides were applied to 66 percent of the 2007 cotton acreage. Acephate was the most utilized insecticide with 26 percent of the planted acreage being treated at an average rate of 0.900 pounds per acre per crop year. Dicrotophos was the second most commonly utilized insecticide, applied to 21 percent of acreage. It was applied at an average rate of 0.565 pounds per acre per crop year.

Fungicides were applied to 1 percent of the planted acres in the Program States. Etridiazole and PCNB were both applied to 1 percent of the acres planted to cotton. They were applied at an average rate of 0.146 and 0.635 pounds per acre per crop year, respectively.

Other Chemicals were used to treat 85 percent of the cotton acreage. Ethephon was the most commonly applied Other Chemical covering 69 percent of the acreage; followed by Thidiazuron, applied to 37 percent of the acreage; and Mepiquat chloride, applied to 35 percent of the acreage. They were applied at 1.259, 0.073, and 0.058 pounds per acre per year, respectively.

**Apples:** Seven States were included in the 2007 survey: California, Michigan, New York, North Carolina, Oregon, Pennsylvania, and Washington. Nitrogen was applied to 71 percent of the 2007 apple acres in the Program States at an average rate of 53 pounds per acre per crop year. Phosphate was applied to 24 percent of the planted acres, at an average rate of 36 pounds per acre per crop year. An average of 65 pounds per acre per crop year of Potash was applied to 34 percent of the bearing acreage. Sulfur was applied to 12 percent of the planted acres at an average rate of 27 pounds per acre per crop year.

Herbicides were applied to 61 percent of the apple bearing acreage in 2007 in the 7 Program States. The most utilized herbicide was Glyphosate isopropylamine salt, on 45 percent of the acreage at an average of 1.925 pounds per acre per crop year. The herbicides Paraquat and Simazine were a distant second, in terms of percent of acres treated, with 12 and 10 percent of the acres receiving an application, respectively. They were applied at an average rate of 1.440 and 1.843 pounds per acre per crop year, respectively.

Insecticides were applied to 97 percent of the surveyed acreage. The most commonly used insecticides were Azinphos-methyl, Chlorpyrifos, and Petroleum distillate on 62, 59, and 58 percent

of the acreage, respectively. The average rate per application per crop year for the three most commonly applied insecticides were 2.045, 1.732, and 31.410 pounds per acre, respectively.

Fungicides were used on 91 percent of the acreage. Mancozeb was the most commonly applied fungicide with 37 percent of the bearing acreage being treated. It was applied at an average rate of 7.309 pounds per acre per crop year. Myclobutanil was applied to 36 percent of the bearing acres at an average rate of 0.191 pounds per acre per crop year. Captan was the third most commonly applied with 34 percent of the bearing acres treated. An average of 10.274 pounds per acre per crop year was applied.

Other Chemicals were used to treat 65 percent of the acreage. Benzyladenine was the most commonly utilized Other Chemical, applied to 23 percent of the acreage at an average rate of 0.043 pounds per acre per crop year; followed by Gibberellins A4A7, applied to 18 percent of the acreage at an average rate per crop year of 0.024 pounds per acre.

**Organic Apples:** Six Program States were included in the 2007 survey: California, Michigan, New York, Oregon, Pennsylvania, and Washington. However, due to data confidentiality rules the chemical application data for 5 of the 6 States surveyed were combined into one category called Other States (OS). Washington State was the only state with publishable data. Nitrogen, phosphate, potash, and sulfur applications were made on 53, 25, 26, and 12 percent of the acreage, respectively. The rate per application per crop year for nitrogen was 131 pounds per acre; followed by 26 pounds of potash per acre; followed by phosphate and sulfur both being applied at a rate of 20 pounds per acre, respectively.

There were no reports of herbicides applied to organic apple in the 6 Program States. Insecticides were used on 79 percent of the surveyed acres. Cyd-X Granulo. Virus was the most commonly applied insecticide, on 56 percent of the acres; followed by Bt subsp. kurstaki on 53 percent of the acres. The pounds per acre per crop year for Cyd-X Granulo and Bt. Subsp. kurstaki were not publishable.

Fungicides were used on 75 percent of the acreage. The more commonly used fungicides were Calcium polysulfide, Sulfur, and Bacillus pumilus covering 66, 41, and 28 percent of the acreage, respectively. The average rate per application per crop year for Calcium polysulfide and Sulfur were 35.424 and 17.879 pounds per acre, respectively. The pounds per acre per crop year for Bacillus pumilus was not publishable.

Other Chemicals were applied to 51 percent of the acreage, with Mineral oil being applied to 21 percent of the acreage at an average rate per crop year of 40.574 pounds per acre. Cytokinins and Butenoic Acid Hydro. were the next two most commonly applied Other Chemicals, at 11 and 10 percent, respectively. The rate per application data for the active ingredient Cytokinins was not publishable. Butenoic Acid Hydro was applied at an average rate per crop year of 0.052 pounds per acre.

**All Cotton: Fertilizer Use by State, 2007**  
**Percent of Acres Treated and Total Applied**

State	Planted Acreage	Percent of Acres Treated and Total Applied							
		Nitrogen		Phosphate		Potash		Sulfur	
	<i>1,000 Acres</i>	<i>Percent</i>	<i>Mil. lbs.</i>	<i>Percent</i>	<i>Mil. lbs.</i>	<i>Percent</i>	<i>Mil. lbs.</i>	<i>Percent</i>	<i>Mil. lbs.</i>
AL	400	97	34.2	87	17.0	90	23.3	46	2.1
AR	860	98	94.1	83	29.4	85	63.9	46	5.5
CA	455	96	53.6	39	13.2	20	4.3	( <sup>1</sup> )	
GA	1,030	98	90.9	91	56.3	91	81.3	67	10.5
LA	335	100	29.3	70	8.1	63	16.1	( <sup>1</sup> )	
MS	660	100	77.3	33	12.4	54	37.7	28	2.0
MO	380	98	36.1	88	10.3	95	24.5	64	2.6
NC	500	92	31.3	71	11.0	89	44.2	25	2.9
SC	180	99	16.2	79	6.5	94	16.0	33	0.8
TN	515	100	52.3	95	25.2	100	45.1	60	2.8
TX	4,925	86	347.7	60	109.8	24	19.8	42	26.2
US	10,240	92	862.8	67	299.2	52	376.2	42	56.3

<sup>1</sup> Insufficient reports to publish data for the fertilizer primary nutrient.



**All Cotton: Fertilizer Primary Nutrient Applications,  
Program States and Total, 2007**

Primary Nutrient	Planted Acreage	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>1,000 Acres</i>	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Mil. lbs.</i>
Alabama	400					
Nitrogen		97	1.6	55	88	34.2
Phosphate		87	1.0	47	49	17.0
Potash		90	1.0	62	65	23.3
Sulfur		46	1.1	10	11	2.1
Arkansas	860					
Nitrogen		98	1.6	69	111	94.1
Phosphate		83	1.1	36	41	29.4
Potash		85	1.2	74	87	63.9
Sulfur		46	1.2	12	14	5.5
California	455					
Nitrogen		96	1.8	70	123	53.6
Phosphate		39	1.2	63	74	13.2
Potash		20	1.2	39	48	4.3
Sulfur <sup>1</sup>						
Georgia	1,030					
Nitrogen		98	1.9	47	90	90.9
Phosphate		91	1.2	49	60	56.3
Potash		91	1.2	70	87	81.3
Sulfur		67	1.2	13	15	10.5
Louisiana	335					
Nitrogen		100	1.2	70	87	29.3
Phosphate		70	1.0	33	35	8.1
Potash		63	1.1	72	76	16.1
Sulfur <sup>1</sup>						
Mississippi	660					
Nitrogen		100	1.4	81	117	77.3
Phosphate		33	1.0	56	58	12.4
Potash		54	1.0	106	106	37.7
Sulfur		28	1.0	11	11	2.0
Missouri	380					
Nitrogen		98	1.6	61	97	36.1
Phosphate		88	1.0	30	31	10.3
Potash		95	1.1	63	68	24.5
Sulfur		64	1.0	11	11	2.6

See footnote(s) at end of table.

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**All Cotton: Fertilizer Primary Nutrient Applications,  
Program States and Total, 2007 (continued)**

Primary Nutrient	Planted Acreage	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>1,000 Acres</i>	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Mil. lbs.</i>
North Carolina	500					
Nitrogen		92	2.0	34	68	31.3
Phosphate		71	1.2	27	31	11.0
Potash		89	1.1	89	99	44.2
Sulfur		25	1.4	17	23	2.9
South Carolina	180					
Nitrogen		99	1.7	54	91	16.2
Phosphate		79	1.1	42	46	6.5
Potash		94	1.1	89	94	16.0
Sulfur		33	1.2	11	14	0.8
Tennessee	515					
Nitrogen		100	1.2	87	102	52.3
Phosphate		95	1.0	51	51	25.2
Potash		100	1.0	88	88	45.1
Sulfur		60	1.0	9	9	2.8
Texas	4,925					
Nitrogen		86	1.8	45	82	347.7
Phosphate		60	1.2	32	37	109.8
Potash		24	1.1	15	17	19.8
Sulfur		42	1.4	9	13	26.2
Program States	10,240					
Nitrogen		92	1.7	53	91	862.8
Phosphate		67	1.1	38	43	299.2
Potash		52	1.1	63	70	376.2
Sulfur		42	1.3	10	13	56.3

<sup>1</sup> Insufficient reports to publish fertilizer data.

**All Cotton: Active Ingredients and  
Publication Status  
By Program States, 2007**

Active Ingredient	Program States											
	ALL	AL	AR	CA	GA	LA	MS	MO	NC	SC	TN	TX
Herbicides												
2,4-D	*		*								*	*
2,4-D, 2-EHE	P	*	P		*	P	*	P	P	*	P	*
2,4-D, BEE	*				*	*						
2,4-D, dimeth. salt	P	P	P		P	P	P	*	P	P	*	P
Acetochlor	*				*						*	
Alachlor	*				*						*	
Atrazine	*										*	
Barban	P		P	P		*	*					*
Bromacil	*											*
Bromoxynil octanoate	*								*			
Butylate	*				*							
Carfentrazone-ethyl	P	P	P	P	P	P	P	P	P	P	P	P
Chlorimuron-ethyl	*				*							
Clethodim	P	*		*		*	*		*			*
Clomazone	P										P	
Cyanazine	*				*				*		*	
Desmedipham	*		*						*		*	
Dicamba	P		*							*	*	*
Dicamba, digly. salt	P	*	P				P	P	*		P	*
Dicamba, dimet. salt	P	P	P			*	*	*			*	*
Dicamba, sodium salt	P		*					P			*	
Diuron	P	P	P	P	P	P	P	P	P	P	P	P
Ethalfuralin	*				*							
Fenoxaprop-p-ethyl	*		*					*	*			
Fluazifop-P-butyl	*			*							*	*
Flumiclorac-pentyl	P	*			*				P			
Flumioxazin	P	P	P	P	P	P	P	P	P	P	P	
Fluometuron	P	P	P		*	P	P	P	P	P	P	*
Fomesafen	P	*			P		*			P	*	
Glufosinate-ammonium	P	*	*	*	*		*				*	P
Glyphosate	P	P	P		*	P	P	P	P	P	P	*
Glyphosate amm. salt	P		*			*	*		*		*	*
Glyphosate iso. salt	P	P	P	P	P	P	P	P	P	P	P	P
Glyphosate pot. salt	*											*
Imazaquin, mon. salt	*					*						
Imazethapyr, ammon.	*										*	
Lactofen	*	*										
Linuron	P	*	*	*		*	*		P	*		
MCPP-P, DMA Salt	*						*					
MSMA	P	*		*	P	*	*	*	P	*		*
Metolachlor	P		P	*		*	P	*	*	P	*	*
Metribuzin	*				*						*	
Napropamide	*				*							

See footnote(s) at end of table.

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**All Cotton: Active Ingredients and  
Publication Status  
By Program States, 2007 (continued)**

Active Ingredient	Program States											
	ALL	AL	AR	CA	GA	LA	MS	MO	NC	SC	TN	TX
Herbicides (continued)												
Norflurazon	P					*		*				*
Oxyfluorfen	P			P	*	*					*	
Pendimethalin	P	P	P	P	P		P	P	P	P	P	P
Phenmedipham	*		*						*			
Picloram, K salt	*											*
Prometryn	P	P	*	P	P	P	P	*	P	P	P	P
Propazine	*					*						
Prosulfuron	*		*									
Pyraflufen-ethyl	P	*	*	P	P		*		P	P	*	P
Pyriithiobac-sodium	P	P	P	P	P	*	P	P	P	P	*	P
Quizalofop-P-ethyl	*					*					*	*
Rimsulfuron	*								*	*	*	
S-Metolachlor	P	*	P	P	P	P	P	*	P	P	*	P
Sethoxydim	P	*		*		*					*	
Sulfosate	P	*	*	*	*	*	*		*	*	*	
Thifensulfuron	P		*				*	*				*
Thiobencarb	*						*	*				
Tribenuron-methyl	P		*				*	*				*
Triclopyr	*					*						
Trifloxysulfuron-sod	P	P	P		*	P	P	*	P	P	P	*
Trifluralin	P	P	*	P	P	*	*	*	*	P		P
Insecticides												
Abamectin	P		*	P				*				
Acephate	P	P	P	P	P	P	P	P	P	P	P	P
Acetamiprid	P		*	P		*	P					P
Aldicarb	P	P	P	P	P	*	P	P	P	P	*	P
Benzoic acid	*			*								
Bifenthrin	P	*	*	P	P	*	*	P	*	*	P	*
Bt subsp. kurstaki	*			*	*							*
Buprofezin	*		*	*								
Carbaryl	*										*	*
Carbofuran	*		*							*		
Chlorpyrifos	P			*		P		*	*			
Cyfluthrin	P	*	P	P	P	P	P	P	P	P	P	*
Cypermethrin	P	P	P		P	P	P	P	P	P	P	P
Deltamethrin	*				*							
Diazinon	*				*	*						
Dicofol	P		*	P			*	*	*		*	
Dicrotophos	P	P	P		P	P	P	P	*	*	P	P
Diflubenzuron	*				*							
Dimethoate	P	*	*	P	*	P	P					*
Emamectin benzoate	*			*	*							

See footnote(s) at end of table.

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**All Cotton: Active Ingredients and  
Publication Status  
By Program States, 2007 (continued)**

Active Ingredient	Program States											
	ALL	AL	AR	CA	GA	LA	MS	MO	NC	SC	TN	TX
<b>Insecticides (continued)</b>												
Endosulfan	*											*
Esfenvalerate	P		P		*	*	*	*			P	P
Ethion	*				*							
Ethyl parathion	*				*							
Etoxazole	P		*	P			*	*				
Fenpropathrin	*			*	*							*
Fenpyroximate	*			*								
Fonicamid	P			P								
Hexythiazox	*							*				
Imidacloprid	P		P	*		P	P	P	*		P	P
Indoxacarb	P			P	*							*
Lambda-cyhalothrin	P	*	P		P	P	P	*	P	P	P	P
Malathion	P		*		*	P	*		*		P	P
Methamidophos	P		*					*				
Methomyl	*			*								*
Methyl parathion	P				P	*	*	*		*		
Naled	*			*	*							
Novaluron	P		P		*	P	P	*	*			*
Oxamyl	P	*	P	*		P	P	*	*		*	P
Oxydemeton-methyl	*	*										
Permethrin	P	*			*	*		*			*	*
Petroleum distillate	P		*	*	*							
Phorate	P		*	P	*				*	*		
Piperonyl butoxide	*			*					*		*	
Profenofos	*							*		*		
Propargite	*		*	*				*				
Pyrethrins	*			*					*		*	
Pyriproxyfen	P			*	*							
Spinosad	P				*		*					*
Spiromesifen	P			*				*				
Thiamethoxam	P	*	P	P	*	P	P	P	*		P	P
Zeta-cypermethrin	P		*	*	P	*	*	*	P	*	P	*
<b>Fungicides</b>												
Azoxystrobin	P	*	*	P		*	*	*	*		*	*
Carboxin	*								*			
Etridiazole	P	*	*			*	*		*	P	*	
Iprodione	*					*	*					
Mefenoxam	P						*	*	*	*		
Metalaxyl	*										*	
PCNB	P	*	*			*	*		P	P	*	
Sulfur	*				*			*				

See footnote(s) at end of table.

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**All Cotton: Active Ingredients and  
Publication Status  
By Program States, 2007 (continued)**

Active Ingredient	Program States											
	ALL	AL	AR	CA	GA	LA	MS	MO	NC	SC	TN	TX
Other Chemicals												
(3S,6R)methylisoprop	*				*							
(3S,6S)methylisoprop	*				*							
Alkyl. dim. benz. am	*				*							
Bacillus cereus	P	*	*	*	P	*	P	*	P	P	P	P
Cacodylic acid	P		*	*	*		*			*		
Capsaicin	*						*					
Carbon	*				*							
Cyclanilide	P	P	P	P	P	P	P	*	P	*	P	P
Cytokinins	P		*					*				*
Dichloropropene	*				*							
Dimethipin	*	*							*		*	
Endothall	P		*	P			*					
Ethephon	P	P	P	P	P	P	P	P	P	P	P	P
Fluthiacet-methyl	*											*
Garlic oil	*				*							
Gibberellic acid	P						*	*				*
Harpin a B protein	*		*				*	*				
Indolebutyric acid	P						*	*				*
Kinetin	P	*	*		*	P		*	P	P	*	P
Mepiquat chloride	P	P	P	P	P	P	P	P	P	P	P	P
Mepiquat pentaborate	P	*	*			P	*	*	P	*	*	P
Metam-potassium	*		*									
Monocarbamide dihyd.	P	P	P	P	P	P	P	*	P	*	*	P
NAA, Ethyl ester	*					*						
NAA, Potassium salt	*								*			
Paraquat	P	*		P	*	P	P	P	P	*	P	P
Sodium 5-nitroguaiac	*					*						
Sodium chlorate	P	P	P	P	*	P	P	*	*	P	P	P
Sodium nitrate	*				*							
Sodium o-nitrophenol	*					*						
Sodium p-nitrophenol	*					*						
Thidiazuron	P	P	P	P	P	P	P	P	P	P	P	P
Tribufos	P	P	P	P	P	P	P	P	P	P	P	P
Tridecen-1-YL-Acetate	*											*
Tridecenyl acetate	*											*
Trinexapac-ethyl	*											*
Zinc phosphide	*				*							

P Usage data are published for this active ingredient.

\*Usage data are not published for this active ingredient.

**All Cotton: Planted Acreage, Pesticide,  
Percent of Area Receiving Applications and Total Applied,  
Program States and Total, 2007**

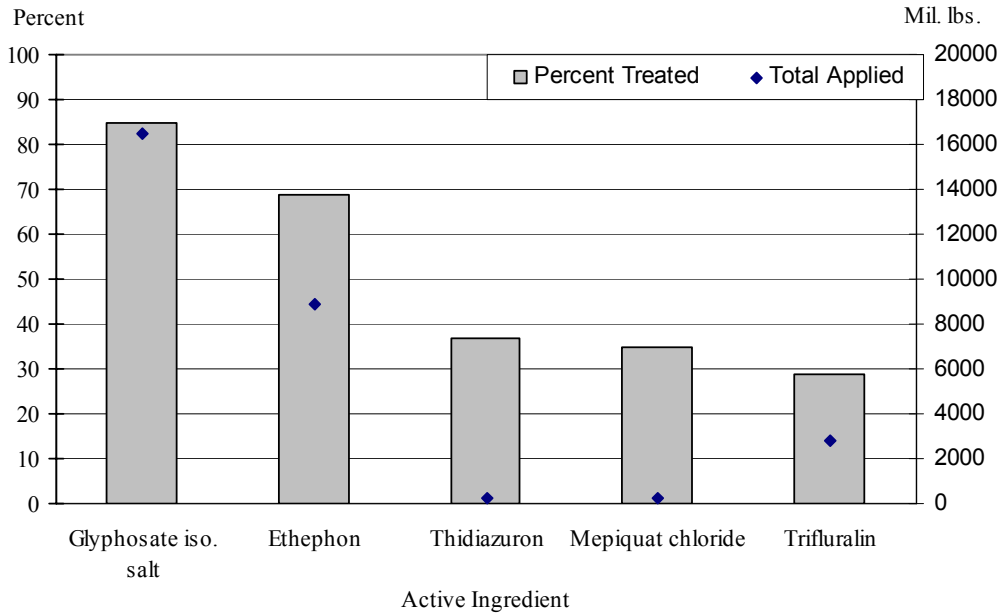
State	Planted Acreage <i>1,000 Acres</i>	Area Receiving and Total Applied							
		Herbicide		Insecticide <sup>1</sup>		Fungicide		Other <sup>1</sup>	
		<i>Percent</i>	<i>1,000 lbs.</i>	<i>Percent</i>	<i>1,000 lbs.</i>	<i>Percent</i>	<i>1,000 lbs.</i>	<i>Percent</i>	<i>1,000 lbs.</i>
AL	400	98	941	55	88	( <sup>2</sup> )		75	423
AR	860	97	2,399	92	1,092	2	16	96	1,780
CA	455	90	565	90	506	2	1	93	1,414
GA	1,030	100	3,163	85	956	( <sup>2</sup> )		96	3,955
LA	335	98	992	99	562	( <sup>2</sup> )		100	567
MS	660	100	2,132	97	1,231	2	3	99	1,146
MO	380	100	995	83	270	( <sup>2</sup> )		100	867
NC	500	100	1,479	79	300	3	15	99	896
SC	180	100	535	92	85	13	13	86	291
TN	515	100	1,482	94	228	( <sup>2</sup> )		99	985
TX	4,925	96	11,532	43	2,624	( <sup>2</sup> )		74	5,702
<b>Total</b>	<b>10,240</b>	<b>97</b>	<b>26,214</b>	<b>66</b>	<b>7,943</b>	<b>1</b>	<b>75</b>	<b>85</b>	<b>18,025</b>

<sup>1</sup> Total Applied excludes Bt's (*Bacillus thuringiensis*) and other biologicals.

Quantities are not available because amounts of active ingredient are not comparable between products.

<sup>2</sup> Insufficient reports to publish data for pesticide class.

**All Cotton-Percent of Acres Treated and Total Applied**



**All Cotton: Agricultural Chemical Applications,  
Program States, 2007<sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
Herbicides					
2,4-D, 2-EHE	3	1.0	0.431	0.435	127
2,4-D, dimeth. salt	6	1.1	0.514	0.571	348
Barban	1	1.2	0.036	0.043	5
Carfentrazone-ethyl	10	1.1	0.017	0.019	19
Clethodim	*	1.0	0.123	0.123	4
Clomazone	*	1.0	0.088	0.088	2
Dicamba	1	1.0	0.161	0.161	14
Dicamba, digly. salt	4	1.0	0.213	0.218	92
Dicamba, dimet. salt	2	1.0	0.244	0.244	51
Dicamba, sodium salt	*	1.0	0.144	0.144	7
Diuron	26	1.1	0.440	0.499	1,325
Flumiclorac-pentyl	*	1.0	0.037	0.039	2
Flumioxazin	6	1.2	0.058	0.068	41
Fluometuron	4	1.0	0.715	0.733	277
Fomesafen	2	1.2	0.243	0.281	48
Glufosinate-ammonium	2	1.3	0.350	0.442	77
Glyphosate	5	2.0	0.728	1.481	761
Glyphosate amm. salt	1	1.7	0.485	0.829	85
Glyphosate iso. salt	85	2.4	0.787	1.900	16,465
Linuron	1	1.2	0.374	0.444	31
MSMA	3	1.0	1.361	1.368	380
Metolachlor	2	1.1	0.911	0.967	221
Norflurazon	*	1.0	0.757	0.757	21
Oxyfluorfen	1	1.0	0.303	0.303	16
Pendimethalin	17	1.0	0.838	0.849	1,451
Prometryn	7	1.0	0.849	0.872	640
Pyraflufen-ethyl	8	1.1	0.003	0.003	3
Pyriithiobac-sodium	10	1.1	0.052	0.058	57
S-Metolachlor	6	1.0	0.974	0.994	618
Sethoxydim	*	1.0	0.209	0.209	4
Sulfosate	1	2.1	0.928	1.923	147
Thifensulfuron	*	1.0	0.008	0.008	( <sup>2</sup> )
Tribenuron-methyl	*	1.0	0.004	0.004	( <sup>2</sup> )
Trifloxysulfuron-sod	3	1.1	0.006	0.007	2
Trifluralin	29	1.1	0.836	0.921	2,763
Insecticides					
Abamectin	3	1.1	0.006	0.007	2
Acephate	26	2.1	0.428	0.900	2,368
Acetamiprid	6	1.1	0.039	0.041	26
Aldicarb	18	1.0	0.666	0.678	1,241
Bifenthrin	3	1.6	0.070	0.111	36
Chlorpyrifos	*	1.2	0.593	0.741	18

See footnote(s) at end of table.

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**All Cotton: Agricultural Chemical Applications,  
Program States, 2007 <sup>1</sup> (continued)**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Insecticides (continued)</b>					
Cyfluthrin	8	1.3	0.034	0.044	36
Cypermethrin	7	1.3	0.058	0.073	52
Dicofol	*	1.0	0.869	0.869	44
Dicrctophos	21	1.7	0.325	0.565	1,242
Dimethoate	1	1.7	0.247	0.418	37
Esfenvalerate	2	1.2	0.039	0.049	11
Etoxazole	1	1.3	0.035	0.046	4
Fonicamid	1	1.3	0.092	0.123	7
Imidacloprid	6	1.6	0.044	0.071	41
Indoxacarb	1	1.1	0.093	0.100	13
Lambda-cyhalothrin	5	1.5	0.026	0.039	21
Malathion	5	4.5	0.837	3.799	1,890
Methamidophos	*	1.0	0.150	0.150	4
Methyl parathion	*	1.0	0.746	0.746	31
Novaluron	4	1.5	0.042	0.061	26
Oxamyl	3	1.4	0.328	0.456	134
Permethrin	*	1.0	0.040	0.040	1
Petroleum distillate	*	1.4	5.521	7.888	333
Phorate	1	1.0	0.762	0.762	45
Pyriproxyfen	*	1.4	0.051	0.070	2
Spinosad	*	1.0	0.071	0.071	1
Spiromesifen	*	1.0	0.109	0.109	4
Thiamethoxam	11	1.6	0.025	0.039	45
Zeta-cypermethrin	3	1.4	0.021	0.029	9
<b>Fungicides</b>					
Azoxystrobin	*	1.0	0.115	0.115	4
Etridiazole	1	1.0	0.140	0.146	8
Mefenoxam	*	1.0	0.043	0.043	1
PCNB	1	1.0	0.615	0.635	44
<b>Other Chemicals</b>					
Bacillus cereus <sup>3</sup>	5	1.6			
Cacodylic acid	*	1.0	0.666	0.666	26
Cyclanilide	14	1.3	0.087	0.113	165
Cytokinins	1	1.3	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>2</sup> )
Endothall	*	1.0	0.118	0.118	5
Ethephon	69	1.2	1.086	1.259	8,843
Gibberellic acid	1	1.0	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>2</sup> )
Indolebutyric acid	1	1.0	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>2</sup> )
Kinetin	2	1.5	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>2</sup> )
Mepiquat chloride	35	1.9	0.030	0.058	208
Mepiquat pentaborate	4	1.6	0.066	0.106	43

See footnote(s) at end of table.

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**All Cotton: Agricultural Chemical Applications,  
Program States, 2007 <sup>1</sup> (continued)**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
Other Chemicals (continued)					
Monocarbamide dihyd.	7	1.1	2.393	2.604	1,902
Paraquat	19	1.1	0.372	0.397	767
Sodium chlorate	6	1.2	1.890	2.267	1,396
Thidiazuron	37	1.1	0.065	0.073	275
Tribufos	29	1.1	0.675	0.743	2,227

\* Area applied is less than 0.5 percent.

<sup>1</sup> Planted acreage in 2007 for the 11 Program States was 10.2 million acres.

States included are AL, AR, CA, GA, LA, MS, MO, NC, SC, TN, and TX.

<sup>2</sup> Total applied is less than 500 lbs.

<sup>3</sup> Rates and total applied are not available because amounts of active ingredient are not comparable between products.

<sup>4</sup> Rate per acre is less than 0.0005 lbs.

**All Cotton: Agricultural Chemical Applications,  
Alabama, 2007 <sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D, dimeth. salt	3	1.0	0.463	0.463	6
Carfentrazone-ethyl	2	1.0	0.018	0.018	( <sup>2</sup> )
Dicamba, dimet. salt	7	1.0	0.421	0.421	12
Diuron	40	1.1	0.124	0.130	21
Flumioxazin	6	1.0	0.060	0.060	2
Fluometuron	12	1.0	0.806	0.806	39
Glyphosate	5	2.0	0.629	1.273	25
Glyphosate iso. salt	83	2.4	0.866	2.039	677
Pendimethalin	16	1.0	0.902	0.902	58
Prometryn	9	1.0	0.661	0.661	24
Pyriithiobac-sodium	13	1.3	0.041	0.053	3
Trifloxysulfuron-sod	22	1.0	0.005	0.005	( <sup>2</sup> )
Trifluralin	6	1.0	0.547	0.547	14
<b>Insecticides</b>					
Acephate	8	1.5	0.289	0.436	13
Aldicarb	18	1.0	0.647	0.647	45
Cypermethrin	12	1.2	0.052	0.065	3
Dicrotophos	20	1.2	0.227	0.269	21
<b>Other Chemicals</b>					
Cyclanilide	27	1.2	0.098	0.113	12
Ethephon	60	1.0	0.991	1.003	239
Mepiquat chloride	23	1.5	0.032	0.047	4
Monocarbamide dihyd.	5	1.0	3.151	3.151	60
Sodium chlorate	10	1.0	0.701	0.701	27
Thidiazuron	42	1.0	0.040	0.040	7
Tribufos	28	1.0	0.630	0.630	71

<sup>1</sup> Planted acreage in 2007 for Alabama was 400,000 acres.

<sup>2</sup> Total applied is less than 500 lbs.

**All Cotton: Agricultural Chemical Applications,  
Arkansas, 2007 <sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D, 2-EHE	6	1.0	0.636	0.636	31
2,4-D, dimeth. salt	6	1.4	0.330	0.475	24
Barban	4	1.2	0.028	0.035	1
Carfentrazone-ethyl	13	1.3	0.015	0.019	2
Dicamba, digly. salt	8	1.0	0.170	0.170	12
Dicamba, dimet. salt	14	1.0	0.236	0.236	29
Diuron	35	1.1	0.409	0.431	130
Flumioxazin	15	1.4	0.059	0.086	11
Fluometuron	6	1.0	0.572	0.572	27
Glyphosate	8	1.6	0.762	1.250	90
Glyphosate iso. salt	90	2.9	0.730	2.110	1,640
Metolachlor	12	1.0	0.784	0.784	78
Pendimethalin	5	1.0	0.545	0.545	24
Pyrithiobac-sodium	2	1.3	0.025	0.034	( <sup>2</sup> )
S-Metolachlor	20	1.0	0.919	0.919	160
Trifloxysulfuron-sod	3	1.0	0.008	0.008	( <sup>2</sup> )
<b>Insecticides</b>					
Acephate	53	2.2	0.461	1.029	469
Aldicarb	16	1.0	0.657	0.657	93
Cyfluthrin	7	1.0	0.025	0.025	2
Cypermethrin	11	1.6	0.043	0.071	6
Dicrotophos	61	2.0	0.305	0.615	322
Esfenvalerate	5	1.4	0.042	0.058	2
Imidacloprid	9	1.5	0.037	0.056	4
Lambda-cyhalothrin	8	1.3	0.023	0.031	2
Novaluron	16	1.0	0.050	0.051	7
Oxamyl	13	1.4	0.324	0.468	54
Thiamethoxam	37	1.5	0.025	0.037	12
<b>Other Chemicals</b>					
Cyclanilide	31	1.5	0.074	0.108	28
Ethephon	88	1.6	0.801	1.259	952
Mepiquat chloride	55	1.9	0.033	0.064	30
Monocarbamide dihyd.	6	1.3	1.995	2.647	128
Sodium chlorate	14	1.8	1.127	2.000	248
Thidiazuron	57	1.1	0.056	0.062	31
Tribufos	56	1.3	0.450	0.581	280

<sup>1</sup> Planted acreage in 2007 for Arkansas was 860,000 acres.

<sup>2</sup> Total applied is less than 500 lbs.

**All Cotton: Agricultural Chemical Applications,  
California, 2007<sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
Barban	6	1.0	0.077	0.077	2
Carfentrazone-ethyl	6	1.0	0.031	0.031	1
Diuron	65	1.3	0.035	0.045	13
Flumioxazin	9	1.1	0.058	0.063	2
Glyphosate iso. salt	34	2.0	0.757	1.518	235
Oxyfluorfen	8	1.0	0.353	0.353	12
Pendimethalin	10	1.0	0.868	0.871	40
Prometryn	6	1.2	1.845	2.292	60
Pyraflufen-ethyl	25	1.5	0.003	0.005	1
Pyriithiobac-sodium	17	1.0	0.038	0.038	3
S-Metolachlor	10	1.0	1.191	1.191	53
Trifluralin	35	1.0	0.737	0.737	116
<b>Insecticides</b>					
Abamectin	53	1.1	0.007	0.007	2
Acetamiprid	18	1.0	0.060	0.060	5
Aldicarb	21	1.2	1.132	1.311	124
Bifenthrin	5	1.5	0.081	0.118	3
Cyfluthrin	4	1.1	0.067	0.073	1
Dicofol	6	1.0	1.078	1.078	29
Dimethoate	3	1.0	0.281	0.281	4
Etoxazole	13	1.1	0.038	0.042	3
Flonicamid	13	1.3	0.092	0.123	7
Indoxacarb	17	1.1	0.096	0.104	8
Phorate	2	1.0	1.020	1.020	11
Thiamethoxam	5	1.0	0.033	0.033	1
<b>Fungicides</b>					
Azoxystrobin	2	1.0	0.090	0.090	1
<b>Other Chemicals</b>					
Cyclanilide	9	1.0	0.097	0.097	4
Endothall	6	1.0	0.088	0.088	2
Ethephon	67	1.2	0.832	1.024	311
Mepiquat chloride	44	1.5	0.042	0.061	12
Monocarbamide dihyd.	44	1.2	2.055	2.518	503
Paraquat	38	1.0	0.507	0.518	89
Sodium chlorate	19	1.1	3.981	4.510	386
Thidiazuron	66	1.2	0.067	0.081	24
Tribufos	8	1.2	1.806	2.101	73

<sup>1</sup> Planted acreage in 2007 for California was 455,000 acres.

**All Cotton: Agricultural Chemical Applications,  
Georgia, 2007 <sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D, dimeth. salt	14	1.2	0.520	0.637	91
Carfentrazone-ethyl	7	1.0	0.020	0.020	1
Diuron	33	1.2	0.552	0.666	229
Flumioxazin	9	1.1	0.065	0.071	6
Fomesafen	14	1.2	0.249	0.295	41
Glyphosate iso. salt	95	2.1	0.790	1.686	1,647
MSMA	13	1.0	1.401	1.415	191
Pendimethalin	43	1.0	0.927	0.927	415
Prometryn	6	1.1	0.746	0.786	48
Pyraflufen-ethyl	14	1.0	0.002	0.002	( <sup>2</sup> )
Pyriithiobac-sodium	19	1.3	0.044	0.056	11
S-Metolachlor	11	1.0	0.945	0.945	111
Trifluralin	27	1.1	0.869	0.929	261
<b>Insecticides</b>					
Acephate	8	1.4	0.323	0.458	38
Aldicarb	60	1.0	0.688	0.689	425
Bifenthrin	13	1.7	0.069	0.119	16
Cyfluthrin	13	1.2	0.038	0.047	7
Cypermethrin	9	1.2	0.073	0.089	8
Dicrotophos	41	1.8	0.415	0.735	310
Lambda-cyhalothrin	6	1.5	0.026	0.040	2
Methyl parathion	3	1.0	0.938	0.938	27
Zeta-cypermethrin	5	1.6	0.019	0.031	2
<b>Other Chemicals</b>					
Bacillus cereus <sup>3</sup>	7	2.2			
Cyclanilide	39	1.5	0.080	0.119	47
Ethephon	79	1.1	1.347	1.487	1,216
Mepiquat chloride	62	1.8	0.030	0.054	35
Monocarbamide dihyd.	6	1.0	3.648	3.648	226
Thidiazuron	50	1.0	0.071	0.072	37
Tribufos	41	1.0	0.590	0.590	246

<sup>1</sup> Planted acreage in 2007 for Georgia was 1.0 million acres.

<sup>2</sup> Total applied is less than 500 lbs.

<sup>3</sup> Rates and total applied are not available because amounts of active ingredient are not comparable between products.

**All Cotton: Agricultural Chemical Applications,  
Louisiana, 2007<sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D, 2-EHE	12	1.1	0.424	0.451	18
2,4-D, dimeth. salt	24	1.0	0.614	0.614	49
Carfentrazone-ethyl	18	1.0	0.012	0.012	1
Diuron	37	1.1	0.813	0.900	110
Flumioxazin	4	1.0	0.050	0.050	1
Fluometuron	5	1.1	0.613	0.685	11
Glyphosate	27	2.3	0.809	1.843	168
Glyphosate iso. salt	69	2.8	0.754	2.086	480
Prometryn	2	1.0	0.592	0.592	5
S-Metolachlor	23	1.0	0.919	0.928	73
Trifloxysulfuron-sod	6	1.0	0.006	0.006	( <sup>2</sup> )
<b>Insecticides</b>					
Acephate	76	2.1	0.595	1.263	321
Chlorpyrifos	3	1.5	0.671	1.031	12
Cyfluthrin	21	1.3	0.028	0.036	2
Cypermethrin	32	1.1	0.057	0.061	7
Diclotophos	55	1.6	0.361	0.574	106
Dimethoate	10	2.4	0.231	0.559	19
Imidacloprid	21	1.8	0.053	0.098	7
Lambda-cyhalothrin	17	1.2	0.018	0.021	1
Malathion	10	1.5	0.851	1.234	41
Novaluron	27	1.3	0.038	0.049	4
Oxamyl	15	1.3	0.277	0.355	18
Thiamethoxam	34	1.6	0.031	0.050	6
<b>Other Chemicals</b>					
Cyclanilide	11	1.9	0.043	0.080	3
Ethephon	87	1.2	0.809	0.978	284
Kinetin	5	2.2	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>2</sup> )
Mepiquat chloride	63	2.4	0.031	0.074	16
Mepiquat pentaborate	3	2.2	0.117	0.259	2
Monocarbamide dihyd.	3	1.3	1.831	2.455	26
Paraquat	4	1.0	0.401	0.401	5
Sodium chlorate	15	1.2	1.292	1.490	76
Thidiazuron	90	1.2	0.064	0.074	22
Tribufos	51	1.1	0.694	0.766	131

<sup>1</sup> Planted acreage in 2007 for Louisiana was 335,000 acres.

<sup>2</sup> Total applied is less than 500 lbs.

<sup>3</sup> Rate per acre is less than 0.0005 lbs.

**All Cotton: Agricultural Chemical Applications,  
Mississippi, 2007 <sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D, dimeth. salt	27	1.0	0.519	0.519	91
Carfentrazone-ethyl	12	1.0	0.018	0.018	1
Dicamba, digly. salt	6	1.0	0.129	0.129	5
Diuron	36	1.1	0.613	0.702	166
Flumioxazin	16	1.3	0.049	0.062	7
Fluometuron	3	1.3	0.611	0.820	18
Glyphosate	10	3.9	0.629	2.480	165
Glyphosate iso. salt	90	3.2	0.793	2.519	1,489
Metolachlor	2	1.4	0.906	1.262	21
Pendimethalin	8	1.0	0.508	0.508	26
Prometryn	4	1.0	0.775	0.775	21
Pyriithiobac-sodium	7	1.2	0.030	0.037	2
S-Metolachlor	4	1.4	1.025	1.485	36
Trifloxysulfuron-sod	4	1.1	0.006	0.007	( <sup>2</sup> )
<b>Insecticides</b>					
Acephate	74	3.3	0.539	1.754	862
Acetamiprid	2	2.7	0.034	0.090	1
Aldicarb	6	1.0	0.566	0.566	22
Cyfluthrin	17	1.8	0.028	0.049	5
Cypermethrin	21	1.5	0.049	0.075	11
Dicrotophos	57	2.0	0.331	0.654	246
Dimethoate	4	1.5	0.262	0.385	9
Imidacloprid	17	2.1	0.039	0.084	10
Lambda-cyhalothrin	19	1.9	0.025	0.047	6
Novaluron	22	2.0	0.038	0.076	11
Oxamyl	6	1.1	0.189	0.217	8
Thiamethoxam	44	2.2	0.023	0.050	15
<b>Other Chemicals</b>					
Bacillus cereus <sup>3</sup>	7	3.6			
Cyclanilide	20	1.2	0.096	0.116	16
Ethephon	85	1.2	1.118	1.288	721
Mepiquat chloride	54	2.9	0.030	0.086	31
Monocarbamide dihyd.	1	1.0	2.627	2.627	13
Paraquat	5	1.1	0.290	0.318	9
Sodium chlorate	5	1.2	2.756	3.402	111
Thidiazuron	92	1.1	0.072	0.076	46
Tribufos	50	1.1	0.513	0.585	194

<sup>1</sup> Planted acreage in 2007 for Mississippi was 660,000 acres.

<sup>2</sup> Total applied is less than 500 lbs.

<sup>3</sup> Rates and total applied are not available because amounts of active ingredient are not comparable between products.



**All Cotton: Agricultural Chemical Applications,  
Missouri, 2007 <sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D, 2-EHE	5	1.0	0.787	0.787	14
Carfentrazone-ethyl	8	1.5	0.009	0.013	( <sup>2</sup> )
Dicamba, digly. salt	11	1.0	0.295	0.295	13
Dicamba, sodium salt	7	1.0	0.163	0.163	4
Diuron	17	1.3	0.427	0.564	36
Flumioxazin	6	1.0	0.064	0.064	1
Fluometuron	5	1.0	0.371	0.371	7
Glyphosate	9	1.7	0.985	1.651	58
Glyphosate iso. salt	95	2.7	0.811	2.218	804
Pendimethalin	9	1.0	0.729	0.729	26
Pyriithiobac-sodium	6	1.1	0.030	0.034	1
<b>Insecticides</b>					
Acephate	53	2.0	0.380	0.767	156
Aldicarb	17	1.1	0.665	0.702	46
Bifenthrin	15	1.8	0.081	0.145	8
Cyfluthrin	9	1.1	0.033	0.037	1
Cypermethrin	15	1.0	0.028	0.028	2
Dicrotophos	19	1.3	0.295	0.385	27
Imidacloprid	31	1.8	0.041	0.074	9
Thiamethoxam	14	1.1	0.022	0.025	1
<b>Other Chemicals</b>					
Ethephon	94	1.3	1.348	1.701	608
Mepiquat chloride	59	2.2	0.033	0.072	16
Paraquat	7	1.0	0.160	0.160	4
Thidiazuron	73	1.1	0.065	0.074	21
Tribufos	50	1.2	0.710	0.876	168

<sup>1</sup> Planted acreage in 2007 for Missouri was 380,000 acres.

<sup>2</sup> Total applied is less than 500 lbs.

**All Cotton: Agricultural Chemical Applications,  
North Carolina, 2007<sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D, 2-EHE	2	1.0	0.226	0.226	2
2,4-D, dimeth. salt	8	1.0	0.606	0.606	25
Carfentrazone-ethyl	12	1.1	0.015	0.018	1
Diuron	25	1.1	0.521	0.563	71
Flumiclorac-pentyl	10	1.0	0.038	0.039	2
Flumioxazin	8	1.0	0.044	0.044	2
Fluometuron	12	1.0	0.758	0.758	47
Glyphosate	15	2.0	0.766	1.517	118
Glyphosate iso. salt	89	2.5	0.738	1.871	833
Linuron	1	1.0	0.481	0.481	3
MSMA	19	1.0	1.410	1.410	132
Pendimethalin	19	1.0	0.624	0.636	62
Prometryn	26	1.0	0.843	0.843	110
Pyraflufen-ethyl	7	1.0	0.003	0.003	( <sup>2</sup> )
Pyrithiobac-sodium	15	1.0	0.064	0.064	5
S-Metolachlor	12	1.0	0.890	0.890	54
Trifloxysulfuron-sod	17	1.1	0.006	0.007	1
<b>Insecticides</b>					
Acephate	39	1.3	0.481	0.619	122
Aldicarb	35	1.0	0.756	0.756	132
Cyfluthrin	18	1.0	0.033	0.033	3
Cypermethrin	4	1.0	0.108	0.108	2
Lambda-cyhalothrin	17	1.6	0.028	0.044	4
Zeta-cypermethrin	13	1.4	0.022	0.031	2
<b>Fungicides</b>					
PCNB	2	1.0	1.094	1.094	14
<b>Other Chemicals</b>					
Bacillus cereus <sup>3</sup>	10	1.2			
Cyclanilide	40	1.1	0.133	0.147	29
Ethephon	87	1.0	1.194	1.206	522
Kinetin	3	1.2	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>2</sup> )
Mepiquat chloride	53	1.5	0.029	0.043	12
Mepiquat pentaborate	3	1.2	0.069	0.085	1
Monocarbamide dihyd.	15	1.0	2.913	2.913	219
Paraquat	4	1.0	0.451	0.451	8
Thidiazuron	49	1.0	0.069	0.070	17
Tribufos	29	1.0	0.530	0.537	77

<sup>1</sup> Planted acreage in 2007 for North Carolina was 500,000 acres.

<sup>2</sup> Total applied is less than 500 lbs.

<sup>3</sup> Rates and total applied are not available because amounts of active ingredient are not comparable between products.

<sup>4</sup> Rate per acre is less than 0.0005 lbs.

**All Cotton: Agricultural Chemical Applications,  
South Carolina, 2007<sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D, dimeth. salt	13	1.0	0.438	0.456	11
Carfentrazone-ethyl	14	1.3	0.012	0.015	( <sup>2</sup> )
Diuron	12	1.5	0.337	0.494	11
Flumioxazin	22	1.1	0.065	0.072	3
Fluometuron	21	1.0	0.896	0.896	34
Fomesafen	12	1.0	0.214	0.214	4
Glyphosate	10	1.0	0.698	0.723	13
Glyphosate iso. salt	90	2.7	0.734	1.998	325
Metolachlor	15	1.2	1.020	1.197	33
Pendimethalin	19	1.0	0.567	0.583	20
Prometryn	20	1.2	0.857	1.017	36
Pyraflufen-ethyl	4	1.5	0.002	0.003	( <sup>2</sup> )
Pyriothiobac-sodium	21	1.1	0.057	0.061	2
S-Metolachlor	12	1.0	0.910	0.952	20
Trifloxysulfuron-sod	14	1.0	0.006	0.006	( <sup>2</sup> )
Trifluralin	8	1.0	0.635	0.635	9
<b>Insecticides</b>					
Acephate	17	1.0	0.276	0.284	9
Aldicarb	51	1.0	0.685	0.718	66
Cyfluthrin	45	1.6	0.033	0.053	4
Cypermethrin	13	1.5	0.077	0.114	3
Lambda-cyhalothrin	20	1.4	0.031	0.043	2
<b>Fungicides</b>					
Etridiazole	13	1.0	0.107	0.107	2
PCNB	13	1.0	0.431	0.431	10
<b>Other Chemicals</b>					
Bacillus cereus <sup>3</sup>	15	2.1			
Ethephon	62	1.0	1.127	1.176	131
Kinetin	10	1.0	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>2</sup> )
Mepiquat chloride	46	1.5	0.028	0.042	3
Sodium chlorate	10	1.0	1.205	1.205	21
Thidiazuron	26	1.0	0.067	0.067	3
Tribufos	40	1.1	0.814	0.886	64

<sup>1</sup> Planted acreage in 2007 for South Carolina was 180,000 acres.

<sup>2</sup> Total applied is less than 500 lbs.

<sup>3</sup> Rates and total applied are not available because amounts of active ingredient are not comparable between products.

<sup>4</sup> Rate per acre is less than 0.0005 lbs.

**All Cotton: Agricultural Chemical Applications,  
Tennessee, 2007 <sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D, 2-EHE	8	1.0	0.336	0.336	13
Carfentrazone-ethyl	13	1.0	0.014	0.014	1
Clomazone	4	1.0	0.088	0.088	2
Dicamba, digly. salt	47	1.0	0.226	0.235	57
Diuron	33	1.2	0.213	0.253	43
Flumioxazin	17	1.1	0.061	0.064	6
Fluometuron	9	1.0	0.812	0.812	37
Glyphosate	4	2.2	0.709	1.534	28
Glyphosate iso. salt	94	2.7	0.851	2.307	1,115
Pendimethalin	8	1.1	0.830	0.941	40
Prometryn	7	1.0	0.881	0.921	35
Trifloxysulfuron-sod	7	1.0	0.006	0.006	( <sup>2</sup> )
<b>Insecticides</b>					
Acephate	35	1.3	0.295	0.370	67
Bifenthrin	4	1.1	0.070	0.075	1
Cyfluthrin	23	1.2	0.046	0.056	7
Cypermethrin	8	1.2	0.073	0.088	3
Dicrotophos	30	1.2	0.310	0.364	57
Esfenvalerate	15	1.4	0.042	0.058	4
Imidacloprid	18	1.2	0.042	0.052	5
Lambda-cyhalothrin	7	1.8	0.034	0.060	2
Malathion	8	1.8	0.758	1.342	57
Thiamethoxam	31	1.2	0.021	0.025	4
Zeta-cypermethrin	12	1.2	0.021	0.026	2
<b>Other Chemicals</b>					
Bacillus cereus <sup>3</sup>	13	1.7			
Cyclanilide	6	1.1	0.111	0.120	4
Ethephon	79	1.1	1.311	1.466	597
Mepiquat chloride	57	1.6	0.038	0.060	17
Paraquat	14	1.0	0.493	0.493	34
Sodium chlorate	17	1.0	2.103	2.103	188
Thidiazuron	34	1.1	0.043	0.050	9
Tribufos	61	1.0	0.368	0.373	118

<sup>1</sup> Planted acreage in 2007 for Tennessee was 515,000 acres.

<sup>2</sup> Total applied is less than 500 lbs.

<sup>3</sup> Rates and total applied are not available because amounts of active ingredient are not comparable between products.

**All Cotton: Agricultural Chemical Applications,  
Texas, 2007 <sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D, dimeth. salt	1	1.2	0.578	0.681	44
Carfentrazone-ethyl	9	1.0	0.020	0.020	9
Diuron	16	1.1	0.565	0.611	494
Glufosinate-ammonium	3	1.3	0.347	0.446	65
Glyphosate iso. salt	84	2.2	0.792	1.740	7,220
Pendimethalin	17	1.0	0.860	0.875	739
Prometryn	7	1.0	0.840	0.840	279
Pyraflufen-ethyl	10	1.0	0.003	0.003	2
Pyriithiobac-sodium	9	1.0	0.064	0.065	28
S-Metolachlor	2	1.0	1.120	1.120	99
Trifluralin	50	1.1	0.846	0.943	2,330
<b>Insecticides</b>					
Acephate	14	1.8	0.242	0.443	311
Acetamiprid	10	1.0	0.034	0.035	18
Aldicarb	10	1.0	0.519	0.528	264
Cypermethrin	2	1.0	0.076	0.076	8
Dicrotophos	7	1.6	0.250	0.408	143
Esfenvalerate	1	1.0	0.030	0.030	2
Imidacloprid	2	1.2	0.051	0.061	5
Lambda-cyhalothrin	1	1.1	0.019	0.020	1
Malathion	8	5.4	0.839	4.495	1,695
Oxamyl	1	1.6	0.319	0.524	31
Thiamethoxam	4	1.2	0.030	0.036	6
<b>Other Chemicals</b>					
Bacillus cereus <sup>2</sup>	3	1.1			
Cyclanilide	5	1.1	0.081	0.089	20
Ethephon	56	1.1	1.095	1.187	3,261
Kinetin	1	1.2	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>4</sup> )
Mepiquat chloride	16	1.7	0.024	0.040	31
Mepiquat pentaborate	7	1.6	0.064	0.104	34
Monocarbamide dihyd.	5	1.0	2.224	2.224	600
Paraquat	32	1.1	0.353	0.381	597
Sodium chlorate	3	1.0	1.981	1.981	291
Thidiazuron	13	1.3	0.071	0.092	58
Tribufos	15	1.0	1.060	1.109	804

<sup>1</sup> Planted acreage in 2007 for Texas was 4.9 million acres.

<sup>2</sup> Rates and total applied are not available because amounts of active ingredient are not comparable between products.

<sup>3</sup> Rate per acre is less than 0.0005 lbs.

<sup>4</sup> Total applied is less than 500 lbs.

**Apples: Fertilizer Use by State, 2007**  
**Percent of Acres Treated and Total Applied**

State	Bearing Acreage	Percent of Acres Treated and Total Applied							
		Nitrogen		Phosphate		Potash		Sulfur	
	<i>Acres</i>	<i>Percent</i>	<i>1,000 lbs.</i>	<i>Percent</i>	<i>1,000 lbs.</i>	<i>Percent</i>	<i>1,000 lbs.</i>	<i>Percent</i>	<i>1,000 lbs.</i>
CA	20,500	41	704.0	10	54.6	14	82.2	( <sup>1</sup> )	
MI	35,000	58	941.5	25	294.1	51	1,122.6	6	36.1
NY	42,000	79	1,047.5	25	198.3	72	3,027.0	17	168.6
NC	6,800	56	267.2	53	297.1	54	300.7	( <sup>1</sup> )	
OR	4,200	66	136.8	41	73.7	40	60.2	24	27.7
PA	21,500	45	287.0	29	182.2	29	234.5	( <sup>1</sup> )	
WA	158,000	81	7,477.9	22	1,345.8	22	1,499.7	15	717.3
US	288,000	71	10,861.8	24	2,445.8	34	6,327.0	12	962.1

<sup>1</sup> Insufficient reports to publish data for the fertilizer primary nutrient.

**Apples: Fertilizer Primary Nutrient Applications,  
Program States and Total, 2007**

Primary Nutrient	Bearing Acreage	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Acres</i>	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
California	20,500					
Nitrogen		41	1.6	51	83	704.0
Phosphate		10	1.4	19	27	54.6
Potash		14	1.2	25	29	82.2
Sulfur <sup>1</sup>						
Michigan	35,000					
Nitrogen		58	1.9	24	46	941.5
Phosphate		25	2.2	15	33	294.1
Potash		51	1.9	33	63	1,122.6
Sulfur		6	1.8	10	18	36.1
New York	42,000					
Nitrogen		79	1.2	26	32	1,047.5
Phosphate		25	1.0	19	19	198.3
Potash		72	1.1	92	100	3,027.0
Sulfur		17	1.0	24	24	168.6
North Carolina	6,800					
Nitrogen		56	1.1	64	70	267.2
Phosphate		53	1.1	77	83	297.1
Potash		54	1.1	76	82	300.7
Sulfur <sup>1</sup>						
Oregon	4,200					
Nitrogen		66	2.2	22	49	136.8
Phosphate		41	2.5	17	42	73.7
Potash		40	2.2	16	36	60.2
Sulfur		24	1.1	26	28	27.7
Pennsylvania	21,500					
Nitrogen		45	1.2	25	30	287.0
Phosphate		29	1.1	27	29	182.2
Potash		29	1.1	35	38	234.5
Sulfur <sup>1</sup>						
Washington	158,000					
Nitrogen		81	1.6	38	59	7,477.9
Phosphate		22	1.5	25	38	1,345.8
Potash		22	1.4	30	43	1,499.7
Sulfur		15	1.1	28	30	717.3

See footnote(s) at end of table.

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**Apples: Fertilizer Primary Nutrient Applications,  
Program States and Total, 2007 (continued)**

Primary Nutrient	Bearing Acreage	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Acres</i>	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
Program States	288,000					
Nitrogen		71	1.5	35	53	10,861.8
Phosphate		24	1.5	24	36	2,445.8
Potash		34	1.4	47	65	6,327.0
Sulfur		12	1.1	25	27	962.1

<sup>1</sup> Insufficient reports to publish fertilizer data.



**Apples: Active Ingredients and  
Publication Status  
By Program States, 2007**

Active Ingredient	Program States							
	ALL	CA	MI	NY	NC	OR	PA	WA
<b>Herbicides</b>								
2,4-D	P			*			*	
2,4-D, dieth. salt	*		*			*		
2,4-D, dimeth. salt	P		P	P	P	P	P	P
Atrazine	*						*	
Carfentrazone-ethyl	P	*	*	*			*	
Dichlobenil	*				*			
Diuron	P		P	P	*	P	P	*
Flumioxazin	P		*		*	*	P	
Glufosinate-ammonium	P	*			*		*	*
Glyphosate	*		*	*			*	
Glyphosate amm. salt	*							*
Glyphosate iso. salt	P	P	P	P	P	P	P	P
Metolachlor	*			*				
Nicosulfuron	*							*
Norflurazon	P	*	*	*	*		*	P
Oryzalin	P	*	*		*	P		P
Oxyfluorfen	P	*	*		*	*		*
Paraquat	P	*	P	P	*	P	P	P
Pendimethalin	P	*	P			P	P	*
Pronamide	*							*
Sethoxydim	*			*				*
Simazine	P	*	P	P	*	P	P	P
Terbacil	P		P	*	*		P	
Trifluralin	*					*		*
<b>Insecticides</b>								
Abamectin	P		P	*		P	P	*
Acetamiprid	P	*	P	*	P	P	P	P
Azadirachtin	P			*		*		P
Azinphos-methyl	P	P	P	P	P	P	P	P
Beauveria bassiana	*							*
Benzoic acid	P	*	P	P	P	*	P	P
Beta-cyfluthrin	P		*				*	
Bifenazate	P			*	*	P	*	*
Bifenthrin	*							*
Bt subsp israelensis	*					*		*
Bt subsp. aizawai	*					*		
Bt subsp. kurstaki	P	*	P	P		*	P	P
Bt. (Berliner)	*	*						
Buprofezin	*					*		*
Carbaryl	P	P	P	P	P	P	P	P
Chlorpyrifos	P	P	P	P	P	P	P	P
Clofentezine	P		*	*			*	*

See footnote(s) at end of table.

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**Apples: Active Ingredients and  
Publication Status  
By Program States, 2007 (continued)**

Active Ingredient	Program States							
	ALL	CA	MI	NY	NC	OR	PA	WA
Insecticides (continued)								
Clothianidin	*					*		
Cyd-X Granulo. Virus	P	*	P	*	*	P	*	P
Cyfluthrin	P		P	P			P	
Deltamethrin	*		*					
Diazinon	P	P		*	*	*	P	P
Dicofol	*		*					
Dimethoate	P		*	*	*	*	*	
Emamectin benzoate	P		P	P		*	*	P
Endosulfan	P		*	P	P	*	P	P
Esfenvalerate	P	*	P	P	P	*	P	
Ethion	P				*		P	*
Etoxazole	P		P	P	*	*	P	*
Fenbutatin-oxide	*	*	*					*
Fenpropathrin	P	P	P	P	P		P	
Fenpyroximate	P		P			*		*
Flonicamid	P					*		*
Flucythrinate	*							*
Formetanate hydro.	P					*		*
Gamma-cyhalothrin	P		P	P			P	
Hexythiazonx	P		*	P	*		*	P
Imidacloprid	P	*	P	P	*	P	P	P
Indoxacarb	P			P	*		*	
Kaolin	P	P	*	P		P	*	P
Lambda-cyhalothrin	P	*	P	P		*	P	P
Lindane	*			*				
Malathion	P		*		*	*	*	
Methidathion	*						*	*
Methomyl	P		P	*	*		P	
Methoxychlor	*					*		
Naled	*			*				
Neem oil, clar. hyd.	*	*			*			
Novaluron	P	*	P		*	P	P	P
Octacide-264	*							*
Oxamyl	P		*	*			P	
Permethrin	P		P	*	P		*	
Petroleum distillate	P	P	P	P	P	P	P	P
Petroleum oil	P		P	P	*		P	*
Phorate	*							*
Phosmet	P	P	P	P	P	P	P	P
Piperonyl butoxide	*		*		*			*
Potassium salts	*	*						*
Propargite	*							*
Pyrethrins	P	*	*	*	*	*		*

See footnote(s) at end of table.

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**Apples: Active Ingredients and  
Publication Status  
By Program States, 2007 (continued)**

Active Ingredient	Program States							
	ALL	CA	MI	NY	NC	OR	PA	WA
<b>Insecticides (continued)</b>								
Pyridaben	P		P	P	*	*	P	P
Pyriproxyfen	P		*	*	*	*	*	P
Rotenone	*				*			
Ryania	*			*				
Silicon dioxide	*				*			
Soybean oil	*			*				
Spinosad	P	*	P	P	*	P		P
Thiacloprid	P		P	P	P	P	P	P
Thiamethoxam	P		*	P		*	*	*
Trichlorfon	*						*	
<b>Fungicides</b>								
Bacillus pumilus	P		*			*		P
Bacillus subtilis	P	*	P	*		*	*	P
Basic copper sulfate	P		P	P	P	*	P	*
Benomyl	*		*				*	
Boscalid	P	*	*	P	P	P	P	P
Butanone	*							*
Calcium polysulfide	P	P	P	*	*	P	*	P
Captan	P	*	P	P	P	P	P	*
Chlorothalonil	P		*		*		P	
Copper chloride hyd.	*				*			
Copper hydroxide	P	*	P	P	P	P	P	*
Copper octanoate	*							*
Copper oxide	P	*				P		*
Copper oxychlor. sul.	P		P	P	P		P	
Copper oxychloride	P		P	*	*		P	
Copper sulfate	P		P	P	*	P	*	
Cyprodinil	P		P	*	P		P	*
Dodine	P		*	P	P	P	P	*
Fenarimol	P	*	P	P	P	*	P	P
Fenbuconazole	P		*				*	
Ferbam	*				*			
Flutolanil	*				*			
Fosetyl-al	P			*		*		*
Kresoxim-methyl	P		P	P	P	P	P	P
Mancozeb	P	P	P	P	P	P	P	P
Maneb	*		*	*				
Mefenoxam	*		*					
Metalaxyl	*			*				
Metiram	P		P	*	P	*	P	
Myclobutanil	P	P	P	P	P	P	P	P
Oxytetracycline	P		P			P		P

See footnote(s) at end of table.

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**Apples: Active Ingredients and  
Publication Status  
By Program States, 2007 (continued)**

Active Ingredient	Program States							
	ALL	CA	MI	NY	NC	OR	PA	WA
Fungicides (continued)								
Phosphorous acid	*							*
Potassium bicarbon.	P	*		*		P	*	P
Propiconazole	*		*			*	*	*
Pseudo. fluores A506	*					*		*
Pyraclostrobin	P	*	*	P	P	P	P	P
Pyrimethanil	P		P	*			*	
Quinoline	*							*
Streptomycin	P	P	P	P	P	*	P	*
Streptomycin sulfate	P	*	P	P	P		*	
Sulfur	P	*	P	P	P	P	*	P
Thiophanate	*	*						
Thiophanate-methyl	P		P	P	P	P	P	P
Thiram	P			*		*	P	
Triadimefon	P		P	*	*		*	P
Trifloxystrobin	P	P	P	P	P	P	P	P
Triflumizole	P			*		P	*	P
Vinclozolin	*			*				
Ziram	P	*	P	P	P	*	P	P
Other Chemicals								
Acequinocyl	*			*				
Benzyladenine	P	*	P	P	*	P	P	P
Butenoic Acid Hydro.	P		*	P		*	P	P
Chlorophacinone	P			P			P	P
Cholecalciferol	*		*					
Cytokinins	P					P		P
Dodecadien-1-ol	P	P	*		*	P	P	P
Dodecanol	P	P				P		P
E-8-Dodecenyl acetat	*		*			*	*	
Ethephon	P			*		*	P	P
Gibberellic acid	P		P	*	*		P	P
Gibberellins A4A7	P	*	P	*	*	P	P	P
Hydrogen peroxide	*						*	*
Metam-potassium	*							*
Mineral oil	P							P
NAA	P		*	*	*	P		P
NAA, Ammonium salt	*	*				*		*
NAA, Potassium salt	P	*	P	*		P	*	P
NAA, Sodium	P		P	P	*	*	P	*
NAD	P					*	*	P
NRRL B-21856	*							*
Octadecadien (E,Z)	P	*				P		*
Octadecadien (Z,Z)	P	*				P		*

See footnote(s) at end of table.

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**Apples: Active Ingredients and  
Publication Status  
By Program States, 2007 (continued)**

Active Ingredient	Program States							
	ALL	CA	MI	NY	NC	OR	PA	WA
Other Chemicals (continued)								
Prohexadione calcium	P		P	P	*	*	P	P
Spirodiclofen	P		P			P	P	P
Strychnine	*							*
Tetradecanol	P	P				P		P
Tetradecen-1-OL (Z)	*	*					*	
Warfarin	P		P					
Z-8-Dodecanol	*		*			*	*	
Z-8-Dodecen acetate	*		*			*	*	
Zinc phosphide	P		*	P		*	P	*

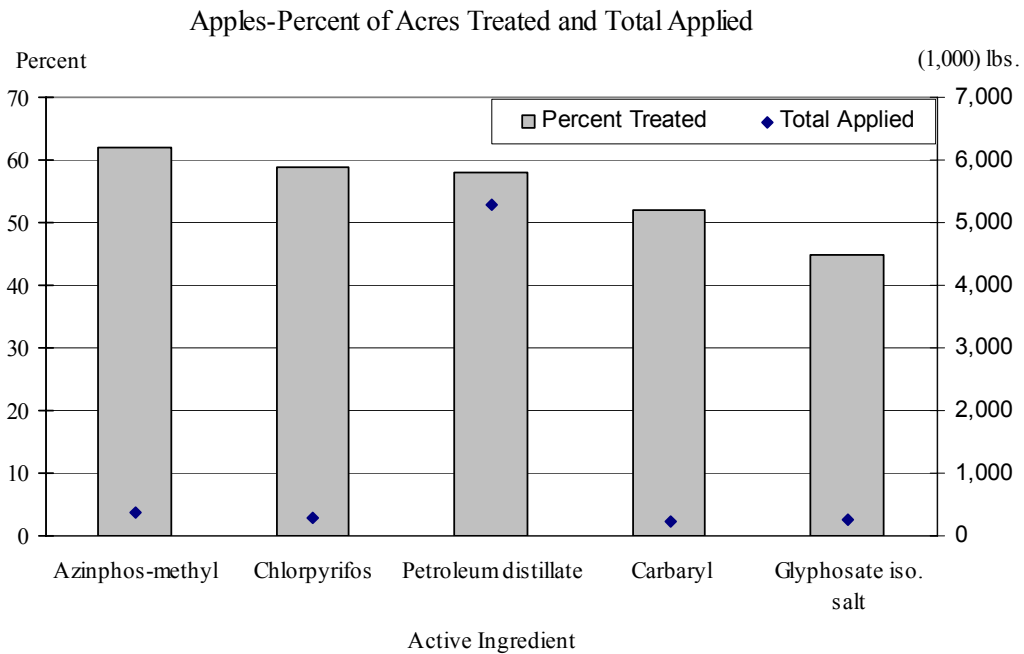
P Usage data are published for this active ingredient.

\* Usage data are not published for this active ingredient.

**Apples: Bearing Acreage, Pesticide,  
Percent of Area Receiving Applications and Total Applied,  
Program States and Total, 2007**

State	Bearing Acreage	Area Receiving and Total Applied							
		Herbicide		Insecticide <sup>1</sup>		Fungicide <sup>1</sup>		Other <sup>1</sup>	
	<i>Acres</i>	<i>Percent</i>	<i>1,000 lbs.</i>	<i>Percent</i>	<i>1,000 lbs.</i>	<i>Percent</i>	<i>1,000 lbs.</i>	<i>Percent</i>	<i>1,000 lbs.</i>
CA	20,500	35	14.2	74	537.1	67	212.1	29	0.3
MI	35,000	58	51.1	99	329.9	100	874.9	67	5.0
NY	42,000	73	72.2	100	408.3	100	1,154.8	49	2.5
NC	6,800	21	3.8	97	254.5	98	202.0		
OR	4,200	70	10.1	95	146.9	84	60.7	67	1.0
PA	21,500	84	30.7	98	235.2	97	307.6	70	4.2
WA	158,000	61	305.1	99	5,611.2	89	1,891.3	75	148.7
Total	288,000	61	487.2	97	7,523.2	91	4,703.4	65	161.8

<sup>1</sup> Total Applied excludes Bt's (*Bacillus thuringiensis*) and other biologicals.  
Quantities are not available because amounts of active ingredient are not comparable between products.



**Apples: Agricultural Chemical Applications,  
Program States, 2007<sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D	1	1.2	0.454	0.523	1.0
2,4-D, dimeth. salt	8	1.3	0.977	1.280	29.7
Carfentrazone-ethyl	1	1.2	0.026	0.031	0.1
Diuron	6	1.1	1.484	1.688	31.0
Flumioxazin	*	1.1	0.232	0.245	0.3
Glufosinate-ammonium	1	1.9	0.743	1.422	4.0
Glyphosate iso. salt	45	1.6	1.193	1.925	250.5
Norflurazon	5	1.4	1.575	2.186	28.5
Oryzalin	2	1.0	2.099	2.098	11.0
Oxyfluorfen	1	1.0	1.121	1.126	3.6
Paraquat	12	1.2	1.194	1.440	49.7
Pendimethalin	3	1.4	1.443	2.055	16.9
Simazine	10	1.3	1.421	1.843	52.1
Terbacil	1	1.0	0.826	0.826	2.0
<b>Insecticides</b>					
Abamectin	2	1.2	0.010	0.012	0.1
Acetamiprid	37	1.7	0.147	0.254	27.0
Azadirachtin	*	2.8	0.021	0.059	( <sup>2</sup> )
Azinphos-methyl	62	2.5	0.832	2.045	363.3
Benzoic acid	19	1.4	0.197	0.273	15.2
Beta-cyfluthrin	*	1.3	0.018	0.023	( <sup>2</sup> )
Bifenazate	1	1.0	0.449	0.449	1.3
Bt subsp. kurstaki <sup>3</sup>	10	1.8			
Carbaryl	52	1.4	1.115	1.566	233.8
Chlorpyrifos	59	1.2	1.502	1.732	292.2
Clofentezine	1	1.0	0.207	0.208	0.6
Cyd-X Granulo. Virus <sup>3</sup>	10	2.6			
Cyfluthrin	1	1.1	0.032	0.034	0.1
Diazinon	8	1.4	1.504	2.078	50.1
Dimethoate	*	1.6	1.132	1.854	1.8
Emamectin benzoate	16	1.2	0.013	0.016	0.7
Endosulfan	9	1.2	1.458	1.723	43.3
Esfenvalerate	10	1.5	0.044	0.064	1.9
Ethion	*	1.9	0.220	0.413	0.4
Etoxazole	3	1.0	0.085	0.088	0.7
Fenpropathrin	12	1.6	0.258	0.402	14.3
Fenpyroximate	7	1.1	0.086	0.091	1.9
Flonicamid	*	1.6	0.086	0.139	0.2
Formetanate hydro.	3	1.0	0.766	0.766	6.7
Gamma-cyhalothrin	5	2.0	0.015	0.030	0.4
Hexythiazonx	3	1.1	0.125	0.133	1.0
Imidacloprid	25	1.5	0.086	0.128	9.3

See footnote(s) at end of table.

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**Apples: Agricultural Chemical Applications,  
Program States, 2007 <sup>1</sup> (continued)**

Active Ingredient	Area Applied	Appli-cations	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
Insecticides (continued)					
Indoxacarb	4	1.4	0.090	0.129	1.3
Kaolin	3	2.3	33.500	75.830	593.5
Lambda-cyhalothrin	10	1.5	0.031	0.048	1.4
Malathion	*	1.5	2.695	4.172	1.2
Methomyl	4	1.8	0.526	0.943	9.5
Novaluron	15	1.5	0.163	0.238	10.6
Oxamyl	*	1.3	0.211	0.269	0.2
Permethrin	1	1.4	0.170	0.242	1.0
Petroleum distillate	58	1.8	17.808	31.410	5,281.8
Petroleum oil	4	1.5	14.180	20.719	262.0
Phosmet	25	2.2	1.609	3.561	255.0
Pyrethrins	*	1.1	0.128	0.147	0.1
Pyridaben	7	1.1	0.248	0.262	5.6
Pyriproxyfen	2	1.0	0.098	0.099	0.5
Spinosad	24	1.4	0.104	0.146	10.1
Thiacloprid	8	1.5	0.167	0.258	5.7
Thiamethoxam	8	1.0	0.121	0.126	2.8
Fungicides					
Bacillus pumilus <sup>3</sup>	4	2.5			
Bacillus subtilis <sup>3</sup>	1	1.3			
Basic copper sulfate	3	1.2	1.239	1.523	13.3
Boscalid	14	1.4	0.014	0.020	0.8
Calcium polysulfide	18	1.5	16.190	23.579	1,223.6
Captan	34	5.2	1.988	10.274	1,005.5
Chlorothalonil	*	1.2	1.303	1.537	1.2
Copper hydroxide	7	1.3	2.617	3.361	66.8
Copper oxide	1	1.0	3.777	3.963	8.6
Copper oxychlo. sul.	2	1.5	1.529	2.264	13.3
Copper oxychloride	2	1.0	2.526	2.626	13.3
Copper sulfate	2	1.6	0.789	1.257	6.0
Cyprodinil	4	1.5	0.183	0.276	3.4
Dodine	3	1.5	0.800	1.223	9.4
Fenarimol	13	1.4	0.067	0.091	3.5
Fenbuconazole	*	1.7	0.061	0.103	0.1
Fosetyl-al	1	1.0	2.443	2.456	7.2
Kresoxim-methyl	13	1.7	0.111	0.190	7.0
Mancozeb	37	2.7	2.676	7.309	769.8
Metiram	7	3.1	2.586	8.078	172.7
Myclobutanil	36	1.5	0.128	0.191	19.5
Oxytetracycline	7	1.2	0.171	0.207	4.3
Potassium bicarbon.	1	1.2	2.397	2.798	9.2
Pyraclostrobin	14	1.4	0.001	0.001	( <sup>2</sup> )

See footnote(s) at end of table.

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**Apples: Agricultural Chemical Applications,  
Program States, 2007 <sup>1</sup> (continued)**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
Fungicides (continued)					
Pyrimethanil	3	1.3	0.239	0.323	3.0
Streptomycin	9	1.6	0.173	0.273	6.7
Streptomycin sulfate	3	1.8	0.281	0.511	3.9
Sulfur	26	2.2	6.290	13.630	1,034.1
Thiophanate-methyl	18	2.5	0.375	0.939	49.8
Thiram	*	2.6	4.592	11.709	5.6
Triadimefon	4	1.6	0.131	0.207	2.6
Trifloxystrobin	20	1.6	0.066	0.103	6.0
Triflumizole	21	1.7	0.276	0.465	27.9
Ziram	11	2.0	3.009	6.100	195.7
Other Chemicals					
Benzyladenine	23	1.3	0.034	0.043	2.9
Butenoic Acid Hydro.	15	1.1	0.071	0.075	3.3
Chlorophacinone	2	1.1	0.001	0.001	( <sup>2</sup> )
Cytokinins	1	1.6	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>2</sup> )
Dodecadien-1-ol	2	1.3	0.012	0.016	0.1
Dodecanol	1	1.2	0.004	0.004	( <sup>2</sup> )
Ethephon	13	1.3	0.485	0.615	23.3
Gibberellic acid	3	1.8	0.026	0.048	0.4
Gibberellins A4A7	18	1.0	0.024	0.024	1.2
Mineral oil	1	2.1	19.794	40.951	113.0
NAA	12	1.7	0.020	0.033	1.1
NAA, Potassium salt	4	1.2	0.036	0.045	0.5
NAA, Sodium	11	1.4	0.012	0.017	0.5
NAD	4	1.0	0.058	0.058	0.7
Octadecadien (E,Z)	*	1.0	0.001	0.001	( <sup>2</sup> )
Octadecadien (Z,Z)	*	1.0	0.017	0.017	( <sup>2</sup> )
Prohexadione calcium	6	2.0	0.213	0.422	7.4
Spirodiclofen	7	1.2	0.208	0.239	4.8
Tetradecanol	1	1.2	0.001	0.001	( <sup>2</sup> )
Warfarin	*	1.0	0.006	0.006	( <sup>2</sup> )
Zinc phosphide	2	1.4	0.117	0.159	1.0

\* Area applied is less than 0.5 percent.

<sup>1</sup> Bearing acreage in 2007 for the 7 Program States was 288,000 acres.

States included are CA, MI, NY, NC, OR, PA, and WA.

<sup>2</sup> Total applied is less than 50 lbs.

<sup>3</sup> Rates and total applied are not available because amounts of active ingredient are not comparable between products.

<sup>4</sup> Rate per acre is less than 0.0005 lbs.

**Apples: Agricultural Chemical Applications,  
California, 2007<sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
Herbicides					
Glyphosate iso. salt	26	2.1	0.913	1.897	10.0
Insecticides					
Azinphos-methyl	13	2.5	0.744	1.871	4.8
Carbaryl	18	1.4	1.171	1.695	6.2
Chlorpyrifos	35	1.0	1.279	1.317	9.4
Diazinon	12	1.5	1.387	2.138	5.1
Fenpropathrin	24	1.3	0.317	0.400	1.9
Kaolin	9	2.6	27.576	71.374	135.7
Petroleum distillate	41	1.5	27.158	41.613	347.3
Phosmet	24	2.4	1.924	4.663	22.9
Fungicides					
Calcium polysulfide	17	1.4	12.040	16.466	58.9
Mancozeb	25	1.5	2.679	4.110	21.2
Myclobutanil	28	1.5	0.117	0.177	1.0
Streptomycin	12	2.7	0.164	0.441	1.1
Trifloxystrobin	36	1.4	0.074	0.102	0.8
Other Chemicals					
Dodecadien-1-ol	16	1.3	0.006	0.008	( <sup>2</sup> )
Dodecanol	16	1.3	0.003	0.004	( <sup>2</sup> )
Tetradecanol	16	1.3	0.001	0.001	( <sup>2</sup> )

<sup>1</sup> Bearing acreage in 2007 for California was 20,500 acres.

<sup>2</sup> Total applied is less than 50 lbs.

**Apples: Agricultural Chemical Applications,  
Michigan, 2007<sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D, dimeth. salt	19	1.2	0.895	1.079	7.4
Diuron	11	1.0	1.584	1.659	6.6
Glyphosate iso. salt	42	1.2	1.067	1.252	18.3
Paraquat	7	1.1	0.751	0.854	2.0
Pendimethalin	7	1.3	2.180	2.797	6.6
Simazine	8	1.1	2.164	2.366	6.7
Terbacil	4	1.0	0.504	0.504	0.7
<b>Insecticides</b>					
Abamectin	11	1.1	0.011	0.013	( <sup>2</sup> )
Acetamiprid	22	1.5	0.182	0.279	2.2
Azinphos-methyl	86	2.7	0.803	2.194	65.8
Benzoic acid	18	1.4	0.193	0.267	1.7
Bt subsp. kurstaki <sup>3</sup>	3	1.0			
Carbaryl	47	1.2	0.970	1.128	18.4
Chlorpyrifos	65	1.4	1.141	1.648	37.5
Cyd-X Granulo. Virus <sup>3</sup>	14	2.1			
Cyfluthrin	2	1.0	0.035	0.035	( <sup>2</sup> )
Emamectin benzoate	23	1.5	0.014	0.021	0.2
Esfenvalerate	39	1.4	0.035	0.048	0.7
Etoxazole	4	1.1	0.092	0.097	0.1
Fenpropathrin	12	1.3	0.277	0.353	1.5
Fenpyroximate	16	1.0	0.096	0.096	0.5
Gamma-cyhalothrin	4	1.9	0.020	0.037	0.1
Imidacloprid	25	1.6	0.073	0.113	1.0
Lambda-cyhalothrin	8	1.1	0.027	0.029	0.1
Methomyl	15	1.5	0.755	1.124	5.9
Novaluron	41	1.5	0.137	0.210	3.0
Permethrin	8	1.3	0.177	0.236	0.6
Petroleum distillate	8	1.5	17.203	25.179	73.3
Petroleum oil	6	1.0	6.928	6.933	13.6
Phosmet	46	2.4	1.551	3.766	60.4
Pyridaben	13	1.0	0.294	0.294	1.4
Spinosad	4	2.2	0.081	0.182	0.2
Thiacloprid	29	1.5	0.173	0.267	2.7
<b>Fungicides</b>					
Bacillus subtilus <sup>3</sup>	5	1.4			
Basic copper sulfate	6	1.1	0.838	0.901	1.9
Calcium polysulfide	2	1.3	6.547	8.825	5.7
Captan	93	4.7	2.171	10.262	332.6
Copper hydroxide	11	1.4	2.027	2.750	10.8
Copper oxychlo. sul.	7	1.1	2.031	2.229	5.3

See footnote(s) at end of table.

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**Apples: Agricultural Chemical Applications,  
Michigan, 2007 <sup>1</sup> (continued)**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
Fungicides (continued)					
Copper oxychloride	4	1.1	2.253	2.497	3.5
Copper sulfate	7	1.7	0.746	1.267	3.1
Cyprodinil	12	1.3	0.166	0.216	0.9
Fenarimol	5	2.2	0.044	0.096	0.2
Kresoxim-methyl	26	1.7	0.124	0.208	1.9
Mancozeb	77	3.2	3.224	10.263	276.7
Metiram	20	2.7	3.209	8.762	59.9
Myclobutanil	28	2.1	0.110	0.234	2.3
Oxytetracycline	2	1.5	0.232	0.352	0.3
Pyrimethanil	13	1.4	0.290	0.415	1.9
Streptomycin	25	1.5	0.225	0.328	2.8
Streptomycin sulfate	7	2.3	0.293	0.669	1.5
Sulfur	15	3.9	4.512	17.781	92.9
Thiophanate-methyl	18	2.6	0.324	0.837	5.2
Triadimefon	13	1.9	0.061	0.117	0.5
Trifloxystrobin	43	1.9	0.060	0.113	1.7
Ziram	27	2.1	2.877	6.092	58.6
Other Chemicals					
Benzyladenine	16	1.2	0.062	0.072	0.4
Gibberellic acid	3	1.6	0.047	0.074	0.1
Gibberellins A4A7	2	1.3	0.010	0.014	( <sup>2</sup> )
NAA, Potassium salt	3	1.2	0.006	0.007	( <sup>2</sup> )
NAA, Sodium	32	1.1	0.021	0.024	0.3
Prohexadione calcium	16	1.6	0.152	0.240	1.4
Spirodiclofen	32	1.0	0.217	0.227	2.5
Warfarin	4	1.0	0.006	0.006	( <sup>2</sup> )

<sup>1</sup> Bearing acreage in 2007 for Michigan was 35,000 acres.

<sup>2</sup> Total applied is less than 50 lbs.

<sup>3</sup> Rates and total applied are not available because amounts of active ingredient are not comparable between products.

**Apples: Agricultural Chemical Applications,  
New York, 2007<sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D, dimeth. salt	18	1.1	1.296	1.366	10.5
Diuron	15	1.0	1.221	1.263	8.0
Glyphosate iso. salt	54	1.1	1.248	1.390	31.5
Paraquat	10	1.3	0.763	1.016	4.1
Simazine	20	1.1	1.693	1.906	16.2
<b>Insecticides</b>					
Azinphos-methyl	48	2.4	0.579	1.366	27.4
Benzoic acid	17	1.4	0.184	0.250	1.8
Bt subsp. kurstaki <sup>2</sup>	20	1.7			
Carbaryl	46	1.4	0.997	1.432	27.7
Chlorpyrifos	53	1.3	1.269	1.595	35.8
Cyfluthrin	4	1.0	0.035	0.035	0.1
Emamectin benzoate	20	1.3	0.013	0.017	0.1
Endosulfan	28	1.2	1.052	1.272	14.7
Esfenvalerate	18	1.1	0.053	0.057	0.4
Etoxazole	9	1.1	0.099	0.104	0.4
Fenpropathrin	49	1.7	0.265	0.448	9.1
Gamma-cyhalothrin	19	2.3	0.016	0.038	0.3
Hexythiazox	2	1.1	0.103	0.112	0.1
Imidacloprid	38	1.5	0.043	0.064	1.0
Indoxacarb	19	1.4	0.101	0.142	1.1
Kaolin	*	4.9	25.793	126.699	9.9
Lambda-cyhalothrin	29	1.5	0.036	0.056	0.7
Petroleum distillate	19	1.3	4.930	6.632	52.4
Petroleum oil	15	1.2	17.905	21.432	136.6
Phosmet	60	2.1	1.471	3.148	78.8
Pyridaben	12	1.1	0.212	0.238	1.2
Spinosad	8	1.8	0.114	0.201	0.7
Thiacloprid	10	1.9	0.173	0.325	1.4
Thiamethoxam	5	1.0	0.121	0.121	0.3
<b>Fungicides</b>					
Basic copper sulfate	6	1.1	0.888	0.977	2.5
Boscalid	11	1.7	0.013	0.021	0.1
Captan	97	6.0	2.016	12.074	493.2
Copper hydroxide	26	1.3	2.703	3.452	37.9
Copper oxychlor. sul.	4	1.0	1.883	1.883	3.0
Copper sulfate	3	1.5	0.836	1.280	1.8
Dodine	8	1.1	0.794	0.862	2.8
Fenarimol	8	2.2	0.063	0.137	0.5
Kresoxim-methyl	21	1.8	0.109	0.192	1.7
Mancozeb	84	2.9	2.444	7.069	249.4

See footnote(s) at end of table.

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**Apples: Agricultural Chemical Applications,  
New York, 2007 <sup>1</sup> (continued)**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
Fungicides (continued)					
Myclobutanil	27	1.4	0.119	0.170	1.9
Pyraclostrobin	11	1.7	0.001	0.001	( <sup>3</sup> )
Streptomycin	28	1.4	0.141	0.194	2.3
Streptomycin sulfate	7	1.2	0.293	0.358	1.0
Sulfur	36	3.7	4.664	17.130	257.7
Thiophanate-methyl	63	2.3	0.367	0.844	22.4
Trifloxystrobin	25	1.7	0.066	0.111	1.2
Ziram	8	1.5	2.110	3.146	10.1
Other Chemicals					
Benzyladenine	9	1.1	0.020	0.021	0.1
Butenoic Acid Hydro.	14	1.3	0.098	0.130	0.8
Chlorophacinone	4	1.0	0.001	0.001	( <sup>3</sup> )
NAA, Sodium	30	1.7	0.007	0.013	0.2
Prohexadione calcium	4	1.4	0.208	0.295	0.5
Zinc phosphide	5	2.0	0.070	0.139	0.3

\* Area applied is less than 0.5 percent.

<sup>1</sup> Bearing acreage in 2007 for New York was 42,000 acres.

<sup>2</sup> Rates and total applied are not available because amounts of active ingredient are not comparable between products.

<sup>3</sup> Total applied is less than 50 lbs.

**Apples: Agricultural Chemical Applications,  
North Carolina, 2007<sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D, dimeth. salt	5	1.4	0.853	1.237	0.4
Glyphosate iso. salt	13	1.5	1.130	1.735	1.5
<b>Insecticides</b>					
Acetamiprid	69	2.3	0.221	0.515	2.4
Azinphos-methyl	52	2.3	0.827	1.866	6.6
Benzoic acid	39	1.7	0.215	0.364	1.0
Carbaryl	3	1.0	1.123	1.132	0.2
Chlorpyrifos	65	1.2	1.065	1.309	5.8
Endosulfan	3	1.5	1.010	1.495	0.3
Esfenvalerate	13	3.9	0.064	0.252	0.2
Fenpropathrin	18	1.5	0.214	0.323	0.4
Permethrin	14	1.7	0.151	0.255	0.2
Petroleum distillate	83	1.3	31.288	39.133	221.3
Phosmet	41	2.5	1.918	4.875	13.4
Thiacloprid	10	2.4	0.133	0.317	0.2
<b>Fungicides</b>					
Basic copper sulfate	5	2.2	3.354	7.366	2.4
Boscalid	10	2.0	0.015	0.030	( <sup>2</sup> )
Captan	63	4.7	2.462	11.573	49.4
Copper hydroxide	7	1.4	2.112	3.044	1.5
Copper oxychlor. sul.	18	3.2	0.845	2.674	3.2
Cyprodinil	19	2.8	0.197	0.556	0.7
Dodine	26	1.7	0.695	1.207	2.1
Fenarimol	21	2.2	0.060	0.133	0.2
Kresoxim-methyl	38	2.0	0.163	0.335	0.9
Mancozeb	45	2.7	2.879	7.802	24.1
Metiram	48	3.4	2.702	9.157	30.0
Myclobutanil	35	2.8	0.111	0.314	0.7
Pyraclostrobin	10	2.0	0.001	0.002	( <sup>2</sup> )
Streptomycin	8	2.6	0.167	0.429	0.2
Streptomycin sulfate	10	1.2	0.178	0.214	0.1
Sulfur	28	3.4	5.989	20.206	39.0
Thiophanate-methyl	50	4.9	0.486	2.366	8.0
Trifloxystrobin	17	2.5	0.079	0.198	0.2
Ziram	43	3.5	3.603	12.718	36.9

<sup>1</sup> Bearing acreage in 2007 for North Carolina was 6,800 acres.

<sup>2</sup> Total applied is less than 50 lbs.

**Apples: Agricultural Chemical Applications,  
Oregon, 2007<sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D, dimeth. salt	12	1.0	1.150	1.153	0.6
Diuron	14	1.2	2.691	3.184	1.9
Glyphosate iso. salt	46	1.8	1.209	2.235	4.3
Oryzalin	6	1.0	2.051	2.037	0.5
Paraquat	14	1.5	0.616	0.910	0.5
Pendimethalin	6	1.1	2.386	2.696	0.6
Simazine	4	1.2	3.085	3.703	0.6
<b>Insecticides</b>					
Abamectin	6	1.4	0.012	0.016	( <sup>2</sup> )
Acetamiprid	51	1.6	0.122	0.194	0.4
Azinphos-methyl	53	1.8	1.004	1.775	3.9
Bifenazate	6	1.0	0.570	0.570	0.1
Carbaryl	37	1.6	1.020	1.654	2.6
Chlorpyrifos	59	1.0	1.989	2.007	5.0
Cyd-X Granulo. Virus <sup>3</sup>	1	5.9			
Imidacloprid	21	1.1	0.096	0.103	0.1
Kaolin	13	1.5	27.277	41.973	23.0
Novaluron	12	1.1	0.232	0.265	0.1
Petroleum distillate	77	1.8	17.277	31.408	101.8
Phosmet	49	1.5	2.628	3.857	8.0
Spinosad	11	1.1	0.119	0.129	0.1
Thiacloprid	15	1.0	0.234	0.234	0.1
<b>Fungicides</b>					
Boscalid	32	1.2	0.020	0.024	( <sup>2</sup> )
Calcium polysulfide	9	1.4	15.056	21.147	8.1
Captan	11	3.2	3.860	12.541	5.8
Copper hydroxide	23	1.1	4.580	4.963	4.7
Copper oxide	4	1.6	3.877	6.293	1.1
Copper sulfate	2	1.7	0.652	1.130	0.1
Dodine	6	2.7	1.053	2.823	0.7
Kresoxim-methyl	2	1.1	0.123	0.135	( <sup>2</sup> )
Mancozeb	47	1.9	3.292	6.414	12.6
Myclobutanil	59	2.0	0.113	0.224	0.6
Oxytetracycline	5	1.1	0.193	0.221	( <sup>2</sup> )
Potassium bicarbon.	5	1.4	2.162	3.052	0.7
Pyraclostrobin	32	1.2	0.001	0.001	( <sup>2</sup> )
Sulfur	44	1.3	9.690	12.564	23.3
Thiophanate-methyl	11	1.4	0.874	1.222	0.6
Trifloxystrobin	26	1.4	0.068	0.093	0.1
Triflumizole	32	1.5	0.290	0.445	0.6

See footnote(s) at end of table.

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**Apples: Agricultural Chemical Applications,  
Oregon, 2007<sup>1</sup> (continued)**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
Other Chemicals					
Benzyladenine	20	1.2	0.041	0.050	( <sup>2</sup> )
Cytokinins	13	1.4	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>2</sup> )
Dodecadien-1-ol	13	1.0	0.051	0.051	( <sup>2</sup> )
Dodecanol	8	1.0	0.003	0.003	( <sup>2</sup> )
Gibberellins A4A7	15	1.0	0.028	0.029	( <sup>2</sup> )
NAA	17	1.4	0.036	0.050	( <sup>2</sup> )
NAA, Potassium salt	15	1.1	0.030	0.033	( <sup>2</sup> )
Octadecadien (E,Z)	7	1.0	0.001	0.001	( <sup>2</sup> )
Octadecadien (Z,Z)	7	1.0	0.017	0.017	( <sup>2</sup> )
Spirodiclofen	18	1.5	0.211	0.312	0.2
Tetradecanol	8	1.0	0.001	0.001	( <sup>2</sup> )

<sup>1</sup> Bearing acreage in 2007 for Oregon was 4,200 acres.

<sup>2</sup> Total applied is less than 50 lbs.

<sup>3</sup> Rates and total applied are not available because amounts of active ingredient are not comparable between products.

<sup>4</sup> Rate per acre is less than 0.0005 lbs.

**Apples: Agricultural Chemical Applications,  
Pennsylvania, 2007<sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D, dimeth. salt	15	1.1	1.120	1.260	4.1
Diuron	9	1.2	1.682	2.059	3.9
Flumioxazin	1	1.0	0.337	0.337	0.1
Glyphosate iso. salt	26	1.2	1.219	1.504	8.3
Paraquat	22	1.1	0.818	0.908	4.2
Pendimethalin	9	1.0	1.771	1.858	3.4
Simazine	11	1.2	1.710	1.989	4.7
Terbacil	2	1.0	0.603	0.603	0.2
<b>Insecticides</b>					
Abamectin	12	1.4	0.008	0.011	( <sup>2</sup> )
Acetamiprid	29	1.6	0.141	0.224	1.4
Azinphos-methyl	70	2.8	0.433	1.226	18.5
Benzoic acid	54	1.9	0.133	0.252	2.9
Bt subsp. kurstaki <sup>3</sup>	2	1.8			
Carbaryl	44	1.4	1.005	1.402	13.3
Chlorpyrifos	36	1.7	0.941	1.567	12.0
Cyfluthrin	8	1.2	0.028	0.032	0.1
Diazinon	34	1.9	0.796	1.504	11.1
Endosulfan	2	1.2	2.302	2.690	1.2
Esfenvalerate	26	1.8	0.034	0.061	0.3
Ethion	3	1.8	0.347	0.636	0.3
Etoxazole	10	1.0	0.050	0.050	0.1
Fenpropathrin	23	1.6	0.175	0.278	1.4
Gamma-cyhalothrin	20	1.4	0.010	0.014	0.1
Imidacloprid	21	1.4	0.036	0.051	0.2
Lambda-cyhalothrin	15	2.5	0.015	0.038	0.1
Methomyl	23	2.1	0.352	0.747	3.7
Novaluron	22	1.9	0.093	0.178	0.8
Oxamyl	1	1.8	0.308	0.540	0.2
Petroleum distillate	28	1.5	7.101	10.610	64.5
Petroleum oil	12	1.4	19.510	26.389	67.2
Phosmet	39	3.3	1.098	3.592	30.3
Pyridaben	2	1.2	0.216	0.262	0.1
Thiacloprid	10	1.6	0.094	0.147	0.3
<b>Fungicides</b>					
Basic copper sulfate	11	1.5	1.041	1.542	3.7
Boscalid	13	1.4	0.013	0.018	0.1
Captan	80	4.8	1.326	6.350	109.1
Chlorothalonil	3	1.0	0.708	0.708	0.4
Copper hydroxide	5	1.4	1.707	2.383	2.6
Copper oxychlo. sul.	3	1.0	2.534	2.534	1.8

See footnote(s) at end of table.

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**Apples: Agricultural Chemical Applications,  
Pennsylvania, 2007<sup>1</sup> (continued)**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
Fungicides (continued)					
Copper oxychloride	8	1.0	3.477	3.577	5.9
Cyprodinil	15	1.4	0.171	0.240	0.8
Dodine	3	1.3	0.490	0.659	0.5
Fenarimol	5	2.4	0.047	0.112	0.1
Kresoxim-methyl	56	1.8	0.081	0.148	1.8
Mancozeb	68	3.6	1.589	5.701	82.5
Metiram	23	3.0	1.818	5.533	26.9
Myclobutanil	33	2.1	0.115	0.247	1.7
Pyraclostrobin	13	1.4	0.001	0.001	( <sup>2</sup> )
Streptomycin	4	1.8	0.145	0.257	0.2
Thiophanate-methyl	60	2.7	0.320	0.873	11.2
Thiram	2	2.9	5.188	15.194	5.0
Trifloxystrobin	24	1.9	0.051	0.100	0.5
Ziram	30	3.0	2.025	6.173	39.8
Other Chemicals					
Benzyladenine	16	1.2	0.050	0.061	0.2
Butenoic Acid Hydro.	11	1.3	0.099	0.128	0.3
Chlorophacinone	3	1.0	0.001	0.001	( <sup>2</sup> )
Dodecadien-1-ol	2	1.8	0.010	0.017	( <sup>2</sup> )
Ethephon	27	1.6	0.208	0.335	2.0
Gibberellic acid	1	1.8	0.020	0.035	( <sup>2</sup> )
Gibberellins A4A7	4	1.0	0.016	0.016	( <sup>2</sup> )
NAA, Sodium	31	1.4	0.012	0.016	0.1
Prohexadione calcium	6	1.7	0.102	0.178	0.2
Spirodiclofen	17	1.6	0.145	0.232	0.9
Zinc phosphide	8	1.0	0.173	0.173	0.3

<sup>1</sup> Bearing acreage in 2007 for Pennsylvania was 21,500 acres.

<sup>2</sup> Total applied is less than 50 lbs.

<sup>3</sup> Rates and total applied are not available because amounts of active ingredient are not comparable between products.

**Apples: Agricultural Chemical Applications,  
Washington, 2007 <sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Herbicides</b>					
2,4-D, dimeth. salt	3	2.0	0.718	1.465	6.8
Glyphosate iso. salt	50	1.8	1.219	2.227	176.7
Norflurazon	8	1.4	1.573	2.239	26.7
Oryzalin	2	1.0	2.105	2.105	8.3
Paraquat	14	1.2	1.475	1.717	37.8
Simazine	9	1.5	1.143	1.698	23.0
<b>Insecticides</b>					
Acetamiprid	46	1.7	0.130	0.224	16.3
Azadirachtin	*	2.8	0.021	0.060	( <sup>2</sup> )
Azinphos-methyl	66	2.4	0.959	2.268	236.3
Benzoic acid	17	1.1	0.239	0.271	7.1
Bt subsp. kurstaki <sup>3</sup>	12	2.0			
Carbaryl	63	1.4	1.167	1.675	165.4
Chlorpyrifos	64	1.0	1.772	1.835	186.8
Cyd-X Granulo. Virus <sup>3</sup>	13	2.8			
Diazinon	9	1.1	2.220	2.430	33.4
Emamectin benzoate	18	1.1	0.013	0.014	0.4
Endosulfan	8	1.2	1.810	2.093	26.4
Hexythiazonx	4	1.0	0.132	0.138	0.9
Imidacloprid	27	1.5	0.110	0.165	6.9
Kaolin	3	2.1	36.711	77.137	382.9
Lambda-cyhalothrin	6	1.3	0.035	0.045	0.4
Novaluron	15	1.3	0.200	0.256	5.9
Petroleum distillate	85	1.8	17.910	32.991	4,421.1
Phosmet	8	1.3	2.501	3.328	41.2
Pyridaben	7	1.0	0.245	0.255	2.8
Pyriproxyfen	2	1.0	0.097	0.100	0.3
Spinosad	39	1.4	0.104	0.143	8.8
Thiacloprid	3	1.1	0.193	0.217	0.9
<b>Fungicides</b>					
Bacillus pumilus <sup>3</sup>	7	2.5			
Bacillus subtilis <sup>3</sup>	1	1.0			
Boscalid	19	1.4	0.014	0.020	0.6
Calcium polysulfide	30	1.5	16.702	24.544	1,148.1
Fenarimol	18	1.1	0.072	0.082	2.4
Kresoxim-methyl	3	1.2	0.152	0.181	0.8
Mancozeb	12	1.5	3.719	5.616	103.3
Myclobutanil	40	1.3	0.141	0.177	11.3
Oxytetracycline	12	1.2	0.167	0.201	3.9
Potassium bicarbon.	2	1.1	2.398	2.741	6.8
Pyraclostrobin	19	1.4	0.001	0.001	( <sup>2</sup> )

See footnote(s) at end of table.

--continued

**Apples: Agricultural Chemical Applications,  
Washington, 2007 <sup>1</sup> (continued)**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
Fungicides (continued)					
Sulfur	30	1.4	7.539	10.872	515.3
Thiophanate-methyl	2	1.0	0.666	0.677	2.5
Triadimefon	4	1.0	0.203	0.208	1.3
Trifloxystrobin	12	1.2	0.074	0.086	1.6
Triflumizole	36	1.7	0.279	0.468	26.7
Ziram	5	1.0	4.899	4.951	40.5
Other Chemicals					
Benzyladenine	33	1.3	0.031	0.040	2.1
Butenoic Acid Hydro.	21	1.0	0.061	0.061	2.0
Chlorophacinone	3	1.2	0.001	0.001	( <sup>2</sup> )
Cytokinins	2	1.6	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>2</sup> )
Dodecadien-1-ol	*	1.0	0.031	0.031	( <sup>2</sup> )
Dodecanol	*	1.0	0.007	0.007	( <sup>2</sup> )
Ethephon	19	1.2	0.559	0.682	20.3
Gibberellic acid	4	1.9	0.023	0.044	0.3
Gibberellins A4A7	30	1.0	0.024	0.024	1.1
Mineral oil	2	2.1	19.794	40.951	113.0
NAA	20	1.7	0.020	0.033	1.0
NAA, Potassium salt	6	1.3	0.040	0.050	0.5
NAD	7	1.0	0.059	0.059	0.7
Prohexadione calcium	5	2.5	0.256	0.628	5.2
Spirodiclofen	3	1.0	0.265	0.265	1.2
Tetradecanol	*	1.0	0.001	0.001	( <sup>2</sup> )

\* Area applied is less than 0.5 percent.

<sup>1</sup> Bearing acreage in 2007 for Washington was 158,000 acres.

<sup>2</sup> Total applied is less than 50 lbs.

<sup>3</sup> Rates and total applied are not available because amounts of active ingredient are not comparable between products.

<sup>4</sup> Rate per acre is less than 0.0005 lbs.

**Organic Apples: Fertilizer Use by State, 2007**  
**Percent of Acres Treated and Total Applied**

State	Bearing Acreage	Percent of Acres Treated and Total Applied							
		Nitrogen		Phosphate		Potash		Sulfur	
	<i>Acres</i>	<i>Percent</i>	<i>1,000 lbs.</i>	<i>Percent</i>	<i>1,000 lbs.</i>	<i>Percent</i>	<i>1,000 lbs.</i>	<i>Percent</i>	<i>1,000 lbs.</i>
WA	7,200	67	704.9	27	37.1	26	52.6	( <sup>1</sup> )	
Other States <sup>2</sup>	3,300	23	29.6	23	16.7	27	20.3	( <sup>1</sup> )	
US	10,500	53	734.5	25	53.8	26	72.9	12	24.6

<sup>1</sup> Insufficient reports to publish data for the fertilizer primary nutrient.

<sup>2</sup> Other States include CA, MI, NY, PA, and OR.

**Organic Apples: Fertilizer Primary Nutrient Applications,  
Program States and Total, 2007**

Primary Nutrient	Bearing Acreage	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Acres</i>	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
Washington	7,200					
Nitrogen		67	2.1	70	146	704.9
Phosphate		27	1.9	10	19	37.1
Potash		26	2.3	12	28	52.6
Sulfur <sup>1</sup>						
Other States <sup>2</sup>	3,300					
Nitrogen		23	1.5	25	38	29.6
Phosphate		23	1.5	15	22	16.7
Potash		27	1.7	14	23	20.3
Sulfur <sup>1</sup>						
Program States	10,500					
Nitrogen		53	2.0	65	131	734.5
Phosphate		25	1.8	11	20	53.8
Potash		26	2.1	12	26	72.9
Sulfur		12	1.1	18	20	24.6

<sup>1</sup> Insufficient reports to publish fertilizer data.

<sup>2</sup> Other States include CA, MI, NY, PA, and OR.

**Organic Apples: Active Ingredients and  
Publication Status  
By Program States, 2007**

Active Ingredient	Program States		
	ALL	OS <sup>1</sup>	WA
<b>Insecticides</b>			
Azadirachtin	P	*	*
Bt subsp israelensis	*	*	*
Bt subsp. kurstaki	P	P	P
Bt. (Berliner)	*	*	
Cyd-X Granulo. Virus	P	P	P
Kaolin	P	P	P
Neem oil, clar. hyd.	*	*	
Petroleum distillate	P	P	P
Petroleum oil	P		P
Potassium salts	*	*	*
Pyrethrins	*	*	*
Soybean oil	*	*	
Spinosad	P	P	P
<b>Fungicides</b>			
Bacillus pumilus	P	*	*
Bacillus subtilis	P	*	*
Calcium polysulfide	P	P	P
Copper hydroxide	P	P	
Copper octanoate	*		*
Copper oxide	P	*	*
Copper sulfate	*	*	
Oxytetracycline	P	*	*
Potassium bicarbon.	P	*	*
Pseudo. fluores A506	*		*
Streptomycin	*	*	*
Sulfur	P	P	P
Trifloxystrobin	*		*
<b>Other Chemicals</b>			
Benzyladenine	*		*
Butenoic Acid Hydro.	P		P
Cytokinins	P		P
Dodecadien-1-ol	P	P	P
Dodecanol	P	*	*
Gibberellic acid	*		*
Gibberellins A4A7	*		*
Hydrogen peroxide	*		*
Mineral oil	P		P
NAA, Ammonium salt	*		*
Octadecadien (E,Z)	*	*	
Octadecadien (Z,Z)	*	*	
Tetradecanol	P	*	*

P Usage data are published for this active ingredient.

\*Usage data are not published for this active ingredient.

<sup>1</sup> Other States include CA, MI, NY, PA, and OR.



**Organic Apples: Bearing Acreage, Pesticide,  
Percent of Area Receiving Applications and Total Applied,  
Program States and Total, 2007**

State	Bearing Acreage	Area Receiving and Total Applied							
		Herbicide		Insecticide <sup>1</sup>		Fungicide <sup>1</sup>		Other	
	<i>Acres</i>	<i>Percent</i>	<i>1,000 lbs.</i>	<i>Percent</i>	<i>1,000 lbs.</i>	<i>Percent</i>	<i>1,000 lbs.</i>	<i>Percent</i>	<i>1,000 lbs.</i>
WA	7,200			95	366.4	87	270.1	62	89.0
Other States <sup>2</sup>	3,300			45	168.2	48	61.2		
Total	10,500			79	534.6	75	331.2	51	89.0

<sup>1</sup> Total Applied excludes Bt's (*Bacillus thuringiensis*) and other biologicals.

Quantities are not available because amounts of active ingredient are not comparable between products.

<sup>2</sup> Other States include CA, MI, NY, PA, and OR.

**Organic Apples: Agricultural Chemical Applications,  
Program States, 2007<sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Insecticides</b>					
Azadirachtin	3	2.8	0.021	0.059	( <sup>2</sup> )
Bt subsp. kurstaki <sup>3</sup>	53	2.2			
Cyd-X Granulo. Virus <sup>3</sup>	56	4.0			
Kaolin	13	3.6	33.901	121.269	161.2
Petroleum distillate	49	5.1	12.616	64.314	331.4
Petroleum oil	11	4.1	8.006	33.221	38.8
Spinosad	49	2.3	0.099	0.226	1.2
<b>Fungicides</b>					
Bacillus pumilus <sup>3</sup>	28	2.1			
Bacillus subtilis <sup>3</sup>	4	1.2			
Calcium polysulfide	66	2.1	17.147	35.424	245.8
Copper hydroxide	3	4.2	1.456	6.136	1.9
Copper oxide	13	1.0	3.485	3.619	4.9
Oxytetracycline	5	1.4	0.217	0.297	0.1
Potassium bicarbon.	2	2.6	2.296	5.863	1.5
Sulfur	41	2.2	8.047	17.879	76.7
<b>Other Chemicals</b>					
Butenoic Acid Hydro.	10	1.0	0.052	0.052	0.1
Cytokinins	11	1.8	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>2</sup> )
Dodecadien-1-ol	6	1.0	0.023	0.023	( <sup>2</sup> )
Dodecanol	5	1.0	0.005	0.005	( <sup>2</sup> )
Mineral oil	21	1.5	26.198	40.574	88.2
Tetradecanol	5	1.0	0.001	0.001	( <sup>2</sup> )

<sup>1</sup> Bearing acreage in 2007 for the 6 Program States was 10,500 acres.

States included are CA, MI, NY, PA, OR, and WA.

<sup>2</sup> Total applied is less than 50 lbs.

<sup>3</sup> Rates and total applied are not available because amounts of active ingredient are not comparable between products.

<sup>4</sup> Rate per acre is less than 0.0005 lbs.

**Organic Apples: Agricultural Chemical Applications,  
Washington, 2007 <sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Insecticides</b>					
Bt subsp. kurstaki <sup>2</sup>	73	2.2			
Cyd-X Granulo. Virus <sup>2</sup>	75	3.7			
Kaolin	9	1.9	42.818	83.473	55.2
Petroleum distillate	61	5.5	11.355	62.250	271.3
Petroleum oil	16	4.1	8.006	33.221	38.8
Spinosad	67	2.2	0.102	0.221	1.1
<b>Fungicides</b>					
Calcium polysulfide	83	2.0	19.246	38.224	228.1
Sulfur	48	1.5	7.042	10.498	36.1
<b>Other Chemicals</b>					
Butenoic Acid Hydro.	15	1.0	0.052	0.052	0.1
Cytokinins	17	1.8	( <sup>3</sup> )	( <sup>3</sup> )	( <sup>4</sup> )
Dodecadien-1-ol	1	1.0	0.104	0.104	( <sup>4</sup> )
Mineral oil	30	1.5	26.198	40.574	88.2

<sup>1</sup> Bearing acreage in 2007 for Washington was 7,200 acres.

<sup>2</sup> Rates and total applied are not available because amounts of active ingredient are not comparable between products.

<sup>3</sup> Rate per acre is less than 0.0005 lbs.

<sup>4</sup> Total applied is less than 50 lbs.

**Organic Apples: Agricultural Chemical Applications,  
Other States, 2007 <sup>1</sup>**

Active Ingredient	Area Applied	Applications	Rate per Application	Rate per Crop Year	Total Applied
	<i>Percent</i>	<i>Number</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>1,000 lbs.</i>
<b>Insecticides</b>					
Bt subsp. kurstaki <sup>2</sup>	7	2.3			
Cyd-X Granulo. Virus <sup>2</sup>	14	7.1			
Kaolin	20	5.2	30.581	158.738	106.0
Petroleum distillate	24	3.0	25.271	75.622	60.1
Spinosad	11	3.7	0.078	0.290	0.1
<b>Fungicides</b>					
Calcium polysulfide	29	2.6	7.128	18.223	17.7
Copper hydroxide	9	4.2	1.456	6.136	1.9
Sulfur	26	5.2	9.219	47.819	40.6
<b>Other Chemicals</b>					
Dodecadien-1-ol	16	1.0	0.009	0.009	( <sup>3</sup> )

<sup>1</sup> Bearing acreage in 2007 for Other States (CA, MI, NY, OR and PA) was 3,300 acres.

<sup>2</sup> Rates and total applied are not available because amounts of active ingredient are not comparable between products.

<sup>3</sup> Total applied is less than 50 lbs.

## Distribution Tables – Highlights

The following distribution tables provide details about the distribution of agricultural chemical active ingredients commonly applied to the selected field. Chemical distribution rates are listed by active ingredient for the Percent of Acres Treated, Number of Applications, Rate per Application, and Rate per Crop year. In order for an active ingredient to be published in these tables, at least 30 farm operators reported an application of the active ingredient on the specified crop. The data in each table are summarized for a specific group of States, called Program States. The Program States designation is specific for each crop and provided in tables within the publication (See page 3).

These distribution tables show the 10<sup>th</sup> percentile, median, 90<sup>th</sup> percentile, mean, and coefficient of variation (CV) of the reported rates. The 10<sup>th</sup> percentile is the value below which 10 percent of all application rates fall. Thus, only 10 percent of operators reported an application rate for the active ingredient on the specified crop that was lower than the 10<sup>th</sup> percentile value. Likewise, the 90<sup>th</sup> percentile is a value for which 90 percent of all applications were at rates lower than this value. The median is the midpoint of the distribution with half of the reported application rates higher and half lower than the median value. The mean is the weighted average calculated by summing the application rate multiplied by the acres applied and then dividing by the acres applied.

The CV is a relative measure of the variability, expressed as a percentage of the estimate. For a specific commodity, the States have different agricultural practices which can lead to a wide range of pesticide usage rates. These ranges can lead to higher CV rates for different active ingredients. Some active ingredients are only applied in one manner resulting in smaller CVs, while other active ingredients have more varied agricultural uses which will have larger CVs. Please see the Survey and Estimation Procedures and Reliability sections for more information.

The Number of Applications, Rate per Application, and Rate per Crop Year distribution tables are calculated using data only from reports where the farm operator applied the active ingredient. Data presented in the Percent of Acres Treated table account for all operations in the sample producing the target commodity, whether or not the listed active ingredient was applied.

**All Cotton: Percent of Acres Treated Distribution,  
Program States, 2007 <sup>1</sup>**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
<b>Herbicides</b>					
2,4-D, 2-EHE	0	0	0	3	27
2,4-D, dimeth. salt	0	0	0	6	11
Carfentrazone-ethyl	0	0	0	10	13
Dicamba, digly. salt	0	0	0	4	11
Diuron	0	0	100	26	6
Flumioxazin	0	0	0	6	13
Fluometuron	0	0	0	4	19
Glyphosate	0	0	0	5	16
Glyphosate iso. salt	0	100	100	85	1
MSMA	0	0	0	3	19
Metolachlor	0	0	0	2	24
Pendimethalin	0	0	100	17	10
Prometryn	0	0	0	7	15
Pyraflufen-ethyl	0	0	0	8	17
Pyriproxyfen-sodium	0	0	0	10	11
S-Metolachlor	0	0	0	6	16
Trifloxysulfuron-sod	0	0	0	3	14
Trifluralin	0	0	100	29	4
<b>Insecticides</b>					
Abamectin	0	0	0	3	10
Acephate	0	0	100	26	5
Acetamiprid	0	0	0	6	25
Aldicarb	0	0	100	18	7
Bifenthrin	0	0	0	3	17
Cyfluthrin	0	0	0	8	11
Cypermethrin	0	0	0	7	10
Dicofol	0	0	100	21	5
Dimethoate	0	0	0	1	25
Esfenvalerate	0	0	0	2	25
Imidacloprid	0	0	0	6	12
Lambda-cyhalothrin	0	0	0	5	12
Malathion	0	0	0	5	23
Novaluron	0	0	0	4	17
Oxamyl	0	0	0	3	18
Thiamethoxam	0	0	100	11	8
Zeta-cypermethrin	0	0	0	3	23

See footnote(s) at end of table.

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**All Cotton: Percent of Acres Treated Distribution,  
Program States, 2007 <sup>1</sup> (continued)**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
Fungicides					
PCNB	0	0	0	1	25
Other Chemicals					
Bacillus cereus	0	0	0	5	15
Cyclanilide	0	0	100	14	8
Ethephon	0	100	100	69	2
Kinetin	0	0	0	2	26
Mepiquat chloride	0	0	100	35	3
Mepiquat pentaborate	0	0	0	4	28
Monocarbamide dihyd.	0	0	0	7	10
Paraquat	0	0	100	19	10
Sodium chlorate	0	0	0	6	12
Thidiazuron	0	0	100	37	4
Tribufos	0	0	100	29	6

<sup>1</sup> Planted acreage in 2007 for the 11 Program States was 10.2 million acres.

**All Cotton: Number of Applications Distribution,  
Program States, 2007 <sup>1</sup>**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
<b>Herbicides</b>					
2,4-D, 2-EHE	1	1	1	1	1
2,4-D, dimeth. salt	1	1	2	1	5
Carfentrazone-ethyl	1	1	1	1	3
Dicamba, digly. salt	1	1	1	1	2
Diuron	1	1	2	1	2
Flumioxazin	1	1	2	1	6
Fluometuron	1	1	1	1	2
Glyphosate	1	2	4	2	11
Glyphosate iso. salt	1	2	4	2	2
MSMA	1	1	1	1	1
Metolachlor	1	1	1	1	3
Pendimethalin	1	1	1	1	1
Prometryn	1	1	1	1	1
Pyraflufen-ethyl	1	1	1	1	3
Pyriithiobac-sodium	1	1	1	1	3
S-Metolachlor	1	1	1	1	2
Trifloxysulfuron-sod	1	1	1	1	5
Trifluralin	1	1	2	1	3
<b>Insecticides</b>					
Abamectin	1	1	1	1	3
Acephate	1	2	4	2	6
Acetamiprid	1	1	1	1	4
Aldicarb	1	1	1	1	1
Bifenthrin	1	1	3	2	9
Cyfluthrin	1	1	2	1	5
Cypermethrin	1	1	2	1	4
Dicrotophos	1	1	3	2	5
Dimethoate	1	1	4	2	19
Esfenvalerate	1	1	2	1	11
Imidacloprid	1	1	3	2	7
Lambda-cyhalothrin	1	1	3	2	8
Malathion	1	3	10	5	15
Novaluron	1	1	2	2	10
Oxamyl	1	1	3	1	9
Thiamethoxam	1	1	3	2	5
Zeta-cypermethrin	1	1	2	1	8

See footnote(s) at end of table.

--continued



**All Cotton: Number of Applications Distribution,  
Program States, 2007 <sup>1</sup> (continued)**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
Fungicides					
PCNB	1	1	1	1	1
Other Chemicals					
Bacillus cereus	1	1	3	2	8
Cyclanilide	1	1	2	1	6
Ethephon	1	1	2	1	2
Kinetin	1	1	2	2	10
Mepiquat chloride	1	2	3	2	4
Mepiquat pentaborate	1	1	2	2	5
Monocarbamide dihyd.	1	1	1	1	3
Paraquat	1	1	1	1	4
Sodium chlorate	1	1	2	1	4
Thidiazuron	1	1	2	1	2
Tribufos	1	1	1	1	2

<sup>1</sup> Planted acreage in 2007 for the 11 Program States was 10.2 million acres.

**All Cotton: Rate Per Application Distribution,  
Program States, 2007 <sup>1</sup>**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	
<b>Herbicides</b>					
2,4-D, 2-EHE	0.238	0.360	0.625	0.431	9
2,4-D, dimeth. salt	0.263	0.470	0.940	0.514	5
Carfentrazone-ethyl	0.008	0.016	0.025	0.017	5
Dicamba, digly. salt	0.063	0.250	0.250	0.213	6
Diuron	0.016	0.258	1.000	0.440	10
Flumioxazin	0.032	0.064	0.064	0.058	6
Fluometuron	0.425	0.640	1.000	0.715	5
Glyphosate	0.516	0.749	0.859	0.728	3
Glyphosate iso. salt	0.516	0.773	1.125	0.787	2
MSMA	0.750	1.500	2.063	1.361	6
Metolachlor	0.250	0.975	1.500	0.911	17
Pendimethalin	0.413	0.825	1.140	0.838	5
Prometryn	0.330	0.793	1.625	0.849	9
Pyraflufen-ethyl	0.002	0.003	0.005	0.003	5
Pyriithiobac-sodium	0.019	0.040	0.106	0.052	13
S-Metolachlor	0.750	0.938	1.191	0.974	5
Trifloxysulfuron-sod	0.004	0.006	0.011	0.006	7
Trifluralin	0.500	0.750	1.250	0.836	3
<b>Insecticides</b>					
Abamectin	0.004	0.006	0.009	0.006	6
Acephate	0.113	0.450	0.750	0.428	4
Acetamiprid	0.018	0.033	0.070	0.039	15
Aldicarb	0.375	0.750	0.750	0.666	4
Bifenthrin	0.047	0.070	0.100	0.070	5
Cyfluthrin	0.016	0.032	0.047	0.034	6
Cypermethrin	0.020	0.054	0.098	0.058	7
Diclotophos	0.156	0.320	0.500	0.325	3
Dimethoate	0.188	0.200	0.367	0.247	8
Esfenvalerate	0.008	0.046	0.064	0.039	14
Imidacloprid	0.023	0.043	0.063	0.044	6
Lambda-cyhalothrin	0.014	0.021	0.041	0.026	6
Malathion	0.469	0.928	0.928	0.837	4
Novaluron	0.028	0.039	0.058	0.042	5
Oxamyl	0.157	0.236	0.471	0.328	11
Thiamethoxam	0.016	0.023	0.031	0.025	4
Zeta-cypermethrin	0.013	0.019	0.038	0.021	11

See footnote(s) at end of table.

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**All Cotton: Rate Per Application Distribution,  
Program States, 2007 <sup>1</sup> (continued)**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	
Fungicides					
PCNB	0.400	0.500	1.300	0.615	11
Other Chemicals					
Bacillus cereus	*	*	*	*	6
Cyclanilide	0.004	0.094	0.141	0.087	11
Ethephon	0.400	1.125	1.500	1.086	2
Kinetin	*	*	*	*	14
Mepiquat chloride	0.014	0.027	0.044	0.030	5
Mepiquat pentaborate	0.026	0.064	0.103	0.066	10
Monocarbamide dihyd.	0.912	2.720	3.648	2.393	6
Paraquat	0.063	0.375	0.703	0.372	9
Sodium chlorate	0.500	1.500	3.998	1.890	8
Thidiazuron	0.031	0.063	0.100	0.065	3
Tribufos	0.211	0.600	1.219	0.675	5

\*Rate per acre is less than 0.0005 lbs.

<sup>1</sup> Planted acreage in 2007 for the 11 Program States was 10.2 million acres.

**All Cotton: Rate per Crop Year Distribution,  
Program States, 2007<sup>1</sup>**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	
<b>Herbicides</b>					
2,4-D, 2-EHE	0.238	0.360	0.625	0.435	9
2,4-D, dimeth. salt	0.263	0.470	0.940	0.571	6
Carfentrazone-ethyl	0.008	0.019	0.025	0.019	5
Dicamba, digly. salt	0.063	0.250	0.250	0.218	6
Diuron	0.016	0.250	1.000	0.499	10
Flumioxazin	0.048	0.064	0.128	0.068	7
Fluometuron	0.425	0.650	1.000	0.733	5
Glyphosate	0.703	1.043	2.513	1.481	12
Glyphosate iso. salt	0.750	1.828	3.094	1.900	2
MSMA	0.750	1.500	2.063	1.368	6
Metolachlor	0.250	0.975	2.000	0.967	18
Pendimethalin	0.413	0.825	1.140	0.849	5
Prometryn	0.330	0.793	1.793	0.872	9
Pyraflufen-ethyl	0.002	0.003	0.005	0.003	6
Pyriithiobac-sodium	0.019	0.046	0.128	0.058	13
S-Metolachlor	0.750	0.938	1.267	0.994	5
Trifloxysulfuron-sod	0.005	0.007	0.012	0.007	6
Trifluralin	0.600	0.850	1.250	0.921	4
<b>Insecticides</b>					
Abamectin	0.004	0.006	0.009	0.007	7
Acephate	0.188	0.487	2.250	0.900	7
Acetamiprid	0.014	0.033	0.070	0.041	17
Aldicarb	0.375	0.750	0.750	0.678	4
Bifenthrin	0.025	0.094	0.211	0.111	12
Cyfluthrin	0.017	0.037	0.067	0.044	6
Cypermethrin	0.020	0.059	0.156	0.073	9
Diclotophos	0.188	0.438	1.000	0.565	6
Dimethoate	0.125	0.250	1.000	0.418	15
Esfenvalerate	0.008	0.031	0.099	0.049	24
Imidacloprid	0.031	0.056	0.133	0.071	7
Lambda-cyhalothrin	0.015	0.033	0.066	0.039	10
Malathion	0.758	1.875	9.281	3.799	14
Novaluron	0.039	0.052	0.084	0.061	9
Oxamyl	0.200	0.471	0.889	0.456	7
Thiamethoxam	0.016	0.031	0.078	0.039	7
Zeta-cypermethrin	0.012	0.023	0.073	0.029	16

See footnote(s) at end of table.

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**All Cotton: Rate per Crop Year Distribution,  
Program States, 2007 <sup>1</sup> (continued)**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	
Fungicides					
PCNB	0.350	0.500	1.300	0.635	11
Other Chemicals					
Bacillus cereus	*	*	*	*	10
Cyclanilide	0.013	0.125	0.188	0.113	7
Ethephon	0.500	1.139	1.875	1.259	2
Kinetin	*	*	*	*	22
Mepiquat chloride	0.016	0.044	0.109	0.058	6
Mepiquat pentaborate	0.038	0.103	0.205	0.106	11
Monocarbamide dihyd.	0.912	2.736	3.648	2.604	6
Paraquat	0.059	0.391	0.750	0.397	8
Sodium chlorate	0.500	1.875	4.575	2.267	7
Thidiazuron	0.031	0.063	0.125	0.073	3
Tribufos	0.234	0.750	1.500	0.743	5

\*Rate per acre is less than 0.0005 lbs.

<sup>1</sup> Planted acreage in 2007 for the 11 Program States was 10.2 million acres.

**Apples: Percent of Acres Treated Distribution,  
Program States, 2007 <sup>1</sup>**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
<b>Herbicides</b>					
2,4-D, dimeth. salt	0	0	26	8	15
Diuron	0	0	0	6	24
Glyphosate iso. salt	0	25	100	45	6
Paraquat	0	0	83	12	22
Pendimethalin	0	0	0	3	44
Simazine	0	0	36	10	21
<b>Insecticides</b>					
Abamectin	0	0	0	2	16
Acetamiprid	0	0	100	37	8
Azinphos-methyl	0	100	100	62	6
Benzoic acid	0	0	100	19	16
Bt subsp. kurstaki	0	0	52	10	31
Carbaryl	0	75	100	52	10
Chlorpyrifos	0	100	100	59	7
Cyd-X Granulo. Virus	0	0	50	10	24
Diazinon	0	0	0	8	21
Emamectin benzoate	0	0	100	16	18
Endosulfan	0	0	0	9	29
Esfenvalerate	0	0	50	10	9
Etoxazole	0	0	0	3	33
Fenpropathrin	0	0	100	12	9
Fenpyroximate	0	0	0	7	31
Gamma-cyhalothrin	0	0	0	5	18
Imidacloprid	0	0	100	25	9
Kaolin	0	0	0	3	20
Lambda-cyhalothrin	0	0	50	10	14
Methomyl	0	0	0	4	12
Novaluron	0	0	100	15	13
Permethrin	0	0	0	1	25
Petroleum distillate	0	100	100	58	4
Petroleum oil	0	0	0	4	19
Phosmet	0	0	100	25	7
Pyridaben	0	0	0	7	17
Spinosad	0	0	100	24	12
Thiacloprid	0	0	0	8	14

See footnote(s) at end of table.

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**Apples: Percent of Acres Treated Distribution,  
Program States, 2007 <sup>1</sup> (continued)**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
<b>Fungicides</b>					
Bacillus pumilus	0	0	0	4	55
Basic copper sulfate	0	0	0	3	19
Boscalid	0	0	100	14	21
Calcium polysulfide	0	0	100	18	21
Captan	0	0	100	34	2
Copper hydroxide	0	0	0	7	16
Copper oxychlo. sul.	0	0	0	2	21
Copper oxychloride	0	0	0	2	28
Copper sulfate	0	0	0	2	32
Cyprodinil	0	0	0	4	16
Dodine	0	0	0	3	28
Fenarimol	0	0	100	13	13
Kresoxim-methyl	0	0	100	13	9
Mancozeb	0	0	100	37	5
Metiram	0	0	0	7	12
Myclobutanil	0	0	100	36	10
Oxytetracycline	0	0	0	7	43
Pyraclostrobin	0	0	100	14	21
Pyrimethanil	0	0	0	3	11
Streptomycin	0	0	0	9	15
Streptomycin sulfate	0	0	0	3	26
Sulfur	0	0	100	26	15
Thiophanate-methyl	0	0	100	18	7
Triadimefon	0	0	0	4	25
Trifloxystrobin	0	0	100	20	11
Triflumizole	0	0	100	21	19
Ziram	0	0	100	11	12
<b>Other Chemicals</b>					
Benzyladenine	0	0	100	23	22
Butenoic Acid Hydro.	0	0	100	15	32
Dodecadien-1-ol	0	0	0	2	38
Ethephon	0	0	100	13	19
Gibberellins A4A7	0	0	100	18	30
NAA	0	0	100	12	18
NAA, Potassium salt	0	0	0	4	24
NAA, Sodium	0	0	52	11	12
Prohexadione calcium	0	0	0	6	14
Spirodiclofen	0	0	0	7	11

<sup>1</sup> Bearing acreage in 2007 for the 7 Program States was 288,000 acres.

**Apples: Number of Applications Distribution,  
Program States, 2007 <sup>1</sup>**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
<b>Herbicides</b>					
2,4-D, dimeth. salt	1	1	2	1	7
Diuron	1	1	2	1	8
Glyphosate iso. salt	1	1	2	2	5
Paraquat	1	1	2	1	7
Pendimethalin	1	1	2	1	12
Simazine	1	1	2	1	7
<b>Insecticides</b>					
Abamectin	1	1	2	1	7
Acetamiprid	1	1	3	2	17
Azinphos-methyl	1	2	4	3	3
Benzoic acid	1	1	2	1	6
Bt subsp. kurstaki	1	1	3	2	12
Carbaryl	1	1	2	1	7
Chlorpyrifos	1	1	2	1	3
Cyd-X Granulo. Virus	1	2	5	3	11
Diazinon	1	1	3	1	8
Emamectin benzoate	1	1	2	1	5
Endosulfan	1	1	2	1	7
Esfenvalerate	1	1	3	2	7
Etoxazole	1	1	1	1	3
Fenpropathrin	1	1	3	2	7
Fenpyroximate	1	1	1	1	5
Gamma-cyhalothrin	1	2	3	2	9
Imidacloprid	1	1	3	2	8
Kaolin	1	2	3	2	12
Lambda-cyhalothrin	1	1	2	2	9
Methomyl	1	2	3	2	8
Novaluron	1	1	2	2	6
Permethrin	1	1	3	1	12
Petroleum distillate	1	1	4	2	11
Petroleum oil	1	1	3	2	13
Phosmet	1	2	4	2	5
Pyridaben	1	1	1	1	3
Spinosad	1	1	2	1	11
Thiacloprid	1	1	3	2	10

See footnote(s) at end of table.

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**Apples: Number of Applications Distribution,  
Program States, 2007 <sup>1</sup> (continued)**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
<b>Fungicides</b>					
Bacillus pumilus	1	3	3	3	10
Basic copper sulfate	1	1	1	1	12
Boscalid	1	1	2	1	11
Calcium polysulfide	1	1	2	2	11
Captan	2	5	8	5	8
Copper hydroxide	1	1	2	1	10
Copper oxychlo. sul.	1	1	2	2	16
Copper oxychloride	1	1	1	1	3
Copper sulfate	1	1	3	2	17
Cyprodinil	1	1	2	2	12
Dodine	1	1	2	2	10
Fenarimol	1	1	2	1	8
Kresoxim-methyl	1	2	3	2	5
Mancozeb	1	3	5	3	5
Metiram	2	3	5	3	8
Myclobutanil	1	1	2	2	7
Oxytetracycline	1	1	2	1	12
Pyraclostrobin	1	1	2	1	11
Pyrimethanil	1	1	2	1	6
Streptomycin	1	1	2	2	9
Streptomycin sulfate	1	1	3	2	15
Sulfur	1	2	4	2	12
Thiophanate-methyl	1	2	5	3	8
Triadimefon	1	1	3	2	15
Trifloxystrobin	1	1	3	2	4
Triflumizole	1	1	3	2	11
Ziram	1	1	4	2	8
<b>Other Chemicals</b>					
Benzyladenine	1	1	2	1	9
Butenoic Acid Hydro.	1	1	1	1	5
Dodecadien-1-ol	1	1	2	1	14
Ethephon	1	1	2	1	7
Gibberellins A4A7	1	1	1	1	2
NAA	1	1	3	2	16
NAA, Potassium salt	1	1	2	1	14
NAA, Sodium	1	1	2	1	8
Prohexadione calcium	1	2	3	2	9
Spirodiclofen	1	1	2	1	4

<sup>1</sup> Bearing acreage in 2007 for the 7 Program States was 288,000 acres.

**Apples: Rate Per Application Distribution,  
Program States, 2007 <sup>1</sup>**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	
<b>Herbicides</b>					
2,4-D, dimeth. salt	0.297	0.950	1.425	0.977	8
Diuron	0.800	1.598	2.250	1.484	10
Glyphosate iso. salt	0.598	1.125	1.500	1.193	7
Paraquat	0.469	0.938	2.500	1.194	24
Pendimethalin	0.845	0.845	2.855	1.443	24
Simazine	0.500	1.003	2.000	1.421	12
<b>Insecticides</b>					
Abamectin	0.006	0.012	0.012	0.010	5
Acetamiprid	0.072	0.149	0.219	0.147	9
Azinphos-methyl	0.496	1.000	1.000	0.832	3
Benzoic acid	0.094	0.219	0.250	0.197	4
Carbaryl	0.500	1.000	1.800	1.115	6
Chlorpyrifos	0.781	1.500	2.000	1.502	5
Diazinon	0.563	1.000	2.000	1.504	18
Emamectin benzoate	0.010	0.013	0.015	0.013	2
Endosulfan	1.000	1.125	2.250	1.458	10
Esfenvalerate	0.017	0.041	0.072	0.044	9
Etoxazole	0.045	0.090	0.113	0.085	12
Fenpropathrin	0.150	0.300	0.338	0.258	5
Fenpyroximate	0.050	0.100	0.130	0.086	11
Gamma-cyhalothrin	0.008	0.016	0.020	0.015	5
Imidacloprid	0.025	0.058	0.118	0.086	32
Kaolin	17.100	31.667	47.500	33.500	9
Lambda-cyhalothrin	0.016	0.038	0.039	0.031	7
Methomyl	0.225	0.450	0.900	0.526	7
Novaluron	0.101	0.130	0.213	0.163	6
Permethrin	0.125	0.150	0.200	0.170	5
Petroleum distillate	7.000	15.167	35.000	17.808	4
Petroleum oil	1.572	9.333	35.000	14.180	18
Phosmet	0.591	1.540	2.620	1.609	4
Pyridaben	0.155	0.234	0.345	0.248	4
Spinosad	0.063	0.113	0.125	0.104	6
Thiacloprid	0.094	0.188	0.215	0.167	5

See footnote(s) at end of table.

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**Apples: Rate Per Application Distribution,  
Program States, 2007<sup>1</sup> (continued)**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	
<b>Fungicides</b>					
Basic copper sulfate	0.284	1.136	2.000	1.239	15
Boscalid	0.008	0.014	0.016	0.014	11
Calcium polysulfide	9.000	16.167	26.400	16.190	5
Captan	0.944	1.967	3.000	1.988	3
Copper hydroxide	1.250	2.500	4.200	2.617	6
Copper oxychlo. sul.	0.300	1.250	3.000	1.529	17
Copper oxychloride	1.000	3.000	4.000	2.526	17
Copper sulfate	0.158	0.945	1.512	0.789	19
Cyprodinil	0.117	0.188	0.234	0.183	4
Dodine	0.425	0.850	1.258	0.800	7
Fenarimol	0.031	0.063	0.094	0.067	5
Kresoxim-methyl	0.063	0.125	0.156	0.111	4
Mancozeb	1.333	2.250	4.500	2.676	5
Metiram	1.290	2.400	3.840	2.586	6
Myclobutanil	0.069	0.125	0.200	0.128	8
Oxytetracycline	0.170	0.170	0.170	0.171	4
Pyraclostrobin	*	0.001	0.001	0.001	11
Pyrimethanil	0.146	0.195	0.391	0.239	7
Streptomycin	0.085	0.170	0.255	0.173	6
Streptomycin sulfate	0.148	0.283	0.400	0.281	9
Sulfur	2.925	6.000	9.000	6.290	5
Thiophanate-methyl	0.175	0.350	0.525	0.375	4
Triadimefon	0.063	0.125	0.250	0.131	12
Trifloxystrobin	0.039	0.063	0.078	0.066	3
Triflumizole	0.130	0.250	0.375	0.276	8
Ziram	1.310	2.787	5.238	3.009	5
<b>Other Chemicals</b>					
Benzyladenine	0.011	0.037	0.059	0.034	15
Butenoic Acid Hydro.	0.044	0.055	0.110	0.071	22
Dodecadien-1-ol	0.002	0.009	0.014	0.012	29
Ethephon	0.124	0.500	1.000	0.485	10
Gibberellins A4A7	0.011	0.019	0.038	0.024	22
NAA	0.004	0.007	0.072	0.020	24
NAA, Potassium salt	0.003	0.014	0.110	0.036	32
NAA, Sodium	0.003	0.009	0.026	0.012	13
Prohexadione calcium	0.092	0.206	0.321	0.213	6
Spirodiclofen	0.125	0.250	0.281	0.208	6

\* Rate per acre is less than 0.0005 lbs.

<sup>1</sup> Bearing acreage in 2007 for the 7 Program States was 288,000 acres.

**Apples: Rate per Crop Year Distribution,  
Program States, 2007<sup>1</sup>**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	
<b>Herbicides</b>					
2,4-D, dimeth. salt	0.594	1.425	1.900	1.280	7
Diuron	0.800	1.000	4.000	1.688	17
Glyphosate iso. salt	0.750	1.500	3.000	1.925	11
Paraquat	0.500	1.250	2.500	1.440	21
Pendimethalin	1.250	1.519	3.000	2.055	16
Simazine	0.576	2.000	4.000	1.843	10
<b>Insecticides</b>					
Abamectin	0.006	0.012	0.023	0.012	8
Acetamiprid	0.131	0.157	0.543	0.254	9
Azinphos-methyl	0.789	2.000	3.750	2.045	4
Benzoic acid	0.150	0.250	0.500	0.273	5
Carbaryl	0.500	1.000	3.000	1.566	12
Chlorpyrifos	1.000	1.500	2.498	1.732	6
Diazinon	0.750	1.875	2.500	2.078	18
Emamectin benzoate	0.011	0.014	0.030	0.016	6
Endosulfan	1.000	1.250	3.000	1.723	12
Esfenvalerate	0.017	0.052	0.126	0.064	12
Etoxazole	0.045	0.090	0.113	0.088	12
Fenpropathrin	0.169	0.300	0.713	0.402	8
Fenpyroximate	0.050	0.100	0.100	0.091	15
Gamma-cyhalothrin	0.006	0.031	0.041	0.030	9
Imidacloprid	0.038	0.078	0.400	0.128	27
Kaolin	47.500	51.300	142.500	75.830	12
Lambda-cyhalothrin	0.025	0.039	0.075	0.048	8
Methomyl	0.450	0.600	1.800	0.943	10
Novaluron	0.130	0.208	0.389	0.238	6
Permethrin	0.125	0.200	0.450	0.242	13
Petroleum distillate	10.500	28.000	49.000	31.410	9
Petroleum oil	0.980	21.000	42.000	20.719	15
Phosmet	1.050	3.220	6.650	3.561	6
Pyridaben	0.165	0.239	0.345	0.262	7
Spinosad	0.063	0.125	0.250	0.146	11
Thiacloprid	0.130	0.188	0.500	0.258	9

See footnote(s) at end of table.

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**Apples: Rate per Crop Year Distribution,  
Program States, 2007 <sup>1</sup> (continued)**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	
<b>Fungicides</b>					
Basic copper sulfate	0.284	1.136	2.000	1.523	22
Boscalid	0.011	0.016	0.032	0.020	11
Calcium polysulfide	9.000	18.000	48.000	23.579	14
Captan	3.204	8.602	18.000	10.274	10
Copper hydroxide	1.500	3.000	5.000	3.361	10
Copper oxychlo. sul.	0.750	1.500	4.000	2.264	14
Copper oxychloride	1.000	3.000	4.000	2.626	17
Copper sulfate	0.158	1.008	2.995	1.257	33
Cyprodinil	0.141	0.234	0.469	0.276	12
Dodine	0.425	0.850	2.125	1.223	15
Fenarimol	0.053	0.078	0.172	0.091	8
Kresoxim-methyl	0.084	0.156	0.375	0.190	5
Mancozeb	2.250	6.225	13.500	7.309	5
Metiram	2.400	7.200	13.600	8.078	7
Myclobutanil	0.100	0.182	0.250	0.191	5
Oxytetracycline	0.170	0.170	0.340	0.207	13
Pyraclostrobin	0.001	0.001	0.002	0.001	11
Pyrimethanil	0.188	0.296	0.570	0.323	7
Streptomycin	0.017	0.213	0.510	0.273	14
Streptomycin sulfate	0.160	0.399	0.850	0.511	16
Sulfur	6.300	9.975	24.000	13.630	10
Thiophanate-methyl	0.263	0.700	2.065	0.939	9
Triadimefon	0.063	0.188	0.250	0.207	19
Trifloxystrobin	0.063	0.078	0.156	0.103	5
Triflumizole	0.250	0.375	0.781	0.465	8
Ziram	2.280	4.560	11.556	6.100	6
<b>Other Chemicals</b>					
Benzyladenine	0.011	0.030	0.079	0.043	22
Butenoic Acid Hydro.	0.044	0.047	0.110	0.075	24
Dodecadien-1-ol	0.002	0.012	0.027	0.016	35
Ethephon	0.250	0.500	1.000	0.615	10
Gibberellins A4A7	0.011	0.019	0.038	0.024	22
NAA	0.007	0.017	0.072	0.033	18
NAA, Potassium salt	0.003	0.010	0.110	0.045	44
NAA, Sodium	0.005	0.013	0.035	0.017	9
Prohexadione calcium	0.103	0.392	0.828	0.422	10
Spirodiclofen	0.141	0.250	0.313	0.239	6

<sup>1</sup> Bearing acreage in 2007 for the 7 Program States was 288,000 acres.

**Organic Apples: Percent of Acres Treated Distribution,  
Program States, 2007<sup>1</sup>**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
<b>Insecticides</b>					
Bt subsp. kurstaki	0	100	100	53	7
Cyd-X Granulo. Virus	0	100	100	56	7
Petroleum distillate	0	0	100	49	15
Spinosad	0	19	100	49	8
<b>Fungicides</b>					
Calcium polysulfide	0	100	100	66	7
Sulfur	0	0	100	41	13

<sup>1</sup> Bearing acreage in 2007 for the 6 Program States was 10,500 acres.

**Organic Apples: Number of Applications Distribution,  
Program States, 2007<sup>1</sup>**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
<b>Insecticides</b>					
Bt subsp. kurstaki	1	2	3	2	15
Cyd-X Granulo. Virus	1	2	8	4	20
Petroleum distillate	1	3	10	5	20
Spinosad	1	1	5	2	22
<b>Fungicides</b>					
Calcium polysulfide	1	2	4	2	17
Sulfur	1	1	5	2	20

<sup>1</sup> Bearing acreage in 2007 for the 6 Program States was 10,500 acres.

**Organic Apples: Rate Per Application Distribution,  
Program States, 2007 <sup>1</sup>**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	
Insecticides					
Petroleum distillate	7.000	9.947	21.500	12.616	12
Spinosad	0.075	0.100	0.150	0.099	6
Fungicides					
Calcium polysulfide	5.250	16.167	27.000	17.147	17
Sulfur	5.016	7.618	12.113	8.047	11

<sup>1</sup> Bearing acreage in 2007 for the 6 Program States was 10,500 acres.

**Organic Apples: Rate per Crop Year Distribution,  
Program States, 2007 <sup>1</sup>**

Active Ingredient	10th Percentile	Median	90th Percentile	Mean	cv(%)
	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	<i>Pounds per Acre</i>	
Insecticides					
Petroleum distillate	7.000	42.000	189.000	64.314	20
Spinosad	0.100	0.150	0.500	0.226	19
Fungicides					
Calcium polysulfide	9.000	26.190	108.000	35.424	31
Sulfur	5.520	8.000	25.650	17.879	29

<sup>1</sup> Bearing acreage in 2007 for the 6 Program States was 10,500 acres.

## Integrated Pest Management Practices - Highlights

**Overview:** The following tables present data on pest management practices that growers use on field and fruit crop acres to control pests. Each question has been placed into one of four pest management categories: Prevention, Avoidance, Monitoring, or Suppression. The actual questions used to collect these data are shown in the survey instrument on page 121. It is important to note that the practice of good pest management is site-specific in nature, and individual tactics are principally determined by the particular crop/pest/environment scenario.

The data are published in two tables: Percent of Farms Utilizing Practice, and Percent of Acres Utilizing Practice. These percentages are published at the Program State and State levels. For all the crops in this survey, the percentages refer only to farms and acres.

Producers were first asked how many total acres of crops they grew in 2007, followed by questions regarding the use of specific pest management practices, in a yes/no format. Pests were defined as weeds, insects, or diseases. If the respondent used a specific practice on any crop, it was assumed that the practice was used on all of the crop acres. For example, if a producer had 100 acres of various apple crops, and used field mapping of previous weed problems to assist in making weed management decisions, it was assumed that all 100 acres were mapped.

**Cotton:** Applying herbicides after weeds emerged was the most commonly reported pest management practice for prevention, used by 90 percent of the cotton farms, on 88 percent of the acres. The next most commonly used prevention practices were; applying insecticides to the cotton field and applying herbicides before weeds emerged, used by 75 and 68 percent of the cotton farms, on 65 and 73 percent of the acres, respectively.

For avoidance practices, choosing a crop variety for pest resistance was used by the majority of cotton farms, 59 percent, on 58 percent of the acreage. The second most commonly utilized avoidance practice was rotating crops to control pest, used by 44 percent of cotton farmers on 40 percent of the acreage.

For monitoring practices, scouting for insects and mites along with scouting for weeds were the most commonly used scouting practices, used on 93 and 92 percent of the farms that produced cotton, respectively. Scouting for weeds and scouting for insects and mites were the most common monitoring practice, occurring on 92 and 91 percent of the cotton acres, respectively.

The most widely used pest suppression practice was the use scouting to make decisions and maintaining ground cover or physical barriers. These practices were used on 36 and 30 percent of the cotton farms. The suppression practice of scouting to make decisions and maintaining ground cover or physical barriers were used on 33 and 27 percent of the acreage, respectively.

**Apples:** Applying insecticides to the apple block was the most commonly reported prevention practice, used by 93 percent of the apple farms, on 96 percent of the acres. The next most commonly used prevention practice was chopping, spraying, mowing and plowing field edges within the block used by 80 percent of the apple farms, on 85 percent of the acres.

For avoidance practices, adjusting harvesting dates was the most commonly utilized avoidance practice used by 12 percent of the apple farms, on 10 percent of the acreage. The second most



commonly utilized avoidance practice was choosing a crop variety for pest resistance, used by 9 percent of apple farmers on 8 percent of the acres.

For monitoring practices, scouting for insects or mites along with scouting for diseases were the most commonly applied monitoring practices, used on 95 and 92 percent of the farms, respectively. Scouting for insects or mites was usually done by the farm supply or chemical dealer while scouting for diseases was usually done by the operator, partner, or family member. Scouting for insects or mites along with scouting for diseases were the most common monitoring practices, occurring on 98 and 96 percent of the apple acres, respectively.

The most widely used pest suppression practice was to alternate pesticides with different MOA and maintaining ground cover or physical barriers. These practices were used on 75 and 64 percent of the farms. The suppression practice of alternating pesticides with different MOA and maintaining ground cover or physical barriers were used on 76 and 70 percent of the acreage, respectively.

**Organic Apples:** Applying insecticides to the apple block was the most commonly reported prevention practice, used by 73 percent of the apple farms, on 76 percent of the acres. The next most commonly used prevention practice was chopping, spraying, mowing and plowing field edges within the block used by 66 percent of the apple farms, on 72 percent of the acres.

For avoidance practices, choosing a crop variety for pest resistance was used by 13 percent of the organic apple farms, on 17 percent of the acreage. The second most commonly utilized avoidance practice was adjusting harvesting dates to control pest, used by 7 percent of organic apple farmers on 13 percent of the acres.

For monitoring practices, scouting for insects or mites along with scouting for diseases were the most commonly applied monitoring practices, used on 96 and 93 percent of the farms that produced organic apples, respectively. Scouting for insects or mites was usually done by the operator, partner, or family member. Scouting for insects or mites along with scouting for diseases were the most common monitoring practices, occurring on 99 and 98 percent of the apple acres, respectively.

The most widely used pest suppression practice was to maintain ground cover or physical barriers along with using biological pest controls. These practices were used on 71 and 68 percent of the organic apple farms. The suppression practice of using biological pesticides and maintaining ground cover or physical barriers were both used on 74 percent of the acreage. The suppression practice of utilizing biologicals to control pest was used on 78 percent of the acreage.

**Pest Management Practices  
Percent of Farms Utilizing Practice  
All Cotton, 2007**

Practice	States					
	ALL	AL	AR	CA	GA	LA
<b>Prevention Practices:</b>						
No-till or minimum till used to manage pests	57	50	68	34	64	68
Plow down crop residue	41	28	47	71	34	56
Remove/burn down crop residue	23	21	26	23	26	40
Clean implements after fieldwork	51	32	45	55	63	27
Field cultivated for weed control	25	3	23	94	10	5
Field edges/etc. chopped, mowed/etc.	60	45	63	66	72	66
Water management practice	5	2	17	30	2	5
Treat seed for insect or disease after purchase	21	21	24	12	26	28
Applied herbicides before weeds emerged	68	54	61	53	92	57
Routine treatment for the presence of weeds	91	85	81	85	98	94
Weeds scouted from the previous year	8	15	19	15	2	6
Applied herbicides after weeds emerged	90	90	88	58	88	98
Routine treatment for the presence of weeds	66	83	63	62	76	57
Weeds scouted from the previous year	33	17	36	38	24	43
Applied insecticides to this cotton field	75	68	92	82	84	99
Routine treatment for the presence of insects	38	62	25	41	31	18
Scouted for insect infestation	62	38	72	59	69	82
Used flamer to kill weeds	*			1	*	
Maintain beneficial insect or vertebrate habitat	13	19	11	19	8	11
Protection of beneficial organisms	25	34	34	36	9	37
<b>Avoidance Practices:</b>						
Adjust planting/harvesting dates	21	27	17	20	28	29
Rotate crops to control pests	44	46	14	44	75	59
Planting locations planned to avoid pests	14	10	9	18	18	27
Crop variety chosen for pest resistance	59	53	51	37	74	68
<b>Monitoring Practices:</b>						
Deliberate scouting activities	83	74	97	89	93	94
Scouting by general observation	14	17	3	10	7	6
Field was not scouted	3	9		1	*	
Scouted for pests	49	55	69	63	43	53
Scouting due to pest advisory warning	19	20	9	23	40	15
Scouting due to pest development model	19	23	30	15	26	7
Scouted for weeds	92	83	91	97	98	97
Scouting for weeds was done by:						
Operator, partner, or family member	57	65	21	24	57	46
An employee	3	1	1	5	1	5
Farm supply or chemical dealer	3	*	3	32		
Indep. crop consultant or comm. scout	37	33	74	40	42	49

See footnote(s) at end of table.

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**Pest Management Practices  
Percent of Farms Utilizing Practice  
All Cotton, 2007 -continued**

Practice	States					
	MS	MO	NC	SC	TN	TX
<b>Prevention Practices:</b>						
No-till or minimum till used to manage pests	62	49	72	72	63	39
Plow down crop residue	38	16	28	27	14	61
Remove/burn down crop residue	31	35	24	14	44	12
Clean implements after fieldwork	55	9	45	67	56	60
Field cultivated for weed control	9	28	3	8	3	60
Field edges/etc. chopped, mowed/etc.	89	23	55	41	66	57
Water management practice	7	2	2	2		4
Treat seed for insect or disease after purchase	10	35	28	6	11	20
Applied herbicides before weeds emerged	52	62	64	77	65	74
Routine treatment for the presence of weeds	90	100	89	84	96	92
Weeds scouted from the previous year	9		10	16	4	7
Applied herbicides after weeds emerged	99	99	97	96	92	84
Routine treatment for the presence of weeds	77	87	61	69	51	58
Weeds scouted from the previous year	22	13	39	31	49	40
Applied insecticides to this cotton field	93	79	76	89	91	49
Routine treatment for the presence of insects	34	41	45	48	36	39
Scouted for insect infestation	65	59	55	52	64	60
Used flamer to kill weeds	1	1				1
Maintain beneficial insect or vertebrate habitat	26	3	12	15	7	16
Protection of beneficial organisms	33	36	27	17	15	24
<b>Avoidance Practices:</b>						
Adjust planting/harvesting dates	30	4	29	12	9	16
Rotate crops to control pests	28	13	55	55	19	45
Planting locations planned to avoid pests	14	5	19	19	6	11
Crop variety chosen for pest resistance	64	45	70	50	41	59
<b>Monitoring Practices:</b>						
Deliberate scouting activities	92	94	88	86	91	63
Scouting by general observation	7	2	9	14	8	32
Field was not scouted	1	4	2	*	1	5
Scouted for pests	59	72	58	39	41	32
Scouting due to pest advisory warning	17	18	18	11	16	14
Scouting due to pest development model	25	10	18	11	33	10
Scouted for weeds	90	79	95	99	99	89
Scouting for weeds was done by:						
Operator, partner, or family member	64	28	59	78	40	75
An employee	10		4	2	7	1
Farm supply or chemical dealer	*		1	*	3	4
Indep. crop consultant or comm. scout	25	72	35	20	50	20

See footnote(s) at end of table.

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**Pest Management Practices  
Percent of Farms Utilizing Practice  
All Cotton, 2007 -continued**

Practice	States					
	ALL	AL	AR	CA	GA	LA
Scouted for insects or mites	93	88	100	99	97	100
Scouting for insects or mites was done by:						
Operator, partner, or family member	41	50	9	15	46	4
An employee	2	1	1	3	1	3
Farm supply or chemical dealer	4	1	3	36		
Indep. crop consultant or comm. scout	53	49	87	46	53	93
Scouted for diseases	81	73	90	92	86	94
Scouting for diseases was done by:						
Operator, partner, or family member	44	56	11	17	46	22
An employee	2	1	2	3	1	3
Farm supply or chemical dealer	3	*	3	36		
Indep. crop consultant or comm. scout	51	43	84	45	53	75
Records kept to track pests	43	42	66	74	40	72
Field mapping of weed problems	10	8	8	21	4	9
Soil/plant tissue analysis to detect pests	7	8	4	6	13	5
Weather monitoring	68	51	80	50	78	89
Pesticide applicator training	31	22	14	50	21	25
<b>Suppression Practices:</b>						
Biological pest controls	8	6	15	5	1	12
Biological pesticides	12	15	20	14	7	15
Beneficial organisms	1		3	1		
Scouting used to make decisions	36	46	51	47	35	35
Maintain ground cover or physical barriers	30	43	13	12	39	17
Adjust planting methods	12	10	4	19	25	16
Alternate pesticides with different MOA	29	18	38	46	28	64
Maintain buffer strips or border rows	3	7	3	4	6	2
Grow a trap crop	4	8	2	1	3	4

See footnote(s) at end of table.

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**Pest Management Practices  
Percent of Farms Utilizing Practice  
All Cotton, 2007 -continued**

Practice	States					
	MS	MO	NC	SC	TN	TX
Scouted for insects or mites	99	96	96	99	98	80
Scouting for insects or mites was done by:						
Operator, partner, or family member	14	15	58	61	33	58
An employee	3		4	2	6	*
Farm supply or chemical dealer	4	1	1	*	4	8
Indep. crop consultant or comm. scout	79	84	37	37	57	34
Scouted for diseases	81	83	92	88	96	61
Scouting for diseases was done by:						
Operator, partner, or family member	25	17	59	68	41	58
An employee	2		4	1	7	*
Farm supply or chemical dealer	*	1	1	*	3	6
Indep. crop consultant or comm. scout	72	82	37	30	49	36
Records kept to track pests	59	80	39	28	33	27
Field mapping of weed problems	7	18	17	14	8	8
Soil/plant tissue analysis to detect pests	7	14	11	5	2	3
Weather monitoring	95	48	68	68	79	55
Pesticide applicator training	30	17	46	19	50	34
<b>Suppression Practices:</b>						
Biological pest controls	4		22	9	12	*
Biological pesticides	5	13	14	18	13	11
Beneficial organisms			*		1	1
Scouting used to make decisions	53	33	42	29	26	23
Maintain ground cover or physical barriers	29	16	46	28	14	27
Adjust planting methods	11	*	11	5	4	13
Alternate pesticides with different MOA	54	12	34	25	35	13
Maintain buffer strips or border rows	4	1	1	3	6	1
Grow a trap crop	8	4	1	5	3	5

\* Percentage is less than 0.5

**Pest Management Practices  
Percent of Acres Utilizing Practice  
All Cotton, 2007**

Practice	States					
	ALL	AL	AR	CA	GA	LA
<b>Prevention Practices:</b>						
No-till or minimum till used to manage pests	54	54	67	31	67	63
Plow down crop residue	51	25	47	79	38	50
Remove/burn down crop residue	20	22	28	24	28	37
Clean implements after fieldwork	57	26	33	57	66	32
Field cultivated for weed control	38	4	20	92	6	5
Field edges/etc. chopped, mowed/etc.	59	38	62	69	72	66
Water management practice	7	2	17	29	3	5
Treat seed for insect or disease after purchase	22	31	24	13	23	28
Applied herbicides before weeds emerged	73	55	63	53	92	57
Routine treatment for the presence of weeds	92	80	79	86	98	97
Weeds scouted from the previous year	7	18	21	14	2	3
Applied herbicides after weeds emerged	88	91	89	58	87	98
Routine treatment for the presence of weeds	67	77	59	63	73	59
Weeds scouted from the previous year	32	22	40	37	27	41
Applied insecticides to this cotton field	65	55	90	83	85	99
Routine treatment for the presence of insects	35	50	27	36	24	26
Scouted for insect infestation	65	50	72	64	76	74
Used flamer to kill weeds	*			1	*	
Maintain beneficial insect or vertebrate habitat	14	20	11	17	6	10
Protection of beneficial organisms	25	46	34	33	9	37
<b>Avoidance Practices:</b>						
Adjust planting/harvesting dates	20	24	10	21	29	23
Rotate crops to control pests	40	46	19	45	75	53
Planting locations planned to avoid pests	12	15	8	17	22	24
Crop variety chosen for pest resistance	58	44	48	31	75	66
<b>Monitoring Practices:</b>						
Deliberate scouting activities	77	75	98	91	93	97
Scouting by general observation	21	15	2	8	7	3
Field was not scouted	2	10		1	*	
Scouted for pests	42	51	71	68	41	55
Scouting due to pest advisory warning	18	16	8	25	40	17
Scouting due to pest development model	18	23	31	20	24	6
Scouted for weeds	92	78	93	97	96	98
Scouting for weeds was done by:						
Operator, partner, or family member	60	62	19	22	50	35
An employee	4	2	*	6	1	9
Farm supply or chemical dealer	3	*	2	32		
Indep. crop consultant or comm. scout	33	36	79	40	49	56

See footnote(s) at end of table.

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**Pest Management Practices  
Percent of Acres Utilizing Practice  
All Cotton, 2007 -continued**

Practice	States					
	MS	MO	NC	SC	TN	TX
<b>Prevention Practices:</b>						
No-till or minimum till used to manage pests	60	48	74	73	71	45
Plow down crop residue	40	18	26	23	19	64
Remove/burn down crop residue	27	30	19	11	45	12
Clean implements after fieldwork	55	13	49	63	65	66
Field cultivated for weed control	4	39	3	7	9	61
Field edges/etc. chopped, mowed/etc.	87	28	49	36	67	56
Water management practice	8	1	7	5		6
Treat seed for insect or disease after purchase	7	38	41	5	21	20
Applied herbicides before weeds emerged	60	59	63	71	73	79
Routine treatment for the presence of weeds	92	100	86	84	94	93
Weeds scouted from the previous year	8		13	16	6	5
Applied herbicides after weeds emerged	99	99	95	96	95	87
Routine treatment for the presence of weeds	84	85	54	61	58	67
Weeds scouted from the previous year	15	15	45	39	42	32
Applied insecticides to this cotton field	97	83	80	92	94	42
Routine treatment for the presence of insects	31	44	43	48	34	39
Scouted for insect infestation	68	56	57	52	66	60
Used flamer to kill weeds	1	*				1
Maintain beneficial insect or vertebrate habitat	23	4	19	9	13	16
Protection of beneficial organisms	41	30	27	14	18	22
<b>Avoidance Practices:</b>						
Adjust planting/harvesting dates	19	5	35	11	9	20
Rotate crops to control pests	25	16	59	56	17	38
Planting locations planned to avoid pests	9	7	22	14	3	10
Crop variety chosen for pest resistance	73	43	68	52	34	60
<b>Monitoring Practices:</b>						
Deliberate scouting activities	93	96	88	84	93	61
Scouting by general observation	6	1	9	15	6	36
Field was not scouted	1	3	3	1	*	3
Scouted for pests	51	75	62	40	39	28
Scouting due to pest advisory warning	17	17	18	14	20	15
Scouting due to pest development model	20	9	19	10	30	15
Scouted for weeds	93	80	93	97	100	92
Scouting for weeds was done by:						
Operator, partner, or family member	59	21	62	76	46	79
An employee	21		3	3	11	1
Farm supply or chemical dealer	*		1	1	3	2
Indep. crop consultant or comm. scout	20	79	35	21	40	18

See footnote(s) at end of table.

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**Pest Management Practices  
Percent of Acres Utilizing Practice  
All Cotton, 2007 -continued**

Practice	States					
	ALL	AL	AR	CA	GA	LA
Scouted for insects or mites	91	86	100	99	98	100
Scouting for insects or mites was done by:						
Operator, partner, or family member	43	43	8	11	42	2
An employee	2	2	*	4	1	3
Farm supply or chemical dealer	5	1	2	38		
Indep. crop consultant or comm. scout	51	55	90	47	57	94
Scouted for diseases	76	70	91	94	83	93
Scouting for diseases was done by:						
Operator, partner, or family member	43	52	12	13	41	18
An employee	2	2	1	5	1	4
Farm supply or chemical dealer	4	*	2	38		
Indep. crop consultant or comm. scout	51	46	85	45	57	78
Records kept to track pests	41	39	69	73	43	70
Field mapping of weed problems	9	5	6	21	5	9
Soil/plant tissue analysis to detect pests	6	5	6	10	13	3
Weather monitoring	68	57	80	57	81	89
Pesticide applicator training	32	22	11	44	21	25
<b>Suppression Practices:</b>						
Biological pest controls	5	5	17	6	1	10
Biological pesticides	10	12	23	11	8	9
Beneficial organisms	1		2	2		
Scouting used to make decisions	33	46	48	51	41	35
Maintain ground cover or physical barriers	27	40	15	12	35	13
Adjust planting methods	13	9	4	23	26	18
Alternate pesticides with different MOA	23	13	39	53	23	62
Maintain buffer strips or border rows	3	4	3	6	6	2
Grow a trap crop	3	3	1	2	4	8

See footnote(s) at end of table.

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**Pest Management Practices  
Percent of Acres Utilizing Practice  
All Cotton, 2007 -continued**

Practice	States					
	MS	MO	NC	SC	TN	TX
Scouted for insects or mites	99	97	95	99	100	83
Scouting for insects or mites was done by:						
Operator, partner, or family member	12	9	60	60	38	62
An employee	5		3	3	7	*
Farm supply or chemical dealer	3	2	1	1	5	5
Indep. crop consultant or comm. scout	80	89	36	37	50	32
Scouted for diseases	85	84	89	90	98	63
Scouting for diseases was done by:						
Operator, partner, or family member	17	10	60	71	47	62
An employee	4		2	1	11	*
Farm supply or chemical dealer	1	3	*	1	3	3
Indep. crop consultant or comm. scout	78	87	38	28	39	35
Records kept to track pests	50	85	44	28	34	27
Field mapping of weed problems	9	20	21	13	12	8
Soil/plant tissue analysis to detect pests	6	14	8	3	2	3
Weather monitoring	95	42	70	65	78	61
Pesticide applicator training	27	17	49	27	47	36
<b>Suppression Practices:</b>						
Biological pest controls	2		24	7	16	*
Biological pesticides	3	13	19	18	14	7
Beneficial organisms			1		1	1
Scouting used to make decisions	58	38	44	32	29	21
Maintain ground cover or physical barriers	17	23	51	32	20	29
Adjust planting methods	10	*	13	7	4	14
Alternate pesticides with different MOA	52	16	39	28	43	9
Maintain buffer strips or border rows	5	3	3	2	10	1
Grow a trap crop	9	4	2	7	13	2

\* Percentage is less than 0.5

**Pest Management Practices  
Percent of Farms Utilizing Practice  
Apples, 2007**

Practice	States							
	ALL	CA	MI	NY	NC	OR	PA	WA
<b>Prevention Practices:</b>								
Remove crop residue, leaf litter, or remove prunin	62	63	75	60	80	45	65	59
Clean implements after block work	47	43	35	43	71	44	21	59
Cultivate block for weed control	10	32	2	2	4	12	3	14
Chop, spray, mow or plow	80	54	86	83	78	78	88	81
Water management practice	16	21	5	4	3	30	*	27
Applied herbicides before weeds emerged	16	14	14	8	12	21	19	18
Routine treatment for the presence of weeds	71	88	82	77	67	60	45	72
Weeds scouted from the previous year	29	12	18	23	27	40	55	28
Applied herbicides after weeds emerged	53	32	58	64	19	51	66	51
Routine treatment for the presence of weeds	60	77	71	63	57	57	60	52
Weeds scouted from the previous year	40	23	29	37	43	43	40	48
Applied insecticides to this apple block	93	61	96	99	85	82	94	98
Routine treatment for the presence of insects	41	52	32	25	71	48	31	50
Scouted for insect infestation	59	48	68	75	29	52	69	50
Used flamer to kill weeds	3	6		*	1	2	2	6
Maintain beneficial insect or vertebrate habitat	45	34	47	27	22	64	42	53
Protection of beneficial organisms	60	33	65	60	14	65	60	66
Non-chemical controls for deer	13	29	17	27	5	5	14	3
<b>Avoidance Practices:</b>								
Adjust harvesting dates	12	20	12	15	14	9	7	10
Crop variety chosen for pest resistance	9	14	21	6	20	9	9	6
<b>Monitoring Practices:</b>								
Deliberate scouting activities	85	56	88	92	56	65	87	90
Scouting by general observation	11	34	6	5	20	26	9	9
Block was not scouted	4	9	6	3	23	9	4	1
Scouted for pests	73	31	71	80	31	56	66	84
Scouting due to pest advisory warning	31	11	35	24	22	30	28	38
Scouting due to pest development model	44	18	50	25	17	48	41	56
Scouted for weeds	79	72	70	78	52	74	87	84
Scouting for weeds was done by:								
Operator, partner, or family member	51	78	60	51	89	67	61	39
An employee	7	2	5	2		5	3	12
Farm supply or chemical dealer	28	6	30	7		15	34	39
Indep. crop consultant or comm. scout	15	15	6	41	11	13	2	10
Scouted for insects or mites	95	88	91	96	74	86	94	98
Scouting for insects or mites was done by:								
Operator, partner, or family member	36	80	29	34	89	65	44	25
An employee	6	3	8	2		5	3	8
Farm supply or chemical dealer	40	5	54	15		16	48	53
Indep. crop consultant or comm. scout	19	12	10	50	11	13	5	14

See footnote(s) at end of table.

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**Pest Management Practices  
Percent of Farms Utilizing Practice  
Apples, 2007 -continued**

Practice	States							
	ALL	CA	MI	NY	NC	OR	PA	WA
Scouted for diseases	92	83	94	96	76	84	95	93
Scouting for diseases was done by:								
Operator, partner, or family member	39	78	31	34	89	66	46	30
An employee	5	4	8	2		6	3	6
Farm supply or chemical dealer	38	5	52	15		16	47	50
Indep. crop consultant or comm. scout	18	13	9	49	11	12	4	13
Records kept to track pests	62	33	58	78	30	49	52	67
Field mapping of weed problems	12	1	10	7	11	9	7	18
Soil/plant tissue analysis to detect pests	16	1	16	15	18	17	11	21
Weather monitoring	85	49	94	94	80	87	92	85
Pesticide applicator training	54	23	53	68	31	53	52	57
<b>Suppression Practices:</b>								
Biological pest controls	53	35	35	20	14	59	51	78
Biological pesticides	42	19	29	29	11	45	33	61
Beneficial organisms	6	8	7	2	1	6	5	8
Scouting used to make decisions	61	24	73	73	34	53	67	60
Maintain ground cover or physical barriers	64	56	77	29	60	69	68	75
Living mulch	55	60	56	45	18	31	60	58
Alternate pesticides with different MOA	75	31	83	86	53	65	91	74
Maintain buffer strips or border rows	9	8	2	3	1	4	2	17

\* Percentage is less than 0.5

**Pest Management Practices  
Percent of Acres Utilizing Practice  
Apples, 2007**

Practice	States							
	ALL	CA	MI	NY	NC	OR	PA	WA
<b>Prevention Practices:</b>								
Remove crop residue, leaf litter, or remove prunin	67	64	78	56	86	55	51	69
Clean implements after block work	54	41	32	47	79	51	21	65
Cultivate block for weed control	11	41	2	2	2	27	2	12
Chop, spray, mow or plow	85	62	91	84	86	81	87	87
Water management practice	20	17	7	4	1	35	1	31
Applied herbicides before weeds emerged	19	26	16	14	10	24	27	19
Routine treatment for the presence of weeds	75	84	86	91	84	67	38	75
Weeds scouted from the previous year	25	16	14	9	15	33	62	25
Applied herbicides after weeds emerged	56	37	58	71	15	69	75	54
Routine treatment for the presence of weeds	52	76	62	64	41	43	57	42
Weeds scouted from the previous year	48	24	38	36	59	57	43	58
Applied insecticides to this apple block	96	69	99	98	95	95	95	99
Routine treatment for the presence of insects	40	62	25	25	69	37	24	47
Scouted for insect infestation	60	38	75	75	31	63	76	53
Used flamer to kill weeds	3	9		*	1	*	*	5
Maintain beneficial insect or vertebrate habitat	51	30	39	31	15	68	43	64
Protection of beneficial organisms	61	31	55	61	5	71	55	69
Non-chemical controls for deer	10	23	15	34	2	6	13	1
<b>Avoidance Practices:</b>								
Adjust harvesting dates	10	23	11	15	25	15	6	7
Crop variety chosen for pest resistance	8	14	15	5	29	14	12	4
<b>Monitoring Practices:</b>								
Deliberate scouting activities	88	57	95	94	63	77	91	90
Scouting by general observation	10	39	3	5	14	21	6	9
Block was not scouted	2	4	1	1	23	2	4	*
Scouted for pests	77	41	71	88	41	72	78	81
Scouting due to pest advisory warning	33	17	41	25	36	31	41	35
Scouting due to pest development model	51	18	62	44	13	50	49	56
Scouted for weeds	85	86	69	82	44	86	91	90
Scouting for weeds was done by:								
Operator, partner, or family member	42	68	51	61	83	57	55	29
An employee	13	1	13	2		10	2	19
Farm supply or chemical dealer	33	8	31	4		13	42	43
Indep. crop consultant or comm. scout	13	23	5	33	17	20	1	9
Scouted for insects or mites	98	96	98	98	77	97	96	99
Scouting for insects or mites was done by:								
Operator, partner, or family member	28	68	27	35	85	50	41	18
An employee	12	2	11	1		10	3	18
Farm supply or chemical dealer	42	10	53	16		18	53	51
Indep. crop consultant or comm. scout	18	21	9	48	15	23	3	13

See footnote(s) at end of table.

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**Pest Management Practices  
Percent of Acres Utilizing Practice  
Apples, 2007 -continued**

Practice	States							
	ALL	CA	MI	NY	NC	OR	PA	WA
Scouted for diseases	96	92	99	98	77	96	95	97
Scouting for diseases was done by:								
Operator, partner, or family member	30	66	27	36	85	55	42	20
An employee	11	2	11	1		10	3	16
Farm supply or chemical dealer	42	10	53	16		17	53	51
Indep. crop consultant or comm. scout	17	21	9	47	15	18	2	12
Records kept to track pests	68	39	54	81	34	60	63	74
Field mapping of weed problems	16	4	10	11	18	7	5	22
Soil/plant tissue analysis to detect pests	18	1	28	9	18	31	23	20
Weather monitoring	86	54	98	89	94	96	94	85
Pesticide applicator training	56	14	55	62	36	57	61	60
<b>Suppression Practices:</b>								
Biological pest controls	63	34	40	27	14	76	65	83
Biological pesticides	43	23	33	32	11	50	35	54
Beneficial organisms	11	13	7	4	*	7	13	13
Scouting used to make decisions	62	27	84	77	38	68	75	56
Maintain ground cover or physical barriers	70	46	85	32	69	71	67	81
Living mulch	51	64	47	51	4	32	66	51
Alternate pesticides with different MOA	76	32	78	88	68	79	94	76
Maintain buffer strips or border rows	14	6	3	6	1	4	*	22

\* Percentage is less than 0.5

**Pest Management Practices  
Percent of Acres Utilizing Practice  
Organic Apples, 2007**

Practice	States		
	ALL	WA	OS <sup>1</sup>
<b>Prevention Practices:</b>			
Remove crop residue, leaf litter, or remove prunin	55	62	38
Clean implements after block work	57	74	18
Cultivate block for weed control	76	84	58
Chop, spray, mow or plow	72	89	35
Water management practice	34	46	8
Applied herbicides before weeds emerged			
Routine treatment for the presence of weeds			
Weeds scouted from the previous year			
Applied herbicides after weeds emerged			
Routine treatment for the presence of weeds			
Weeds scouted from the previous year			
Applied insecticides to this apple block	76	95	32
Routine treatment for the presence of insects	36	35	43
Scouted for insect infestation	64	65	57
Used flamer to kill weeds	24	32	5
Maintain beneficial insect or vertebrate habitat	69	88	26
Protection of beneficial organisms	70	90	23
Non-chemical controls for deer	6	*	20
<b>Avoidance Practices:</b>			
Adjust harvesting dates	13	17	4
Crop variety chosen for pest resistance	17	13	27
<b>Monitoring Practices:</b>			
Deliberate scouting activities	80	98	40
Scouting by general observation	19	2	57
Block was not scouted	1	*	3
Scouted for pests	74	93	29
Scouting due to pest advisory warning	20	28	4
Scouting due to pest development model	42	57	6
Scouted for weeds	71	71	71
Scouting for weeds was done by:			
Operator, partner, or family member	50	34	88
An employee	10	11	8
Farm supply or chemical dealer	32	46	
Indep. crop consultant or comm. scout	7	8	4
Scouted for insects or mites	99	100	96
Scouting for insects or mites was done by:			
Operator, partner, or family member	40	20	88
An employee	6	6	8
Farm supply or chemical dealer	43	60	*
Indep. crop consultant or comm. scout	11	14	4

See footnote(s) at end of table.

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**Pest Management Practices  
Percent of Farms Utilizing Practice  
Organic Apples, 2007**

Practice	States		
	ALL	WA	OS <sup>1</sup>
<b>Prevention Practices:</b>			
Remove crop residue, leaf litter, or remove prunin	50	48	52
Clean implements after block work	52	64	37
Cultivate block for weed control	58	72	39
Chop, spray, mow or plow	66	80	47
Water management practice	30	43	12
Applied herbicides before weeds emerged			
Routine treatment for the presence of weeds			
Weeds scouted from the previous year			
Applied herbicides after weeds emerged			
Routine treatment for the presence of weeds			
Weeds scouted from the previous year			
Applied insecticides to this apple block	73	89	50
Routine treatment for the presence of insects	51	53	48
Scouted for insect infestation	49	47	52
Used flamer to kill weeds	31	44	14
Maintain beneficial insect or vertebrate habitat	64	80	41
Protection of beneficial organisms	65	86	37
Non-chemical controls for deer	8	1	18
<b>Avoidance Practices:</b>			
Adjust harvesting dates	7	6	9
Crop variety chosen for pest resistance	13	8	21
<b>Monitoring Practices:</b>			
Deliberate scouting activities	78	91	59
Scouting by general observation	20	8	36
Block was not scouted	3	1	5
Scouted for pests	64	83	38
Scouting due to pest advisory warning	19	29	5
Scouting due to pest development model	37	57	9
Scouted for weeds	62	71	50
Scouting for weeds was done by:			
Operator, partner, or family member	63	51	86
An employee	14	15	11
Farm supply or chemical dealer	19	29	
Indep. crop consultant or comm. scout	4	5	3
Scouted for insects or mites	96	98	93
Scouting for insects or mites was done by:			
Operator, partner, or family member	57	35	88
An employee	8	7	10
Farm supply or chemical dealer	25	42	*
Indep. crop consultant or comm. scout	10	15	2

See footnote(s) at end of table.

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**Pest Management Practices  
Percent of Farms Utilizing Practice  
Organic Apples, 2007 -continued**

Practice	States		
	ALL	WA	OS <sup>1</sup>
Scouted for diseases	93	97	87
Scouting for diseases was done by:			
Operator, partner, or family member	57	37	87
An employee	9	7	10
Farm supply or chemical dealer	25	41	*
Indep. crop consultant or comm. scout	10	15	2
Records kept to track pests	58	79	29
Field mapping of weed problems	8	11	3
Soil/plant tissue analysis to detect pests	19	28	6
Weather monitoring	63	82	38
Pesticide applicator training	43	58	21
<b>Suppression Practices:</b>			
Biological pest controls	68	88	41
Biological pesticides	62	85	29
Beneficial organisms	20	22	18
Scouting used to make decisions	37	56	12
Maintain ground cover or physical barriers	71	89	46
Living mulch	65	63	68
Alternate pesticides with different MOA	47	70	17
Maintain buffer strips or border rows	53	74	24

\* Percentage is less than 0.5

<sup>1</sup> Other States include CA, MI, NY, PA, and OR.



## Pesticide class, Common name, and Trade name

The following is a list of common name, associated class, and trade name of active ingredients in this publication. The classes are herbicides (H), insecticides (I), fungicides (F), and other chemicals (O). This list is provided as an aid in reviewing pesticide data. Pre-mixes are not cataloged. The list is not complete for all pesticides used on field and fruit crops and NASS does not mean to promote use of any specific trade name.

**Pesticide Class, Common Names, and Trade Names**

Class	Common Names	Trade Names
O	(3S,6R)methylisoprop	Red Scale Down
O	(3S,6S)methylisoprop	Red Scale Down
H	2,4-D	Banvel 720, Unison
H	2,4-D, 2-EHE	2,4-D L.V. 4 Ester (3.84 lbs/ g), 2,4-D LV4 (3.80 lbs/g), 2,4-D LV6, Agsco 400 (EC), Barrage, Barrage HF, Low Vol 4 Ester Weed Killer, Maestro D, Salvo, Weedone LV4 EC
H	2,4-D, BEE	Weedone LV6
H	2,4-D, dieth. salt	Hi-Dep, Weedar 64A
H	2,4-D, dimeth. salt	2,4-D Amine, 2,4-D Amine 4, 2,4-D Amine 6, Banvel + 2,4-D, Hi-Dep, Saber, Savage, Triplet SF Selective Herbicide, Weedar 64
I	Abamectin	Abacus, Abba, Agri-Mek 0.15EC, Epi-mek 0.15 EC, Paraspray 8-E, Zephyr 0.15 EC
I	Acephate	Acephate 75 WSP, Acephate 90SP, Acephate 97UP, Bracket 90, Orthene 75 S, Orthene 75 WSP, Orthene 90 WSP, Orthene 90S, Orthene 97
O	Acequinocyl	Kanemite 15 SC
I	Acetamiprid	Assail 30 SG, Assail 70WP, Intruder WSP
H	Acetochlor	Degree
H	Alachlor	Bronco (4EC), Intro (4E)
I	Aldicarb	Temik 15G, Temik TSX
O	Alkyl. dim. benz. am	Lysol
H	Atrazine	Atrazine 4L, Extrazine II 4L
I	Azadirachtin	Aza-Direct, Neemix 4.5, Neemix Botanical Insecticide
I	Azinphos-methyl	Azinphos-M 2 EC, Azinphos-M 50 WP, Azinphosmethyl 50W, Guthion 2L, Guthion 35% WP, Guthion Solupak 50%
F	Azoxystrobin	Quadris, Uniform
O	Bacillus cereus	Mep-Plus, Pix Plus
F	Bacillus pumilus	Sonata AS
F	Bacillus subtilis	Serenade Biofungicide (WP), Serenade MAX
H	Barban	Carbyne 2EC
F	Basic copper sulfate	Basic Copper 53, Bonide Garden Dust, C-O-C-S WDG, Cuprofix Disperss, Cuprofix Ultra 40D, Super-Cu Copper Fungicide, Tri-Basic Copper
I	Beauveria bassiana	Mycotrol Botanigard ES
F	Benomyl	Benlate
I	Benzoic acid	Intrepid 2F, Intrepid 80 WSP
O	Benzyladenine	Accel PGR, Exilis Plus, Maxcel, Perlan PGR, Promalin PGR, Typy
I	Beta-cyfluthrin	Baythroid XL
I	Bifenazate	Acramite 50WS
I	Bifenthrin	Attain Total Release, Bifenture EC, Brigade 2EC, Brigade WSB 10WP, Capture 2EC, Discipline 2EC, Fanfare 2EC, Sniper, Tundra EC
F	Boscalid	Pristine
H	Bromacil	Hyvar X (80WP)
H	Bromoxynil octanoate	Maestro D
I	Bt subsp israelensis	BMP 123 (2X) WP, Bt Dust No. 2, Raven

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**Pesticide Class, Common Names, and Trade Names - continued**

Class	Common Names	Trade Names
I	Bt subsp. aizawai	Xentari WDG
I	Bt subsp. kurstaki	Biobit HP, Deliver, Dipel 2X (WP), Dipel 4L, Dipel DF, Dipel ES, Dipel WP, Javelin WG, Javelin WP
I	Bt. (Berliner)	Bt Sulfur 15-50 Dust
I	Buprofezin	Centaur, Courier 40 SC
F	Butanone	Triadimefon 50% DF
O	Butenoic Acid Hydro.	ReTain
H	Butylate	Sutan+ 6.7E
O	Cacodylic acid	Bolls-Eye, Quick Pick
F	Calcium polysulfide	Lilly Miller Dormant Spray, Lime Sulfur Solution, Sulforix, Tetrasul 4s5
O	Capsaicin	Browse Ban
F	Captan	Agway Fruit Tree Spray, Captan 4L, Captan 50W, Captan 80 WDG, Captan 80-WP, Captec 4L
I	Carbaryl	Agway Fruit Tree Spray, Carbaryl 4L, Carbaryl 50W, Savit 4F, Sevin 4F, Sevin 50W, Sevin 80S, Sevin 80WSP, Sevin SL, Sevin XLR Plus
I	Carbofuran	Furadan 4F
O	Carbon	The Giant Destroyer
F	Carboxin	Vitavax-4G
H	Carfentrazone-ethyl	Aim (40% WDG), Aim EC, Aim EW, Shark, Shark EW
H	Chlorimuron-ethyl	Canopy SP
O	Chlorophacinone	Rozol (Pellets)
F	Chlorothalonil	Applause 720, Bravo 500, Bravo 720, Bravo Weather Stik, Terranil 6L
I	Chlorpyrifos	Chlorpyrifos 4E AG, Dursban 1% Granules, Govern 4E, Lock-On, Lorsban 4E, Lorsban 50W, Lorsban 75WG, Nufos 4E, Pilot 4E-SG, Warhawk, Whirlwind, Yuma 4E
O	Cholecalciferol	Quintox Rat and Mouse Bait
H	Clethodim	Arrow 2EC, Prism, Select 2 EC, Volunteer
I	Clofentezine	Apollo SC
H	Clomazone	Command 3ME, Command 4EC
I	Clothianidin	Clutch 50 WDG
F	Copper chloride hyd.	Agra-cop 50WP
F	Copper hydroxide	Champ Dry Prill, Champ Formula 2, Champion WP, GX-569 Fungicide/ Bactericide, Kocide 2000, Kocide DF, Kocide LF, Kop-Hydroxide 50, Nu-Cop 50DF
F	Copper octanoate	NEU1140F Copper Soap
F	Copper oxide	Nordox (WP), Nordox 75 WG
F	Copper oxychlo. sul.	C-O-C-S 50WP
F	Copper oxychloride	C-O-C-S WDG
F	Copper sulfate	Copper Sulfate, Copper Sulfate Powdered Bluestone
H	Cyanazine	Bladex 90DF, Cy-Pro 4L, Extrazine II 4L
O	Cyclanilide	Finish, Finish 6, Stance Plant Regulator
I	Cyd-X Granulo. Virus	CYD-X, Carpovirusine, Virossoft Bioinsecticide
I	Cyfluthrin	Baythroid 2 (EC), Leverage 2.7, Tombstone
I	Cypermethrin	Ammo 2.5 EC, Battery 2.5 EC, Cyper AG, Holster, Tenkoz Cypermethrin, Up-Cyde 2.5 EC
F	Cyprodinil	Vanguard WG

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**Pesticide Class, Common Names, and Trade Names - continued**

Class	Common Names	Trade Names
O	Cytokinins	Cytokin Bioregulator Concentrate, Cytoplex HMS,
I	Deltamethrin	Foliar Triggrr, Stimplex
H	Desmedipham	Battalion 0.2EC, Decis 1.5EC
I	Diazinon	Betamix (EC)
H	Dicamba	D-z-n Diazinon 50W, Diazinon 4E, Diazinon 50W, KnoxOut NL
H	Dicamba, digly. salt	Banvel 720, Banvel SGF (2EC),
H	Dicamba, dimet. salt	Oracle Dicamba Agricultural Herbicide, Vision (aka ALB 40)
H	Dicamba, sodium salt	Clarity
H	Dichlobenil	Banvel (4L), Banvel + 2,4-D, Rifle,
O	Dichloropropene	Triplet SF Selective Herbicide
I	Dicofol	Dicamba SG
I	Dicrotophos	Casoron 4G
I	Diflubenzuron	Telone II
O	Dimethipin	Dicofol 4 E, Kelthane EC, Kelthane MF
I	Dimethoate	Bidrin 8
H	Diuron	Dimilin 2F
O	Dodecadien-1-ol	Harvade - 5F
O	Dodecanol	Dimate 4EC, Dimethoate 2.67 EC, Dimethoate 400,
F	Dodine	Dimethoate 4EC
O	E-8-Dodecenyl acetat	ADIOS, Direx 4L, Direx 80DF, Diuron 4L, Diuron 80DF,
I	Emamectin benzoate	Diuron 80W, Dropp Ultra, Ginstar EC, Karmex DF, Layby Pro
I	Endosulfan	Checkmate CM, Checkmate CM-F, Isomate-C Plus, Isomate-C TT,
O	Endothall	NoMate CM Spiral
I	Esfenvalerate	Isomate-C Plus, Isomate-C TT
H	Ethalfuralin	Cyprex 65-W, Syllit 65W, Syllit FL
O	Ethephon	Checkmate OFM, Consep OFM Spr2m Pheromone Sprayable,
I	Ethion	Isomate-M 100
I	Ethyl parathion	Denim, Proclaim
I	Etoxazole	Endosulfan 2EC, Endosulfan 3EC, Endosulfan 50W, Thiodan 3EC,
F	Etridiazole	Thiodan 50WP, Thionex (Thiodan) 3EC, Thionex 50W
F	Fenarimol	Accelerate, Herbicide 273
F	Fenbuconazole	Asana, Asana XL
I	Fenbutatin-oxide	Sonalan HFP
H	Fenoxprop-p-ethyl	Boll Buster, Boll'd, CottonQuik, Ethephon 2, Ethephon 6,
I	Fenpropathrin	Ethrel Plant Regulator (2EC), Finish, Finish 6, FirstPick,
I	Fenpyroximate	Flash Plant Regulator, MFX Cotton Harvest Aid,
F	Ferbam	Prep Brand Ethephon, Setup, Super Boll
I	Fonicamid	Ethion 10G, Ethion 25 WP, Ethion 8 EC
		Parathion 4L
		Zeal Miticide
		Temik TSX, Terraclor Super X (EC), Terraclor Super X 18.8G
		Rubigan A.S., Rubigan EC
		Indar 75 WSP
		Vendex 50WP
		Bugle, Silverado
		Danitol 2.4 EC Spray
		FujiMite
		Carbamate 76WDG
		Beleaf SG, Carbine 50 WG

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**Pesticide Class, Common Names, and Trade Names - continued**

Class	Common Names	Trade Names
H	Fluazifop-P-butyl	Fusilade DX
I	Flucythrinate	AAStar
H	Flumiclorac-pentyl	Resource
H	Flumioxazin	Chateau Herbicide SW, Chateau WDG, Valor WP
H	Fluometuron	Cotoran 4L, Cotoran 80W, Cotoran DF, Flo-Met 4L, Flo-Met 80DF
O	Fluthiacet-methyl	Fluthiacet-methyl
F	Flutolanil	Moncut 50WP
H	Fomesafen	Reflex
I	Formetanate hydro.	Carzol SP
F	Fosetyl-al	Aliette WDG (For Crop Protection)
I	Gamma-cyhalothrin	Proaxis
O	Garlic oil	Envirepel
O	Gibberellic acid	Cytoplex HMS, PGR-IV, ProGibb 4%, ProVide Plant Growth Regulator, RyzUp
O	Gibberellins A4A7	Accel PGR, Perlan PGR, Promalin PGR, TypRus Plant Growth Regulator, Typy
H	Glufosinate-ammonium	Ignite (only for cotton), Ignite 1SC (aka Rely), Rely Herbicide
H	Glyphosate	Fireball, Sequence, Touchdown Herbicide, Touchdown HiTech, Touchdown Total
H	Glyphosate amm. salt	Credit Duo Extra, Glyphosate-4DS, Roundup Ultra Dry
H	Glyphosate iso. salt	Accord XRT (aka GF-1279), Buccaneer, Buccaneer Plus, ClearOut 41 Plus, Cornerstone, Credit, Credit Duo Extra, Durango, Extra Credit 5, Gly Star Original, Gly Star Plus, Gly-4 Plus, Glyphos X-TRA, Glyphomax, Glyphomax Plus, Glyphomax XRT, Glyphosate 4 (Turf & Ornamental), Glyphosate Original, Glyphosate-4DS, Helosate Plus, Hi-Yield Killzall, Honcho, Honcho Plus, Mirage (4EC), Mirage Plus, Roundup Custom, Roundup D-Pak, Roundup Export, Roundup Original, Roundup Original II, Roundup Original Max, Roundup Pro (T & O), Roundup Super Concentrate, Roundup Ultra, Roundup Ultra Max, Roundup Weather Max, Staple Plus
H	Glyphosate pot. salt	RT Master II
O	Harpin a B protein	ProAct
I	Hexythiazox	Onager, Savey 50 DF, Savey 50 WP
O	Hydrogen peroxide	Oxidate
H	Imazaquin, mon. salt	Tri-Scept
H	Imazethapyr, ammon.	Pursuit W
I	Imidacloprid	Admire 2 Flowable, Admire Pro, Couraze 1.6F, Couraze 2F, Couraze Max 4F, Impulse, Leverage 2.7, Nuprid, Pasada, Prey 1.6 Insecticide, Provado 1.6 Flowable, Provado Solupak (75WSP), Trimax, WRANGLER
O	Indolebutyric acid	Cytoplex HMS, PGR-IV
I	Indoxacarb	Avaunt Insecticide, Steward
F	Iprodione	Rovral 4 Flowable
I	Kaolin	Surround WP
O	Kinetin	Mepex Gin Out, Mepex Plus, Mepiquat Extra

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**Pesticide Class, Common Names, and Trade Names - continued**

Class	Common Names	Trade Names
F	Kresoxim-methyl	Sovran
H	Lactofen	Cobra (2E)
I	Lambda-cyhalothrin	Karate (1EC), Karate Z, Lambda-T, Silencer, Taiga Z, Warrior
I	Lindane	Lindane 20%EC
H	Linuron	Layby Pro, Linex 4L
H	MCPP-P, DMA Salt	Triplet SF Selective Herbicide
H	MSMA	MSMA 6 Plus, MSMA 6.6 (EC), MSMA 600 Plus, MSMA Plus, MSMA Plus H.C. (6 lbs)
I	Malathion	Agway Fruit Tree Spray, Cythion ULV (9.33 lbs), Fyfanon ULV 9.9lbs. (96.5%), Malathion 25 WP, Malathion 5 EC (56%), Malathion 5 EC (57%), Malathion 50% EC, Malathion 55, Malathion ULV 9.7lbs. (95%), Malathion ULV 9.9lbs. (96.5%)
F	Mancozeb	Dithane 75DF Rainshield (For T & O), Dithane DF Rainshield, Dithane F-45 Rainshield, Dithane M-45 (WP), Mancozeb 80% WP, Manzate 200 DF, Manzate 200 WP, Manzate 75DF, Penncozeb (80WP), Penncozeb 75DF
F	Maneb	Dithane M-22 Special (80WP)
F	Mefenoxam	Ridomil Gold EC, Ridomil Gold PC, Ridomil Gold PC GR, Uniform
O	Mepiquat chloride	Compact, Mep-Plus, Mepex, Mepex Gin Out, Mepex Plus, Mepichlor 4.2% Liquid, Mepichlor Pill, Mepiquat Chloride, Mepiquat Extra, Pix, Pix Concentrate, Pix DF, Pix Plus, Pix Ultra, Ponnax Growth Regulator, Stance Plant Regulator
O	Mepiquat pentaborate	Pentia
F	Metalaxyl	Proturf Fluid Fungicide II, Ridomil 2E
O	Metam-potassium	K-Pam HL
I	Methamidophos	Monitor 4 Spray (For Cotton & Potatoes)
I	Methidathion	Supracide 2E
I	Methomyl	Lannate L (1.8 lbs.), Lannate LV (2.4 lbs.), Lannate SP
I	Methoxychlor	Agway Fruit Tree Spray
I	Methyl parathion	Methyl Parathion 4EC, Methyl Parathion 6EC
F	Metiram	Polyram 80 DF, Polyram 80WP
H	Metolachlor	Dual 25G, Dual 8E, Dual II, Me-Too-Lachlor, Me-Too-Lachlor II, Stalwart C
H	Metribuzin	Canopy SP, Sencor DF (75%)
O	Mineral oil	ProNatural Dormant Oil
O	Monocarbamide dihyd.	CottonQuik, FirstPick
F	Myclobutanil	Nova 40W, Rally 40W, Rally 40WSP
O	NAA	NAA-200
O	NAA, Ammonium salt	Liqui-Stik Concentrate
O	NAA, Ethyl ester	Prune Smart Sprout Inhibitor
O	NAA, Potassium salt	Fruit Fix 200, Fruit Fix 800, NAA 2% WP, NAA-800
O	NAA, Sodium	Fruitone-N
O	NAD	Amid-Thin W
O	NRRL B-21856	Pantoea Agglomerans Strain E325 NRRL
I	Naled	Dibrom 8 Miscible, GH-18
H	Napropamide	Devrinol 50-DF

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**Pesticide Class, Common Names, and Trade Names - continued**

Class	Common Names	Trade Names
I	Neem oil, clar. hyd.	Trilogy
H	Nicosulfuron	Accent Herbicide
H	Norflurazon	Solicam DF, Zorial Rapid 80 (DF)
I	Novaluron	Diamond 0.83EC, Pedestal, Rimon 0.83EC
I	Octacide-264	Pyronyl Oil Concentrate OR-3610A
O	Octadecadien (E,Z)	Isomate-P Pheromone
O	Octadecadien (Z,Z)	Isomate-P Pheromone
H	Oryzalin	Oryzalin 4 A.S., Surflan AS Specialty (T & O)
I	Oxamyl	Vydate C-LV, Vydate L
I	Oxydemeton-methyl	Metasystox-R (2EC)
H	Oxyfluorfen	Goal 1.6E, Goal 2XL, Goaltender
F	Oxytetracycline	Mycoshield (WP)
F	PCNB	Ridomil Gold PC, Ridomil Gold PC GR, Temik TSX, Terraclor Super X (EC), Terraclor Super X 18.8G
H	Paraquat	Cyclone, Firestorm, Gramoxone Extra, Gramoxone Inteon, Gramoxone Max, Gramoxone Super, Ortho Paraquat CL, Parazone 3SL, Starfire (1.5L)
H	Pendimethalin	Pendimethalin, Pendulum AquaCap Herbicide, Prowl (4EC), Prowl 3.3 EC, Prowl DG, Prowl H2O, Stealth
I	Permethrin	Ambush, Ambush 25W, Perm-UP 3.2 EC, Permethrin 3.2 AG, Pounce 25WP, Pounce 3.2EC
I	Petroleum distillate	Dormant Emulsion Oil, Gavicide Super 90, JMS Stylet-Oil, Oil, Saf-T-Side, Sol Oil Plus, Sunspray 6E, Sunspray Ultra-Fine Spray Oil, Superior Oil, Supreme Oil Spray, Volck Supreme Spray
I	Petroleum oil	BioCover MLT, Damoil, Glacial Spray Fluid, ProNatural All Season Spray Oil
H	Phenmedipham	Betamix (EC)
I	Phorate	AAStar, Thimet 15-G, Thimet 20-G
I	Phosmet	Imidan 50-WSB, Imidan 70 WSB (WP)
F	Phosphorous acid	Phostrol
H	Picloram, K salt	Tordon 22K (2EC)
I	Piperonyl butoxide	Bonide Rose, Flower & Ornamental Spray, Diatect Multipurpose Insecticide, Pyrenone Crop Spray, Pyreth-it, Pyronyl Oil Concentrate OR-3610A
F	Potassium bicarbon.	Armcarb 100, Kaligreen (WP), MilStop Broad Spectrum Foliar Fungicide
I	Potassium salts	M-Pede
I	Profenofos	Curacron 6E, Curacron 8E
O	Prohexadione calcium	Apogee PGR
H	Prometryn	Caparol 4L, Cotton-Pro, Prometryne 4L, Suprend
H	Pronamide	Kerb 50WP Specicalty (Turf & Ornamental)
I	Propargite	Comite, Comite II
H	Propazine	Milogard 4L
F	Propiconazole	Orbit (3.6EC)
H	Prosulfuron	Peak (WDG)
F	Pseudo. fluores A506	BlightBan A506
F	Pyraclostrobin	Pristine
H	Pyraflufen-ethyl	ET

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**Pesticide Class, Common Names, and Trade Names - continued**

Class	Common Names	Trade Names
I	Pyrethrins	Bonide Garden Dust, Bonide Rose, Flower & Ornamental Spray, Diatect Multipurpose Insecticide, PyGanic EC 1.4 II, PyGanic EC 5.0 II, Pyrenone Crop Spray, Pyreth-it, Pyronyl Oil Concentrate OR-3610A
I	Pyridaben	Nexter, Pyramite
F	Pyrimethanil	SCALA SC
I	Pyriproxyfen	Esteem 35 WP, Knack
H	Pyriithiobac-sodium	Staple, Staple LX, Staple Plus
F	Quinoline	Quintec
H	Quizalofop-P-ethyl	Assure II
H	Rimsulfuron	Matrix (aka Shadeout)
I	Rotenone	Bonide Garden Dust
I	Ryania	Ryan 50
H	S-Metolachlor	Charger Max, Dual II Magnum, Dual Magnum, Medal II, Sequence
H	Sethoxydim	Poast, Poast Plus, Trigger
I	Silicon dioxide	Diatect Multipurpose Insecticide
H	Simazine	Princep 4L, Princep Caliber 90, Sim-Trol 4L, Simazine 4L, Simazine 80W, Simazine 90DF
O	Sodium 5-nitroguaiac	Chaperone
O	Sodium chlorate	Defol 5, Defol 6, Defol 750, First Choice Cotton Defoliant, Pick-Quik Liquid Defoliant, Poly-Foliant Liquid Defoliant, Sodium Chlorate 2lb, Sodium Chlorate 3lb, Sodium Chlorate 5lb, Sodium Chlorate 6lb
O	Sodium nitrate	The Giant Destroyer
O	Sodium o-nitrophenol	Chaperone
O	Sodium p-nitrophenol	Chaperone
I	Soybean oil	Golden Citrus Natur'l Spray Oil
I	Spinosad	Entrust, SpinTor 2SC, Success, Tracer
O	Spirodiclofen	Envidor 2 SC
I	Spiromesifen	Oberon 2 SC
F	Streptomycin	Agri-Mycin 17, Agri-Strep (17WP), Streptomycin 3000 Dust
F	Streptomycin sulfate	Bac-Master, Firewall 17 WP, Streptomycin sulfate
O	Strychnine	Gopher Getter AG Bait
H	Sulfosate	Touchdown 5, Touchdown 6
F	Sulfur	Bonide Garden Dust, Bt Sulfur 15-50 Dust, Golden-Dew, Kumulus DF, Micro Sulf, Microfine Sulfur, Microspense Wettable Sulfur, Microthiol Disperss, Microthiol Disperss (USE-7449), Microthiol Special, Sulfur (92%), Sulfur 6L (52%), Sulfur 90W, Sulfur DF (80%), Sulfur Dusting (90%), Sulfur Dusting (92%), Sulfur Spray 97WP, Sulfur Wettable Powder (95%), That Flowable Sulfur (52% L), The Giant Destroyer, Thiolux (80DF), Thiolux Jet, Yellow Sulfur Special Dusting Sulfur
H	Terbacil	Sinbar (80WP)
O	Tetradecanol	Isomate-C Plus, Isomate-C TT
O	Tetradecen-1-OL (Z)	Isomate OBLR/ PLR
I	Thiacloprid	Calypso

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**Pesticide Class, Common Names, and Trade Names - continued**

Class	Common Names	Trade Names
I	Thiamethoxam	Actara, Centric, Centric 40 WG
O	Thidiazuron	ADIOS, DAZE 4SC, Dropp 50WP, Dropp SC, Dropp Ultra, FreeFall, Ginstar EC, Klean-Pik 500SC, Takedown SC, Thidiazuron 50 WSB
H	Thifensulfuron	Affinity BroadSpec Herbicide, Harmony Extra XP, Harmony GT XP
H	Thiobencarb	Bolero 8EC
F	Thiophanate	Cleary 3336 Turf Fungicide
F	Thiophanate-methyl	3336 G, T-Methyl 70W WSB, Thiophanate Methyl 4.5F AG, Topsin 4.5FL, Topsin M 70WP, Topsin M 85 WDG, Topsin M WSB
F	Thiram	Thiram 65WP, Thiram 75WP
F	Triadimefon	Bayleton 50% DF, Proturf Fluid Fungicide II
H	Tribenuron-methyl	Affinity BroadSpec Herbicide, Harmony Extra XP
O	Tribufos	Def 6 Emulsifiable Defoliant, Folex 6EC
I	Trichlorfon	Dylox 80% SP
H	Triclopyr	Pathfinder II
O	Tridecen-1-yl-Acetat	NoMate TPW Fiber
O	Tridecanyl acetate	NoMate TPW Fiber
F	Trifloxystrobin	Flint, Gem
H	Trifloxysulfuron-sod	Envoke, Suprend
F	Triflumizole	Procure 480SC, Procure 50WS, Procure 50WS (Use 7242)
H	Trifluralin	Treflan 4L, Treflan 5 (EC), Treflan E.C., Treflan HFP, Treflan TR-10, Tri-4, Tri-Scept, Trific 60DF, Trifluralin 10G, Trifluralin 4EC, Trifluralin 5EC, Triflurex HFP, Trilin, Trust 4EC
O	Trinexapac-ethyl	Palisade EC
F	Vinclozolin	Curalan EG
O	Warfarin	D-con Mouse
O	Z-8-Dodecanol	Checkmate OFM, Consep OFM Spr2m Pheromone Sprayable, Isomate-M 100
O	Z-8-Dodecen acetate	Checkmate OFM, Consep OFM Spr2m Pheromone Sprayable, Isomate-M 100
I	Zeta-cypermethrin	Fury 1.5 EC, Mustang, Mustang Max
O	Zinc phosphide	ZP Rodent Bait AG, Zinc Phosphide Oat Bait
F	Ziram	Ziram 76 DF, Ziram 87.3 WP, Ziram Granuflo



## Survey & Estimation Procedures

**Survey Procedures:** There were 4,566 samples drawn from the NASS List Sampling Frame for cotton and apples. This extensive sampling frame covers all types of farms and accounts for about 90 percent of all land in farms in the United States. The cotton sample was selected from a list of operators identified as current cotton producers. Samples were selected from States with the largest production for the selected crops. The apple samples were selected from list frame control data. The organic apple sample was drawn from a listing of organic apple growers provided by the Economic Research Service (ERS).

Data collection for the Agricultural Resource Management Survey (ARMS) survey occurred during the months of October through December 2007. The probability of being selected for the sample was based on the percentage of acreage for a given crop that a grower had on a State's list frame. The maximum of these probabilities was selected to draw the sample. The general idea is to assure that the total acreage of the targeted commodity that a grower has on the list frame was included when determining a grower's probability of selection. The operator of the sampled farm was personally interviewed to obtain information on chemical applications made to each sampled farm.

**Estimation Procedures:** The chemical application data, reported by product name or trade name, are reviewed within each State and across States for reasonableness and consistency. This review compares reported data with manufacturer's recommendations and with data from other farm operators using the same product. Following this review, product information are converted to an active ingredient level. The chemical usage estimates in this publication consist of survey estimates of those active ingredients. Detailed data within a table may not multiply across or add down due to independent rounding of the published values.

Estimates of the total amount of active ingredient applied to cotton are based on the acreage estimates published in the annual NASS report "**Crop Production - 2007 Summary**" [Cr Pr 2-1(08)] released January 12, 2008. Please note that the estimates for total amounts of an active ingredient will not be revised even if there are subsequent revisions to acreage of the cotton crop.

Estimates of the total amount of active ingredient applied to apples are based on the acreage estimates published in the annual NASS report "**Noncitrus Fruit and Nuts – 2007 Preliminary Summary**" [Fr Nt 1-3(08)] released on January 23, 2008. Apple estimates were based upon operations with bearing apple acreage only.

Estimates of the total amount of active ingredient applied to organic apples were based on the Economic Research Service (ERS) estimate of organic apple acres in the Program States. Information from other USDA-accredited State and private organic certifiers were also used as check data when estimating the number of organic apple acres at the Program State level.

## Reliability

The probability nature of the survey provides expansion of data so that the estimates are statistically representative of chemical use on the targeted crops in the Program States. The reliability of these survey results is affected by sampling variability and non-sampling errors.

Since all operations producing the crops of interest are not included in the sample, survey estimates are subject to sampling variability. The sampling variability expressed as a percent of the estimate is called the coefficient of variation (CV). Sampling variability of the estimates differed considerably by chemical and crop. Variability for estimates of percent of acres treated will be higher than the variability for estimates of application rates. This is because application rates have a narrower range of responses, which are recommended by the manufacturer of the product, and are generally followed. In general, the more often the chemical was applied, the smaller the sampling variability. For example, estimates of a commonly used active ingredient such as Glyphosate isopropylamine salt will exhibit less variability than a rarely used chemical. A commonly used active ingredient is defined as an active ingredient used on at least 40 percent of the acres planted for a crop at the Program State level. For these active ingredients, CVs range from 2 percent to 30 percent at the Program State level and 3 percent to 63 percent at the individual state level. Active ingredients that are less frequently used have CVs that range from 1 percent to 80 percent.

The variability of estimates also depends on factors such as how similar agricultural practices are across States or within a State. Some active ingredients have widely varying recommended rates with different application approaches. This can increase the variability of the rates and acres treated. The differing intensity of the pest problem can influence the variability of acres treated and rate. The more consistent the intensity of the pest problem, the more likely the acres treated and rates are to be similar.

Non-sampling errors can occur in complete censuses as well as sample surveys. They are caused by the inability to obtain correct information from each person surveyed, differences in interpreting questions or definitions, and mistakes in coding or processing the data. Special efforts are taken at each step of the survey to minimize non-sampling errors.

## Terms and Definitions

**Active ingredient:** The specific chemical which kills or controls the target pest(s). Usage data are reported by pesticide product and are converted to an amount of active ingredient. A single method of conversion has been chosen for active ingredients having more than one way of being converted. For example in this report, copper compounds are expressed in their metallic copper equivalent, and others such as 2,4-D and glyphosate are expressed in their salt or acid equivalent form.

**Application rates:** Refer to the average number of pounds of a fertilizer primary nutrient or pesticide active ingredient applied to an acre of land. Rate per application is the average number of pounds applied per acre in one application. Rate per crop year is the average number of pounds applied per acre counting multiple applications. Number of applications is the average number of times a treated acre received a specific primary nutrient or active ingredient.

**Area applied:** Represents the percentage of crop acres receiving one or more applications of a specific primary nutrient or active ingredient.

**Avoidance:** May be practiced when pest populations exist in a field or site but the impact of the pest on the crop can be avoided through some cultural practice. Examples of avoidance tactics include crop rotation such that the crop of choice is not a host for the pest, choosing cultivars with genetic resistance to pests, using trap crops, choosing cultivars with maturity dates that may allow harvest before pest populations develop, fertilization programs to promote rapid crop development, and simply not planting certain areas of fields where pest populations are likely to cause crop failure. Some tactics for avoidance and prevention strategies may overlap.

The following pest management questions were categorized as avoidance practices:

Did you adjust planting or harvesting dates for specific purpose of managing or reducing the spread of pests in this block or field?

Did you rotate crops in this field during the past 3 years for the specific purpose of managing or reducing the spread of pests in this field?

Did you plan planting locations to avoid cross infestation of pests for the specific purpose of managing or reducing the spread of pests in this field?

Did you choose crop variety because of specific resistance to certain pests for the specific purpose of managing or reducing the spread of pests in this block or field?

**Beneficial insects:** Insects collected and introduced into locations because of their value in biologic control as prey on harmful insects and parasites.

**Chemigation:** Application of an agricultural chemical by injecting it into irrigation water.

**Common name:** An officially recognized name for an active ingredient. This report shows active ingredient by common name.

**Crop year:** The period immediately following harvest of the previous crop through harvest of the current crop.

**Cultivar:** A horticulturally or agriculturally derived variety of a plant, as distinguished from a natural variety.

**Farm:** Any establishment from which \$1,000 or more of agricultural products were sold or would normally be sold during the year. Government payments are included in sales. Places with all acreage enrolled in set aside or other government programs are considered to be a farm.

**Fertilizer:** The primary nutrients; nitrogen, phosphate, potash, and sulfur.

**Fungi:** A lower form of parasitic plant life which often reduces crop production and/or lowers the grade quality of its host.

**Mechanism of Action (MOA):** The method/biological pathway the pesticide uses to kill the pest.

**Monitoring:** Includes proper identification of pests through systematic sampling or counting or other forms of scouting. Also, weather monitoring to predict levels of pest populations or to determine the most effective time to make pesticide applications, and soil testing where appropriate.

The following pest management practices questions were categorized as monitoring practices:

In 2007, how was your block or field primarily scouted for insects, weeds, diseases, and/or beneficial organisms? (By deliberately going to the field or block specifically for scouting activities? By conducting general observations while performing routine tasks? The block or field was not scouted?)

Was an established scouting process used (systematic sampling, recording counts, etc.) or were insect traps used in this block or field?

Was scouting for pests done in this block or field due to a pest advisory warning?

Was scouting for pests done in this block or field due to a pest development model?

Was this apple block or cotton field scouted for weeds? (If so, Who did the majority of the scouting? Operator, partner or family member, OR An employee, OR Farm supply or chemical dealer, OR Independent crop consultant or commercial scout?)

Was this apple block or cotton field scouted for insects or mites? (If so, Who did the majority of the scouting? Operator, partner or family member, OR An employee, OR Farm supply or chemical dealer, OR Independent crop consultant or commercial scout?)

Was this apple block or cotton field scouted for diseases? (If so, Who did the majority of the scouting? Operator, partner or family member, OR An employee, OR Farm supply or chemical dealer, OR Independent crop consultant or commercial scout?)

Were written or electronic records kept to track the activity or numbers of weeds, insects, or diseases?

Did you use field mapping of previous weed problems to assist you in making weed management decisions for the specific purpose of managing or reducing the spread of pests in this field /block?

Were the services of a diagnostic laboratory used for pest identification or soil or plant tissue pest analysis?

Was weather data used to assist in determining either the need or when to make pesticide applications?

Were floral lures, attractants, repellants, pheromone traps, or other biological pest controls used on this block or field?

**Nematodes:** Microscopic, worm-shaped parasitic animals.

**Pesticides:** As defined by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), pesticides include any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant. The four classes of pesticides presented in this report and the pests targeted are: herbicides - weeds, insecticides - insects, fungicides - fungi, and other chemicals - other forms of life. Miticides and nematicides are included as insecticides while soil fumigants, growth regulators, defoliants, and desiccants are included as other chemicals.

**Pheromone:** A chemical substance produced by an insect which serves as a stimulus to other individuals of the same species for one or more behavioral responses.

**Prevention:** The practice of keeping a pest population from infesting a crop or field. It includes such tactics as using pest-free seeds and transplants, alternative tillage approaches such as no-till or minimum till, choosing cultivars with genetic resistance to insects or disease, irrigation scheduling to avoid situations conducive to disease development, cleaning equipment and implements after completing field work, using field sanitation procedures, and eliminating alternate hosts or sites for insect pests and disease organisms.

The following pest management questions were categorized as prevention practices:

Was no-till or minimum till used to manage pests?

Did you remove crop residue, leaf litter, or remove prunings for the specific purpose of managing or reducing the spread of pests in this field or block?

Did you clean equipment and field implements after completing field or block work to reduce the spread of pests?

How many times did you cultivate this field or block for weed control during the growing season?

Were field edges, lanes, ditches, roadways or fence lines chopped, mowed, plowed, sprayed, or burned to manage pests in this field or block?

Were water management practices such as irrigation scheduling, controlled drainage, or treatment of retention water used on this field to manage for pest or toxic producing fungi and bacteria (i.e. aflatoxin)?

Were the herbicides applied to this cotton field or apple block BEFORE weeds emerged?

Were the herbicides applied to this cotton field or apple block AFTER weeds emerged?

Were the insecticides applied to this cotton field or apple block based primarily on routine treatments of what insects are usually present or scouting for insect infestation?

Did you use a flamer to kill weeds for the specific purpose of managing or reducing the spread of pests in this field or block?

Did you maintain a beneficial insect or vertebrate habitat for the specific purpose of managing or reducing the spread of pests in this field or block?

Was protection of beneficial organisms a factor in your pest control decisions for this field or block?

Did you use any non-chemical controls for deer on this block?

**Suppression:** Reducing the presence or spread of pests. Suppression tactics include making adjustments in cultural practices such as narrow row spacing or optimized in-row plant populations, using cover crops or mulches, or using crops with allelopathic potential in the rotation. Physical suppression tactics may include cultivation or mowing for weed control, baited or pheromone traps for certain insects, and temperature management or exclusion devices for insect and disease management. Biological pesticides and controls, including mating disruption for insects, can be considered as alternatives to conventional pesticides. Determining pest thresholds and alternating pesticide active ingredients to avoid resistance buildup are suppression methods which minimize pesticide use.

The following pest management questions were categorized as suppression practices:

Were floral lures, attractants, repellants, pheromone traps, or other biological pest controls used on this field or block?

Were any biological pesticides such as Bt (*Bacillus thuringiensis*), insect growth regulators (Courier, Intrepid, etc.) neem or other natural/biological based products sprayed or applied to manage pests in this field or block?

Were any beneficial organisms (insects, nematodes, fungi) applied or released in this block to manage pests?

Was scouting data compared to published information on infestation thresholds to determine when to take measures to manage pests in the field or block?

Were ground covers, mulches, or other physical barriers maintained to manage pest problems?

Was row spacing, plant density, or row directions adjusted to manage pests?

Were pesticides with different mechanisms of action rotated or tank mixed for the primary purpose of keeping pests from becoming resistant to pesticides?

Did you maintain buffer strips or border rows to isolate organic cotton or organic apples from non-organic crops or land, or did you take a buffer harvest?

Was a trap crop grown to help manage insects in this field?

**Trade name:** A trademark name given to a specific formulation of a pesticide product. A formulation contains a specific concentration of the active ingredient, carrier materials, and other ingredients such as emulsifiers and wetting agents.

C

FERTILIZER and NUTRIENT APPLICATIONS---SELECTED FIELD

C

1. Were commercial FERTILIZERS applied to this field for the 2007 cotton crop? ..... YES = 1

CODE	EDIT TABLE
0202	0201

2. [If COMMERCIAL fertilizer applied, continue, else go to item 5.]

3. How many commercial fertilizer applications were made to this field for the 2007 crop? (Include applications made by airplanes and custom applicators) .....

NUMBER
0203

4. Now I need to record information for each application

CHECKLIST	
INCLUDE	EXCLUDE
<input checked="" type="checkbox"/> Custom applied fertilizers	<input checked="" type="checkbox"/> Micronutrients
<input type="checkbox"/> Fertilizers applied in the fall of 2006 and those applied earlier if this field was fallow in 2006	<input type="checkbox"/> Unprocessed manure
<input type="checkbox"/> Commercially prepared manure or compost	<input type="checkbox"/> Fertilizer applied to previous crops in this field
	<input type="checkbox"/> Lime and Gypsum/landplaster

T-TYPE	TABLE
2	001
Line 99	Office Use Lines in Table 0213

APPLICATION CODES for COLUMN 6	
1 Broadcast, ground without incorporation	5 In irrigation water
2 Broadcast, ground with incorporation	6 Chisel, injected or knifed in
3 Broadcast, by aircraft	7 Banded/Sidedressed in or over row
4 In seed furrow	8 Foliar or directed spray

LINE	2 MATERIALS USED [Enter percentage analysis or actual pounds of plant nutrients applied per acre.] [Show Common Fertilizers in Respondent Booklet.]				3 What quantity was applied per acre? [Leave this column blank if actual nutrients were reported.]	4 [Enter material code.] 1 Pounds 12 Gallons 19 Pounds of actual nutrients	5 When was this applied? 1 In the fall before seeding 2 In the spring before seeding 3 At seeding 4 After seeding	6 How was this applied? [Refer to code list above.]	7 How many acres were treated in this application?  ACRES
	N Nitrogen	P <sub>2</sub> O <sub>5</sub> Phosphate	K <sub>2</sub> O Potash	S Sulfur					
01	0205	0206	0207	0214	0208	0209	0210	0211	0212
02	0205	0206	0207	0214	0208	0209	0210	0211	0212
03	0205	0206	0207	0214	0208	0209	0210	0211	0212
04	0205	0206	0207	0214	0208	0209	0210	0211	0212
05	0205	0206	0207	0214	0208	0209	0210	0211	0212
06	0205	0206	0207	0214	0208	0209	0210	0211	0212
07	0205	0206	0207	0214	0208	0209	0210	0211	0212
08	0205	0206	0207	0214	0208	0209	0210	0211	0212

T - TYPE 0	TABLE 000	LINE 00
---------------	--------------	------------



D

**PESTICIDE APPLICATIONS---SELECTED FIELD**

D

Now I have some questions about all the pesticides used on this field for the 2007 cotton crop including both custom applications and applications made by this operation.

1. Were any herbicides, insecticides, fungicides or other chemicals used on this cotton field for the 2007 crop? ..... YES = 1  
 [Include biological pesticides such as Bt, insect growth regulators, pheromones, etc.]

0302	0301
------	------

[Probe for applications made in the fall of 2006 (and those made earlier if this field was fallow).]  
 [If no pesticides applied, go to Section E.]

Include defoliant, fungicides, herbicides, insecticides, and other pesticides. Include biological and botanical pesticides.	Exclude fertilizers reported earlier and seed treatments.	T - TYPE	TABLE
		3	001
LINE 99	OFFICE USE LINE IN TABLE	0319	

CHEMICAL PRODUCT NAME	LINE	2	3	4	5	6	OR	7	8
		What products were applied to this field? [Show product codes from Respondent Booklet.]	Was this product bought in liquid or dry form? [Enter L or D]	Was this part of a tank mix? [If tank mix, enter line number of first product in mix.]	When was this applied? 1 BEFORE planting 3 AT planting 4 AFTER planting 5 DEFOLIATION prior to harvest	How much was applied per acre per application?	What was the total amount applied per application in this field?	[Enter unit code.] 1 Pounds 12 Gallons 13 Quarts 14 Pints 15 Liquid Oz. 28 Dry Oz. 30 Grams	
	01	0305		0306	0307	0308		0309	0310
	02	0305		0306	0307	0308		0309	0310
	03	0305		0306	0307	0308		0309	0310
	04	0305		0306	0307	0308		0309	0310
	05	0305		0306	0307	0308		0309	0310
	06	0305		0306	0307	0308		0309	0310
	07	0305		0306	0307	0308		0309	0310
	08	0305		0306	0307	0308		0309	0310
	09	0305		0306	0307	0308		0309	0310
	10	0305		0306	0307	0308		0309	0310
	11	0305		0306	0307	0308		0309	0310
	12	0305		0306	0307	0308		0309	0310
	13	0305		0306	0307	0308		0309	0310
	14	0305		0306	0307	0308		0309	0310

2. [For pesticides not listed in Respondent Booklet, specify---]

LINE	Pesticide Type (Herbicide, Insecticide, Fungicide, etc.)	EPA No. or Trade name And Formulation	Form Purchased (Liquid or Dry)	Where Purchased [Ask ONLY if EPA No. cannot be reported.]

APPLICATIONS CODES for column 9	
1 Broadcast, ground without incorporation	6 Chisel/Injected or Knifed in
2 Broadcast, ground with incorporation	7 Banded in or over row
3 Broadcast, by aircraft	8 Foliar or directed spray
4 In Seed furrow	9 Spot treatments
5 In Irrigation water	

[ENUMERATOR NOTE:  
  
Use these columns only if  
TOTAL COST  
(item 4 on next page)  
cannot be provided.]

LINE	9	10	11	13	OPTIONAL ITEM 4 What was the cost per unit of the product?	
	How was this product applied? [Enter code from above.]	How many acres in this field were treated with this product?  ACRES	How many times was it applied?  NUMBER	Were these applications made by— 1 Operator, partner or family member? 2 Custom applicator? 3 Employee/Other?	DOLLARS and CENTS PER UNIT	UNIT CODE
01	0311	0312	0313	0316	0317	0318
02	0311	0312	0313	0316	0317	0318
03	0311	0312	0313	0316	0317	0318
04	0311	0312	0313	0316	0317	0318
05	0311	0312	0313	0316	0317	0318
06	0311	0312	0313	0316	0317	0318
07	0311	0312	0313	0316	0317	0318
08	0311	0312	0313	0316	0317	0318
09	0311	0312	0313	0316	0317	0318
10	0311	0312	0313	0316	0317	0318
11	0311	0312	0313	0316	0317	0318
12	0311	0312	0313	0316	0317	0318
13	0311	0312	0313	0316	0317	0318
14	0311	0312	0313	0316	0317	0318

T-TYPE	TABLE	LINE
0	000	00



10. **In 2007, how was this field primarily scouted for insects, weeds, diseases, and/or beneficial organisms---**

1	By deliberately going to the field specifically for scouting activities? [Enter code 1 and go to item 11.]	CODE	0808
2	By conducting general observations while performing routine tasks? [Enter code 2 and go to item 13.]		
3	This field was not scouted. [Enter code 3 and go to item 18.]		

11. **Was an established scouting process used (systematic sampling, recording counts, etc.) or were insect traps used in this field? [Exclude traps checked as part of either BWEP or PBWP].**..... YES = 1

CODE 0809

12. **Was scouting for pests done in this field due to---**

a. a pest advisory warning?..... YES = 1

b. a pest development model?..... YES = 1

CODE 0810

CODE 0811

1	2	3
	<i>[If YES, ask---]</i> <b>Was the infestation level for [column 1]—</b>	<i>[If column 1 = YES, ask---]</i> <b>Who did the majority of the scouting for [column 1]---</b>
	1 Worse than normal 2 Normal 3 Less than normal <b>CODE</b>	1 Operator, partner or family member 2 An employee 3 Farm supply or chemical dealer 4 Independent crop consultant or commercial scout <b>CODE</b>
13. <b>Was this cotton field scouted for--</b> YES = 1		
a. Weeds?.....	0812	0813
b. Insects or mites?.....	0815	0816
c. Diseases?.....	0818	0819
		0814
		0817
		0820

14. *[If item 13, column 3 = 3 or 4, ask--- else go to item 15.]*

**How much did you pay for the scouting services for this field?**  
*[Include landlord and contractor cost.]*.....

<b>DOLLARS &amp; CENTS PER ACRE</b>	OR	<b>TOTAL DOLLARS</b>
0835		0836

a. **[Note: If scouting performed at no cost, explain:\_\_\_\_\_]**.....

OFFICE USE 0333

		CODE
15.	Were written or electronic records kept for this field to track the activity or numbers of weeds, insects or diseases? .....	0838
	YES = 1	
16.	Was scouting data compared to published information on infestation thresholds to determine when to take measures to manage pests in field? .....	0839
	YES = 1	
17.	Did you use field mapping of previous weed problems to assist you in making weed management decisions? .....	0840
	YES = 1	
18.	Did you do any of the following other type(s) of pest management practices for the specific purpose of managing or reducing the spread of pests in this field? [Enter code "1" for all that apply.]	CODE
a.	Use the services of a diagnostic laboratory for pest identification or soil plant tissue pest analysis for this field? .....	0841
	YES = 1	
b.	Plow down crop residues (using conventional tillage)? .....	0842
	YES = 1	
c.	Remove/burn down crop residue? .....	0843
	YES = 1	
d.	Rotate crops in this field during the past 3 years? .....	0844
	YES = 1	
e.	Maintain ground covers, mulches, or other physical barriers? .....	0845
	YES = 1	
f.	Choose crop variety because of specific resistance to certain pest? .....	0846
	YES = 1	
g.	Use no-till or minimum till? .....	0847
	YES = 1	
h.	Plan planting locations to avoid cross infestation of pests? .....	0848
	YES = 1	
i.	Adjust planting or harvesting dates? .....	0849
	YES = 1	
j.	Chop, spray, mow, plow, or burn field edges, lanes, ditches, roadways, or fence lines? .....	0850
	YES = 1	
k.	Clean equipment and field implements after completing field work to reduce the spread of pests? .....	0851
	YES = 1	
l.	Adjust row spacing, plant density or row directions? .....	0852
	YES = 1	
m.	Have the seed used in this field treated for insect or disease control after you purchased the seed? .....	0854
	YES = 1	
n.	Maintain a beneficial insect or vertebrate habitat? .....	0855
	YES = 1	
o.	Maintain buffer strips or border rows to isolate organic cotton from non-organic crops or land, or did you take a buffer harvest? .....	0856
	YES = 1	
p.	Use a flamer to kill weeds? .....	0857
	YES = 1	
19.	Was this field cultivated for weed control during the growing season? .....	0863
	YES = 1	
a.	[If YES, ask--]	NUMBER
	How many times did you cultivate this field for weed control during the growing season? .....	0864

20. Were any beneficial organisms (insects, nematodes, fungi) applied or released in this field to manage pests? ..... YES = 1
21. Were floral lures, attractants, repellants, pheromone traps or other biological pest controls used on this field? ..... YES = 1   
 [If item 20 or 21 = YES, ask---]
- a. What were the TOTAL materials and application costs for all biological pests controls for this field? .....  
 [Include landlord's and contractor's share. Include cost for beneficial organisms (insects, nematodes, and fungi). Exclude biological pesticides and BWEF traps.]
- | DOLLARS & CENTS PER ACRE          | OR | TOTAL DOLLARS                     |
|-----------------------------------|----|-----------------------------------|
| <input type="text" value="0859"/> |    | <input type="text" value="0860"/> |
|                                   |    | <input type="text" value="0869"/> |
22. Was a trap crop grown to help manage insects in this field? ..... YES = 1
23. Were water management practices such as irrigation scheduling, controlled drainage, or treatment of retention water used on this field to manage for pests or toxic producing fungi and bacteria (i.e. aflatoxin)? ..... YES = 1   
 CODE
24. Was protection of beneficial organisms a factor in your pest control decisions for this field? ..... YES = 1   
 CODE

**PEST MANAGEMENT INFORMATION**

25. [Show Pest Management Information Sources Code List from Respondent Booklet.]

**Which outside sources of information on pest management practices and products were used for the 2007 cotton crop?**

(Starting with the most influential in determining the pest management practices used on this operation, enter code(s) for up to 3 sources.)

**PEST MANAGEMENT INFORMATION SOURCES CODE LIST**

1 County, Cooperative, or University Extension Advisor, Publications or demonstrations	[Enter up to 3 source codes.]
2 Farm Supply or Chemical Dealer	
3 Commercial Scouting Service	<b>FIRST</b>
4 Independent Crop Consultant or Pest Control Advisor/Custom Applicator	<input type="text" value="0865"/>
5 Other Growers or Producers	
6 Producer Associations, Newsletters or Trade Magazines	<b>SECOND</b>
7 Electronic Information Services (DTN, Internet, World Wide Web, etc.)	<input type="text" value="0866"/>
8 Employee Pest Advisor	
11 Other – (Specify: _____)	<b>THIRD</b>
12 None – Operator used no <b>outside</b> information source	<input type="text" value="0867"/>

26. Other than pesticide applicator training, have you (the operator) attended any training session on pest identification and management since October 1, 2006? ..... YES = 1   
 CODE

Completion Code for Pest Management Data	
1- Incomp/R	0340

## Report Features

Released May 21, 2008, by the National Agricultural Statistics Service (NASS), Agricultural Statistics Board, U.S. Department of Agriculture. For information on "Agricultural Chemical Usage" call Doug Farmer at (202) 720-7492, office hours 7:30 a.m. to 4:00 p.m. ET.

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