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Overview

As determined by the U.S. Environmental Protection Agency (EPA), a restricted use pesticide is a pesticide which is available for purchase and use only by certified pesticide applicators or persons under their direct supervision, and only for the uses covered by the applicator's certification. This group of pesticides is not available for use by the general public because of the very high toxicities or due to the environmental hazards associated with the materials. However, an active ingredient may be restricted for one crop but not for another. This report shows only those active ingredients which are restricted for each specific crop, based on the "Restricted Use Product (RUP) Report, July 2003" published by the EPA. In the RUP report, EPA often limits some, but not all, formulations of a product. For example, liquid products containing greater than 13.5% concentration of azinphos-methyl are restricted.

The agricultural chemical use estimates in this report are based on data compiled from the 2003 Agricultural Resource Management Survey, the 2003 Fruit Chemical Use Survey, and the 2003 Nursery and Floriculture Chemical Use Survey. All target crop data refer to on-farm use of restricted use pesticides for the 2003 crop year. Data were collected late in the growing season or after the operator had indicated that planned applications were completed.

Highlights

FIELD CROPS: Field crop data on restricted use pesticides were compiled from the Agricultural Resource Management Survey (ARMS) in 35 Program States. Targeted crops in the 2003 ARMS included barley, corn, fall potatoes, sorghum, and upland cotton. The Program States accounted for 80 to 96 percent of the U.S. acreage for these crops.

Barley: Acetic acid was the most widely used restricted use herbicide on acres planted to barley. When reviewing total pounds of insecticide applied, methyl parathion and disulfoton were applied at the highest rates and highest total pounds applied of the other restricted use insecticides used on barley.

Corn: Atrazine was again the most widely used restricted use herbicide applied to corn, with 68 percent of the corn acres treated. Acetochlor was used on 26 percent of the corn acres. Restricted use insecticides were applied to a range of less than 1 percent to 7 percent of the corn planted acres. Cyfluthrin and tebuprimiphos were both applied to 7 percent of the acres planted to corn. Though one of the smaller percentages of area applied, terbufos had the largest total pounds applied, at 1,660,000.

Cotton, Upland: A wide range of restricted use pesticides was reported on upland cotton, which had 21 different active ingredients applied. Aldicarb, at 25 percent of the acres treated, was the most commonly used restricted use insecticide used on upland cotton acres, followed by dicrotophos, at 15 percent. Paraquat, used as a defoliant, and hence classified under the “Other Chemicals” heading for upland cotton, was used on 15 percent of the upland cotton acreage.

Potatoes, Fall: EPTC, a restricted use herbicide, was applied on 20 percent of the fall potatoes planted acreage. Cyfluthrin, esfenvalerate, and methamidophos were the three most commonly applied active ingredients reported in the restricted insecticides class for fall potatoes. Metam-sodium, a soil fumigant, was applied to 25 percent of the fall potato acres.

Sorghum: At 70 percent of the acres treated, atrazine was not only the highest herbicide restricted use active ingredient, but it was also applied on the highest percentage of acres as compared to all the restricted use pesticides on the five field commodities in this publication. Alachlor was the next most widely used restricted use herbicide, applied to 11 percent of the sorghum planted acres.

Highlights (continued)

FRUIT CROPS: Growers in 12 Program States were surveyed to obtain chemical use data on 24 selected fruit crops in 2003. The data on restricted use applications cover the period immediately following harvest of the 2002 crop through harvest of the 2003 crop.

A limited number of restricted use herbicides were applied to fruit crops in 2003. Paraquat was applied to many of the targeted crops, at application percentages ranging up to 74 percent of the raspberries acreage.

Several restricted use insecticides were used extensively on fruit crops in the Program States. Esfenvalerate was applied to 67 percent of the apricot acreage, and diazinon was applied to 52 percent of the raspberry acreage. Other restricted use insecticides applied to more than 30 percent of planted acres were: abamectin on grapefruit, tangelos, and tangerines; and esfenvalerate on nectarines and peaches.

Chlorothalonil continues to be the most commonly used restricted use fungicide and was applied to 83 percent of the tart cherry acres. The second most commonly applied fungicide was copper oxide, used on 10 percent of the table grapes and 7 percent of the wine grapes.

Restricted use pesticides used as “other chemicals” applied included strychnine, methyl bromide, chloropicrin, and zinc phosphide.

NURSERY and FLORICULTURE: Nursery and floriculture data include pesticide use in calendar year 2003 related to the production of nursery and floriculture crops in 6 major producing states: California, Florida, Michigan, Oregon, Pennsylvania, and Texas. Trained enumerators personally interviewed nursery and floriculture operators or managers to obtain information on chemical applications made on sampled operations.

A wide variety of restricted use active ingredients were reported for all nursery and floriculture. The most common restricted use herbicide applied by producers in the 6 Program States to nursery and floriculture products was atrazine, at 40,100 total pounds.

Numerous restricted use insecticide active ingredients were reported on nursery and floriculture products. When comparing total pounds applied, permethrin and diflubenzuron were the two most heavily applied restricted use insecticides.

Methyl bromide and chloropicrin were overall the most widely used restricted use active ingredients, with total pounds applied at 449,600 pounds and 255,000 pounds, respectively, reported in the Program States.

**Barley, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Acetic acid	3	1.0	0.33	0.35	49
Picloram	*	1.0	0.009	0.009	1
Insecticides					
Carbofuran	*	1.4	0.11	0.16	3
Disulfoton	*	1.0	0.69	0.69	7
Lambda-cyhalothrin	*	1.0	0.02	0.02	(²)
Methyl parathion	*	1.0	0.25	0.27	9

* Area applied is less than 0.5 percent.

¹ Planted acreage in 2003 for the 11 Program States was 4.9 million acres. States included are CA, ID, MN, MT, ND, PA, SD, UT, WA, WI, and WY.

² Total applied is less than 500 lbs.

**Corn, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Acetamide	2	1.0	0.42	0.42	731
Acetic acid	1	1.0	0.48	0.48	388
Acetochlor	26	1.0	1.88	1.90	35,628
Alachlor	2	1.0	1.72	1.72	2,615
Atrazine	68	1.0	1.04	1.13	55,642
Cyanazine	*	1.0	0.98	0.98	102
Dicamba, Pot. salt	4	1.0	0.37	0.37	1,044
Paraquat	1	1.0	0.51	0.51	381
Insecticides					
Carbofuran	*	1.0	0.79	0.79	332
Cyfluthrin	7	1.0	0.006	0.006	32
Fipronil	2	1.0	0.12	0.12	141
Lambda-cyhalothrin	1	1.0	0.02	0.02	20
Methyl parathion	*	1.1	0.33	0.39	186
Permethrin	1	1.0	0.08	0.09	71
Tebupirimphos	7	1.0	0.12	0.12	565
Tefluthrin	6	1.0	0.11	0.11	523
Terbufos	2	1.0	1.11	1.12	1,660

* Area applied is less than 0.5 percent.

¹ Planted acreage in 2003 for the 18 Program States was 72.8 million acres. States included are CO, IL, IN, IA, KS, KY, MI, MN, MO, NE, NY, NC, ND, OH, PA, SD, TX, and WI.

**Cotton, Upland: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Cyanazine	*	1.3	0.46	0.62	52
Insecticides					
Abamectin	3	1.1	0.006	0.007	3
Aldicarb	25	1.0	0.60	0.62	2,006
Bifenthrin	*	1.0	0.07	0.07	6
Carbofuran	1	1.0	0.16	0.16	21
Cyfluthrin	9	1.7	0.03	0.06	65
Cypermethrin	8	1.3	0.06	0.08	83
Deltamethrin	1	1.4	0.02	0.03	5
Diclotophos	15	1.6	0.27	0.44	817
Disulfoton	*	1.1	0.47	0.47	13
Esfenvalerate	1	1.1	0.03	0.03	6
Lambda-cyhalothrin	11	1.4	0.02	0.03	36
Methamidophos	*	1.0	0.12	0.12	4
Methomyl	*	1.4	0.25	0.36	24
Methyl parathion	2	1.1	0.56	0.62	147
Oxamyl	3	1.2	0.26	0.32	133
Permethrin	*	1.0	0.06	0.07	3
Phorate	5	1.0	0.51	0.52	309
Profenofos	2	1.1	0.59	0.69	145
Tralomethrin	1	1.8	0.02	0.03	6
Other Chemicals					
Paraquat	15	1.0	0.31	0.33	640

* Area applied is less than 0.5 percent.

¹ Planted acreage in 2003 for the 12 Program States was 12.8 million acres. States included are AL, AZ, AR, CA, GA, LA, MS, MO, NC, SC, TN, and TX.

**Potatoes, Fall: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
EPTC	20	1.0	3.44	3.58	751
Insecticides					
Aldicarb	7	1.0	2.72	2.72	188
Carbofuran	4	1.3	0.56	0.78	31
Cyfluthrin	31	1.5	0.03	0.04	14
Esfenvalerate	17	1.5	0.04	0.06	10
Methamidophos	13	1.5	0.92	1.38	185
Methomyl	*	1.0	0.40	0.41	1
Methyl parathion	3	1.9	1.04	2.04	62
Oxamyl	8	2.2	0.81	1.81	156
Permethrin	3	1.4	0.13	0.20	7
Phorate	11	1.0	2.84	2.84	315
Other Chemicals					
Dichloropropene	3	1.0	155.24	155.24	5,510
Metam-sodium	25	1.0	121.70	123.11	31,758
Paraquat	2	1.1	0.42	0.48	10

* Area applied is less than 0.5 percent.

¹ Planted acreage in 2003 for the 10 Program States was 1.0 million acres. States included are CO, ID, ME, MI, MN, ND, OR, PA, WA, and WI.

**Sorghum, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Acetic acid	*	1.3	0.22	0.30	10
Alachlor	11	1.0	2.17	2.24	2,172
Atrazine	70	1.1	1.04	1.19	7,039
Dicamba, Pot. salt	3	1.0	0.27	0.27	57
Paraquat	*	1.0	0.71	0.71	23
Insecticides					
Lambda-cyhalothrin	*	1.0	0.02	0.02	1
Terbufos	4	1.1	0.39	0.47	159

* Area applied is less than 0.5 percent.

¹ Planted acreage in 2003 for the 7 Program States was 8.5 million acres. States included are CO, KS, MO, NE, OK, SD, and TX.

**Apples, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat	13	1.3	0.64	0.85	33.9
Insecticides					
Azinphos-methyl	3	3.0	0.37	1.15	10.3
Clofentezine	4	1.1	0.11	0.12	1.6
Esfenvalerate	11	1.5	0.04	0.06	1.9
Ethyl parathion	*	1.1	0.15	0.17	0.1
Lambda-cyhalothrin	8	2.0	0.03	0.05	1.3
Methidathion	*	1.0	0.84	0.90	0.9
Methomyl	7	1.4	0.62	0.90	19.9
Methyl parathion	*	1.1	0.08	0.08	0.1
Oxamyl	*	1.1	0.39	0.46	0.8
Permethrin	3	1.4	0.10	0.14	1.3
Pyrethrins	1	1.6	0.04	0.07	0.2
Other Chemicals					
Strychnine	*	1.0	0.006	0.007	(²)
Zinc phosphide	4	1.0	0.09	0.09	1.1

* Area applied is less than 0.5 percent.

¹ Bearing acreage in 2003 for the 7 Program States was 305,500 acres. States included are CA, MI, NY, NC, OR, PA, and WA. Both bearing and non-bearing acres are included for California.

² Total applied is less than 50 lbs.

**Apricots, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Insecticides					
Esfenvalerate	67	2.3	0.05	0.11	1.3
Fungicides					
Chlorothalonil	10	1.3	2.72	3.74	6.4

¹ Total acreage in 2003 for California was 17,500 acres. Both bearing and non-bearing acres are included.

**Blackberries, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat	24	1.4	0.26	0.37	0.6
Simazine	18	1.0	1.54	1.54	1.8
Insecticides					
Azinphos-methyl	6	1.0	0.30	0.32	0.1
Diazinon	11	1.2	1.44	1.75	1.3
Esfenvalerate	24	1.0	0.04	0.05	0.1

¹ Bearing acreage in 2003 for Oregon was 6,700 acres.

**Blueberries, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Dichlobenil	*	1.0	1.28	1.28	0.1
Paraquat	16	1.3	0.47	0.65	3.7
Simazine	10	1.1	1.02	1.20	4.4
Insecticides					
Azinphos-methyl	2	1.1	0.27	0.31	0.2
Diazinon	17	1.6	0.67	1.07	6.4
Esfenvalerate	16	1.7	0.03	0.06	0.3

* Area applied is less than 0.5 percent.

¹ Bearing acreage in 2003 for the 5 Program States was 34,700 acres. States included are GA, MI, NJ, NC, and OR.

**Cherries, Sweet, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat	16	1.5	0.50	0.78	9.2
Insecticides					
Azinphos-methyl	2	1.2	0.19	0.24	0.4
Clofentezine	7	1.0	0.12	0.13	0.7
Esfenvalerate	21	1.9	0.04	0.08	1.3
Permethrin	25	1.8	0.01	0.02	0.4
Fungicides					
Chlorothalonil	14	2.0	1.09	2.26	23.5
Other Chemicals					
Chloropicrin	6	1.1	27.56	30.22	139.2
Methyl bromide	7	1.0	62.04	67.78	356.7
Strychnine	5	1.9	0.005	0.009	(²)
Zinc phosphide	*	1.1	0.03	0.04	(²)

* Area applied is less than 0.5 percent.

¹ Bearing acreage in 2003 for the 4 Program States was 76,100 acres. States included are CA, MI, OR, and WA. Both bearing and non-bearing acres are included for California.

² Total applied is less than 50 lbs.

**Cherries, Tart, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat	14	1.0	0.48	0.51	2.1
Simazine	7	1.0	0.88	0.88	1.7
Insecticides					
Lambda-cyhalothrin	13	1.8	0.04	0.07	0.3
Permethrin	10	1.5	0.11	0.17	0.5
Fungicides					
Chlorothalonil	83	2.9	1.88	5.58	135.0

¹ Bearing acreage in 2003 for the 2 Program States was 29,000 acres. States included are MI and NY.

**Grapefruit, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat ²	2	1.1	0.45	0.53	1.1
Insecticides					
Abamectin	45	1.0	0.01	0.01	0.7
Aldicarb	20	1.0	3.24	3.27	81.4
Diflubenzuron ²	12	1.0	0.12	0.12	1.4
Ethion	13	1.0	3.83	3.86	65.0
Oxamyl	1	1.2	0.10	0.12	0.2
Fungicides					
Copper chloride hyd.	6	1.3	3.43	4.63	37.3

¹ Bearing acreage in 2003 for the 3 Program States was 127,500 acres. States included are CA, FL, and TX. Both bearing and non-bearing acres are included for California.

² The data published represent Florida only.

**Grapes, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat	15	1.2	0.44	0.57	81.9
Simazine	4	1.0	1.33	1.43	56.2
Insecticides					
Diazinon	1	1.0	0.93	0.98	12.9
Fenamiphos ²	2	1.1	1.81	2.05	28.4
Methomyl	3	1.1	0.67	0.75	18.9
Fungicides					
Copper oxide	5	1.2	0.82	1.02	48.6
Other Chemicals					
Strychnine	4	1.3	0.01	0.02	0.6

¹ Bearing acreage in 2003 for the 4 Program States was 977,600 acres. States included are CA, MI, NY, and WA. Both bearing and non-bearing acres are included for California.

² The data published represent California only.

**Grapes, Raisin: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat	9	1.1	0.30	0.33	7.6

¹ Total acreage in 2003 for California was 260,000 acres. Both bearing and non-bearing acres are included.

**Grapes, Table: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat	22	1.1	0.73	0.87	18.2
Insecticides					
Fenamiphos	1	1.7	1.89	3.26	4.2
Methomyl	28	1.1	0.73	0.82	21.1
Fungicides					
Copper oxide	10	1.1	0.91	1.03	9.2

¹ Total acreage in 2003 for California was 93,000 acres. Both bearing and non-bearing acres are included.

**Grapes, Wine: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat	15	1.2	0.35	0.44	35.8
Simazine	5	1.0	1.46	1.52	38.3
Insecticides					
Fenamiphos	2	1.1	1.94	2.13	23.3
Fungicides					
Copper oxide	7	1.2	0.90	1.16	40.2
Other Chemicals					
Strychnine	6	1.3	0.01	0.02	0.7

¹ Total acreage in 2003 for California was 529,000 acres. Both bearing and non-bearing acres are included.

**Lemons, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Insecticides					
Abamectin	11	1.2	0.01	0.01	0.1

¹ Total acreage in 2003 for California was 51,500 acres. Both bearing and non-bearing acres are included.

**Nectarines, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat	6	1.9	0.44	0.87	2.3
Insecticides					
Clofentezine	6	1.4	0.13	0.19	0.5
Esfenvalerate	41	1.1	0.04	0.04	0.8
Methomyl	9	1.1	0.63	0.72	2.7

¹ Total acreage in 2003 for California was 41,500 acres. Both bearing and non-bearing acres are included.

**Olives, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat	5	1.2	0.53	0.68	1.4

¹ Total acreage in 2003 for California was 37,500 acres. Both bearing and non-bearing acres are included.

**Oranges (excluding Temples): Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat	5	1.2	0.35	0.42	17.2
Insecticides					
Abamectin	12	1.3	0.008	0.01	1.0
Aldicarb	7	1.0	2.17	2.25	118.9
Cyfluthrin	14	1.1	0.02	0.02	2.7
Diflubenzuron	2	1.0	0.14	0.15	2.0
Ethion	2	1.0	1.75	1.77	25.6
Methodathion	2	1.1	0.80	0.96	14.8
Fungicides					
Copper chloride hyd. ²	1	1.7	4.00	7.07	42.8

¹ Bearing acreage in 2003 for the 2 Program States was 789,100 acres. States included are CA and FL. Both bearing and non-bearing acres are included for California.

² The data published represent Florida only.

**Oranges, Temples: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat	9	1.0	0.37	0.38	0.1
Insecticides					
Abamectin	16	1.4	0.01	0.01	(²)
Ethion	4	1.0	2.07	2.07	0.3

¹ Bearing acreage in 2003 for Florida was 4,200 acres.

² Total applied is less than 50 lbs.

**Peaches, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat	20	2.1	0.64	1.40	37.0
Insecticides					
Azinphos-methyl	17	3.9	0.22	0.84	18.5
Clofentezine	4	1.1	0.09	0.10	0.5
Esfenvalerate	39	1.9	0.05	0.10	5.2
Ethyl parathion	*	1.2	0.12	0.15	0.1
Lambda-cyhalothrin	8	2.6	0.006	0.01	0.1
Methomyl	4	3.3	0.79	2.68	12.9
Methyl parathion	*	1.2	0.06	0.07	(²)
Permethrin	7	2.3	0.17	0.41	3.8

* Area applied is less than 0.5 percent.

¹ Bearing acreage in 2003 for the 7 Program States was 130,300 acres. States included are CA, GA, MI, NJ, PA, SC, and TX. Both bearing and non-bearing acres are included for California.

² Total applied is less than 50 lbs.

**Pears, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat	5	1.2	0.61	0.78	2.3
Insecticides					
Amitraz	*	1.0	0.99	0.99	0.5
Azinphos-methyl	4	1.3	0.35	0.46	1.1
Clofentezine	3	1.0	0.12	0.12	0.2
Diflubenzuron	*	1.4	0.18	0.27	0.1
Permethrin	4	1.2	0.11	0.14	0.3
Other Chemicals					
Zinc phosphide	*	1.4	0.07	0.10	(²)

* Area applied is less than 0.5 percent.

¹ Bearing acreage in 2003 for the 3 Program States was 61,400 acres. States included are CA, OR, and WA. Both bearing and non-bearing acres are included for California.

² Total applied is less than 50 lbs.

**Plums, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat	14	1.2	0.69	0.85	4.7
Insecticides					
Esfenvalerate	27	1.1	0.04	0.04	0.4

¹ Total acreage in 2003 for California was 40,000 acres. Both bearing and non-bearing acres are included.

**Prunes, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat	6	1.2	0.45	0.54	2.8

¹ Total acreage in 2003 for California was 80,000 acres. Both bearing and non-bearing acres are included.

**Raspberries, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Dichlobenil	5	1.0	1.77	1.77	1.0
Paraquat	74	2.1	0.37	0.78	6.7
Simazine	43	1.0	0.70	0.72	3.5
Insecticides					
Diazinon	52	1.4	1.02	1.43	8.5
Fenamiphos	8	1.0	2.98	2.98	2.8

¹ Bearing acreage in 2003 for the 2 Program States was 11,500 acres. States included are OR and WA.

**Tangelos, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Insecticides					
Abamectin	34	1.0	0.01	0.01	(²)
Diflubenzuron	5	1.0	0.11	0.11	0.1
Ethion	11	1.0	3.25	3.29	3.4

¹ Bearing acreage in 2003 for Florida was 9,100 acres.

² Total applied is less than 50 lbs.

**Tangerines, All: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 ¹**

Restricted Use Pesticide	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 Pounds</i>
Herbicides					
Paraquat ²	10	1.3	0.36	0.49	1.1
Insecticides					
Abamectin ²	60	1.1	0.01	0.01	0.2
Cyfluthrin	5	1.0	0.03	0.03	0.1
Diflubenzuron	6	1.1	0.14	0.16	0.3
Ethion	7	1.0	1.76	1.77	4.2

¹ Bearing acreage in 2003 for the 2 Program States was 33,900 acres. States included are CA and FL. Both bearing and non-bearing acres are included for California.

² The data published represent Florida only.

**Nursery and Floriculture: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003**

Active Ingredient	All Nursery and Floriculture		All Nursery	
	Rate per Acre	Total Applied	Rate per Acre	Total Applied
	<i>Pounds</i>	<i>1,000 Pounds</i>	<i>Pounds</i>	<i>1,000 Pounds</i>
Herbicides				
Atrazine	2.49	40.1	2.51	40.0
Dichlobenil	2.37	2.6	2.43	2.5
Paraquat	0.36	0.7	0.36	0.7
Insecticides				
Azinphos-methyl	(¹)	0.1	(¹)	0.1
Carbofuran	0.12	0.1	0.12	0.1
Clofentezine	0.15	1.9	0.13	1.5
Cyfluthrin	0.09	1.2	0.09	1.2
Diflubenzuron	0.08	6.2	0.21	2.0
Esfenvalerate	0.03	0.6	0.03	0.6
Ethoprop	0.73	1.3	(¹)	1.2
Fenpropathrin	0.30	*	0.30	*
Lambda-cyhalothrin	0.02	0.1	0.02	0.1
Lindane	0.62	0.2	0.59	0.2
Methiocarb	0.96	2.9	0.94	1.1
Methomyl	0.55	1.2	(¹)	1.2
Nicotine	2.71	*	(¹)	*
Oxamyl	0.64	0.2	(¹)	0.1
Oxydemeton-methyl	0.42	1.8	0.42	1.8
Permethrin	0.18	9.4	0.19	2.3
Sulfotepp	0.31	*	(¹)	*
Other Chemicals				
Chloropicrin	120.59	255.0	124.82	245.6
Metam-sodium	130.39	22.9	(¹)	6.9
Methyl bromide	195.42	449.6	191.39	391.4

See footnote(s) at end of table.

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**Nursery and Floriculture: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 (continued)**

Active Ingredient	Broadleaf Evergreens		Christmas Trees	
	Rate per Acre	Total Applied	Rate per Acre	Total Applied
	<i>Pounds</i>	<i>1,000 Pounds</i>	<i>Pounds</i>	<i>1,000 Pounds</i>
Herbicides				
Atrazine	(¹)	1.0	2.58	36.8
Dichlobenil	(¹)	0.6		
Paraquat	(¹)	*		
Insecticides				
Azinphos-methyl	(¹)	0.1		
Carbofuran	(¹)	*		
Clofentezine	(¹)	0.6		
Cyfluthrin	(¹)	*	0.05	0.4
Diflubenzuron	(¹)	*	0.07	0.2
Esfenvalerate			(¹)	0.1
Lambda-cyhalothrin	(¹)	*		
Lindane			(¹)	*
Methiocarb	(¹)	0.4		
Oxydemeton-methyl			0.44	0.7
Permethrin	0.10	0.5	0.32	0.3
Other Chemicals				
Methyl bromide	(¹)	5.4		

See footnote(s) at end of table.

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**Nursery and Floriculture: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 (continued)**

Active Ingredient	Coniferous Evergreens		Deciduous Flowering Trees	
	Rate per Acre	Total Applied	Rate per Acre	Total Applied
	<i>Pounds</i>	<i>1,000 Pounds</i>	<i>Pounds</i>	<i>1,000 Pounds</i>
Herbicides				
Atrazine	1.63	1.8		
Dichlobenil	1.33	0.7	(¹)	0.1
Paraquat	(¹)	0.1	(¹)	0.1
Insecticides				
Carbofuran	(¹)	*		
Clofentezine	0.18	0.6	(¹)	*
Cyfluthrin	(¹)	0.1	(¹)	*
Diflubenzuron	0.06	0.1	(¹)	*
Esfenvalerate	0.03	0.1	0.02	0.2
Ethoprop	(¹)	0.1		
Lambda-cyhalothrin	0.02	*	(¹)	*
Lindane	(¹)	*	(¹)	*
Methiocarb	(¹)	0.1	(¹)	*
Methomyl			(¹)	0.1
Oxydemeton-methyl	0.43	1.0	(¹)	*
Permethrin	(¹)	0.2	(¹)	*
Other Chemicals				
Chloropicrin	(¹)	0.7		
Methyl bromide	(¹)	32.5		

See footnote(s) at end of table.

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**Nursery and Floriculture: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 (continued)**

Active Ingredient	Deciduous Shade Trees		Deciduous Shrubs	
	Rate per Acre	Total Applied	Rate per Acre	Total Applied
	<i>Pounds</i>	<i>1,000 Pounds</i>	<i>Pounds</i>	<i>1,000 Pounds</i>
Herbicides				
Atrazine	(¹)	0.1		
Dichlobenil	3.14	0.9	(¹)	0.3
Paraquat	(¹)	0.2	(¹)	*
Insecticides				
Carbofuran			(¹)	*
Clofentezine			(¹)	*
Cyfluthrin	(¹)	*	(¹)	*
Diflubenzuron	(¹)	1.4	(¹)	*
Esfenvalerate	(¹)	*	(¹)	*
Ethoprop	(¹)	1.0		
Fenpropathrin			0.30	*
Lambda-cyhalothrin	(¹)	*	(¹)	*
Lindane	(¹)	*		
Methiocarb	(¹)	*	(¹)	0.1
Methomyl	(¹)	0.2	(¹)	*
Oxydemeton-methyl	(¹)	*		
Permethrin	0.21	1.0	0.21	0.1
Other Chemicals				
Chloropicrin	(¹)	0.2		
Methyl bromide	(¹)	10.9	(¹)	0.4

See footnote(s) at end of table.

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**Nursery and Floriculture: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 (continued)**

Active Ingredient	Fruit and Nut Plants		Nursery Propagation or Lining-out Stock	
	Rate per Acre	Total Applied	Rate per Acre	Total Applied
	<i>Pounds</i>	<i>1,000 Pounds</i>	<i>Pounds</i>	<i>1,000 Pounds</i>
Herbicides				
Dichlobenil	(¹)	0.1	(¹)	*
Paraquat	0.16	0.2	(¹)	0.1
Insecticides				
Carbofuran			(¹)	*
Clofentezine	(¹)	0.1	(¹)	*
Cyfluthrin	(¹)	*	0.21	0.7
Diflubenzuron	(¹)	0.3	0.11	*
Esfenvalerate	0.02	0.2		
Ethoprop	(¹)	0.2		
Lambda-cyhalothrin	(¹)	*	(¹)	*
Lindane			(¹)	0.1
Methiocarb	(¹)	0.1	(¹)	0.1
Methomyl	(¹)	0.6		
Permethrin	(¹)	0.1	(¹)	*
Other Chemicals				
Chloropicrin	(¹)	2.5	(¹)	*
Metam-sodium	(¹)	3.5	(¹)	3.4
Methyl bromide	(¹)	16.9	(¹)	1.7

See footnote(s) at end of table.

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**Nursery and Floriculture: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 (continued)**

Active Ingredient	Ornamental Grasses		Other Woody Ornamentals and Vines	
	Rate per Acre	Total Applied	Rate per Acre	Total Applied
	<i>Pounds</i>	<i>1,000 Pounds</i>	<i>Pounds</i>	<i>1,000 Pounds</i>
Herbicides				
Atrazine			(¹)	0.1
Dichlobenil			(¹)	*
Insecticides				
Clofentezine			0.07	0.2
Cyfluthrin			(¹)	*
Diflubenzuron	(¹)	*	0.08	*
Lambda-cyhalothrin			(¹)	*
Lindane			(¹)	*
Methiocarb	(¹)	*	0.78	0.4
Methomyl			(¹)	*
Nicotine			(¹)	*
Oxamyl			(¹)	*
Permethrin	(¹)	*	(¹)	0.1
Sulfotepp			(¹)	*
Other Chemicals				
Methyl bromide	(¹)	0.4	(¹)	0.4

See footnote(s) at end of table.

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**Nursery and Floriculture: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 (continued)**

Active Ingredient	Palms		Transplants for Commercial Vegetable & Strawberry Production	
	Rate per Acre	Total Applied	Rate per Acre	Total Applied
	<i>Pounds</i>	<i>1,000 Pounds</i>	<i>Pounds</i>	<i>1,000 Pounds</i>
Herbicides				
Atrazine	(¹)	0.3		
Insecticides				
Clofentezine	(¹)	*		
Cyfluthrin	(¹)	*		
Esfenvalerate			(¹)	*
Lambda-cyhalothrin	(¹)	*		
Methiocarb	(¹)	*		
Methomyl			(¹)	0.3
Oxamyl			(¹)	0.1
Permethrin	(¹)	*	(¹)	*
Other Chemicals				
Chloropicrin			153.29	242.2
Methyl bromide			203.39	322.8

See footnote(s) at end of table.

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**Nursery and Floriculture: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 (continued)**

Active Ingredient	All Floriculture		Bedding Plants	
	Rate per Acre	Total Applied	Rate per Acre	Total Applied
	<i>Pounds</i>	<i>1,000 Pounds</i>	<i>Pounds</i>	<i>1,000 Pounds</i>
Herbicides				
Atrazine	(¹)	0.1	(¹)	*
Dichlobenil	(¹)	0.1		
Paraquat	(¹)	*	(¹)	*
Insecticides				
Azinphos-methyl	(¹)	*		
Clofentezine	0.23	0.3	0.14	*
Cyfluthrin	0.02	*	0.04	*
Diflubenzuron	0.06	4.2	0.21	*
Esfenvalerate	(¹)	*	(¹)	*
Ethoprop	(¹)	*		
Lambda-cyhalothrin	0.02	*	(¹)	*
Lindane	(¹)	*	(¹)	*
Methiocarb	0.97	1.7	0.75	0.2
Methomyl	(¹)	*	(¹)	*
Nicotine	2.74	*	1.64	*
Oxamyl	1.54	0.1	(¹)	*
Permethrin	0.18	7.0	0.21	0.5
Sulfotepp	1.12	*	(¹)	*
Other Chemicals				
Chloropicrin	37.09	9.5	(¹)	2.2
Metam-sodium	(¹)	16.0		
Methyl bromide	229.11	58.3	(¹)	38.8

See footnote(s) at end of table.

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**Nursery and Floriculture: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 (continued)**

Active Ingredient	Cut Cultivated Greens		Cut Flowers	
	Rate per Acre	Total Applied	Rate per Acre	Total Applied
	<i>Pounds</i>	<i>1,000 Pounds</i>	<i>Pounds</i>	<i>1,000 Pounds</i>
Herbicides				
Atrazine	(¹)	0.1		
Dichlobenil	(¹)	0.1		
Paraquat	(¹)	*		
Insecticides				
Clofentezine			(¹)	*
Cyfluthrin			(¹)	*
Diflubenzuron	0.06	4.0	0.12	*
Esfenvalerate			(¹)	*
Ethoprop	(¹)	*		
Lambda-cyhalothrin			(¹)	*
Methiocarb			1.05	0.6
Nicotine			(¹)	*
Oxamyl	(¹)	*	(¹)	0.1
Permethrin	0.17	5.8	0.34	0.2
Other Chemicals				
Chloropicrin			(¹)	1.2
Metam-sodium			(¹)	8.9
Methyl bromide			315.52	11.7

See footnote(s) at end of table.

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**Nursery and Floriculture: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 (continued)**

Active Ingredient	Floriculture Propagation Material		Flowering Plants	
	Rate per Acre	Total Applied	Rate per Acre	Total Applied
	<i>Pounds</i>	<i>1,000 Pounds</i>	<i>Pounds</i>	<i>1,000 Pounds</i>
Herbicides				
Paraquat			(¹)	*
Insecticides				
Clofentezine	(¹)	*	0.34	0.2
Cyfluthrin			(¹)	*
Diflubenzuron	(¹)	*	0.04	0.2
Lambda-cyhalothrin	(¹)	*	(¹)	*
Lindane			(¹)	*
Methiocarb	(¹)	*	0.89	0.3
Methomyl			(¹)	*
Nicotine			(¹)	*
Oxamyl			(¹)	*
Permethrin	(¹)	*	0.32	0.4
Sulfotepp			(¹)	*
Other Chemicals				
Chloropicrin			(¹)	6.0
Metam-sodium			(¹)	7.1
Methyl bromide			(¹)	4.9

See footnote(s) at end of table.

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**Nursery and Floriculture: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 (continued)**

Active Ingredient	Foliage Plants		Herbaceous Perennials	
	Rate per Acre	Total Applied	Rate per Acre	Total Applied
	<i>Pounds</i>	<i>1,000 Pounds</i>	<i>Pounds</i>	<i>1,000 Pounds</i>
Herbicides				
Dichlobenil			(¹)	*
Insecticides				
Azinphos-methyl	(¹)	*		
Clofentezine	0.15	0.1	0.22	0.1
Diflubenzuron	0.11	*	0.30	*
Lambda-cyhalothrin	(¹)	*	(¹)	*
Lindane			(¹)	*
Methiocarb	1.07	0.6	1.10	*
Nicotine	(¹)	*	(¹)	*
Oxamyl	(¹)	*		
Permethrin	(¹)	0.1	(¹)	*
Other Chemicals				
Chloropicrin			(¹)	0.1
Methyl bromide			(¹)	2.9

See footnote(s) at end of table.

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**Nursery and Floriculture: Agricultural Chemical Applications,
Restricted Use Pesticides,
Program States, 2003 (continued)**

Active Ingredient	Non-production Areas	
	Rate per Acre	Total Applied
	<i>Pounds</i>	<i>1,000 Pounds</i>
Herbicides		
Atrazine	(¹)	0.9
Dichlobenil	(¹)	8.6
Paraquat	1.00	1.0
Insecticides		
Carbofuran	(¹)	*
Cyfluthrin	(¹)	0.3
Diflubenzuron	(¹)	*
Lambda-cyhalothrin	(¹)	*
Lindane	(¹)	*
Methiocarb	(¹)	0.1
Permethrin	(¹)	*
Other Chemicals		
Chloropicrin	(¹)	*
Methyl bromide	(¹)	12.2

* Total applied is less than 50 pounds

¹ Insufficient number of reports or data deemed too unreliable to publish.

Estimation Procedures

The chemical applications 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 manufacturers' recommendations and with data from other operations using the same product. Following this review, product information is converted to active ingredient level. The chemical usage estimates in this publication consist of survey estimates of those active ingredients.

Estimates of the total amount of active ingredient applied are based on the acreage estimates published in the annual NASS report "**Crop Production - 2003 Summary**" [Cr Pr 2-1(04)] for barley, corn, upland cotton, fall potatoes, and sorghum.

Estimates of the total amount of active ingredient applied for fruits are based on the acreage estimates published in the annual NASS report "**Citrus Fruits - 2003 Summary**" [Fr Nt 3-1(01)] released on September 18, 2003, and "**Noncitrus Fruits and Nuts - 2003 Summary**" [Fr Nt 1-3 (04) a] released on July 7, 2004. The estimates for total amount applied will not be revised even if there are subsequent revisions to acreage for a given crop.

In the nursery and floriculture industry, the use of agricultural chemicals is very different when compared with other sectors of agriculture (field crop, fruit, livestock, vegetable, etc.). Chemical applications to nursery and floriculture commodities are predominately made on a "spot" (small area) basis. Chemical applications are frequently made by chemigation, foggers, aerosols, misters, smokers, root dipping, or drenching of soil. Application rates can be based on teaspoon(s) per pot, per 1,000 cubic feet of greenhouse space, per length of row, or per cubic yard of soil. To provide statistically sound estimates on chemical rates of application, all applications reported as being made by foggers, aerosols, misters, electrostatic sprayers, smokers, rotary atomizers, chemigation, cutting-bulb-flower dip, or growing media drench or douse, were excluded in calculating estimates of rate per acre. Estimates of total pounds of active ingredient applied for all nursery and floriculture included all methods of application. The same production area can be used to produce different types of plant material, or multiple "turns" of the same plant material within the calendar year. Trees may be planted in rows with significant row widths which receive none of the chemicals applied. Due to these, and other unique circumstances, estimates on "percent of area applied", "number of applications", and "rate per crop year" are not available.

Detailed data within some published tables may not multiply across due to independent rounding of the published values. Only those restricted use active ingredients that met NASS publication standards in the "**Agricultural Chemical Usage - 2003 Field Crops Summary**", the "**Agricultural Chemical Usage - 2003 Fruit Summary**", and the "**Agricultural Chemical Usage - 2003 Nursery and Floriculture Summary**" publications are reprinted in this report.

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 pesticides.

Application rates: The application rates refer to the average number of pounds of a 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.

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.

Floriculture: The production, cultivation, and distribution of cut flowers, flowering potted plants, foliage plants, and bedding plants being grown as ornamentals.

Nursery: Any place where plants, shrubs, and trees are grown either for transplanting or as grafting stock.

Operation: For purposes of the surveys included in this publication, a farm or ranching operation is any establishment from which \$1,000 or more agricultural products were sold or would normally be sold during the year. A nursery/floriculture operation is defined as one that produced and sold at least \$10,000 worth of nursery or floriculture product in 2003.

Terms and Definitions (continued)

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, rooting compounds, and disinfectants, are included as other chemicals.

Rate per acre: "Rate per Acre" is the average number of pounds of a pesticide's active ingredient applied in one application to an acre of land regardless of the number of times a particular acre was treated at the same rate.

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 contain more than one active ingredient.

Trade Names, Common Names, and Pesticide Classes

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 field crops, fruit crops, or nursery/floriculture, and NASS does not mean to imply the use of any specific trade name.

Class	Common Name	Trade Name
I	Abamectin	Agri-Mek, Avid, Clinch, Zephyr
H	Acetic acid	2,4-D, Brushmaster, Esteron, LV4, LV-400, Salavan, Starane
H	Acetochlor	Degree Extra, Double Play, Field Master, Fulltime, Keystone, Harness, Surpass, Topnotch, Volley
H	Alachlor	Arena, Bronco, Bullet, Lariat, Lasso, Micro-Tec, Partner, Saddle
I	Aldicarb	Temik
I	Amitraz	Miltac, Ovasyn
H	Atrazine	several
I	Azinphos-methyl	Azinphos, Guthion
I	Bifenthrin	Attain, Brigade, Capture, Double Threat, Talstar
I	Carbofuran	Furadan
O	Chloropicrin	Chloropicrin, Methyl Bromide, Telone, Tri-Con
I	Chlofentezine	Apollo
F	Copper chloride hydroxide	Agra-Cop, Bravo, Microspere
F	Copper oxide	Nordox
H	Cyanazine	Bladex, Conquest, Cy-Pro
I	Cyfluthrin	Aztec, Baythroid, Countdown, Decathalon, Duraplex, Leverage, Renounce, Tempo
I	Cypermethrin	Ammo, Battery, Up-Cyde
I	Deltamethrin	Decis, Deltaguatr, Suspend
I	Diazinon	several
H	Dicamba, Potassium salt	Banvek-K + Atrazine, Marksman
H	Dichlobenil	Barrier, Casoron
O	Dichloropropene	Telone, Vidden
I	Dichrotophos	Bidren
I	Diflubenzuron	Adept, Dimilin, Micromite
I	Disulfoton	Di-Syston, Ferti-Lome, Mocap, Terraclor
H	EPTC	Double Play, Eptam, Eradicane

-- continued

Trade Names, Common Names, and Pesticide Classes (continued)

Class	Common Name	Trade Name
I	Esenvalerate	Asana
I	Ethion	Ethion 4
I	Ethyl parathion	several
I	Fenamiphos	Nemacur
I	Fenpropathrin	Danitol, Tame
I	Fipronil	Garden Tech, Regent
I	Lambda-cyhalothrin	Demand, Karate, Scimitar, Warrior
I	Lindane	Isotox, Lindane
O	Metam-sodium	Busan, Sectagon, Vapam
I	Methamidophos	Monitor
I	Methidathion	Supracide
I	Methiocarb	Mesurool, Metaldehyde, Methiocarb
I	Methomyl	Lannate, Nudrin,
I	Methyl bromide	several
I	Methyl parathion	several
H	Metolachlor	Broadstrike + Dual, Dual, Pennant, Turbo
I	Nicotine	Fulex, Nicotine
I	Oxamyl	Oxymyl, Vydate
F	Oxydemeton-methyl	MSR, Metasystox-RH
I, O	Paraquat	Cyclone, Gramoxone, Starfire, Surefire
I	Permethrin	Ambush, Astro, Eight, Evercide, LastCall, Perm-Up, Permethrin, Pounce, Real Kill, Waylay
I	Phorate	Tenax, Thimet
H	Picloram	Tordon
I	Piperonyl butoxide	several
I	Profenofos	Curacon
H	Simazine	Calibar, Princep, Sim-Trol. Simazat
I	Sulfotepp	Fulex, Plantfume
O	Strychnine	Cooke Gopher, Gopher Getter, Strychnine
I	Tebuprmiphos	Aztec
I	Tefluthrin	Force
I	Terbufos	Counter
I	Tralomethrin	Scout
O	Zinc phosphide	Zinc Phosphide

Report Features

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