

Agricultural Chemical Usage

1999 Fruit Summary

New York and Major States

July 2000



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1999
AGRICULTURAL CHEMICAL USE
ESTIMATES FOR FRUIT CROPS

Overview

This publication is the fifth Fruit Summary in the series of "Agricultural Chemical Usage" reports issued by the National Agricultural Statistics Service (NASS). These reports contain statistics for the on-farm use of agricultural chemicals. Other chemical usage publications issued in the past year have focused on agricultural chemical use on vegetables (*July 1999*) and field crops (*May 2000*).

This data series addresses the increased public interest in agricultural chemical use and provides the means for government agencies to respond effectively to food safety and water quality issues.

Information in this report is provided from a survey funded by the USDA Pesticide Data Program. The purpose of the Pesticide Data Program is to provide reliable pesticide use statistics and to enhance the quality of information on pesticide residues in food. Multiple agencies within the USDA administer this program. This data series addresses the increased public interest in agricultural chemical use and provides the means for government agencies to respond effectively to food safety and water quality issues.

The National Agricultural Statistics Service collects on-farm agricultural chemical use information to support the evaluation of food safety and water quality issues. The Economic Research Service (ERS) conducts research on the impact of alternative pesticide regulations, policies, and practices. The Agricultural Marketing Service (AMS) conducts a pesticide residue monitoring program. This report includes farm use of pesticides for the 1999 crop year for selected fruit and nut crops in 14 major producing States (*Arizona, Indiana, and Texas were added to the 1999 survey*). The entire report can be found on NASS's website (www.usda.gov/nass/pubs/pubs.htm).

Highlights

Apples: New York growers applied nitrogen to 74 percent of the apple acres in 1999. They applied phosphate to 13 percent and potash to 82 percent of the apple acres. Insecticides were used on 99 percent of the acres. The most commonly used fungicide in New York was captan which was applied to 95 percent of the 55,000 bearing acres.

Nitrogen was applied to 70 percent of the apple acreage in the eleven apple States surveyed. Arizona applied nitrogen to the least amount of acres, 2 percent; Michigan and North Carolina to the most, 85 percent. Phosphate and potash were used less among the major States, with applications made to 37 and 49 percent of the acreage, respectively.

Insecticide applications were made on 97 percent of the acreage in the 11 States surveyed. The most commonly used insecticides were azinphos-methyl and chlorpyrifos. Fungicides were applied to 99 percent of New York's and North Carolina's acreage but in lower percentages in the other States, ranging down to 80 percent of California's acreage. Myclobutanil was the fungicide used on the greatest amount of acres and was applied to 42 percent of the acreage.

Herbicides were applied to 60 percent of the acreage overall and ranged from 12 percent of the acreage in South Carolina upwards to 65 percent and above in five States.

Cherries, Tart: New York growers applied nitrogen to 91 percent of the acreage, applied no phosphate and used potash on 77 percent of the acreage. They applied insecticides to 92 percent and fungicides to 91 percent of the acreage. The insecticide phosmet was used on 60 percent of the 2,600 tart cherry acres. Captan, applied to 84 percent of those acres, was the most frequently used fungicide in New York.

For the four tart cherry States surveyed, nitrogen was applied to 89 percent of the acreage, while phosphate and potash were used on 27 and 66 percent, respectively. Insecticides and fungicides were applied to virtually all of the acreage while herbicides were applied to 62 percent of the acreage. Azinphos-methyl was the insecticide applied to the most acres, at 79 percent of the crop. Chlorothalonil, at 78 percent, and sulfur, at 76 percent, were the most widely used fungicides. Glyphosate and paraquat were the two most common herbicides and were applied to 37 and 27 percent of the acres, respectively.

Grapes, All: New York growers did not use phosphate in 1999 and applied potash to 45 percent of the grape acreage. Fungicides were applied to all 31,500 grape acres using mancozeb on 71 percent of those acres. Ninety-three percent of the grape acres received herbicides and 80 percent had insecticides applied. Glyphosphate, an herbicide, was used on 62 percent of the acres.

Nitrogen was applied to 89 percent of the acreage in the seven grape States surveyed. New York and Pennsylvania applied it to the most acres, at 96 and 95 percent, respectively. In contrast, Indiana applied nitrogen more sparingly to only 33 percent of the acres. Phosphate was applied to 65 percent of the total acreage. However, this figure was highly skewed by California at 71 percent since they had 90 percent of the seven-state acreage. Potash applications were made on 71 percent of the acres. Oregon applications were the lowest, at 19 percent, while Michigan was the highest at 77 percent.

Fungicides were applied to slightly more acres than were herbicides and insecticides in the seven States surveyed. The percent of acres treated with fungicides was 81 percent; sulfur was, by far, the leading fungicide and was in use on 76 percent of the acres. In the insecticide category, imidacloprid was the most commonly used material; it was applied to 32 percent of the acreage. Herbicide applications were made to 75 percent of the acres overall with paraquat being the most commonly used at 54 percent of the acreage.

Peaches: New York growers applied nitrogen to 89 percent of the peach acreage. One tenth of the acreage received phosphate and two thirds received potash. Almost all of New York's 1600 peach acres received fungicide (97%). Captan was applied to 77 percent of the acres. A bit more than half of the acres were treated with an herbicide (56%).

Nitrogen was applied to 87 percent of the peach acreage in the ten peach States surveyed. One-third of the acreage received phosphate treatments, and half of the acreage received potash. Insecticide and fungicide use were each reported on 88 percent of the peach acreage in the ten States surveyed. Georgia and New York each reported insecticide use on 99 percent of the crop. All other surveyed States ranged from 81 to 97 percent of the acres. Fungicide usage was lowest in Texas at 74 percent of the acres while the other States ranged from 86 percent in California to 99 percent in Georgia. Herbicide use was reported on 58 percent of the peach acreage. Washington and California each had the lowest percentage treated, reporting use on 43 percent of the crop.

Pears: Only 61 percent of New York's pear acreage had nitrogen applied. Phosphate was applied to 11 percent and potash to 63 percent. Seventy-nine percent of New York's 2,000 pear acres had insecticide applied. Azinphos-methyl was the most commonly used. Seventy-eight percent of the acreage received fungicides and 43 percent received herbicides. These figures are below the average for the six surveyed pear states.

About 78 percent of the pear acreage in the six States surveyed for pears was treated with nitrogen. Phosphate was applied to 20 percent, and potash was applied to 30 percent. California applied nitrogen most frequently, at 89 percent. Michigan was the lowest at 55 percent.

Insecticides were applied to 91 percent of the acreage in the six States surveyed, while fungicides were applied to 86 percent of the acres. Oregon applied insecticides to 99 percent of their acres, followed closely by Pennsylvania at 97 percent and Washington at 96 percent. Fungicides were applied to almost all of the Oregon and Pennsylvania acreage but were reported used on only three-fourths of California's acreage. Herbicides were put on 48 percent of the acreage in the six States. Oregon growers used herbicides on 68 percent of their pear acreage while the percent treated in the other five States ranged from 51 percent downward. An average of 50 percent of the acreage was treated with other chemicals, ranging from 7 to 60 percent.

Apples: Fertilizer Use by State, 1999
Percent of Acres Treated and Total Amount Applied

State	Percent of Acres Treated and Total Applied							
	Bearing	Acreage		Nitrogen	Phosphate		Potash	
	Acres	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent	1,000 Lbs	
AZ 1/	4,000	2	3					
CA	36,500	72	1,016	24	389	25	594	
GA	1,300	83	124	25	21	79	39	
MI	52,500	85	2,887	48	545	70	2,107	
NJ	3,300	34	64	20	22	34	78	
NY	55,000	74	2,167	13	389	82	4,430	
NC	9,000	85	531	86	444	87	438	
OR	8,700	65	464	41	107	41	51	
PA	23,000	65	342	40	247	44	393	
SC	2,400	68	32	65	24	67	33	
WA	172,000	65	4,292	42	1,694	38	2,244	
Total	367,700	70	11,922	37	3,882	49	10,408	

1/ Insufficient reports to publish data for one or more of the fertilizer classes.

**Apples: Fertilizer Primary Nutrient Applications,
States Surveyed and Total, 1999**

Primary Nutrient	Bearing : Acreage	Area Applied	Appli-cations	Rate per Application	Rate per Crop Year	Total Applied
	: Acres	Percent	Number	Pounds per Acre		1,000 Lbs
<u>Arizona:</u>	4,000					
Nitrogen		2	1.6	16	26	3
Phosphate 1/						
Potash 1/						
<u>California:</u>	36,500					
Nitrogen		72	1.2	32	38	1,016
Phosphate		24	1.4	32	45	389
Potash		25	1.3	47	65	594
<u>Georgia:</u>	1,300					
Nitrogen		83	2.1	54	114	124
Phosphate		25	1.8	34	65	21
Potash		79	1.2	30	38	39
<u>Michigan:</u>	52,500					
Nitrogen		85	2.9	22	65	2,887
Phosphate		48	3.3	6	22	545
Potash		70	2.8	20	58	2,107
<u>New Jersey:</u>	3,300					
Nitrogen		34	1.2	46	57	64
Phosphate		20	1.0	30	33	22
Potash		34	1.0	64	69	78
<u>New York:</u>	55,000					
Nitrogen		74	1.2	43	54	2,167
Phosphate		13	1.1	48	53	389
Potash		82	1.0	90	98	4,430
<u>North Carolina:</u>	9,000					
Nitrogen		85	1.2	56	70	531
Phosphate		86	1.0	53	57	444
Potash		87	1.1	51	56	438
<u>Oregon:</u>	8,700					
Nitrogen		65	1.1	73	82	464
Phosphate		41	1.0	29	30	107
Potash		41	1.0	14	14	51
<u>Pennsylvania:</u>	23,000					
Nitrogen		65	1.5	15	23	342
Phosphate		40	1.5	17	27	247
Potash		44	1.5	25	39	393
<u>South Carolina:</u>	2,400					
Nitrogen		68	1.0	18	20	32
Phosphate		65	1.0	15	15	24
Potash		67	1.0	20	20	33
<u>Washington:</u>	172,000					
Nitrogen		65	2.0	19	38	4,292
Phosphate		42	1.3	17	23	1,694
Potash		38	1.5	22	34	2,244
<u>Total:</u>	367,700					
Nitrogen		70	1.8	25	47	11,922
Phosphate		37	1.7	17	28	3,882
Potash		49	1.6	35	57	10,408

1/ Insufficient reports to publish data for one or more of the fertilizer classes.

**Apples: Pesticide, Total Acreage,
Percent of Area Receiving Applications and Total Applied,
States Surveyed and Total, 1999**

Area Receiving and Total Applied 1/									
State : Bearing :		Acreage :		Herbicide	Insecticide 2/	Fungicide	Other Chemical		
		Acres	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent
AZ 3/	:	4,000			96	102.8		57	0.3
CA	:	36,500	35	16.5	86	936.0	80	322.2	14
GA	:	1,300	91	0.5	96	41.5	95	33.9	11
MI	:	52,500	74	64.7	98	816.6	98	1,561.0	41
NJ	:	3,300	26	2.1	84	76.2	86	52.4	42
NY	:	55,000	56	80.7	99	1,026.1	99	1,171.6	56
NC	:	9,000	17	13.0	99	331.3	99	467.4	13
OR	:	8,700	68	20.3	97	312.1	95	72.2	70
PA	:	23,000	65	24.0	97	208.6	98	213.7	44
SC	:	2,400	12	1.1	97	11.5	97	78.8	24
WA	:	172,000	66	193.1	99	5,036.9	88	1,185.5	86
	:								
Total	:	367,700	60	416.0	97	8,899.6	85	5,314.4	62
									275.6

** Total applied is less than 50 lbs.

1/ Acreage in California includes non-bearing acres. Total applied may include applications of some active ingredients made only to non-bearing acres.

2/ Total Applied excludes Bt's (*Bacillus thuringiensis*). Quantities are not available because amounts of active ingredient are not comparable between products.

3/ Insufficient reports to publish data for one or more of the pesticide classes.

**Apples: Agricultural Chemical Applications,
States Surveyed, 1999 1/**

Agricultural Chemical	Area Applied	Appli- cations	Rate per Application	Rate per Crop Year	Total Applied
	: Percent	Number	Pounds per Acre	1,000 Lbs	
<u>Herbicides:</u>					
2,4-D	14	1.1	0.74	0.84	42.8
Diuron	11	1.3	0.65	0.91	35.3
Glufosinate-ammonium	*	1.0	0.39	0.39	0.6
Glyphosate	36	1.4	0.77	1.10	144.8
Norflurazon	8	1.0	0.98	1.07	32.2
Oryzalin	3	1.0	1.35	1.41	17.7
Oxyfluorfen	3	1.0	0.78	0.80	9.8
Paraquat	22	1.4	0.43	0.63	51.3
Pendimethalin	*	1.1	1.17	1.28	2.3
Simazine	16	1.0	1.00	1.08	61.7
Terbacil	2	1.0	0.48	0.50	4.1
<u>Insecticides:</u>					
Abamectin	9	1.2	0.008	0.01	0.3
Azinphos-methyl	73	3.0	0.71	2.15	572.8
Bt(<i>Bacillus thur.</i>) 2/	21	2.0			
Carbaryl	45	1.3	1.07	1.40	230.0
Chlorpyrifos	60	1.5	1.30	1.97	433.1
Clofentezine	9	1.1	0.11	0.13	4.4
Diazinon	4	1.4	0.72	1.02	13.6
Dicofol	*	1.2	1.42	1.75	2.7
Dimethoate	3	1.2	0.81	1.01	10.5
Endosulfan	15	1.3	0.88	1.19	66.6
Esfenvalerate	18	1.6	0.03	0.05	3.2
Fenbutatin-oxide	3	1.0	0.90	0.94	11.6
Formetanate hydro.	8	1.0	0.61	0.65	20.4
Hexythiazox	3	1.1	0.10	0.11	1.2
Imidacloprid	46	1.4	0.05	0.07	12.7
Kaolin	*	1.4	32.06	44.94	22.9
Malathion	6	1.1	0.91	1.05	22.8
Methidathion	*	1.5	0.93	1.42	2.7
Methomyl	10	1.5	0.45	0.70	25.8
Methoxychlor	6	1.3	0.79	1.07	21.8
Methyl parathion	12	2.4	0.55	1.34	60.8
Oxamyl	4	1.2	0.51	0.61	8.3
Permethrin	5	1.1	0.11	0.13	2.3
Petroleum distillate	59	1.6	19.34	32.13	6,976.5
Phosmet	28	2.3	1.36	3.25	330.7
Phosphamidon	*	1.2	0.49	0.63	0.7
Potassium salts	*	1.1	2.70	2.96	3.7
Pyridaben	18	1.0	0.16	0.17	11.5
Spinosad	28	1.6	0.09	0.14	14.7
Tebufenozide	5	2.0	0.13	0.27	5.1
<u>Fungicides:</u>					
Basic Cupric Zinc Su.	*	1.0	0.10	0.11	**
Basic copper sulfate	*	1.1	1.96	2.21	4.7
Benomyl	11	2.4	0.23	0.56	22.9
Calcium polysulfide	3	1.2	16.99	20.34	253.9
Captan	37	5.0	1.63	8.27	1,128.8
Chlorothalonil	*	1.8	0.78	1.46	5.1
Copper hydroxide	17	1.2	2.03	2.46	152.4
Copper oxychlo. sul.	7	1.3	1.87	2.48	65.3
Copper resinate	*	1.0	0.26	0.26	0.3

--continued

**Apples: Agricultural Chemical Applications,
States Surveyed, 1999 1/(continued)**

Agricultural Chemical	: Area Applied	: Appli- cations	: Rate per Application	: Rate per Crop Year	: Total Applied
	: Percent	<u>Number</u>	<u>Pounds per Acre</u>	<u>1,000 Lbs</u>	
Fungicides:(continued)	:				
Copper sulfate	:	*	1.4	1.23	1.75
Cyprodinil	:	9	1.8	0.10	0.19
Dodine	:	3	1.4	0.96	1.40
Fenarimol	:	22	1.9	0.06	0.11
Ferbam	:	*	5.8	2.60	15.09
Fosetyl-al	:	8	1.1	1.50	1.67
Kresoxim-methyl	:	9	1.2	0.16	0.19
Mancozeb	:	34	3.2	2.04	6.72
Maneb	:	1	3.8	2.21	8.49
Mefenoxam	:	4	1.1	0.37	0.43
Metiram	:	17	3.4	2.61	9.06
Myclobutanil	:	42	2.3	0.10	0.23
Oxytetracycline	:	5	1.4	0.11	0.17
Pseudomonas fluores.	:	5	1.1	0.23	0.26
Streptomycin	:	19	1.5	0.15	0.22
Sulfur	:	35	2.4	5.23	12.67
Thiophanate-methyl	:	11	2.7	0.30	0.84
Thiram	:	4	1.6	2.85	4.66
Triadimefon	:	4	1.8	0.07	0.14
Triflumizole	:	17	1.4	0.21	0.30
Triforine	:	*	1.9	0.39	0.75
Ziram	:	13	2.2	2.50	5.72
	:				
Other Chemicals:	:				
6-benzyladenine	:	3	1.3	0.03	0.05
Butenoic Acid Hydro.	:	6	1.0	0.08	0.08
Chlorophacinone	:	1	1.0	0.13	0.13
Cytokinins	:	17	1.1	0.02	0.03
Dodecanol	:	6	1.0	0.03	0.03
E,E-8, 10-Dodecadien	:	6	1.1	0.05	0.06
Ethephon	:	10	1.1	0.56	0.64
Gibberellic acid	:	20	1.2	0.02	0.03
Gibberellins A4A7	:	1	1.3	0.03	0.05
Monocarbamide dihyd.	:	1	1.1	5.84	6.56
NAD	:	6	1.1	0.05	0.05
Naphthaleneacetic ac.	:	34	1.2	0.04	0.04
Strychnine	:	*	1.0	0.02	0.02
Tetradecanol	:	6	1.0	0.007	0.007
Tetradecen-1-OL (Z)	:	*	1.1	0.04	0.05
Zinc phosphide	:	3	1.0	0.13	0.13

* Area applied is less than one percent.

** Total applied is less than 50 lbs.

1/ Bearing acres in 1999 for the 11 States surveyed were 367,700 acres.

States included are AZ, CA, GA, MI, NJ, NY, NC, OR, PA, SC and WA.

Acreage in Arizona and California includes non-bearing acres.

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

**Apples: Agricultural Chemical Applications,
New York, 1999 1/**

Agricultural Chemical	Area Applied	Appli- cations	Rate per Application	Rate per Crop Year	Total Applied
	: Percent	Number	Pounds per Acre	1,000 lbs	
<u>Herbicides:</u>					
2,4-D	20	1.1	1.04	1.14	12.9
Diuron	19	1.0	1.02	1.09	11.3
Glyphosate	37	1.2	0.96	1.21	24.7
Paraquat	24	1.0	0.56	0.59	7.8
Pendimethalin	2	1.0	1.51	1.56	1.7
Simazine	24	1.0	1.35	1.46	19.6
<u>Insecticides:</u>					
Abamectin	9	1.0	0.010	0.010	**
Azinphos-methyl	67	3.1	0.62	1.95	72.0
Bt (<i>Bacillus thur.</i>) 2/	24	1.6			
Carbaryl	56	1.1	1.10	1.29	39.6
Chlorpyrifos	60	1.8	1.00	1.80	59.7
Clofentezine	17	1.0	0.13	0.13	1.2
Dicofol	2	1.1	1.54	1.69	1.8
Dimethoate	5	1.1	1.08	1.22	3.5
Endosulfan	29	1.3	0.87	1.20	19.2
Esfenvalerate	26	1.2	0.04	0.04	0.6
Imidacloprid	46	1.4	0.06	0.09	2.1
Methomyl	15	1.0	0.77	0.83	7.0
Methyl parathion	25	1.4	0.85	1.25	17.3
Oxamyl	12	1.1	0.54	0.61	4.1
Permethrin	8	1.4	0.09	0.12	0.5
Petroleum distillate	53	1.5	15.86	25.09	725.7
Phosmet	43	2.2	1.12	2.54	59.7
Pyridaben	22	1.1	0.17	0.19	2.4
Spinosad	20	1.6	0.08	0.13	1.5
<u>Fungicides:</u>					
Benomyl	33	2.7	0.22	0.60	10.7
Captan	95	4.4	1.64	7.27	381.5
Copper hydroxide	17	1.1	2.39	2.71	25.2
Copper oxychlo. sul.	28	1.2	2.14	2.72	41.8
Cyprodinil	7	1.0	0.14	0.14	0.5
Dodine	7	1.2	1.38	1.65	6.5
Fenarimol	20	2.6	0.06	0.16	1.8
Mancozeb	77	3.7	2.27	8.58	362.7
Metiram	16	3.0	2.62	7.86	71.0
Myclobutanil	57	2.5	0.10	0.25	8.0
Streptomycin	24	1.9	0.14	0.27	3.6
Sulfur	39	2.7	3.80	10.36	220.8
Thiophanate-methyl	38	1.9	0.31	0.62	13.1
Triadimefon	5	2.3	0.08	0.18	0.5
Triflumizole	7	2.0	0.24	0.49	2.0
Ziram	6	1.1	1.75	1.93	6.4
<u>Other Chemicals:</u>					
6-benzyladenine	2	1.2	0.03	0.04	**
Butenoic Acid Hydro.	*	1.0	0.10	0.10	**
Cytokinins	3	1.4	0.006	0.008	**
Ethephon	3	1.0	0.29	0.29	0.5
Giberellic acid	7	1.6	0.008	0.010	**
Naphthaleneacetic ac.	50	1.2	0.04	0.05	1.4

* Area applied is less than one percent.

** Total applied is less than 50 lbs.

1/ Bearing acres in 1999 for New York were 55,000 acres.

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

Cherries, Tart: Fertilizer Use by State, 1999
Percent of Acres Treated and Total Amount Applied

:		Percent of Acres Treated and Total Applied						
State	Bearing	:	Nitrogen		Phosphate		Potash	
:	Acreage	:	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent	1,000 Lbs
MI	28,100		91	1,813	29	333	67	1,467
NY <u>1/</u>	2,600		91	106			77	173
OR <u>1/</u>	1,300		72	41				
PA	1,200		58	13	29	5	30	5
Total	33,200		89	1,973	27	356	66	1,660

1/ Insufficient reports to publish data for one or more of the fertilizer classes.

**Cherries, Tart: Fertilizer Primary Nutrient Applications,
States Surveyed and Total, 1999**

Primary Nutrient	Bearing	Area : Acreage		Appli- : Applied	Rate per cations	Rate per Application	Total Applied
		: Acres	Percent	Number	Pounds per Acre		1,000 Lbs
Michigan:		28,100					
Nitrogen			91	1.4	48	71	1,813
Phosphate			29	1.5	27	41	333
Potash			67	1.2	61	78	1,467
New York:		2,600					
Nitrogen			91	1.0	43	45	106
Phosphate <u>1/</u>							
Potash			77	1.0	86	86	173
Oregon:		1,300					
Nitrogen			72	1.0	44	44	41
Phosphate <u>1/</u>							
Potash <u>1/</u>							
Pennsylvania:		1,200					
Nitrogen			58	1.0	19	19	13
Phosphate			29	1.0	14	14	5
Potash			30	1.0	13	13	5
Total:		33,200					
Nitrogen			89	1.4	47	67	1,973
Phosphate			27	1.4	26	39	356
Potash			66	1.2	61	76	1,660

1/ Insufficient reports to publish data for one or more of the fertilizer classes.

**Cherries, Tart: Pesticide, Total Acreage,
Percent of Area Receiving Applications and Total Applied,
States Surveyed and Total, 1999**

		Area Receiving and Total Applied									
State: Bearing :		Acreage		Herbicide		Insecticide 1/:		Fungicide		Other Chemical	
		Acres	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent	1,000 Lbs	
MI	:	28,100	62	20.2	99	75.8	99	509.5	75	4.4	
NY	:	2,600	59	1.5	92	11.3	91	34.9	41	0.3	
OR	:	1,300	62	0.9	98	2.3	99	19.8			
PA	:	1,200	75	1.0	91	2.4	91	10.8	83	0.3	
	:										
Total:		33,200	62	23.6	98	91.8	98	575.0	70	5.0	

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

**Cherries, Tart: Agricultural Chemical Applications,
States Surveyed, 1999 1/**

Agricultural Chemical	: Area Applied	: Appli- cations	: Rate per Application	: Rate per Crop Year	: Total Applied
	: Percent	Number	Pounds per Acre		1,000 lbs
<u>Herbicides:</u>					
2,4-D	: 13	1.0	0.66	0.66	2.7
Diuron	: *	1.0	0.69	0.69	0.2
Glyphosate	: 37	1.1	0.67	0.75	9.1
Norflurazon	: 1	1.0	1.16	1.16	0.4
Paraquat	: 27	1.1	0.31	0.35	3.1
Simazine	: 22	1.1	0.92	1.05	7.7
	:				
<u>Insecticides:</u>					
Azinphos-methyl	: 79	2.6	0.46	1.22	32.1
Carbaryl	: 12	1.2	1.69	2.10	8.4
Chlorpyrifos	: 20	1.2	0.66	0.84	5.7
Diazinon	: *	1.0	0.95	0.96	0.2
Dimethoate	: 3	1.0	0.91	0.91	0.9
Endosulfan	: *	1.0	1.16	1.22	0.2
Esfenvalerate	: 21	1.5	0.03	0.05	0.3
Methyl parathion	: 6	2.4	0.48	1.19	2.5
Permethrin	: 8	1.6	0.12	0.20	0.6
Petroleum distillate	: 1	1.3	21.50	28.94	9.9
Phosmet	: 67	1.4	0.92	1.37	30.6
	:				
<u>Fungicides:</u>					
Bonomyl	: 5	2.0	0.37	0.75	1.1
Captan	: 29	2.9	1.37	4.04	38.7
Chlorothalonil	: 78	2.1	1.57	3.36	87.6
Copper hydroxide	: 4	1.6	1.33	2.18	2.7
Copper oxychlor. sul.	: 1	1.5	0.60	0.94	0.3
Copper sulfate	: 1	1.3	1.07	1.48	0.5
Dodine	: 17	2.1	0.54	1.16	6.7
Fenarimol	: 3	1.7	0.04	0.08	0.1
Fenbuconazole	: 55	2.4	0.08	0.19	3.4
Ferbam	: 2	1.1	2.19	2.49	1.4
Iprodione	: 2	1.0	0.62	0.65	0.4
Myclobutanil	: 46	1.9	0.08	0.15	2.3
Propiconazole	: 5	1.2	0.10	0.13	0.2
Sulfur	: 76	4.8	3.40	16.45	413.8
Tebuconazole	: 69	3.1	0.11	0.34	7.9
	:				
<u>Other Chemicals:</u>					
Etephenon	: 67	1.1	0.18	0.21	4.6
Gibberellic acid	: 29	1.3	0.010	0.02	0.2

* Area applied is less than one percent.

1/ Bearing acres in 1999 for the 4 States surveyed were 33,200 acres.

States included are MI, NY, OR and PA.

**Cherries, Tart: Agricultural Chemical Applications,
New York, 1999 1/**

Agricultural Chemical	: Area Applied	: Appli- cations	: Rate per Application	: Rate per Crop Year	: Total Applied
	: Percent	<u>Number</u>	<u>Pounds per Acre</u>		<u>1,000 lbs</u>
<u>Herbicides:</u>	:				
2,4-D	:	8	1.0	1.20	1.20
	:				
<u>Insecticides:</u>	:				
Carbaryl	:	20	1.5	2.08	3.27
Esfenvalerate	:	12	1.9	0.05	0.10
Methyl parathion	:	22	1.1	0.89	1.03
Phosmet	:	60	1.9	1.47	2.82
	:				
<u>Fungicides:</u>	:				
Captan	:	84	4.3	1.54	6.78
Chlorothalonil	:	24	1.3	2.00	2.61
Fenbuconazole	:	37	2.8	0.09	0.25
Iprodione	:	22	1.0	0.60	0.64
Sulfur	:	43	2.6	4.93	13.16
	:				
<u>Other Chemicals:</u>	:				
Ethephon	:	39	1.1	0.24	0.27
					0.3

** Total applied is less than 50 lbs.

1/ Bearing acres in 1999 for New York were 2,600 acres.

Grapes, All: Fertilizer Use by State, 1999
Percent of Acres Treated and Total Amount Applied

State :	Bearing Acreage	Percent of Acres Treated and Total Applied					
		Nitrogen		Phosphate		Potash	
		Acres	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent
CA	910,000	90	179,702	71	162,990	74	148,518
IN	450	33	7	25	5	33	12
MI	11,700	84	1,068	21	160	77	1,175
NY 1/	31,500	96	2,269			45	1,654
OR	7,400	36	51	20	23	19	30
PA	12,800	95	1,232	4	29	66	1,186
WA	41,000	73	1,447	22	333	43	792
Total	1,014,850	89	185,776	65	163,563	71	153,367

1/ Insufficient reports to publish data for one or more of the fertilizer classes.

**Grapes, All: Fertilizer Primary Nutrient Applications,
States Surveyed and Total, 1999**

Primary Nutrient	Bearing Acreage	Area Applied	Appli-	Rate per	Rate per	Total
			cations	Application	Crop Year	Applied
	Acres	Percent	Number	Pounds per Acre	1,000 Lbs	
<u>California:</u>	910,000					
Nitrogen		90	3.8	57	219	179,702
Phosphate		71	4.3	58	251	162,990
Potash		74	2.6	84	221	148,518
<u>Indiana:</u>	450					
Nitrogen		33	1.0	50	51	7
Phosphate		25	1.0	48	49	5
Potash		33	1.0	81	82	12
<u>Michigan:</u>	11,700					
Nitrogen		84	1.3	83	109	1,068
Phosphate		21	1.1	58	66	160
Potash		77	1.1	113	130	1,175
<u>New York:</u>	31,500					
Nitrogen		96	1.1	68	75	2,269
Phosphate 1/						
Potash		45	1.0	112	116	1,654
<u>Oregon:</u>	7,400					
Nitrogen		36	2.1	9	19	51
Phosphate		20	2.3	6	15	23
Potash		19	2.6	8	21	30
<u>Pennsylvania:</u>	12,800					
Nitrogen		95	1.4	69	102	1,232
Phosphate		4	1.1	50	56	29
Potash		66	1.0	133	140	1,186
<u>Washington:</u>	41,000					
Nitrogen		73	1.8	26	48	1,447
Phosphate		22	1.1	33	36	333
Potash		43	1.0	42	45	792
<u>Total:</u>	1,014,850					
Nitrogen		89	3.6	57	206	185,776
Phosphate		65	4.2	58	246	163,563
Potash		71	2.5	84	212	153,367

1/ Insufficient reports to publish data for one or more of the fertilizer classes.

**Grapes, All: Pesticide, Total Acreage,
Percent of Area Receiving Applications and Total Applied,
States Surveyed and Total, 1999**

		Area Receiving and Total Applied 1/									
State: Bearing :		Acreage :		Herbicide		Insecticide 2/		Fungicide		Other Chemical	
		Acres	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent	1,000 Lbs	
CA	:	910,000	74	1,949.0	78	2,542.2	82	59,414.7	56	6,218.4	
IN	:	450	92	2.2	96	4.0	95	5.1			
MI	<u>3/</u> :	11,700	92	24.6	98	44.2	99	124.8			
NY	<u>3/</u> :	31,500	93	103.8	80	81.9	100	301.2			
OR	<u>3/</u> :	7,400	80	11.1	6	4.4	96	147.2			
PA	<u>3/</u> :	12,800	97	56.0	92	39.3	100	58.7			
WA	<u>3/</u> :	41,000	80	69.3	40	47.1	47	268.9			
	:										
Total:		1,014,850	75	2,216.0	76	2,763.1	81	60,320.6	56	6,218.6	

1/ Acreage in California includes non-bearing acres. Total applied may include applications of some active ingredients made only to non-bearing acres.

2/ Total Applied excludes Bt's (*Bacillus thuringiensis*). Quantities are not available because amounts of active ingredient are not comparable between products.

3/ Insufficient reports to publish data for one or more of the pesticide classes.

Grapes, All: Agricultural Chemical Applications, States Surveyed, 1999 1/

Agricultural Chemical	: Area Applied	: Appli- cations	: Rate per Application	: Rate per Crop Year	: Total Applied
	: Percent	<u>Number</u>	<u>Pounds per Acre</u>	<u>1,000 lbs</u>	
<u>Herbicides:</u>	:				
2,4-D	:	1	1.1	0.41	4.4
Diuron	:	4	1.0	1.35	62.8
Glyphosate	:	45	1.1	0.82	0.94
Napropamide	:	2	1.0	1.60	1.65
Norflurazon	:	11	1.0	0.71	0.77
Oryzalin	:	33	1.0	1.67	1.71
Oxyfluorfen	:	52	1.2	0.48	0.62
Paraquat	:	54	1.7	0.45	0.77
Pendimethalin	:	1	1.0	0.85	0.86
Sethoxydim	:	3	1.0	0.17	0.18
Simazine	:	23	1.0	1.00	1.08
Sulfosate	:	1	1.0	0.95	1.04
Trifluralin	:	1	1.0	1.46	1.47
	:				
<u>Insecticides:</u>	:				
Azinphos-methyl	:	*	1.5	0.55	0.84
Bt(<i>Bacillus thur.</i>) 2/	:	18	1.1		2.7
Carbaryl	:	4	1.6	1.52	2.45
Chlorpyrifos	:	4	1.0	0.90	0.98
Cryolite	:	19	1.6	5.64	9.34
Diazinon	:	2	1.5	0.98	1.48
Dicofol	:	1	1.0	0.44	0.46
Dimethoate	:	1	1.1	1.28	1.45
Endosulfan	:	*	1.1	1.12	1.24
Fenamiphos	:	3	1.8	1.42	2.59
Fenbutatin-oxide	:	2	1.1	0.89	1.03
Imidacloprid	:	32	1.1	0.03	0.03
Malathion	:	*	1.1	0.77	0.86
Methomyl	:	4	1.2	0.73	0.95
Methoxychlor	:	*	1.0	1.39	1.39
Methyl parathion	:	2	1.7	0.73	1.30
Petroleum distillate	:	2	1.6	4.64	7.83
Phosmet	:	2	1.1	1.28	1.43
Potassium salts	:	*	1.0	9.49	9.77
Propargite	:	24	1.1	1.60	1.90
	:				
<u>Fungicides:</u>	:				
Azoxystrobin	:	10	1.7	0.20	0.34
Benomyl	:	3	1.3	0.53	0.70
Calcium polysulfide	:	12	1.0	16.84	18.02
Captan	:	2	2.0	1.50	3.02
Copper hydroxide	:	16	2.1	0.69	1.45
Copper oxychlo. sul.	:	4	1.8	2.86	5.19
Copper sulfate	:	*	1.4	1.15	1.69
Cyprodinil	:	2	1.3	0.43	0.58
Dicloran	:	1	1.1	1.58	1.83
Fenarimol	:	12	1.5	0.04	0.06
Fenhexamid	:	*	1.2	0.53	0.64
Ferbam	:	*	1.5	2.50	3.95
Iprodione	:	4	1.4	0.71	1.05
Kresoxim-methyl	:	1	1.3	0.11	0.15
Mancozeb	:	6	1.7	2.26	4.06

--continued

**Grapes, All: Agricultural Chemical Applications,
States Surveyed, 1999 1/ (continued)**

Agricultural Chemical	: Area Applied	: Appli- cations	: Rate per Application	: Rate per Crop Year	: Total Applied
	: Percent	<u>Number</u>	<u>Pounds per Acre</u>		<u>1,000 lbs</u>
Fungicides:(continued)	:				
Maneb	:	1	1.7	2.09	3.59
Metalaxyl	:	*	3.3	0.16	0.53
Myclobutanil	:	18	2.5	0.10	0.25
Potassium bicarbonate	:	*	1.0	1.84	1.95
Sulfur	:	76	7.7	9.50	73.93
Tebuconazole	:	4	1.4	0.11	0.17
Triadimefon	:	*	1.2	0.10	0.13
Triflumizole	:	4	1.3	0.17	0.22
Ziram	:	5	1.4	2.38	3.55
	:				
Other Chemicals:	:				
Ethephon	:	4	1.9	0.25	0.48
Gibberellic acid	:	13	2.6	0.04	0.10
Tetradecen-1-OL (Z)	:	19	1.0	0.005	0.005
Tetradecen-1-yl (E)	:	19	1.0	0.03	0.03

* Area applied is less than one percent.

1/ Bearing acres in 1999 for the 7 States surveyed were 1.01 million acres.
States included are CA, IN, MI, NY, OR, PA and WA. Acreage in California
includes non-bearing acres.

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

**Grapes, All: Agricultural Chemical Applications,
New York, 1999 1/**

Agricultural Chemical	: Area Applied	: Appli- cations	: Rate per Application	: Rate per Crop Year	: Total Applied
	: Percent	<u>Number</u>	<u>Pounds per Acre</u>		<u>1,000 lbs</u>
<u>Herbicides:</u>	:				
Diuron	: 58	1.0	1.79	1.79	32.9
Glyphosate	: 62	1.1	0.79	0.89	17.4
Oryzalin	: 11	1.0	3.13	3.13	10.9
Paraquat	: 27	1.1	0.51	0.58	5.0
Simazine	: 57	1.0	1.62	1.68	29.8
Sulfosate	: 8	1.2	0.92	1.13	3.0
	:				
<u>Insecticides:</u>	:				
Carbaryl	: 58	1.3	1.49	2.01	36.6
Methyl parathion	: 20	1.4	0.75	1.05	6.6
	:				
<u>Fungicides:</u>	:				
Azoxystrobin	: 45	1.7	0.17	0.29	4.2
Captan	: 19	2.0	1.53	3.15	19.0
Copper hydroxide	: 19	1.6	0.42	0.69	4.1
Fenarimol	: 49	1.4	0.03	0.04	0.6
Mancozeb	: 71	2.1	2.53	5.41	120.5
Maneb	: 17	2.3	2.03	4.75	24.7
Myclobutanil	: 38	2.6	0.11	0.29	3.5
Sulfur	: 25	3.2	3.79	12.18	95.9
Ziram	: 19	1.0	2.54	2.77	16.5

1/ Bearing acres in 1999 for New York were 31,500 acres.

Peaches: Fertilizer Use by State, 1999
Percent of Acres Treated and Total Amount Applied

State	Bearing	Percent of Acres Treated and Total Applied					
	Acreage	Nitrogen		Phosphate		Potash	
	Acres	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent	1,000 Lbs
CA	74,800	90	5,632	26	498	32	1,712
GA	18,000	99	1,895	66	624	72	1,303
MI	4,600	73	227	22	19	56	162
NJ	8,000	58	495	19	67	91	454
NY	1,600	89	88	10	7	67	80
NC	1,550	97	106	42	26	92	106
PA	5,500	81	166	34	81	38	120
SC	16,500	87	918	29	170	80	1,512
TX	8,000	74	522	59	373	59	359
WA	2,500	74	170	37	33	39	39
Total	141,050	87	10,219	33	1,898	50	5,847

**Peaches: Fertilizer Primary Nutrient Applications,
States Surveyed and Total, 1999**

Primary Nutrient	: Bearing : Acreage	Area Applied	: Appli- cations	: Rate per Application	: Rate per Crop Year	: Total Applied
	: Acres	Percent	Number	Pounds per Acre		1,000 Lbs
<u>California:</u>	: 74,800					
Nitrogen	:	90	1.4	56	84	5,632
Phosphate	:	26	1.0	24	26	498
Potash	:	32	1.1	62	72	1,712
	:					
<u>Georgia:</u>	: 18,000					
Nitrogen	:	99	2.1	50	106	1,895
Phosphate	:	66	1.4	36	52	624
Potash	:	72	1.5	66	100	1,303
	:					
<u>Michigan:</u>	: 4,600					
Nitrogen	:	73	1.9	35	67	227
Phosphate	:	22	2.5	7	19	19
Potash	:	56	1.6	38	62	162
	:					
<u>New Jersey:</u>	: 8,000					
Nitrogen	:	58	1.1	96	108	495
Phosphate	:	19	1.3	33	45	67
Potash	:	91	1.4	42	62	454
	:					
<u>New York:</u>	: 1,600					
Nitrogen	:	89	1.2	47	61	88
Phosphate	:	10	1.0	40	40	7
Potash	:	67	1.0	75	75	80
	:					
<u>North Carolina:</u>	: 1,550					
Nitrogen	:	97	1.3	52	71	106
Phosphate	:	42	1.3	29	39	26
Potash	:	92	1.1	62	74	106
	:					
<u>Pennsylvania:</u>	: 5,500					
Nitrogen	:	81	1.1	33	37	166
Phosphate	:	34	1.1	39	44	81
Potash	:	38	1.1	52	57	120
	:					
<u>South Carolina:</u>	: 16,500					
Nitrogen	:	87	1.3	47	64	918
Phosphate	:	29	1.0	34	36	170
Potash	:	80	1.3	88	115	1,512
	:					
<u>Texas:</u>	: 8,000					
Nitrogen	:	74	1.4	62	88	522
Phosphate	:	59	1.4	56	80	373
Potash	:	59	1.4	52	77	359
	:					
<u>Washington:</u>	: 2,500					
Nitrogen	:	74	1.7	53	91	170
Phosphate	:	37	1.0	33	35	33
Potash	:	39	1.0	38	40	39
	:					
<u>Total:</u>	: 141,050					
Nitrogen	:	87	1.5	54	83	10,219
Phosphate	:	33	1.2	32	40	1,898
Potash	:	50	1.3	63	84	5,847

**Peaches: Pesticide, Total Acreage,
Percent of Area Receiving Applications and Total Applied,
States Surveyed and Total, 1999**

		Area Receiving and Total Applied 1/									
State : Bearing :		Acreage		Herbicide		Insecticide 2/		Fungicide		Other Chemical	
		Acres	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent	1,000 Lbs	
CA	:	74,800	43	80.6	85	1,964.4	86	920.4	25	357.5	:
GA <u>3/</u>	:	18,000	93	38.2	99	79.7	99	770.3			
MI	:	4,600	48	2.6	90	9.3	86	53.2	25	0.1	
NJ <u>3/</u>	:	8,000	76	16.5	91	155.6	98	379.8			
NY <u>3/</u>	:	1,600	56	1.3	99	7.9	97	33.2			
NC	:	1,550	58	0.5	93	6.8	94	38.3			
PA <u>3/</u>	:	5,500	64	5.4	94	24.3	94	96.5			
SC <u>3/</u>	:	16,500	83	145.8	81	222.3	85	1,069.5			
TX	:	8,000	59	11.9	83	24.0	74	44.5			
WA	:	2,500	43	2.2	97	80.6	93	51.7	23	**	
	:										
Total	:	141,050	58	305.0	88	2,574.9	88	3,457.4	19	361.3	

** Total applied is less than 50 lbs.

1/ Acreage in California includes non-bearing acres. Total applied may include applications of some active ingredients made only to non-bearing acres.

2/ Total Applied excludes Bt's (*Bacillus thuringiensis*). Quantities are not available because amounts of active ingredient are not comparable between products.

3/ Insufficient reports to publish data for one or more of the pesticide classes.

**Peaches: Agricultural Chemical Applications,
States Surveyed, 1999 1/**

Agricultural Chemical	Area Applied	Appli- cations	Rate per Application	Rate per Crop Year	Total Applied
	: Percent	Number	Pounds per Acre	1,000 lbs	
<u>Herbicides:</u>					
2,4-D	12	1.3	0.81	1.10	19.1
Diuron	13	1.1	0.89	1.05	19.2
Fluazifop-P-butyl	10	1.2	0.13	0.16	2.2
Glyphosate	38	2.3	0.68	1.59	86.1
Norflurazon	8	1.3	1.17	1.62	17.5
Oryzalin	3	1.0	1.45	1.58	6.6
Oxyfluorfen	11	1.1	0.27	0.30	4.6
Paraquat	37	1.2	0.46	0.57	30.2
Pendimethalin	6	1.0	2.31	2.40	20.2
Simazine	27	1.9	1.26	2.39	90.0
Terbacil	2	1.0	0.49	0.50	1.6
<u>Insecticides:</u>					
Azinphos-methyl	14	4.0	0.64	2.62	50.9
Bt(<i>Bacillus thur.</i>) 2/	6	1.9			
Carbaryl	19	2.3	1.17	2.74	73.7
Chlorpyrifos	21	1.2	1.32	1.64	47.7
Clofentezine	8	1.2	0.10	0.12	1.2
Diazinon	10	1.2	1.78	2.27	32.5
Dicofol	1	1.0	1.41	1.50	2.8
Endosulfan	6	5.8	1.24	7.25	57.2
Esfenvalerate	46	1.7	0.04	0.07	4.3
Fenbutatin-oxide	13	1.1	0.67	0.76	14.0
Formetanate hydro.	2	1.2	0.77	0.95	2.9
Lindane	*	2.3	0.19	0.44	**
Malathion	2	1.8	1.62	2.91	8.8
Methidathion	5	1.1	1.40	1.58	12.1
Methomyl	6	2.2	0.80	1.80	16.6
Methoxychlor	*	2.0	1.28	2.59	0.2
Methyl parathion	38	3.0	0.63	1.90	101.9
Permethrin	25	2.9	0.16	0.47	16.8
Petroleum distillate	37	1.2	30.45	39.21	2,030.0
Phosmet	26	2.2	1.15	2.56	95.3
<u>Fungicides:</u>					
Azoxystrobin	2	1.9	0.10	0.19	0.6
Basic copper sulfate	9	1.3	7.01	9.11	111.4
Benomyl	9	3.4	0.45	1.56	19.7
Calcium polysulfide	*	1.1	11.28	13.27	13.6
Captan	28	3.8	1.58	6.10	242.0
Chlorothalonil	9	2.2	1.48	3.32	40.2
Copper ammonium carb.	3	8.9	0.35	3.15	12.8
Copper hydroxide	26	2.4	2.11	5.09	184.8
Copper oxide	4	1.1	4.85	5.41	29.2
Copper oxychlo. sul.	5	2.7	1.18	3.18	23.2
Copper resinate	4	8.5	0.04	0.32	1.9
Copper sulfate	2	1.3	2.99	3.92	9.7
Cyprodinil	2	1.7	0.16	0.28	0.8
Dodine	*	4.9	0.23	1.12	0.2
Fenarimol	*	2.8	0.010	0.04	**
Fenbuconazole	19	2.5	0.09	0.22	5.8
Ferbam	2	1.1	2.27	2.57	5.8
Iprodione	21	1.3	0.62	0.82	24.0

--continued

**Peaches: Agricultural Chemical Applications,
States Surveyed, 1999 1/ (continued)**

Agricultural Chemical	: Area Applied	: Appli- cations	: Rate per Application	: Rate per Crop Year	: Total Applied
	: Percent	<u>Number</u>	<u>Pounds per Acre</u>	<u>1,000 lbs</u>	
Fungicides:(continued)	:				
Mancozeb	:	*	3.2	0.84	2.68
Myclobutanil	:	8	1.6	0.11	0.18
Oxytetracycline	:	8	4.3	0.14	0.61
Propiconazole	:	44	2.6	0.10	0.27
Streptomycin	:	*	6.5	0.07	0.44
Sulfur	:	53	4.3	7.96	34.59
Tebuconazole	:	9	1.8	0.13	0.24
Thiophanate-methyl	:	2	1.6	0.41	0.65
Triforine	:	*	2.6	0.41	1.12
Vinclozolin	:	*	1.2	0.61	0.79
Ziram	:	15	1.5	3.93	5.91
	:				
Other Chemicals:	:				
Dodecanol	:	*	1.0	0.010	0.010
E,E-8, 10-Dodecadien	:	*	1.0	0.02	0.02
Methyl bromide	:	*	1.1	245.62	292.11
Tetradecanol	:	*	1.0	0.002	0.002
Z-8-Dodecenyl Acetate:	12	1.2	0.006	0.008	0.1
Zinc phosphide	:	*	1.0	0.11	0.11

* Area applied is less than one percent.

** Total applied is less than 50 lbs.

1/ Bearing acres in 1999 for the 10 States surveyed were 141,050 acres.

States included are CA, GA, MI, NJ, NY, NC, PA, SC, TX and WA. Acreage in California includes non-bearing acres.

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

**Peaches: Agricultural Chemical Applications,
New York, 1999 1/**

Agricultural Chemical	: Area Applied	: Appli- cations	: Rate per Application	: Rate per Crop Year	: Total Applied
	: Percent	: Number	: Pounds per Acre		: 1,000 lbs
Herbicides:	:				
2,4-D	: 12	1.0	1.03	1.10	0.2
Glyphosate	: 25	1.1	0.96	1.14	0.5
Paraquat	: 31	1.7	0.30	0.52	0.3
Simazine	: 7	1.0	0.93	0.93	0.1
	:				
Insecticides:	:				
Azinphos-methyl	: 59	2.3	0.68	1.62	1.5
Carbaryl	: 21	2.1	1.15	2.50	0.8
Endosulfan	: 11	1.4	1.16	1.63	0.3
Esfenvalerate	: 41	2.6	0.07	0.18	0.1
Methomyl	: 19	1.5	1.00	1.54	0.5
Methyl parathion	: 32	1.9	0.79	1.54	0.8
Permethrin	: 13	1.2	0.16	0.19	0.4
Petroleum distillate	: 10	1.0	18.25	18.25	3.0
Phosmet	: 12	2.6	1.41	3.72	0.7
	:				
Fungicides:	:				
Bonomyl	: 16	2.1	0.44	0.95	0.2
Captan	: 77	4.1	1.60	6.69	8.3
Chlorothalonil	: 29	2.5	2.04	5.13	2.4
Copper hydroxide	: 17	1.1	1.22	1.34	0.4
Copper oxychlo. sul.	: 26	1.1	3.51	3.89	1.6
Fenbuconazole	: 48	2.0	0.09	0.18	0.1
Ferbam	: 9	1.4	1.88	2.73	0.4
Iprodione	: 6	2.0	0.73	1.50	0.1
Propiconazole	: 30	1.5	0.11	0.18	0.1
Sulfur	: 60	3.6	5.23	19.17	18.4

1/ Bearing acres in 1999 for New York were 1,600 acres.

Pears: Fertilizer Use by State, 1999
Percent of Acres Treated and Total Amount Applied

State	Bearing Acreage	Percent of Acres Treated and Total Applied					
		Nitrogen		Phosphate		Potash	
		Acres	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent
CA	20,300	89	2,009	12	82	35	1,226
MI	850	55	25	10	2	27	23
NY	2,000	61	52	11	6	63	112
OR	17,800	73	1,084	34	416	49	595
PA	1,000	69	10	21	3	23	8
WA	24,400	75	1,439	17	95	10	94
Total	66,350	78	4,619	20	604	30	2,058

**Pears: Fertilizer Primary Nutrient Applications,
States Surveyed and Total, 1999**

Primary Nutrient	Bearing Acreage	Area Applied	Appli- cations	Rate per Application		Rate per Crop Year	Total Applied	
				Acres	Percent	Number	Pounds per Acre	1,000 Lbs
<u>California:</u>	20,300							
Nitrogen		89	2.2			50	112	2,009
Phosphate		12	3.1			11	34	82
Potash		35	1.7			100	173	1,226
<u>Michigan:</u>	850							
Nitrogen		55	1.5			36	54	25
Phosphate		10	1.0			18	18	2
Potash		27	1.0			99	99	23
<u>New York:</u>	2,000							
Nitrogen		61	1.1			38	42	52
Phosphate		11	1.1			21	24	6
Potash		63	1.0			85	89	112
<u>Oregon:</u>	17,800							
Nitrogen		73	2.2			37	83	1,084
Phosphate		34	1.8			36	68	416
Potash		49	1.8			36	68	595
<u>Pennsylvania:</u>	1,000							
Nitrogen		69	1.0			13	14	10
Phosphate		21	1.2			12	15	3
Potash		23	1.2			27	33	8
<u>Washington:</u>	24,400							
Nitrogen		75	1.5			50	78	1,439
Phosphate		17	1.8			12	22	95
Potash		10	1.3			28	37	94
<u>Total:</u>	66,350							
Nitrogen		78	1.9			46	89	4,619
Phosphate		20	2.0			22	45	604
Potash		30	1.6			61	102	2,058

**Pears: Pesticide, Total Acreage,
Percent of Area Receiving Applications and Total Applied,
States Surveyed and Total, 1999**

		Area Receiving and Total Applied									
State: Bearing :		Acreage :		Herbicide		Insecticide		Fungicide		Other Chemical	
		Acres	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent	1,000 Lbs	Percent	1,000 Lbs	
CA <u>1/</u> :	20,300	44	21.6	77	1,032.2	76	340.5	42	0.8		
MI :	850	51	0.3	92	11.7	90	14.1	15	**		
NY :	2,000	43	1.9	79	42.4	78	13.9	10	**		
OR :	17,800	68	26.3	99	1,237.3	99	577.2	60	0.6		
PA :	1,000	24	0.5	97	31.5	95	11.4	7	**		
WA :	24,400	39	30.5	96	1,485.3	84	381.7	55	0.8		
Total:	66,350	48	81.1	91	3,840.4	86	1,338.8	50	2.2		

** Amount Applied is less than 50 lbs.

1/ Acreage in California includes non-bearing acres. Total applied may include applications of some active ingredients made only to non-bearing acres.

2/ Total Applied excludes Bt's (*Bacillus thuringiensis*). Quantities are not available because amounts of active ingredient are not comparable between products.

**Pears: Agricultural Chemical Applications,
States Surveyed, 1999 1/**

Agricultural Chemical	Area Applied	Appli- cations	Rate per Application	Rate per Crop Year	Total Applied
	: Percent	Number	Pounds per Acre	1,000 lbs	
<u>Herbicides:</u>					
2,4-D	: 8	1.3	0.60	0.81	4.3
Diuron	: 10	1.2	1.16	1.40	9.2
Glyphosate	: 41	1.5	0.77	1.22	32.7
Norflurazon	: 3	1.0	1.98	2.01	3.5
Oryzalin	: 1	1.0	1.72	1.77	1.4
Oxyfluorfen	: 5	1.2	0.40	0.52	1.8
Paraquat	: 11	1.3	0.51	0.72	5.1
Simazine	: 17	1.4	1.02	1.47	16.8
Terbacil	: *	1.0	0.63	0.63	0.1
<u>Insecticides:</u>					
Abamectin	: 61	1.3	0.02	0.02	0.8
Amitraz	: 18	1.2	1.34	1.63	19.0
Azinphos-methyl	: 54	1.9	0.98	1.89	67.5
Bt(<i>Bacillus thur.</i>) 2/	: 6	1.8			
Carbaryl	: 3	1.1	1.31	1.51	2.7
Chlorpyrifos	: 39	1.1	1.79	1.98	51.4
Clofentezine	: 5	1.2	0.11	0.13	0.4
Diazinon	: 7	1.2	1.67	2.03	8.9
Dicofol	: *	1.0	1.88	1.90	0.9
Diflubenzuron	: 7	1.0	0.64	0.65	3.0
Dimethoate	: *	1.2	0.71	0.88	0.4
Endosulfan	: 38	1.1	2.02	2.22	56.1
Esfenvalerate	: 24	1.2	0.06	0.08	1.1
Fenbutatin-oxide	: 6	1.1	0.62	0.72	2.7
Formetanate hydro.	: 5	1.0	0.82	0.86	3.1
Hexythiazox	: 15	1.1	0.12	0.14	1.4
Imidacloprid	: 19	1.4	0.19	0.27	3.3
Kaolin	: 2	2.2	43.41	99.61	132.0
Methidathion	: *	1.0	1.59	1.59	0.9
Methomyl	: *	1.0	0.65	0.68	0.2
Methyl parathion	: 17	1.3	1.60	2.22	24.4
Oxamyl	: 1	1.0	1.47	1.58	1.2
Oxythioquinox	: 1	1.1	0.78	0.86	0.6
Permethrin	: *	1.7	0.12	0.21	0.1
Petroleum distillate	: 83	3.2	18.49	60.74	3,342.8
Phosmet	: 36	1.7	2.62	4.58	107.9
Pyridaben	: 19	1.0	0.29	0.31	3.9
Pyriproxyfen	: 15	1.0	0.10	0.11	1.1
<u>Fungicides:</u>					
Basic copper sulfate	: *	1.0	4.36	4.50	2.8
Benomyl	: 15	2.3	0.43	1.01	10.3
Calcium polysulfide	: 24	1.3	13.41	18.33	293.7
Captan	: *	2.4	1.81	4.44	1.7
Copper hydroxide	: 18	1.8	1.80	3.23	37.9
Copper oxychlo. sul.	: 22	2.6	1.62	4.31	62.6
Copper sulfate	: 2	1.4	1.12	1.56	2.1
Cyprodinil	: 6	1.5	0.14	0.22	0.9
Dodine	: 20	1.7	1.39	2.43	31.6
Fenarimol	: 5	1.2	0.07	0.09	0.3

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**Pears: Agricultural Chemical Applications,
States Surveyed, 1999 1/(continued)**

Agricultural Chemical	: Area Applied	: Appli- cations	: Rate per Application	: Rate per Crop Year	: Total Applied
	: Percent	<u>Number</u>	<u>Pounds per Acre</u>	<u>1,000 lbs</u>	
Fungicides: (continued)	:				
Ferbam	:	*	2.0	2.11	4.31
Fosetyl-al	:	2	2.2	1.54	3.47
Kresoxim-methyl	:	1	1.0	0.16	0.17
Mancozeb	:	55	2.0	3.32	6.91
Metiram	:	*	2.0	3.34	6.79
Myclobutanil	:	*	1.2	0.12	0.14
Oxytetracycline	:	41	2.9	0.15	0.44
Pseudomonas fluores.	:	11	2.7	0.13	0.36
Streptomycin	:	30	2.3	0.13	0.30
Sulfur	:	44	1.6	9.29	15.32
Triadimefon	:	5	1.0	0.21	0.21
Triflumizole	:	35	1.4	0.27	0.37
Ziram	:	39	1.4	4.21	5.91
:					
Other Chemicals:	:				
Chlorophacinone	:	*	1.0	0.13	0.13
Dodecanol	:	5	1.0	0.03	0.03
E,E-8, 10-Dodecadien	:	5	1.1	0.05	0.05
Gibberellic acid	:	*	1.6	0.06	0.10
NAD	:	*	1.0	0.04	0.04
Naphthaleneacetic ac.	:	44	1.2	0.05	0.06
Tetradecanol	:	5	1.0	0.005	0.00

* Area applied is less than one percent.

** Total applied is less than 50 lbs.

1/ Bearing acres in 1999 for the 6 States surveyed were 66,350 acres.
States included are CA, MI, NY, OR, PA and WA. Acreage in California
includes non-bearing acres.

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

**Pears: Agricultural Chemical Applications,
New York, 1999 1/**

Agricultural Chemical	: Area Applied	: Appli- cations	: Rate per Application	: Rate per Crop Year	: Total Applied
	: Percent	<u>Number</u>	<u>Pounds per Acre</u>	<u>1,000 lbs</u>	
Herbicides:	:				
2,4-D	: 6	1.1	0.87	0.96	0.1
Glyphosate	: 39	1.3	1.01	1.35	1.0
Simazine	: 18	1.0	1.50	1.50	0.5
	:				
Insecticides:	:				
Abamectin	: 50	1.4	0.02	0.02	**
Amitraz	: 5	1.5	0.75	1.14	0.1
Azinphos-methyl	: 64	2.3	0.68	1.59	2.0
Bt(<i>Bacillus thur.</i>) 2/:	: 10	1.7			
Chlorpyrifos	: 13	1.9	1.17	2.28	0.6
Esfenvalerate	: 37	1.8	0.05	0.09	0.1
Imidacloprid	: 22	1.9	0.11	0.22	0.1
Methomyl	: 9	1.0	0.98	0.98	0.2
Petroleum distillate	: 62	2.0	14.63	30.54	38.2
Phosmet	: 16	1.7	1.23	2.17	0.7
Pyridaben	: 6	1.1	0.32	0.36	**
	:				
Fungicides:	:				
Benomyl	: 12	2.4	0.24	0.58	0.1
Captan	: 11	1.8	1.71	3.15	0.7
Copper hydroxide	: 10	1.0	1.96	1.96	0.4
Copper oxychlo. sul.	: 32	1.3	2.15	2.92	1.9
Fenarimol	: 8	1.6	0.06	0.11	**
Mancozeb	: 71	2.3	1.93	4.45	6.3
Streptomycin	: 41	1.6	0.32	0.51	0.4
Ziram	: 30	2.1	2.44	5.21	3.1
	:				
Other Chemicals:	:				
Naphthaleneacetic ac.:	: 10	2.0	0.02	0.03	**

** Total applied is less than 50 lbs.

1/ Bearing acres in 1999 for New York were 2,000 acres.

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

Survey Procedures

Survey Procedures: Samples were drawn from the NASS List Sampling Frame. This extensive sampling frame covers all types of farms and accounts for about 82% of all land in farms in the U.S. Farms that were more likely to be producers of multiple crops of interest were more likely to be in the sample.

Estimation Procedures: The chemical application's data, reported by product name or trade name are reviewed within 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.

Bearing and non-bearing acreage estimates are primarily based on periodic orchard surveys. In non-survey years, acreage is based on trends, county extension service data, end of year production surveys and other indications. Bearing and non-bearing acres of pecans are not available due to the nature of harvesting Native and Seedling trees. The survey percentages are based on the respondents' consideration of area from which nuts were collected. Estimates of the total amount of active ingredient applied are based on the acreage estimates published in the annual NASS reports "Citrus Fruits - 1999 Summary" [Fr Nt 3-1(99)] released on September 23, 1999 and "Noncitrus Fruits and Nuts - 1999 Summary" [Fr Nt 1-3(00)] released on July 7, 2000. The estimates for total amount applied will not be revised even if there are subsequent revisions to acreage for a given crop.

Detailed data within a table may not multiply across or add down due to independent rounding of the published values.

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 surveyed States. The reliability of these survey results are affected by sampling variability and non-sampling errors. The sampling variability, expressed as a percentage of the estimate, is referred to as the coefficient of variation (cv).

Non-sampling errors are errors that occur during a survey process, and unlike sampling variability, are difficult to measure. They may be caused by interviewers failing to follow instructions, poorly worded questions, non-response, problematic survey procedures, or data handling between collection and publication. In these surveys, all survey procedures and analysis were carried out in a consistent and orderly manner to minimize the occurrence of these types of errors.

Variability for estimates 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, are recommended by the manufacturer of the product, and are generally followed.

Sampling variability of the estimates differed considerably by chemical and crop. In general, the more often the chemical was applied, the smaller the sampling variability. For example, estimates of use of a commonly used product, such as Sulfur, will exhibit less variability than a more rarely used product. For more commonly used chemicals, cv's will range from 1-30 percent at the U.S. level and 5-80 percent at the State level. Some rarer items will have cv's above 100 percent. These items have insufficient data for publication and these instances are noted.

Terms and Definitions

Active ingredient: The active ingredient is the specific chemical which kills or controls the target pests. 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 acid equivalent.

Agricultural chemicals: The phrase "agricultural chemicals" refers to the active ingredients in fertilizers and pesticides.

Application Rates: The 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 acre is the average number of pounds applied in one application. Rate per crop year is the average number of pounds applied counting multiple applications. Number of applications is the average number of times a treated acre receives a specific agricultural chemical.

Area applied: The area that represents the percentage of crop acres receiving one or more applications of a specific agricultural chemical. This report does not contain acre treatments. However, acre treatments can be calculated by multiplying the acres planted by the percent of area applied and the average number of applications.

Bearing acres: The area of fruit, berry, and vine crops that have reached a commercially productive bearing age. This age varies by crop, by area, and by producer.

Common name: The common name is an officially recognized name for an active ingredient. This report shows active ingredient by common name.

Crop year: A crop year refers to the period immediately following harvest for the previous crop through harvest of the current crop.

Fertilizer: The term fertilizer refers to applications of the primary nutrients, nitrogen, phosphate, and potash.

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. This report excludes pesticides used for seed treatments, for spot treatments, and for postharvest applications to the commodity.

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. Some formulations, as in the case of pre-mixes, can contain more than one active ingredient.

Trade Name, Common Name, and Pesticide Class

The following is a list of the 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 fruit and nut crops, and NASS does not mean to imply the use of any specific trade name.

Class :	Common Name	:	Trade Name
H	2,4-D		several
H	2,4-D, Dimethylamine Salt		Saber, Weed-B-Gon
I	abamectin		Agri-Mek
I	acephate		Orthene
H	alachlor		Lasso
I	aldicarb		Temik
O	allium sativum		Allium Sativum
O	aluminum phosphide		Fumitoxin
H	ametryn		Evik
I	amitraz		Mitac
O	ammonium soap		Hinder
F	Ampelomyces quisquales isolate		AQ10
H	atrazine		AAtrex
I	azadirachtin		Align, Neemix, Margosan-o
I	azinphos-methyl		Guthion
F	azoxystrobin		Abound, Heritage, Quadris
F	basic cupric zinc sulfate		Zinc Coposil Dust
F	basic copper sulfate		Top Cop, Tri-Basic
F	benomyl		Benlate
O	benzyladenine		Accel
I	bifenthrin		Capture, Brigade
O	brodifacoum		several
H	bromacil		Hyvar
O	bromadiolone		several
H	bromoxynil		Brominal, Buctril
I	Bt (Bacillus thuringiens)		several
O	butenic acid hydro.		Retain
F	calcium polysulfide		several
F	captafol		Difolatan
F	captan		Captan
I,O	carbaryl		Sevin, Savit
I	carbofuran		Furadan
I	carbophenothion		Trithion
F	carboxin		Vitavax
O	chlorophacinone		Rozol
O	chloropicrin		several

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Class :	Common Name	:	Trade Name
F	chlorothalonil		Bravo
I	chlorpyrifos		Lorsban
O	cholecalciferol		Quintox
H	clethodim		Select
I	clofentezine		Apollo
H	clopyralid		Reclaim, Stinger
F	copper (metallic)		Cop-O-Zinc
F	copper ammonium carb.		Copper-Count-N
F	copper chloride hydroxide		Copper Oxychloride
F	copper hydroxide		several
F	copper oxide		Nordox
F	copper oxychloride sulfate		C-O-C-S
F	copper oxychloride		Microspperse
F	copper resinate		Tenn-Cop
F	copper sulfate		Copper Sulfate
I	cube resin, other		Fruit Tree Spring
F	cresol		Creolin
I	cryolite		Kryocide
O	cyanamid		Dormex
I	cyfluthrin		Baythroid
I	cyhexatin		Pictran
O	cytokinins		Triggr, Promalin
I	cypermethrin		Ammo, Cymbush
F	cypredinil		Switch, Vangard
F	DCNA		Botran
H	DCPA		Dacthal
I	diazinon		several
H	dichlobenil		Casoron, Norosac
F	dichlone		Phygon
O	dichloropropene		Telone
F	dicloran		Botran
I	dicofol		Kelthane
H	difenoquat		Avenge
I	diflubenzuron		Dimilin
I	dimethoate		several
F	dimethylphenol		Gallex
F	dinocap		Karathane
O	diphacinone		Ramik
H	diquat		Diquat
I	disulfoton		Di-Syston
H	diuron		Karmex, Direx
O	DNOC		Elgetol
O	dodecanol		Isomate
O	dodecenyl acetate		Checkmate
O	Z-8-dodecenyl Acetate		Checkmate, Disrupt, Isomate
F	dodine		Cyprex, Syllit
O	E,E-8, 10-dodecadien		Disrupt, Checkmate
I	endosulfan		Thiodan

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Class :	Common Name	:	Trade Name
H	EPTC		Eptam
I	esfenvalerate		Asana
O	ethephon		Ethrel
I	ethion		Ethion
I	ethoprop		Mocap
I	ethyl parathion		several
O	farnesol		Stirrup
I	fenamiphos		Nemacur
F	fenarimol		Rubigan
F	fenbuconazole		RH-7592
I	fenbutatin-oxide		Vendex
I	fenoxy carb		Comply
I	fenpropothrin		Danitol
I	fenvaletrate		several
F	ferbam		Carbamate
H	fluazifop-P-butyl		Fusilade
F	fludioxonil		Maxim, Switch
I	fluvalinate		Spur, Mavrik
F	folpet		Folpet
O	formaldehyde		Formaldehyde
I	Formetanate hydrochloride		Carzol
F	fosetyl-al		Aliette
O	gamma aminobutyric acid		Auxigro
O	garlic oil		Envirepel, Guardian
O	gibberellic acid		ProGibb, ProVide, GibGro, Promalin
O	gibberellins A4A7		Typy
O	gliocladium virens gl-21		Soilgard
H	glufosinate-ammonium		Ignite
F	glyodin		Glyodin
H	glyphosate		Roundup, Rattler
H	glyphosate, isopropyl		Roundup PRO, Roundup Super Concentrate
O	gossypol		No Mate, Stirrup
H	halosulfuron		Battalion
H	hexazinone		Velpar
I	hexythiazox		Savey
I	hydramethylnon		Amdro
O	hydrogen peroxide		Oxidate, Zerotol Algaecide
I	hydrophobic extract neem oil		Neemgard
H	imazaquin		Scepter
I	imidacloprid		Admire
F	iprodione		Rovral
H	isoxaben		Gallery, Snapshot
I	kaolin		Kaolin
F	kresoxim-methyl		Sovran
O	lactic acid		Propel
I	lambda cyhalothrin		Karate
O	L-Glutamic acid		Auxigro
I	lindane		Lindane

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Class :	Common Name	:	Trade Name
I	malathion	several	
O	maleic hydrazide	Royal MH-30, Super Sprout Stop	
F	mancozeb	several	
F	maneb	several	
H	MCPA	several	
F	mefenoxam	Ridomil Gold	
F	metalaxy1	Ridomil	
O	metaldehyde	Metaldehyde	
O	metam-sodium	Vapam	
I	methidathion	Supracide	
I	methiocarb	Mesurol	
I	methomyl	Lannate	
I	methoxychlor	several	
O	methyl anthranilate	Birdshield, ReJek-it	
O	methyl bromide	several	
I	methyl parathion	several	
F	metiram	Polyram	
H	metolachlor	Dual, Bicep	
I	mevinphos	Phosdrin	
H	molinate	Ordram	
O	monocarbamide dihydr	Equik	
H	MSMA	several	
F	myclobutanil	Rally, Nova	
I	Myrothecium verrucaria	Ditera	
O	NAA	several	
O	NAD	Amid-Thin	
I	naled	Dibrom	
O	naphthaleneacetic acid	Fruit-Fix, NAA	
H	napropamide	Devrinol	
O	Neem Oil, Hydrophobic	Trilogy	
O	nerolidol	Stirrup M	
H	norflurazon	Solicam	
H	oryzalin	Surflan	
I	oxamyl	Vydate	
I	oxydemeton-methyl	Metasystox-R	
H	oxyfluorfen	Goal	
F	oxytetracycline	Mycoshield	
I	oxythioquinox	Morestan	
O	paclobutrazol	Bonzi, Proturf	
H	paraquat	Gramoxone	
O	Pelargonic acid	Thinnex Blossom Thinner	
H	Pendimethalin	Prowl	
I	permethrin	Ambush, Pounce	
I	petroleum distillate	several	
I	phosalone	Zolone	
I	phosmet	Imidan	
I	phosphamidon	Phosphamidon	
H	Phytophthora palmivora	DeVine	

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Class :	Common Name	:	Trade Name
I	piperonyl butoxide		Butacide, Incite
I	potassium salts		Safer Insecticidal Soap
F	potassium bicarbonate		Kaligreen
H	pronamide		Kerb
I	propargite		Comite, Omite
F	propiconazole		Banner, Orbit
H	Prosulfuron		Peak
F	Pseudomonas fluorescens		Frostban
I	pyrethrins		Pyrethrins
I	pyridaben		Nexter, Pyramite
I	Pyriproxyfen		Knack
H	quizalofop-ethyl		Assure
I	rotenone		Rotenone
I	ryania		Ryan
I	sabadilla		Sabadilla
H	sethoxydim		Poast
H	simazine		Princep
O	sodium chlorate		several
O	sodium tetrathiocarbamate		Enzone
I	soybean oil		Golden Natur'l Spray Oil
I	spinosad		SpinTor, Success, Tracer
F	streptomycin		Agri-Strep
O	strychnine		several
H,O	sulfcarbamide		Wilthin, Enquik
H	sulfosate		Touchdown
I,F	sulfur		several
F	tebuconazole		Folicur, Lynx
I	tebufenoziide		Confirm
O	tetradecanol		Isomate
O	tetradecen-1-OL (Z)		Checkmate
O	tetradecen-1-yl (E)		Checkmate TPWF, Normate TPW
H	terbacil		Sinbar
F	thiabendazole		Mertect
H	thiazopyr		Mandate
F	thiophanate-methyl		Topsin
F,O	thiram		Thiram
F	triadimefon		Bayleton
I	trichlorfon		Dylox, Proxol
H	triclopyr		Triclopyr
F	triflumizole		Procure
H	trifluralin		Treflan
F	triforine		Funginex
F	triphenyltin hydroxide		several
H	vernolate		Vernam
F	vinclozolin		Ronilan
I	Zeta-cypermethrin		Fury, Mustang
O	zinc phosphide		several
F	ziram		Ziram

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