Summary of Pesticide Use Report Data 2006

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Questions regarding the Summary of Pesticide Use Report Data or information regarding the availability and cost of the computerized database should be directed to: Department of Pesticide Regulation, Pest Management and Licensing Branch, P.O. Box 4015, Sacramento, California 95812-4015.Telephone (916) 445-4038 or email questions to <llichtenberger@cdpr.ca.gov>.

Order Form

To continue to make the *Summary of Pesticide Use Report Data* available, it is necessary to charge for the costs of reproduction and mailing. The reports can also be downloaded free of charge from the Department's web site.

The 1989 - 2006 *Summary of Pesticide Use Report Data* indexed by chemical or commodity reports can be found on DPR's web at www.cdpr.ca.gov. The *Summary of Pesticide Use Report Data* is available in two formats. One report is indexed by chemical and lists the amount of each pesticide used, the commodity on which it was used, the number of agricultural applications, and the acres/units treated. The second report is indexed by commodity and lists the chemicals used, the number of agricultural applications, amount of pesticides used, and the acres/units treated.

The Annual Pesticide Use Report Data (the complete database of reported pesticide applications for 1990-2005) are available on CD ROM. The files are in text (comma delimited format).

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608	Annual Pesticide Use Report Data (CD ROM) (year)_____ (available from 1990) (text format)		$12.00	
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I. INTRODUCTION

Development and Implementation of the Pesticide Use Reporting System

This 2006 *Summary of Pesticide Use Report Data* includes agricultural applications and other selected uses reported in California. The report represents a summary of the data gathered under full use reporting. The Department of Pesticide Regulation (DPR) uses the data to help estimate dietary risk and to ensure compliance with clean air laws as well as ground water protection regulations. Site-specific use report data, combined with geographic data on endangered species habitats, also helps county agricultural commissioners resolve potential pesticide use conflicts. Detailed, individual pesticide use report data may be obtained from DPR for in-depth, analytical purposes.

Under full use reporting, which began in 1990, California became the first state to require reporting of all agricultural pesticide use, including amounts applied and types of crops or places (e.g., structures, roadsides) treated. Commercial applications–including structural fumigation, pest control, and turf applications–must also be reported. Pesticide use reporting is explained in more detail below.

Types of Pesticide Applications Reported

Partial reporting of agricultural pesticide use has been in place in California since at least the 1950s. Beginning in 1970, anyone who used restricted materials was required to file a pesticide use report with the county agricultural commissioner. The criteria established to designate a pesticide as a restricted material include potential hazard to:

- public health
- farm workers
- domestic animals
- honeybees
- the environment
- wildlife
- other crops

Restricted materials, with certain exceptions, may be possessed or used only by, or under the supervision of, licensed or certified persons and only in accordance with an annual permit issued by a county agricultural commissioner.

In addition, the State required commercial pest control operators[1] to report all pesticides used, whether restricted or nonrestricted. These reports included information about the pesticide applied, when and where the application was made, and the crop involved if the application was in agriculture. The reports were entered into a computerized database and summarized by chemical and crop in annual reports.

[1] Pest control operators include those in the business of applying pesticides such as agricultural applicators, structural fumigators, and professional gardeners.

With implementation of full use reporting in 1990, the following pesticide uses are required to be reported to the commissioner, who, in turn, reports the data to DPR:

- For the production of any agricultural commodity, except livestock.
- For the treatment of postharvest agricultural commodities.
- For landscape maintenance in parks, golf courses, and cemeteries.
- For roadside and railroad rights-of-way.
- For poultry and fish production.
- Any application of a restricted material.
- Any application of a pesticide with the potential to pollute ground water (listed in section 6800 (b) of the California Code of Regulations, Title 3, Division 6, Chapter 4, Subchapter 1, Article 1) when used outdoors in industrial and institutional settings.
- Any application by a licensed pest control operator.

The primary exceptions to the use reporting requirements are home and garden use and most industrial and institutional uses.

How Pesticide Data Are Used

DPR undertook the expansion of use reporting primarily in response to concerns of many individuals and groups, including government officials, scientists, farmers, legislators, and public interest groups. It was generally acknowledged that the system for estimating dietary exposure to pesticide residues did not provide sufficient data on which to make realistic assessments; this often resulted in overestimates of risk. Farm worker representatives were also asking for more information to determine exposure and potential risk to those who handle pesticides or who work in treated fields.

There are several key areas in which data generated by full use reporting are proving beneficial.

Risk Assessment

Without information on actual pesticide use, regulatory agencies conducting risk assessment assume all planted crop acreage is treated with many pesticides, even though most crops are treated with just a few chemicals. If the assumptions used by regulatory agencies are incorrect, regulators could make judgments on pesticide risks that are too cautious by several orders of magnitude, reducing the credibility of risk management decisions. The use report data, on the other hand, provides actual use data so DPR can better assess risk and make more realistic risk management decisions.

After the passage of the federal Food Quality Protection Act (FQPA) in 1996, complete pesticide use data became even more important to commodity groups in California and to the U.S. Environmental Protection Agency (U.S. EPA). FQPA contains a new food safety standard against which all pesticide tolerances must be measured. The increased interest in the state's pesticide use data, especially for calculating percent crop treated, came at a time when DPR was increasing the efficiency with which it produced its annual report.

DPR was able to provide up-to-date use data and summaries to commodity groups, University of California specialists, U.S. EPA programs, and other interested parties as they developed the necessary information for the reassessment of existing tolerances.

Worker Health and Safety

Under the reporting regulations, pest control operators must give farmers a written notice after every pesticide application that includes the date and time the application was completed, and the reentry and preharvest intervals.[2] This notice gives the farmer accurate information to help keep workers from entering fields prematurely, and also lets the farmer know the earliest date a commodity can be harvested.

DPR's Worker Health and Safety Branch also uses the data for worker exposure assessment as part of developing an overall risk characterization document. Use data helps scientists estimate typical applications and how often pesticides are used.

Public Health

The expanded reporting system provides DPR, the State Department of Health Services, and the Office of Environmental Health Hazards Assessment with more complete pesticide use data for evaluating possible human illness clusters in epidemiological studies.

Endangered Species

DPR works with the county agricultural commissioners to combine site-specific use report data with geographic information system-based data on locations of endangered species. The resulting database helps commissioners resolve potential conflicts over pesticide use where endangered species may occur. DPR and the commissioners can also examine patterns of pesticide use near habitats to determine the potential impact of proposed use limitations. With location-specific data on pesticide use, restrictions on use can be better designed to protect endangered species while still allowing necessary pest control.

Water Quality

Since 1983, DPR has had a program to work with the rice industry and the Central Valley Regional Water Quality Control Board to reduce contamination of surface water by rice pesticides. Using PUR data to help in pinpointing specific agricultural practices, more precise alternative use recommendations can be made to assure protection of surface water.

The Pesticide Contamination Prevention Act requires site-specific records to help track pesticide use in areas known to be susceptible to ground water contamination. Determinations can also be made from the records on whether a contaminated well is physically associated with agricultural practices. These records also provide data to help

[2] A reentry interval is the time from which a pesticide application is made and when workers may enter a field. A preharvest interval is the time between an application and when a commodity can be harvested.

researchers determine why certain soil types are more prone to ground water contamination.

DPR placed certain pesticide products containing pyrethroids into reevaluation on August 31, 2006. The reevaluation is based on recent studies revealing the widespread presence of synthetic pyrethroid residues in the sediment of California waterways at levels toxic to an aquatic crustacean.

Air Quality

Many pesticide products contain volatile organic compounds (VOCs) that contribute to the formation of smog. DPR worked with the state Air Resources Board to put together a State Implementation Plan under the federal Clean Air Act to reduce emissions of all sources of VOCs, including pesticides, in nonattainment areas of the state. DPR's contribution to the plan included accurate data on the amount of VOCs contained in pesticides and the ability to inventory the use of those pesticides through pesticide use reporting.

Beginning in January 2008, a new regulation will provide a more accurate estimate of VOC emissions as well as reductions of VOC emissions. A key element of the regulation pertains to field fumigation methods because different fumigation methods emit different amounts of VOCs. Within nonattainment areas, the regulation requires PURs to include the specific fumigation method to better estimate VOC emissions.

Pest Management

The Department uses the PUR database to understand patterns and changes in pest management practices. This information can be used to determine possible alternatives to pesticides that are subject to regulatory actions and to help determine possible impacts of different regulatory actions on pest management.

The PUR is used to help meet the needs of FQPA, which requires pesticide use information for determining the appropriateness of pesticide residue tolerances. As part of this process many commodity groups have created crop profiles, which include information on the pest management practices and available options, both chemical and nonchemical. Pesticide use data is critical to developing these lists of practices and options.

The PUR data have been used to support and assess grant projects for a grant program conducted by DPR to develop, demonstrate and implement reduced-hazard pest management strategies from 1995 to 2003. The grants were temporarily suspended due to the statewide budget shortfall, but funds are currently available to offer grants. The PUR data have been used in several projects that build on work conducted in our grant program in the almond and stonefruit industries. In these and other projects, the PUR data are used to address regional pesticide use patterns and environmental problems such as water and air quality. The data are also used to better understand current changes in pesticide use.

DPR has published general analyses of statewide pesticide use patterns and trends. The first analysis covered the years 1991 to 1995, and the second more detailed analysis covered 1991 to 1996. These analyses identified high-use pesticides, the crops to which those pesticides were applied, trends in use, and the pesticides most responsible for changes in use. In addition, since 1997, the annual Summary of Pesticide Use Report Data reports include summary trends of pesticides in several different categories such as carcinogens, reproductive toxins, and ground water contaminants.

Processor and Retailer Requirements

Food processors, produce packers, and retailers often require farmers to submit a complete history of pesticide use on crops. DPR's use report form often satisfies this requirement.

II. COMMENTS AND CLARIFICATIONS OF DATA

The following comments and points should be taken into consideration when analyzing data contained in this report:

TERMINOLOGY

The following terminology is used in this report:

Number of agricultural applications – Number of applications of pesticide products made to production agriculture. More detailed information is given below under "Number of Applications."

Pounds applied – Number of pounds of an active ingredient.

Unit type – The amount listed in this column is one of the following:
A = Acreage
C = Cubic feet (of commodity treated)
K = Thousand cubic feet (of commodity treated)
P = Pounds (of commodity treated)
S = Square feet
T = Tons (of commodity treated)
U = Miscellaneous units (e.g., number of tractors, trees, tree holes, bins, etc.)

COMMODITY CODES

DPR's pesticide product label database is used to cross-check data entries to determine if the product reported is registered for use on the reported commodity. The DPR label database uses a crop coding system based on crop names used by the U.S. EPA to prepare official label language. However, this system caused some problems until DPR modified it in the early 1990s to account for U.S. EPA's grouping of certain crops under generic names. Problems occurred when the label language in the database called a crop by one name, and the use report used another. For example, a grower may have reported a pesticide use on "almonds," but the actual label on the pesticide product--coded into the database--stated the pesticide was to be used on "nuts." DPR modified the database to eliminate records being rejected as "errors" because the specific commodity listed on the use report is not on the label. A qualifier code is appended to the commodity code in the label database to designate a commodity not specifically listed on the label as a correct use. A qualifier code would be attached to the "almond" code when nuts are only listed on the label. This system greatly reduces the number of rejections.

Plants and commodities grown in greenhouse and nursery operations represented a challenge in use reporting because of their diversity. Six commodity groupings were suggested by industry in 1990 and incorporate terminology that are generally known and accepted. The six use reporting categories are: greenhouse-grown cut flowers or greens; outdoor-grown cut flowers or greens; greenhouse-grown plants in containers; outdoor-grown plants in container/field-grown plants; greenhouse-grown transplants/propagative material; and outdoor-grown transplants/propagative material.

Tomatoes and grapes were also separated into two categories because of public and processor interest in differentiating pesticide use. Tomatoes are assigned two codes to differentiate between fresh market and processing categories. One code was assigned to table grapes, which includes grapes grown for fresh market, raisins, canning, or juicing. A second code was assigned to wine grapes.

UNREGISTERED USE

The report contains entries that reflect the use of a pesticide on a commodity for which the pesticide is not currently registered. This sometimes occurs because the original use report was in error, that is, either the pesticide or the commodity was inaccurately reported. DPR's computer program checks that the commodity is listed on the label, but nonetheless such errors appear in the PUR, possibly because of errors in the label database. Also, the validation program does not check whether the pesticide product was registered at the time of application. For example, parathion (ethyl parathion) is shown reported on crops after most uses were suspended in 1992. (These records are researched and corrected as time and resources allow.) DPR continues to implement methods that identify and reduce these types of reporting errors in future reports. Other instances may occur because by law, growers are sometimes allowed to use stock they have on hand of a pesticide product that has been withdrawn from the market by the manufacturer or suspended or canceled by regulatory authorities.

Other reporting "errors" may occur when a pesticide is applied directly to a site to control a particular pest, but is not applied directly to the crop in the field. A grower may use an herbicide to treat weeds on the edge of a field, a fumigant on bare soil prior to planting, or a rodenticide to treat rodent burrows. For example, reporting the use of the herbicide glyphosate on tomatoes – when it was actually applied to bare soil prior to planting the tomatoes – could be perceived to be an error. Although technically incorrect, recording the data as if the application were made directly to the commodity provides valuable crop usage information for DPR's regulatory program.

ADJUVANTS

Data on spray adjuvants (including emulsifiers, wetting agents, foam suppressants, and other efficacy enhancers), not reported prior to full use reporting, are now included. Examples of these types of chemicals include the "alkyls" and some petroleum distillates. (Adjuvants are exempt from federal registration requirements, but must be registered as pesticides in California.)

ZERO POUNDS APPLIED

There are a few entries in this report in which the total pounds applied for certain active ingredients are displayed as zero. This is because the chemical (active ingredient) made up a very small percentage of the formulated product that was used. When these products are applied in extremely low quantities, the resulting value of the active ingredient is too low to register an amount.

ACRES TREATED

The summary information in this annual report cannot be used to determine the total number of acres of a crop. However, it can be used to determine the cumulative acres treated. The problem is that the same field can be treated more than once in a year with the same active ingredient. A similar problem occurs when the product used contains more than one active ingredient. (In any pesticide product, the active ingredient is the component that kills, or otherwise controls, target pests. A pesticide product is made up of one or more active ingredients, as well as one or more inert ingredients.) For example, if a 20-acre field is treated with a product that contains three different pesticide active ingredients, a use report is filed by the farmer correctly recording the application of a single pesticide product to 20 acres. However, in the summary tables, the three different active ingredients will each have recorded 20 acres treated. Adding these values results in a total of 60 acres as being treated instead of the 20 acres actually treated.

NUMBER OF APPLICATIONS

The values for number of applications include only production agricultural applications. Applicators are required to submit one of two basic types of use reports, a production agricultural report or a monthly summary report. The production agricultural report must include information for each application. The monthly summary report, for all uses other than production agriculture, includes only monthly totals for all applications of pesticide product, site or commodity, and applicator. The total number of applications in the monthly summary reports is not consistently given so they are no longer included in the totals. In the annual PUR reports before 1997, each monthly summary record was counted as one application.

In the annual summary report by commodity, the total number of applications given for each commodity may not equal the sum of all applications of each active ingredient on that commodity. As explained above, some pesticide products contain more than one active ingredient. If the number of applications were summed for each active ingredient in such a product, the total number of applications would be more than one, even though only one application of the product was made.

OUTLIERS

In calculating the total pounds of pesticides used in these tables, DPR excluded values for rates of use that were so large they were probably in error. Errors occur, for example, when those reporting pesticide use shift decimal points during data entry. DPR specialists spent more than a year developing, testing, and implementing software to detect probable errors (outliers). Pesticide rates were considered outliers if (1) they were higher than 200 pounds of active ingredient per acre (or greater than 1,000 pounds per acre for fumigants); (2) they were 50 times larger than the median rate for all uses with the same pesticide product, crop treated, unit treated, and record type (that is, production agricultural or all other uses); or (3) they were higher than a value determined by a neural network procedure that approximates what a group of 12 scientists believed were obvious outliers. Although these criteria removed less than one percent of the rate values in the PUR, some rates were so large that if included in the sums, they would have significantly affected total pounds applied of some pesticides. (The outliers are excluded from the total pounds in the summary reports but remain in the database.)

For the years 1991 to 1998, we determined whether or not a use rate was an outlier based on the distribution of rates for all applications on each crop and pesticide during the year of its application. Beginning with the 1999 PUR, we determined outliers in two stages. In the first stage, outliers were identified as data that came to DPR from the counties during the year but based on the distribution of rates from the previous year. This procedure allowed us to include outliers in the error reports sent back to the counties. In the second stage, the outlier program was run after all the current year data were received using the distribution of rates for that year. This procedure found additional outliers for new products and new uses. We currently use the two-stage procedure.

Beginning with the 1999 PUR data, values have been substituted where outliers were identified in the first phase. Nulls were substituted in numeric fields identified as outliers, and "???" were substituted in character fields identified as outliers. A median rate value for use on a commodity/product combination was substituted where a high rate per acre was the error. In addition, "Unknown" was substituted where the reported site code was invalid.

III. DATA SUMMARY

This report is a summary of data submitted to DPR. Total pounds may change slightly due to ongoing error correction. The revised numbers, when available, will more accurately reflect the total pounds applied.

PESTICIDE USE IN CALIFORNIA

In 2006, there were 189,576,938 pounds of pesticide active ingredients reported used in California. Annual use has varied from year to year since full use reporting was implemented in 1990. For example, reported pesticide use was 195 million pounds in 2005, 180 million pounds in 2004, 176 million pounds in 2003, and 170 million pounds in 2002.

Such variances are, and will continue to be, a normal occurrence. These fluctuations can be attributed to a variety of factors, including changes in planted acreage, crop plantings, pest pressures, and weather conditions. For example, extremely heavy rains result in excessive weeds, thus more pesticides may be used; drought conditions may result in fewer planted acres, thus less pesticide may be used.

As in previous years, the greatest pesticide use occurred in California's San Joaquin Valley (Table 1). Four counties in this region had the highest use: Fresno, Kern, Tulare, and San Joaquin.

Table 2 breaks down the pounds of pesticide use by general use categories: production agriculture, post-harvest commodity fumigation, structural pest control, landscape maintenance, and all others.

PESTICIDE SALES IN CALIFORNIA

Reported pesticide applications are only a portion of the pesticides sold each year. Typically, about two-thirds of the pesticide active ingredients sold in a given year are not subject to use reporting. Examples of non-reported active ingredients are chlorine (used primarily for municipal water treatment) and home-use pesticide products.

Sales data for 2006 are in the process of being reviewed and will be released in January 2008, so are not yet available for this report. There were 611 million pounds sold in 2005, 667 million pounds 2004, 661 million pounds in 2003, and 598 million pounds in 2002. Prior years data are posted on DPR's web site at www.cdpr.ca.gov under programs & services/mill assessment/report of pesticides sold in California.

In addition, it should be noted that the pounds of pesticides used and the number of applications are not necessarily accurate indicators of the extent of pesticide use or, conversely, the extent of use of reduced-risk pest management methods. For example, farmers may make a number of small-scale "spot" applications targeted at problem areas rather than one treatment of a large area. They may replace a more toxic pesticide used at one pound per acre with a less hazardous compound that must be applied at several pounds per acre. Either of these scenarios could increase the number of applications or amount of pounds used, respectively, without indicating an increased reliance on pesticides.

Table 1. Total pounds of pesticide active ingredients reported in each county and rank during 2005 and 2006.

	2005 Pesticide Use		2006 Pesticide Use	
County	**Pounds Applied**	**Rank**	**Pounds Applied**	**Rank**
Alameda	358,443	39	259,013	41
Alpine	195	58	64	58
Amador	150,079	43	92,679	45
Butte	3,146,974	18	3,445,277	13
Calaveras	39,379	48	49,205	50
Colusa	1,908,716	23	2,100,392	22
Contra Costa	883,597	31	2,218,546	21
Del Norte	363,736	38	307,890	40
El Dorado	130,004	45	113,738	43
Fresno	32,104,029	1	31,839,898	1
Glenn	2,212,665	22	2,476,359	20
Humboldt	57,682	47	70,769	47
Imperial	6,063,076	10	4,820,543	11
Inyo	6,211	54	16,839	52
Kern	28,184,187	2	30,104,107	2
Kings	6,316,230	9	6,190,881	9
Lake	757,574	35	525,120	36
Lassen	143,329	44	96,273	44
Los Angeles	3,259,438	16	2,641,098	17
Madera	11,236,974	5	9,737,491	5
Marin	58,474	46	58,341	49
Mariposa	5,971	55	7,445	54
Mendocino	1,213,175	28	1,094,588	30
Merced	7,114,980	7	7,329,441	7
Modoc	440,263	37	199,366	42
Mono	2,414	56	4,354	57
Monterey	8,674,310	6	8,209,012	6
Napa	2,338,209	21	1,505,776	26
Nevada	35,843	49	59,993	48
Orange	1,499,748	26	1,264,641	29
Placer	318,173	40	327,779	39
Plumas	7,352	53	7,047	55
Riverside	3,202,340	17	2,602,434	18
Sacramento	3,948,361	13	3,294,073	14
San Benito	764,545	34	751,580	34
San Bernardino	520,552	36	576,005	35
San Diego	1,670,746	25	2,013,072	24
San Francisco	23,510	51	88,393	46
San Joaquin	11,913,039	4	11,295,680	4
San Luis Obispo	2,509,106	20	2,086,420	23
San Mateo	275,592	41	365,491	38

Table 1 (continued) Total pounds of pesticide active ingredients reported in each county and rank during 2005 and 2006.

	2005 Pesticide Use		2006 Pesticide Use	
County	**Pounds Applied**	**Rank**	**Pounds Applied**	**Rank**
Santa Barbara	4,349,957	12	4,072,266	12
Santa Clara	951,455	30	1,388,327	28
Santa Cruz	1,684,259	24	1,722,369	25
Shasta	217,793	42	371,317	37
Sierra	2,360	57	6,661	56
Siskiyou	841,236	33	949,326	31
Solano	1,016,185	29	791,365	33
Sonoma	3,368,231	14	2,531,626	19
Stanislaus	6,020,445	11	5,590,622	10
Sutter	3,309,522	15	3,156,692	15
Tehama	865,830	32	823,095	32
Trinity	11,972	52	10,621	53
Tulare	17,535,850	3	16,985,444	3
Tuolumne	30,034	50	28,397	51
Ventura	6,869,950	8	6,862,378	8
Yolo	2,829,026	19	2,648,416	16
Yuba	1,499,734	27	1,390,902	27
Total	**195,263,057**		**189,576,938**	

Table 2. Pounds of pesticide active ingredients, 1996 – 2006, by general use categories.

Year	Production Agriculture	Postharvest Fumigation	Structural Pest Control	Landscape Maintenance	All Others*	Total Pounds
1996	183,222,942	2,358,093	4,672,859	1,251,975	7,608,989	199,114,858
1997	192,577,086	1,720,696	5,185,923	1,225,365	6,972,132	207,681,203
1998	200,917,991	1,707,519	5,930,239	1,396,233	6,831,459	216,783,441
1999	186,545,985	2,021,893	5,673,318	1,398,398	7,863,022	203,502,616
2000	173,139,552	2,117,018	5,184,686	1,402,827	6,783,178	188,627,261
2001	139,240,354	1,438,309	4,921,897	1,282,288	6,264,659	153,147,508
2002	154,653,274	1,841,493	5,469,435	1,440,557	6,693,912	170,098,670
2003	160,050,159	1,823,261	5,175,354	1,961,065	7,413,865	176,423,703
2004	164,847,199	1,901,504	5,129,734	1,600,583	6,982,124	180,461,145
2005	177,049,046	2,329,136	5,624,324	1,761,405	8,499,147	195,263,057
2006	167,004,409	2,176,666	5,318,467	2,258,530	12,818,866	189,576,938

* This category includes pesticide applications reported in the following general categories: pest control on rights-of-way; public health which includes mosquito abatement work; vertebrate pest control; fumigation of nonfood and nonfeed materials such as lumber, furniture, etc.; pesticide used in research; and regulatory pest control used in ongoing control and/eradication of pest infestations.

IV. TRENDS IN USE IN CERTAIN PESTICIDE CATEGORIES

Reported pesticide use in California in 2006 totaled 190 million pounds, a decrease of nearly 6 million pounds from 2005. Production agriculture, the major category of use subject to reporting requirements, accounted for most of the overall decrease in use. Applications for production agriculture decreased by 10 million pounds. However, there was an increase of 0.5 million pounds in landscape maintenance, 2.2 million pound increase in public health (mostly mosquito control), and 2.1 million pound increase in fumigation of nonfood and nonfeed materials such as lumber, furniture, etc.

The active ingredients (AI) with the largest uses by pounds in 2006 were sulfur, petroleum and mineral oils, metam-sodium, copper compounds, and 1,3-dichloropropene (1,3-D). Most of the decline in pesticide use was from sulfur, which decreased by 15 million pounds (-25 percent). However, sulfur was still the most highly used non-adjuvant pesticide in 2006, both in pounds applied and acres treated. By pounds, sulfur accounted for 24 percent of all reported pesticide use. Sulfur is a natural fungicide favored by both conventional and organic farmers. Other pesticides that declined in use include metam-sodium (1.6 million pound decrease, -13 percent), copper (310,000 pound decrease, -3 percent), and 1,3-D (763,000 pound decrease, -8 percent).

In contrast, some pesticide use increased. Non-adjuvant pesticides with the greatest increase in pounds applied were oil (6.4 million pound increase, 22 percent) and metam-potassium (1.2 million pound increase, 61 percent).

Major crops or sites that showed an overall increase in pesticide pounds applied from 2005 to 2006 included almonds (4.1 million pounds increase), public health (2.2 million pounds), unspecified fumigations (2.1 million pounds), pistachio (1.8 million pounds), and processing tomatoes (960,000 pounds). Major crops or sites with decreased pounds applied included wine grapes (8.5 million pounds decrease), raisin and table grapes (5.5 million pounds), cotton (1.5 million pounds), carrots (1.3 million pounds), and sugarbeets (630,000 pounds).

DPR data analyses have shown that pesticide use varies from year to year depending upon pest problems, weather, acreage and types of crops planted, economics, and other factors. Of the different AI types, insecticides had the greatest increase by pounds. But the vast majority of this increase was from use of oils. By acres treated, insecticide use increased only slightly. Herbicide use had the next largest increase by pounds and the largest increase by acres treated. Fungicide use (other than sulfur) decreased slightly by pounds but increased by acres treated. Similarly, pounds of fumigants decreased but acres treated with fumigants increased.

Pesticide use is reported as the number of pounds of AI and the total number of acres treated. The data for pounds include both agricultural and nonagricultural applications; the data for acres treated are primarily agricultural applications. The number of acres treated means the cumulative number of acres treated; the acres treated in each application are summed even when the same field is sprayed more than once in a year.

(For example, if one acre is treated three times in a season with an individual AI, it is counted as three acres treated in the tables and graphs in Sections IV and V of this report.)

To provide an overview, pesticide use is summarized for eight different pesticide categories from 1996 to 2006 (Tables 3–10) and from 1994 to 2006 (Figures 1–8). These categories classify pesticides according to certain characteristics such as reproductive toxins, carcinogens, or reduced-risk characteristics. Use of most pesticide categories decreased from 2005 to 2006, except for increases in pounds of groundwater contaminants and acres treated with fumigants. Some of the major changes from 2005 to 2006 include:

- Chemicals classified as reproductive toxins decreased in pounds applied from 2005 to 2006 (down 2.0 million pounds or -9.3 percent) and decreased in acres treated (down 350,000 acres or -17 percent). The decrease in pounds was mostly from decreases in the fumigant metam-sodium and the decrease in acres was mostly from decreases in the miticide propargite. By acres treated, use of metam-sodium actually increased. The pesticides in this category are ones listed on the State's Proposition 65 list of chemicals "known to cause reproductive toxicity".

- Use of chemicals classified as carcinogens decreased from 2005 to 2006 (down 1.8 million pounds or -6.5 percent and down 288,000 acres or -7.2 percent). The decrease in pounds was mainly due to a decrease in use of the fumigants metam-sodium and 1,3-dichloropropene and the miticide propargite. The decrease in acres treated was mostly from decrease in propargite. The pesticides in this category are ones listed by U.S. EPA as B2 carcinogens or on the State's Proposition 65 list of chemicals "known to cause cancer".

- Use of insecticide organophosphate and carbamate chemicals, which include compounds of high regulatory concern, continued to decline as they have for nearly every year since 1995. Pounds decreased by 635,000 (-8.5 percent) and acres treated decreased by 668,000 (-10 percent). The AIs with the greatest decreases in pounds were thiobencarb, chlorpyrifos, and EPTC; the AIs with the greatest decreases in acres treated were chlorpyrifos, methomyl, and dimethoate. Use of most OPs and carbamates decreased; however, use of bensulide and phosmet increased.

- Pounds of all chemicals categorized as ground water contaminants increased by 124,000 pounds (7.1 percent), but acres treated remained about the same. Pounds of each groundwater contaminant AI increased. However, acres treated with atrazine, bentazon, bromacil, and diuron decreased while acres treated with simazine, norflurazon, and prometon increased.

- Chemicals categorized as toxic air contaminants, another group of pesticides of regulatory concern, decreased from 2005 to 2006. Use decreased by 1.0 million pounds (-2.5 percent) and by 106,000 acres treated (-2.8 percent). By pounds most toxic air contaminants are fumigants, which are used at high rates, and use of most fumigants, except potassium n-methyldithiocarbamate (metam potassium), decreased. By acres treated, the main decreasing AIs were the fungicide maneb, the herbicide 2,4-D, and the defoliant S,S,S-tributyl phosphorotrithioate.

- Fumigant chemicals decreased in pounds applied from 2005 to 2006 (down 1.7 million pounds or -4.3 percent) but increased in cumulative acres treated (up 28,000 acres or 8.4 percent). Pounds of 4 of the 8 major fumigants decreased (metam-sodium, 1,3-D, sulfuryl fluoride, and sodium tetrathiocarbonate) and pounds of 4 fumigants increased (methyl bromide, chloropicrin, metam-potassium, and aluminum phosphide). By acres treated, use of all major fumigants increased except for 1,3-D and sodium tetrathiocarbonate.

- Use of oil pesticides increased by 6.4 million pounds (22 percent) and 472,000 acres (17 percent). Oils include many different chemicals, but the category used here includes only ones derived from petroleum distillation. Some of these oils may be on the State's Proposition 65 list of chemicals "known to cause cancer" but most serve as alternatives to high-toxicity pesticides. Oils are also used by organic growers.

- Biopesticide use decreased by 178,000 pounds (-17 percent) and by 145,000 acres treated (-5.8 percent) from 2005 to 2006. The largest decrease, both in pounds and acres treated, was in use of potassium bicarbonate. If that AI were excluded, pounds of biopesticides would have increased. Other biopesticides with decreasing pounds were liquefied nitrogen and neem oil. AIs with the greatest increase in pounds were soybean oil and *Bacillus thuringiensis*. By acres treated, the AI with second greatest decrease was *Bacillus thuringiensis* then gamma aminobutyric acid/glutamic acid. Biopesticides include microorganisms and naturally occurring compounds, or compounds essentially identical to naturally occurring compounds that are not toxic to the target pest (such as pheromones).

Since 1993, the reported pounds of pesticides applied have fluctuated from year to year. An increase or decrease in use from one year to the next or in the span of a few years does not necessarily indicate a general trend in use; it simply may reflect normal variations. Short periods of time (three to five years) may suggest trends, such as the increased pesticide use from 2001 to 2005 or the decreased use from 1998 to 2001. However, regression analyses on use from 1993 to 2006 do not indicate a significant trend of either increase or decrease in pesticide use.

To improve data quality when calculating the total pounds of pesticides, DPR excluded values that were so large they were probably in error. The procedure to exclude probable errors involved the development of complex error-checking algorithms, a data improvement process that is ongoing.

Over-reporting errors have a much greater impact on the numerical accuracy of the database than under-reporting errors. For example, if a field is treated with 100 pounds of a pesticide AI and the application is erroneously recorded as 100,000 pounds (a decimal point shift of three places to the right), an error of 99,900 pounds is introduced into the database. If the same degree of error is made in shifting the decimal point to the left, the application is recorded as 0.1 pound, and an error of 99.9 pounds is entered into the database

The summaries detailed in the following use categories are not intended to serve as indicators of pesticide risks to the public or the environment. Rather, the data supports DPR regulatory functions to enhance public safety and environmental protection. (See “How Pesticide Data are Used” on page 2.)

USE TRENDS OF PESTICIDES ON THE STATE'S PROPOSITION 65 LIST OF CHEMICALS THAT ARE "KNOWN TO CAUSE REPRODUCTIVE TOXICITY"

Table 3A. *The reported pounds of pesticides used which are on the State's Proposition 65 list of chemicals that are "known to cause reproductive toxicity." Use includes both agricultural and reportable non-agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1080	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2,4-DB ACID	0	1,697	6,932	12,397	11,453	16,954	9,393	6,408	4,789	7,655	3,132
AMITRAZ	55,459	66,439	13,563	7,558	8,087	263	154	115	0	0	12
ARSENIC PENTOXIDE	205,089	64,372	50,899	245,238	91,267	259,400	194,650	129,889	12,705	180,505	474,517
ARSENIC TRIOXIDE	<1	<1	1	1	<1	<1	<1	<1	<1	<1	<1
BENOMYL	148,517	114,406	227,715	133,109	118,425	76,713	29,005	7,105	2,210	948	898
BROMACIL, LITHIUM SALT	17,381	9,141	4,686	4,162	4,478	3,217	4,016	3,025	1,801	1,059	2,529
BROMOXYNIL OCTANOATE	148,480	115,368	120,877	120,338	115,662	78,454	72,900	75,345	50,223	34,463	37,250
CHLORSULFURON	1,623	2,218	3,102	1,541	2,705	1,312	2,190	8,684	9,967	3,242	3,467
CYANAZINE	566,632	471,904	277,313	180,487	49,864	17,131	7,178	37	8	7	0
CYCLOATE	44,628	55,458	62,753	49,096	37,416	31,785	34,387	30,012	43,209	39,709	41,298
DICLOFOP-METHYL	79,874	41,130	24,783	18,710	21,696	11,765	5,058	9,309	5,988	1,413	174
EPTC	703,996	579,245	393,031	448,883	323,624	276,724	253,634	141,552	182,532	181,790	106,125
ETHYLENE GLYCOL MONOMETHYL ETHER	10,292	8,357	4,371	1,993	2,024	2,248	3,009	1,782	2,729	2,476	4,186
ETHYLENE OXIDE	0	0	31	2	6	3	0	0	0	0	0
FENOXAPROP-ETHYL	3,974	3,895	1,504	2,048	979	366	106	53	64	161	196
FLUAZIFOP-BUTYL	823	2,028	1,211	516	205	149	166	31	34	41	26
HYDRAMETHYLNON	1,741	5,456	3,183	2,267	2,501	2,381	2,741	2,029	1,896	1,380	1,227
LINURON	84,335	84,621	82,170	78,046	65,526	58,173	62,006	60,117	69,289	72,011	58,608
METAM-SODIUM	15,501,650	15,401,098	14,120,788	17,273,325	13,143,954	12,460,997	15,116,768	14,822,689	14,698,228	12,991,279	11,362,375
METHYL BROMIDE	16,124,148	16,711,308	14,314,983	15,355,845	10,900,339	6,625,336	7,008,644	7,289,389	7,105,612	6,504,576	6,518,683
METIRAM	0	0	<1	0	0	2	0	1	5	0	<1
MYCLOBUTANIL	89,087	94,376	129,775	94,626	95,454	83,668	76,635	83,426	70,908	80,143	111,145
NABAM	0	0	50	2	1	8	0	0	10,693	30,440	22,306
NICOTINE	312	258	83	93	21	17	2	2	4	2	<1
NITRAPYRIN	114	49	410	150	192	16	89	117	12	171	0
OXADIAZON	25,281	23,197	22,389	19,253	18,276	15,905	16,692	12,566	12,979	13,762	11,691
OXYDEMETON-METHYL	107,410	117,159	90,790	122,912	110,754	99,756	96,363	93,774	102,563	121,910	119,713
OXYTHIOQUINOX	6,204	2,709	1,576	2,705	411	145	117	34	27	8	90

***Table 3A** (cont.). The reported pounds of pesticides used which are on the State's Proposition 65 list of chemicals that are "known to cause reproductive toxicity."*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
POTASSIUM DIMETHYL DITHIO CARBAMATE	0	15	24,795	0	0	0	23	28	293	0	0
PROPARGITE	1,787,942	1,853,332	1,390,366	1,502,732	1,331,979	1,159,792	972,382	1,054,691	1,010,874	995,038	569,971
RESMETHRIN	663	687	796	695	676	542	661	1,561	245	958	656
SODIUM DIMETHYL DITHIO CARBAMATE	0	0	8,279	355	1,315	173	0	0	10,693	30,440	22,306
SODIUM TETRATHIOCARBONATE	543,229	799,092	900,991	688,701	596,028	375,487	352,342	212,308	259,542	330,886	171,194
STREPTOMYCIN SULFATE	9,494	9,626	14,950	9,405	10,455	7,554	5,989	8,463	4,702	7,790	7,582
TAU-FLUVALINATE	4,139	3,065	2,839	3,315	2,209	2,207	2,117	1,632	1,581	1,162	1,080
THIOPHANATE-METHYL	122,985	88,771	65,158	75,938	68,075	66,985	71,486	125,388	119,063	158,594	112,582
TRIADIMEFON	17,370	12,204	13,029	4,844	3,130	2,764	1,736	1,773	2,111	1,918	1,114
TRIBUTYLTIN METHACRYLATE	185	60	113	270	107	106	39	0	0	0	0
TRIFORINE	24,896	6,604	2,759	519	365	99	72	88	295	137	452
VINCLOZOLIN	60,312	46,929	54,719	52,731	35,728	32,208	22,170	18,581	14,863	3,574	402
WARFARIN	1	1	1	1	1	1	1	3	3	1	9
Grand Total	36,498,267	36,796,276	32,437,763	36,514,809	27,175,390	21,770,803	24,424,918	24,202,003	23,812,739	21,799,650	19,766,996

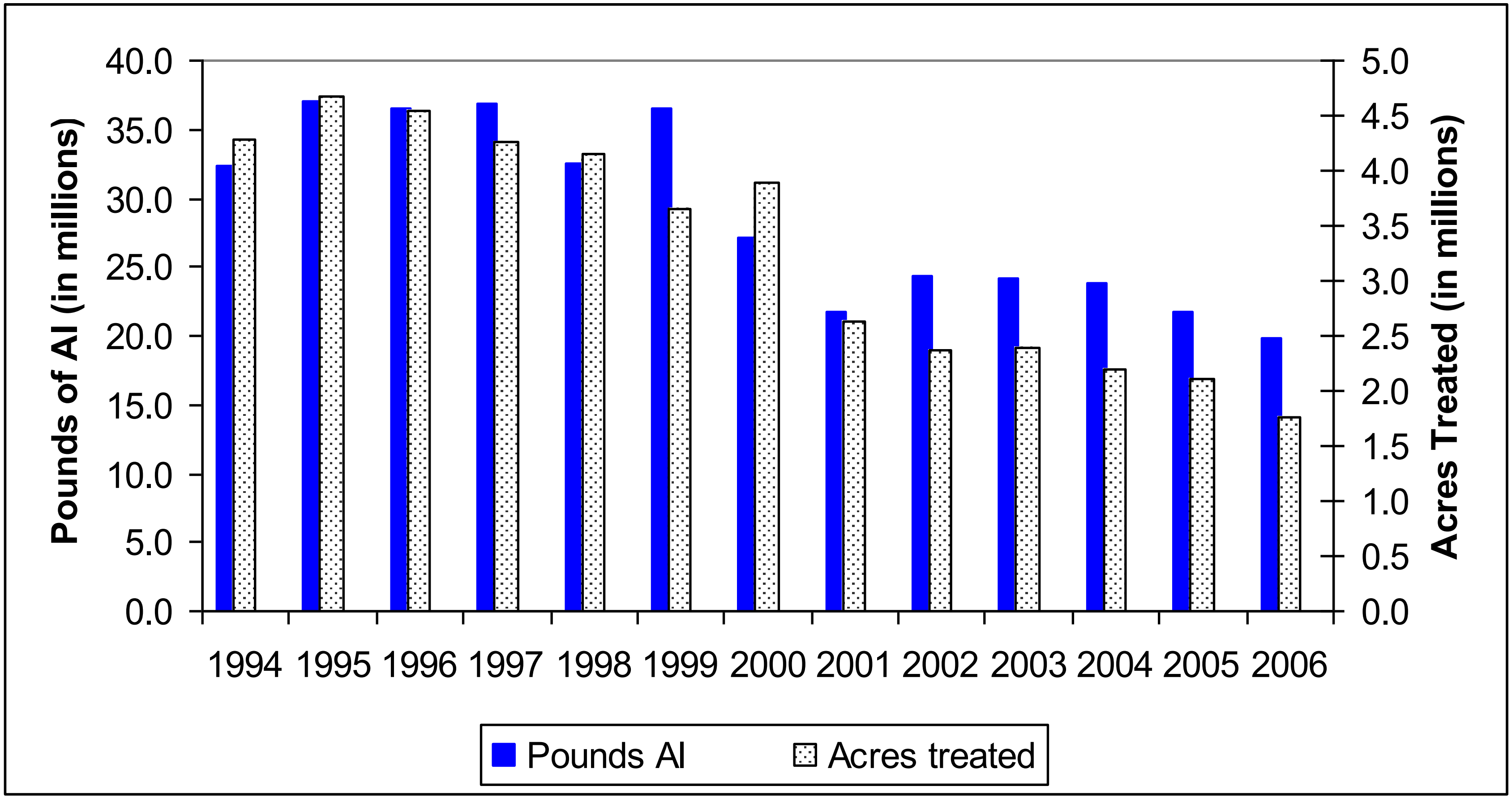
Table 3B. *The reported cumulative acres treated with pesticides that are on the State's Proposition 65 list of chemicals "known to cause reproductive toxicity." Use includes primarily agricultural applications. The grand total for acres treated may be less than the sum of acres treated for all active ingredients because some products contain more than one active ingredient. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*

AI	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
1080	25	0	0	0	42	30	301	50	0	41	22
2,4-DB ACID	0	2,599	12,167	20,063	19,496	25,843	15,584	10,384	8,873	11,777	5,073
AMITRAZ	129,857	161,651	28,945	14,684	16,011	1,269	605	379	0	0	0
ARSENIC PENTOXIDE	0	0	0	0	709,893	56	0	0	48	0	0
ARSENIC TRIOXIDE	0	0	0	0	0	0	1	<1	0	1	0
BENOMYL	310,563	245,687	434,729	242,796	217,613	135,929	47,879	13,340	3,983	2,789	1,674
BROMACIL, LITHIUM SALT	0	0	40	40	30	0	0	0	0	0	0
BROMOXYNIL OCTANOATE	277,062	224,250	240,997	257,417	313,362	251,527	239,110	218,281	162,572	120,175	133,824
CHLORSULFURON	54,360	27,628	39,873	30,691	34,538	29,079	18,836	26,280	25,745	21,903	26,345
CYANAZINE	325,627	288,087	185,082	129,547	56,059	19,708	8,763	25	5	8	0
CYCLOATE	19,597	25,986	29,761	24,555	18,495	15,918	17,228	16,713	20,699	19,319	19,789
DICLOFOP-METHYL	89,276	47,217	28,296	21,442	24,470	14,198	6,259	11,257	7,391	729	186
EPTC	232,820	208,093	141,511	148,685	107,758	99,953	94,240	56,639	64,194	64,230	38,073
ETHYLENE GLYCOL MONOMETHYL ETHER	130,064	96,353	55,099	26,451	28,880	33,256	36,299	24,249	25,075	16,655	25,655
ETHYLENE OXIDE	0	0	194	31	41	0	0	0	0	0	0
FENOXAPROP-ETHYL	25,540	24,439	10,480	13,824	8,847	3,820	1,327	839	1,681	3,247	3,418
FLUAZIFOP-BUTYL	1,513	1,537	3,908	806	137	144	98	0	<1	3	0
HYDRAMETHYLNON	36	35	289	1,615	3,658	2,762	2,148	2,057	1,314	1,990	649
LINURON	104,772	110,067	112,122	111,009	86,376	81,801	86,942	85,412	95,565	101,920	80,836
METAM-SODIUM	215,899	198,395	154,309	186,300	146,847	125,263	141,415	142,406	128,427	97,562	101,880
METHYL BROMIDE	96,507	113,195	90,107	102,115	75,832	60,892	53,140	55,254	57,385	45,700	50,608
METIRAM	0	0	<1	0	0	7	0	<1	2	0	1
MYCLOBUTANIL	814,268	866,360	1,225,372	887,981	843,208	737,643	704,827	742,139	656,020	699,773	643,306
NABAM	0	0	55	20	0	60	0	0	0	0	0
NICOTINE	167	128	57	36	14	31	1	0	2	3	0
NITRAPYRIN	147	105	851	329	276	0	169	258	42	143	0
OXADIAZON	2,213	1,833	1,983	3,408	2,660	2,637	1,838	1,904	3,120	2,209	2,141
OXYDEMETON-METHYL	220,824	244,056	186,964	253,281	225,990	200,171	193,453	189,015	206,751	173,480	164,094
OXYTHIOQUINOX	8,768	5,896	5,306	2,152	817	250	182	71	137	14	10

***Table 3B** (cont.)**.** The reported cumulative acres treated with pesticides that are on the State's Proposition 65 list of chemicals "known to cause reproductive toxicity."*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
POTASSIUM DIMETHYL DITHIO CARBAMATE	0	0	0	0	0	0	2	6	0	0	0
PROPARGITE	980,963	989,265	756,098	795,410	704,529	606,737	524,439	558,056	543,728	519,412	286,592
RESMETHRIN	144	182	160	84,044	33	35	32	66	209	1	1
SODIUM DIMETHYL DITHIO CARBAMATE	0	0	253	20	0	60	0	0	0	0	0
SODIUM TETRATHIOCARBONATE	27,736	35,473	34,488	24,947	21,002	13,574	11,559	6,832	8,497	7,977	6,170
STREPTOMYCIN SULFATE	84,999	89,336	147,617	76,414	97,024	62,184	52,180	63,445	37,461	52,061	57,294
TAU-FLUVALINATE	22,156	18,387	14,075	17,343	10,105	10,893	9,046	7,939	7,313	5,879	5,434
THIOPHANATE-METHYL	128,267	89,556	64,098	81,428	68,984	53,990	64,340	121,339	112,501	135,296	108,358
TRIADIMEFON	100,142	59,229	79,968	25,719	12,130	9,501	6,747	7,625	6,752	8,585	2,945
TRIBUTYLTIN METHACRYLATE	1	<1	1	1	1	<1	0	0	0	0	0
TRIFORINE	53,589	17,455	6,352	1,279	751	244	203	196	61	181	102
VINCLOZOLIN	82,968	67,373	69,067	63,931	43,702	38,570	27,795	21,692	18,207	3,899	440
WARFARIN	541	382	310	129	556	101	449	632	1,504	430	473
Grand Total	4,541,413	4,260,237	4,160,984	3,649,944	3,900,166	2,638,136	2,367,437	2,384,780	2,205,264	2,117,391	1,765,395

Figure 1. *Use trends of pesticides that are on the State's Proposition 65 list of chemicals that are "known to cause reproductive toxicity." Reported pounds of active ingredient (AI) applied include both agricultural and non-agricultural applications. The reported cumulative acres treated include primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*



USE TRENDS OF PESTICIDES LISTED BY U.S. EPA AS CARCINOGENS OR BY THE STATE AS "KNOWN TO CAUSE CANCER"

Table 4A. *The reported pounds of pesticides used that are listed by U.S. EPA as B2 carcinogens or that are on the State's Proposition 65 list of chemicals "known to cause cancer." Use includes both agricultural and reportable non-agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*

AI	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
1,3-DICHLOROPROPENE	1,956,846	2,457,690	3,011,057	3,321,147	4,465,422	4,141,173	5,413,214	7,003,782	8,945,145	9,355,308	8,591,883
ACIFLUORFEN, SODIUM SALT	11	29	<1	10	<1	1	3	<1	18	<1	0
ALACHLOR	45,733	51,259	46,264	29,789	36,468	29,057	28,666	24,913	27,229	21,052	13,740
ARSENIC ACID	53,777	59,835	52,558	48,029	11,906	12,023	4,976	318	223	68	3
ARSENIC PENTOXIDE	205,089	64,372	50,899	245,238	91,267	259,400	194,650	129,889	12,705	180,505	474,517
ARSENIC TRIOXIDE	<1	<1	1	1	<1	<1	<1	<1	<1	<1	<1
CACODYLIC ACID	31,417	26,060	17,381	15,930	16,091	3,981	1,792	207	115	131	20
CAPTAN	919,016	801,899	1,542,556	966,020	643,826	399,146	395,575	498,445	370,418	468,413	508,883
CHLOROTHALONIL	1,053,361	779,390	1,182,963	755,314	684,213	521,581	601,060	713,226	571,622	765,150	821,775
CHROMIC ACID	286,521	89,931	71,109	343,543	128,642	363,225	272,300	182,022	17,753	252,176	662,927
CREOSOTE	491,044	259,086	1,752	4,873	9,879	4,700	9,018	3,385	1,048	<1	0
DAMINOZIDE	7,944	11,028	10,406	9,411	9,079	11,309	10,077	10,111	9,586	8,793	7,777
DDVP	13,097	13,636	13,998	12,325	12,680	12,833	8,477	3,446	3,807	4,914	6,527
DIOCTYL PHTHALATE	1	1	318	1,076	595	640	604	521	397	583	1,016
DIPROPYL ISOCINCHOMERONATE	3	<1	<1	0	<1	1	0	1	<1	<1	52
DIURON	1,266,315	1,228,277	1,504,731	1,188,553	1,351,232	1,105,536	1,302,603	1,344,596	1,398,123	955,983	1,045,525
ETHOPROP	27,955	23,842	27,949	26,196	16,119	19,046	16,531	28,419	23,130	18,924	24,485
ETHYLENE OXIDE	0	0	31	2	6	3	0	0	0	0	0
FENOXYCARB	712	65	552	71	89	86	53	32	34	30	8
FOLPET	<1	<1	<1	<1	<1	0	2	<1	0	<1	<1
FORMALDEHYDE	334,548	416,823	349,785	111,714	55,300	28,612	14,035	18,690	111,151	48,968	73,392
IPRODIONE	521,223	424,555	572,389	411,488	421,582	304,716	247,090	287,850	261,218	284,984	301,231
LINDANE	4,668	5,511	6,330	4,842	4,746	2,388	1,630	908	775	40	378
MANCOZEB	567,866	528,159	988,344	630,987	610,903	428,738	396,912	535,600	379,539	642,444	660,471
MANEB	1,328,368	1,082,071	1,596,466	1,045,567	1,202,545	816,548	851,819	1,026,804	954,085	1,122,684	1,175,427
METAM-SODIUM	15,501,650	15,401,098	14,120,788	17,273,325	13,143,954	12,460,997	15,116,768	14,822,689	14,698,228	12,991,279	11,362,375
METIRAM	0	0	<1	0	0	2	0	1	5	0	<1
ORTHO-PHENYLPHENOL	10,349	15,962	11,248	8,600	8,516	4,016	15,129	4,936	21,740	9,454	2,073
ORTHO-PHENYLPHENOL, SODIUM SALT	37,508	26,192	32,972	29,019	31,681	27,071	25,029	20,536	5,898	4,979	6,826

Table 4A *(cont.)****.*** *The reported pounds of pesticides used that are listed by U.S. EPA as B2 carcinogens or that are on the State's Proposition 65 list of chemicals "known to cause cancer."*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
OXADIAZON	25,281	23,197	22,389	19,253	18,276	15,905	16,692	12,566	12,979	13,762	11,691
OXYTHIOQUINOX	6,204	2,709	1,576	2,705	411	145	117	34	27	8	90
PARA-DICHLOROBENZENE	4	3	219	86	4	11	1	25	10	139	0
PENTACHLOROPHENOL	3	8	33	92	466	14	17	3	2	3	27
POTASSIUM DICHROMATE	41	50	103	319	554	1	<1	11	71	40	0
PROPARGITE	1,787,942	1,853,332	1,390,366	1,502,732	1,331,979	1,159,792	972,382	1,054,691	1,010,874	995,038	569,971
PROPOXUR	1,341	1,760	1,604	1,735	2,145	611	450	306	223	220	210
PROPYLENE OXIDE	224,495	198,559	198,595	172,556	118,381	99,727	99,674	99,396	151,484	147,324	130,016
PROPYZAMIDE	108,929	101,267	106,368	104,484	103,702	108,987	107,663	104,222	118,952	116,132	120,804
SODIUM DICHROMATE	180,478	182,185	122,647	32,699	122	329	633	217	0	0	0
TERRAZOLE	37	38	21	8	2	25	6	575	1,099	750	946
THIODICARB	122,927	156,092	114,785	60,453	36,704	9,042	5,195	8,392	2,249	1,872	894
VINCLOZOLIN	60,312	46,929	54,719	52,731	35,728	32,208	22,170	18,581	14,863	3,574	402
Grand Total	27,183,017	26,332,901	27,226,274	28,432,921	24,605,217	22,383,625	26,153,010	27,960,348	29,126,826	28,415,727	26,576,364

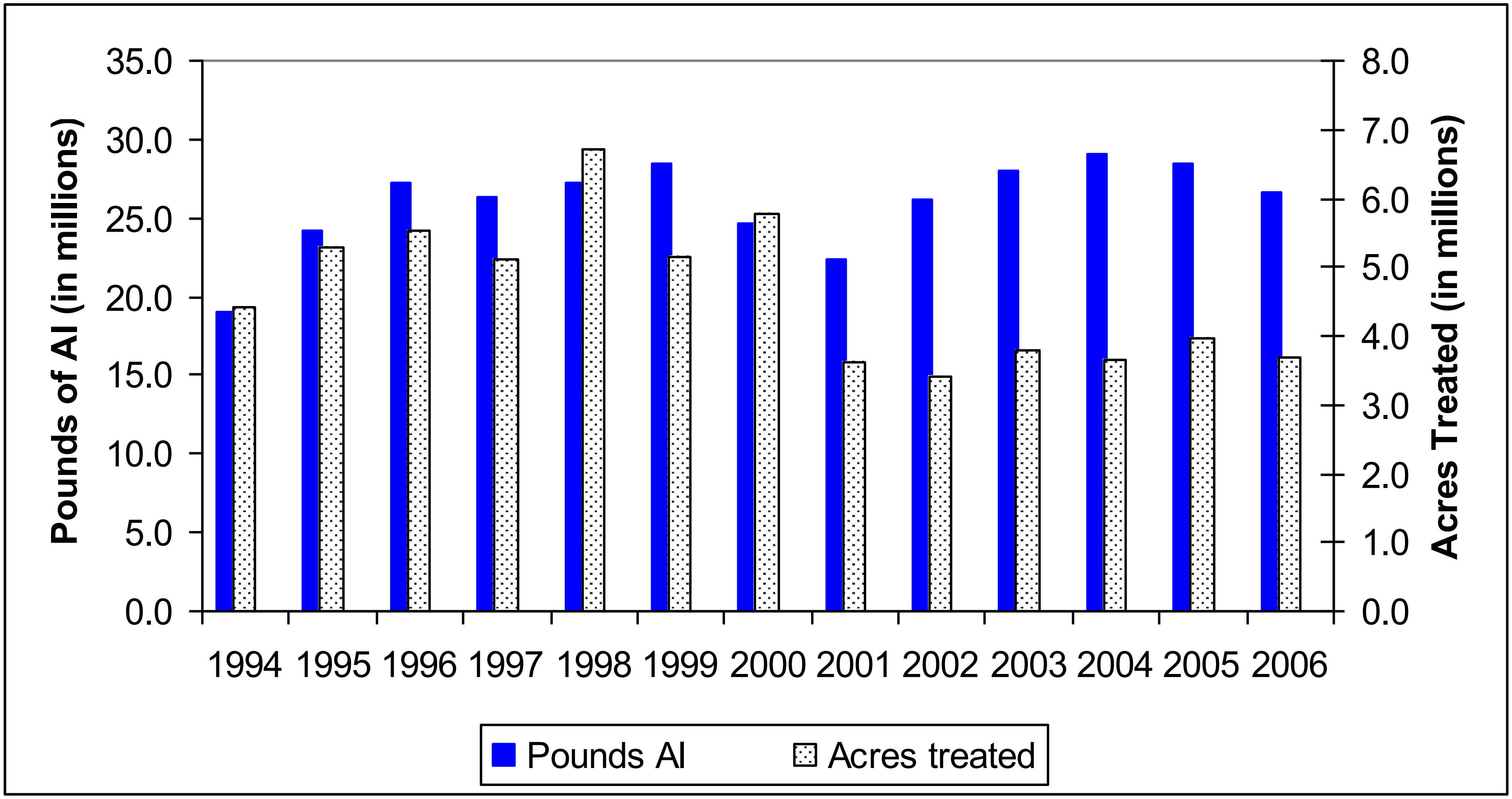
Table 4B. *The reported cumulative acres treated with pesticides listed by U.S. EPA as B2 carcinogens or on the State's Proposition 65 list of chemicals "known to cause cancer." Use includes primarily agricultural applications. The grand total for acres treated is less than the sum of acres treated for all active ingredients because some products contain more than one active ingredient. Data are from the Department of Pesticide Regulation's Pesticide Use.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1,3-DICHLOROPROPENE	17,223	22,193	27,059	29,430	33,244	30,817	42,172	48,944	56,618	51,486	48,870
ACIFLUORFEN, SODIUM SALT	<1	0	0	0	0	0	11	0	3	0	0
ALACHLOR	18,181	19,059	16,430	11,008	13,302	11,453	14,467	10,004	9,888	7,935	5,192
ARSENIC ACID	0	0	0	0	0	0	0	0	0	0	0
ARSENIC PENTOXIDE	0	0	0	0	709,893	56	0	0	48	0	0
ARSENIC TRIOXIDE	0	0	0	0	0	0	1	<1	0	1	0
CACODYLIC ACID	251,414	192,816	126,923	111,607	117,656	31,283	12,648	757	100	82	121
CAPTAN	381,989	347,631	602,684	404,731	309,989	215,969	215,412	271,140	211,028	252,040	262,912
CHLOROTHALONIL	674,086	492,219	796,672	456,007	430,128	312,726	347,736	361,203	331,710	418,600	436,703
CHROMIC ACID	0	0	0	0	709,893	56	0	0	0	0	0
CREOSOTE	0	0	126	11	45	1	0	0	0	0	0
DAMINOZIDE	2,653	3,512	4,510	3,107	3,416	6,146	5,417	3,103	2,667	2,376	2,211
DDVP	1,499	2,596	3,692	2,180	2,336	3,954	4,327	2,576	1,637	7,445	1,526
DIOCTYL PHTHALATE	55	14	6,250	24,270	11,195	10,776	6,649	3,880	6,249	13,858	13,231
DIPROPYL ISOCINCHOMERONATE	0	0	0	0	5	0	0	0	0	1	18
DIURON	685,352	819,993	865,246	849,482	865,974	788,559	796,904	843,897	971,628	894,073	879,497
ETHOPROP	3,139	3,213	3,784	3,610	3,477	3,542	4,152	6,078	4,917	4,296	4,815
ETHYLENE OXIDE	0	0	194	31	41	0	0	0	0	0	0
FENOXYCARB	5	<1	210	3,707	3,405	3,241	1,242	812	1,011	1,398	828
FOLPET	1	2	0	0	0	0	0	0	0	0	0
FORMALDEHYDE	234	12	126	123	47	53	33	18	23	2	265
IPRODIONE	804,311	666,336	1,348,382	933,982	1,194,578	501,033	364,809	445,511	409,250	450,354	467,045
LINDANE	25,352	36,573	32,650	20,930	14,640	13,832	8,010	8,828	9,437	557	9
MANCOZEB	351,801	284,136	683,756	387,300	363,305	228,275	197,196	276,093	194,219	370,266	348,061
MANEB	731,079	624,121	941,308	629,897	611,756	535,105	554,904	660,011	601,360	730,254	675,530
METAM-SODIUM	215,899	198,395	154,309	186,300	146,847	125,263	141,415	142,406	128,427	97,562	101,880
METIRAM	0	0	<1	0	0	7	0	<1	2	0	1

Table 4B *(cont.)**.** The reported cumulative acres treated with pesticides listed by U.S. EPA as B2 carcinogens or on the State's Proposition 65 list of chemicals "known to cause cancer."*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
ORTHO-PHENYLPHENOL	67	75	645	583	321	59	82	726	272	429	63
ORTHO-PHENYLPHENOL, SODIUM SALT	652	0	20	6,234	18,599	60	40	9	0	0	0
OXADIAZON	2,213	1,833	1,983	3,408	2,660	2,637	1,838	1,904	3,120	2,209	2,141
OXYTHIOQUINOX	8,768	5,896	5,306	2,152	817	250	182	71	137	14	10
PARA-DICHLOROBENZENE	0	0	10	0	0	0	0	0	0	0	0
PENTACHLOROPHENOL	15	4	190	0	59	38	0	0	20	3	1
POTASSIUM DICHROMATE	0	0	40	71	40	0	20	0	0	10	0
PROPARGITE	980,963	989,265	756,098	795,410	704,529	606,737	524,439	558,056	543,728	519,412	286,592
PROPOXUR	9	73	45	39	26	4	23	1	7	8	<1
PROPYLENE OXIDE	0	<1	0	573	0	0	<1	0	22	185	20
PROPYZAMIDE	150,791	140,791	144,864	142,194	137,337	145,325	140,803	132,819	147,631	148,376	152,835
SODIUM DICHROMATE	0	0	0	0	0	0	0	0	0	0	0
TERRAZOLE	43	40	78	44	126	132	47	266	253	495	884
THIODICARB	176,788	223,154	155,440	83,796	50,604	13,382	8,258	12,113	3,684	2,965	1,293
VINCLOZOLIN	82,968	67,373	69,067	63,931	43,702	38,570	27,795	21,692	18,207	3,899	440
Grand Total	5,567,551	5,141,327	6,748,098	5,156,146	6,503,992	3,629,339	3,421,030	3,812,918	3,657,305	3,980,588	3,692,995

Figure 2. *Use trends of pesticides that are listed by U.S. EPA as B2 carcinogens or that are on the State's Proposition 65 list of chemicals "known to cause cancer." Reported pounds of active ingredient (AI) applied include both agricultural and reportable non-agricultural applications. The reported cumulative acres treated include primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*



USE TRENDS OF CHOLINESTERASE-INHIBITING PESTICIDES

Table 5A. *The reported pounds of cholinesterase-inhibiting pesticides used. These pesticides are the currently registered organophosphate and carbamate active ingredients. Use includes both agricultural and reportable non-agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
3-IODO-2-PROPYNYL BUTYLCARBAMATE	<1	0	1	<1	<1	<1	0	0	0	0	0
ACEPHATE	355,642	343,840	384,524	307,164	283,367	240,132	217,397	221,781	204,824	195,507	163,662
ALDICARB	545,117	530,066	534,665	280,585	329,319	297,244	244,786	262,103	231,012	230,409	174,196
AZINPHOS-METHYL	406,099	336,353	193,069	216,624	185,055	163,121	151,612	213,892	50,562	55,179	38,775
BENDIOCARB	1,674	259	125	108	593	62	32	23	9	6	2
BENSULIDE	94,593	130,046	192,500	242,460	216,120	186,908	192,220	228,739	237,290	246,148	282,364
BUTYLATE	87,612	84,268	69,805	71,071	32,658	27,640	19,412	26,826	20,323	9,923	2,671
CARBARYL	810,162	754,659	427,546	388,144	364,060	286,199	256,098	205,102	240,135	190,633	156,938
CARBOFURAN	220,622	183,321	161,588	138,665	132,427	95,863	81,486	49,276	30,354	28,093	23,371
CHLORPROPHAM	3,015	2,057	2,321	3,102	3,544	3,504	1,380	6,191	2,861	2,822	3,704
CHLORPYRIFOS	2,723,883	3,212,165	2,451,980	2,259,221	2,094,179	1,673,097	1,419,665	1,545,670	1,778,342	2,005,006	1,919,625
COUMAPHOS	0	0	0	15	152	97	62	64	63	1	3
CYCLOATE	44,628	55,458	62,753	49,096	37,416	31,785	34,387	30,012	43,209	39,709	41,298
DDVP	13,097	13,636	13,998	12,325	12,680	12,833	8,477	3,446	3,807	4,914	6,527
DEMETON	411	0	3	5	2	3	42	<1	0	1	<1
DESMEDIPHAM	6,092	6,188	4,737	6,014	6,651	3,750	3,398	3,636	3,842	3,921	2,944
DIAZINON	1,095,627	956,267	901,388	983,628	1,058,311	999,578	690,375	523,957	492,148	398,583	385,512
DICROTOPHOS	3	0	11	122	0	2	27	41	0	2	6
DIMETHOATE	420,389	515,935	398,448	486,554	396,231	285,548	309,371	294,368	332,049	310,397	292,612
DISULFOTON	142,372	128,335	105,327	95,919	76,201	51,545	54,567	46,815	41,317	31,799	22,601
EPTC	703,996	579,245	393,031	448,883	323,624	276,724	253,634	141,552	182,532	181,790	106,125
ETHEPHON	951,418	882,802	762,217	734,263	734,838	620,075	538,403	574,377	637,205	642,137	579,062
ETHION	2	3	906	64	0	5	13	13	<1	261	13
ETHOPROP	27,955	23,842	27,949	26,196	16,119	19,046	16,531	28,419	23,130	18,924	24,485
FENAMIPHOS	189,379	156,280	125,459	107,745	104,517	66,330	70,939	59,421	58,691	46,336	33,511
FENTHION	141	176	29	22	33	61	79	3	36	15	2
FONOFOS	67,969	50,555	25,349	24,216	4,370	580	465	182	30	15	0
FORMETANATE HYDROCHLORIDE	106,168	97,907	77,723	65,030	43,941	45,280	35,798	28,420	30,651	30,684	33,738
MALATHION	678,702	790,290	663,200	704,893	505,770	554,872	624,604	654,155	492,548	423,433	409,787

***Table 5A** (cont.)**.** The reported pounds of cholinesterase-inhibiting pesticides used. These pesticides are the currently registered organophosphate and carbamate active ingredients.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
METHAMIDOPHOS	260,255	312,067	244,269	116,284	76,865	46,615	30,645	36,987	31,332	37,806	30,570
METHIDATHION	328,895	309,314	178,451	177,105	98,129	93,521	68,389	54,398	61,204	48,857	56,676
METHIOCARB	2,120	4,769	5,384	3,314	2,420	2,265	1,858	2,256	2,789	2,313	1,788
METHOMYL	671,737	824,048	666,694	551,115	554,142	378,132	295,237	359,050	262,195	346,672	316,081
METHYL PARATHION	130,614	153,737	158,248	157,439	75,075	59,620	53,955	73,365	71,525	78,821	84,785
MEVINPHOS	65	493	483	1,268	539	393	40	114	1	160	18
MEVINPHOS, OTHER RELATED	38	283	298	843	301	249	23	76	<1	107	12
MEXACARBATE	31	17	11	1	0	0	0	0	0	0	0
MOLINATE	1,356,258	1,170,699	1,006,025	911,376	1,025,786	733,534	877,572	539,871	367,155	171,362	141,421
NALED	351,361	616,577	260,291	302,708	246,548	276,651	177,102	185,611	152,479	223,725	185,219
O,O-DIMETHYL O-(4-NITRO-M-TOLYL) PHOSPHOROTHIOATE	0	0	0	0	0	0	0	0	0	0	<1
OXAMYL	82,327	119,441	161,042	128,662	137,522	76,971	80,315	93,781	112,603	153,167	116,639
OXYDEMETON-METHYL	107,410	117,159	90,790	122,912	110,754	99,756	96,363	93,774	102,563	121,910	119,713
PARATHION	14,050	5,187	5,762	4,041	3,581	2,589	3,205	611	240	855	1,542
PEBULATE	202,634	184,015	185,696	225,077	160,018	45,619	71,721	35,755	10,118	1,154	210
PHENMEDIPHAM	6,612	6,621	5,836	6,735	7,427	4,249	4,351	5,021	4,576	5,171	4,036
PHORATE	132,262	114,766	122,603	93,488	87,974	70,645	76,482	64,947	60,162	48,981	35,787
PHOSALONE	27	33	11	0	4	0	0	0	0	0	0
PHOSMET	395,160	568,933	645,380	638,704	580,522	482,481	405,236	341,541	658,087	547,813	626,821
POTASSIUM DIMETHYL DITHIO CARBAMATE	0	15	24,795	0	0	0	23	28	293	0	0
PROFENOFOS	184,264	150,575	40,433	49,575	43,879	22,011	24,452	12,871	15,620	23,924	20,885
PROPAMOCARB HYDROCHLORIDE	16,341	10,215	57,121	6,285	4,959	2,288	828	83	5	0	341
PROPETAMPHOS	23,249	17,338	9,970	6,074	4,583	3,991	2,464	721	315	148	206
PROPOXUR	1,341	1,760	1,604	1,735	2,145	611	450	306	223	220	210
S,S,S-TRIBUTYL PHOSPHOROTRITHIOATE	757,987	624,781	438,038	345,842	396,827	257,062	190,149	233,640	179,690	100,210	77,133

***Table 5A** (cont.). The reported pounds of cholinesterase-inhibiting pesticides used. These pesticides are the currently registered organophosphate and carbamate active ingredients.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
SODIUM DIMETHYL DITHIO CARBAMATE	0	0	8,279	355	1,315	173	0	0	10,693	30,440	22,306
SULFOTEP	316	355	213	246	215	267	77	8	29	17	1
SULPROFOS	0	119	84	0	0	<1	0	0	0	0	0
TETRACHLORVINPHOS	7,056	6,044	5,831	3,975	4,687	4,746	3,285	1,262	722	788	1,203
THIOBENCARB	618,412	894,287	724,926	732,505	1,007,249	644,625	839,962	587,211	521,586	448,208	308,497
THIODICARB	122,927	156,092	114,785	60,453	36,704	9,042	5,195	8,392	2,249	1,872	894
TRICHLORFON	3,327	3,843	2,476	2,779	3,996	3,004	1,545	1,068	1,035	1,222	1,003
Grand Total	15,473,843	16,207,537	13,146,480	12,303,033	11,636,346	9,262,992	8,536,181	7,881,229	7,766,461	7,492,569	6,857,530

Table 5B. *The reported cumulative acres treated with cholinesterase-inhibiting pesticides. These pesticides are the currently registered organophosphate and carbamate active ingredients. Use includes primarily agricultural applications. The grand total for acres treated is less than the sum of acres treated for all active ingredients because some products contain more than one active ingredient. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
3-IODO-2-PROPYNYL BUTYLCARBAMATE	0	0	150	0	0	40	0	0	0	0	0
ACEPHATE	406,607	372,566	403,545	370,111	295,383	266,278	232,949	223,408	211,892	198,982	171,791
ALDICARB	490,499	442,029	397,890	266,773	314,440	282,453	225,820	231,090	217,540	214,260	155,823
AZINPHOS-METHYL	277,745	233,406	134,334	140,226	118,805	117,544	94,035	117,060	38,622	37,622	25,534
BENDIOCARB	188	19	28	11	<1	2	0	9	<1	1	0
BENSULIDE	31,916	45,795	61,984	80,873	73,088	62,859	60,883	66,376	70,367	70,546	81,825
BUTYLATE	17,689	17,572	14,259	14,959	7,235	6,270	4,598	5,450	3,940	1,954	610
CARBARYL	312,058	292,721	197,664	216,991	196,464	147,612	106,616	97,811	103,261	99,086	87,749
CARBOFURAN	364,150	322,064	303,957	272,441	258,441	246,149	182,567	91,801	50,138	55,488	40,321
CHLORPROPHAM	4	26	106	151	127	112	80	124	166	88	115
CHLORPYRIFOS	1,869,874	2,223,551	1,669,859	1,420,414	1,441,956	1,355,172	1,235,816	1,478,783	1,323,331	1,680,284	1,535,021
COUMAPHOS	0	0	0	0	1,339	809	1,073	17	49	<1	3
CYCLOATE	19,597	25,986	29,761	24,555	18,495	15,918	17,228	16,713	20,699	19,319	19,789
DDVP	1,499	2,596	3,692	2,180	2,336	3,954	4,327	2,576	1,637	7,445	1,526
DEMETON	1,002	0	18	66	0	56	0	2	0	35	0
DESMEDIPHAM	51,183	61,368	56,272	71,977	60,248	34,738	32,344	35,435	37,152	35,795	30,715
DIAZINON	680,947	530,355	477,809	546,577	480,083	437,934	489,230	483,344	509,233	440,771	439,440
DICROTOPHOS	9	0	16	11	0	0	0	64	0	0	110
DIMETHOATE	955,466	1,097,752	872,311	1,078,024	877,751	639,271	681,367	621,074	701,470	672,666	610,147
DISULFOTON	147,078	124,319	100,935	86,332	69,067	45,258	48,723	39,182	34,481	25,320	18,926
EPTC	232,820	208,093	141,511	148,685	107,758	99,953	94,240	56,639	64,194	64,230	38,073
ETHEPHON	776,247	700,941	653,817	720,773	697,340	631,330	550,256	601,503	660,356	679,253	634,883
ETHION	5	2	621	53	0	5	0	1	0	66	32
ETHOPROP	3,139	3,213	3,784	3,610	3,477	3,542	4,152	6,078	4,917	4,296	4,815
FENAMIPHOS	111,729	97,013	72,102	66,100	60,340	36,999	38,397	36,293	34,142	29,314	18,918
FENTHION	0	0	0	0	0	0	0	0	18	0	0
FONOFOS	55,207	36,123	16,926	14,146	2,325	497	234	116	20	15	0
FORMETANATE HYDROCHLORIDE	103,521	95,544	77,965	63,047	42,880	45,234	36,131	29,411	33,167	31,775	35,293
MALATHION	363,635	410,658	383,121	403,646	324,031	290,933	314,683	287,467	249,319	226,662	217,338

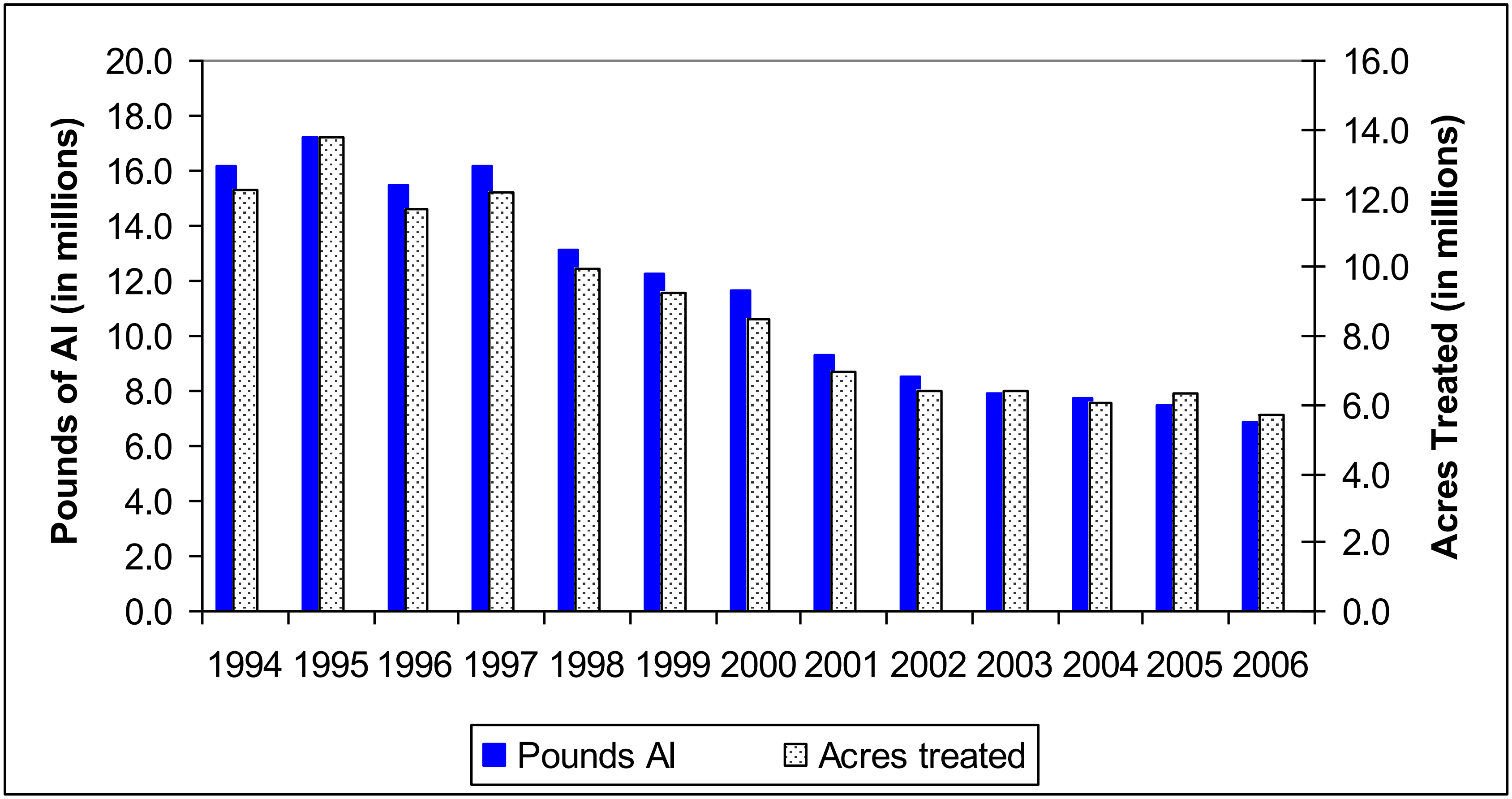
***Table 5B** (cont.). The reported cumulative acres treated with cholinesterase-inhibiting pesticides. These pesticides are the currently registered organophosphate and carbamate active ingredients.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
METHAMIDOPHOS	313,618	263,816	290,061	158,079	101,494	63,046	37,012	41,506	38,874	45,835	37,585
METHIDATHION	245,914	200,528	129,358	115,249	71,992	64,785	48,554	38,516	45,281	37,751	34,765
METHIOCARB	1,511	2,906	3,523	2,369	2,719	1,866	2,000	1,757	3,064	2,501	3,064
METHOMYL	1,145,115	1,376,868	1,118,188	880,910	893,568	627,264	510,006	615,669	437,673	612,249	527,225
METHYL PARATHION	125,729	125,638	128,675	119,315	43,773	39,449	37,514	51,252	48,640	49,771	51,184
MEVINPHOS	538	595	1,094	753	528	143	160	192	3	215	8
MEVINPHOS, OTHER RELATED	538	595	1,094	753	528	143	160	192	3	215	8
MEXACARBATE	34	19	15	1	0	0	0	0	0	0	0
MOLINATE	357,239	317,680	267,078	246,084	276,315	190,488	222,044	134,120	89,593	40,535	33,045
NALED	338,921	606,265	251,044	279,898	244,677	234,184	155,295	148,776	110,218	191,906	159,851
O,O-DIMETHYL O-(4-NITRO-M-TOLYL) PHOSPHOROTHIOATE	0	0	0	0	0	0	0	0	0	0	0
OXAMYL	122,353	176,793	225,380	177,183	179,048	100,294	98,313	115,275	135,832	178,893	137,541
OXYDEMETON-METHYL	220,824	244,056	186,964	253,281	225,990	200,171	193,453	189,015	206,751	173,480	164,094
PARATHION	5,099	2,071	2,592	1,976	4,025	2,977	7,026	1,006	392	717	713
PEBULATE	74,647	69,381	64,501	74,697	51,205	15,122	21,491	10,680	4,319	297	35
PHENMEDIPHAM	52,125	62,449	58,649	73,905	61,975	35,477	34,452	38,265	38,964	38,675	33,040
PHORATE	123,789	106,427	109,759	81,724	71,407	63,160	58,391	50,290	47,488	35,938	26,524
PHOSALONE	18	64	5	0	10	0	0	0	0	0	0
PHOSMET	214,416	236,611	312,707	253,234	219,707	189,517	159,065	128,037	209,843	170,683	199,719
POTASSIUM DIMETHYL DITHIO CARBAMATE	0	0	0	0	0	0	2	6	0	0	0
PROFENOFOS	211,769	162,204	44,641	46,250	46,617	23,700	25,997	13,599	11,657	25,096	20,563
PROPAMOCARB HYDROCHLORIDE	23,793	14,677	81,050	6,851	17,696	2,625	1,041	22	10	0	138
PROPETAMPHOS	0	0	0	0	0	0	0	0	0	0	0
PROPOXUR	9	73	45	39	26	4	23	1	7	8	<1
S,S,S-TRIBUTYL PHOSPHOROTRITHIOATE	531,052	437,505	305,306	245,470	282,844	187,153	129,570	158,604	133,535	74,538	51,658

***Table 5B** (cont.). The reported cumulative acres treated with cholinesterase-inhibiting pesticides. These pesticides are the currently registered organophosphate and carbamate active ingredients.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
SODIUM DIMETHYL DITHIO CARBAMATE	0	0	253	20	0	60	0	0	0	0	0
SULFOTEP	408	251	241	224	168	314	57	3	8	9	0
SULPROFOS	0	83	80	0	0	0	0	0	0	0	0
TETRACHLORVINPHOS	674	356	3,109	1,543	575	232	125	6	291	1,518	1
THIOBENCARB	159,121	227,658	187,295	186,341	252,506	169,056	222,606	154,952	136,132	118,786	79,109
THIODICARB	176,788	223,154	155,440	83,796	50,604	13,382	8,258	12,113	3,684	2,965	1,293
TRICHLORFON	204	149	1,071	97	70	51	19	8	0	0	0
Grand Total	11,720,058	12,202,583	10,003,653	9,302,775	8,553,477	6,995,585	6,428,383	6,431,687	6,072,373	6,397,852	5,729,958

Figure 3. *Use trends of cholinesterase-inhibiting pesticides, which includes pesticides with organophosphate and carbamate active ingredients. Reported pounds of active ingredient (AI) applied include both agricultural and reportable non-agricultural applications. The reported cumulative acres treated include primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*



USE TRENDS OF PESTICIDES ON DPR'S GROUND WATER PROTECTION LIST

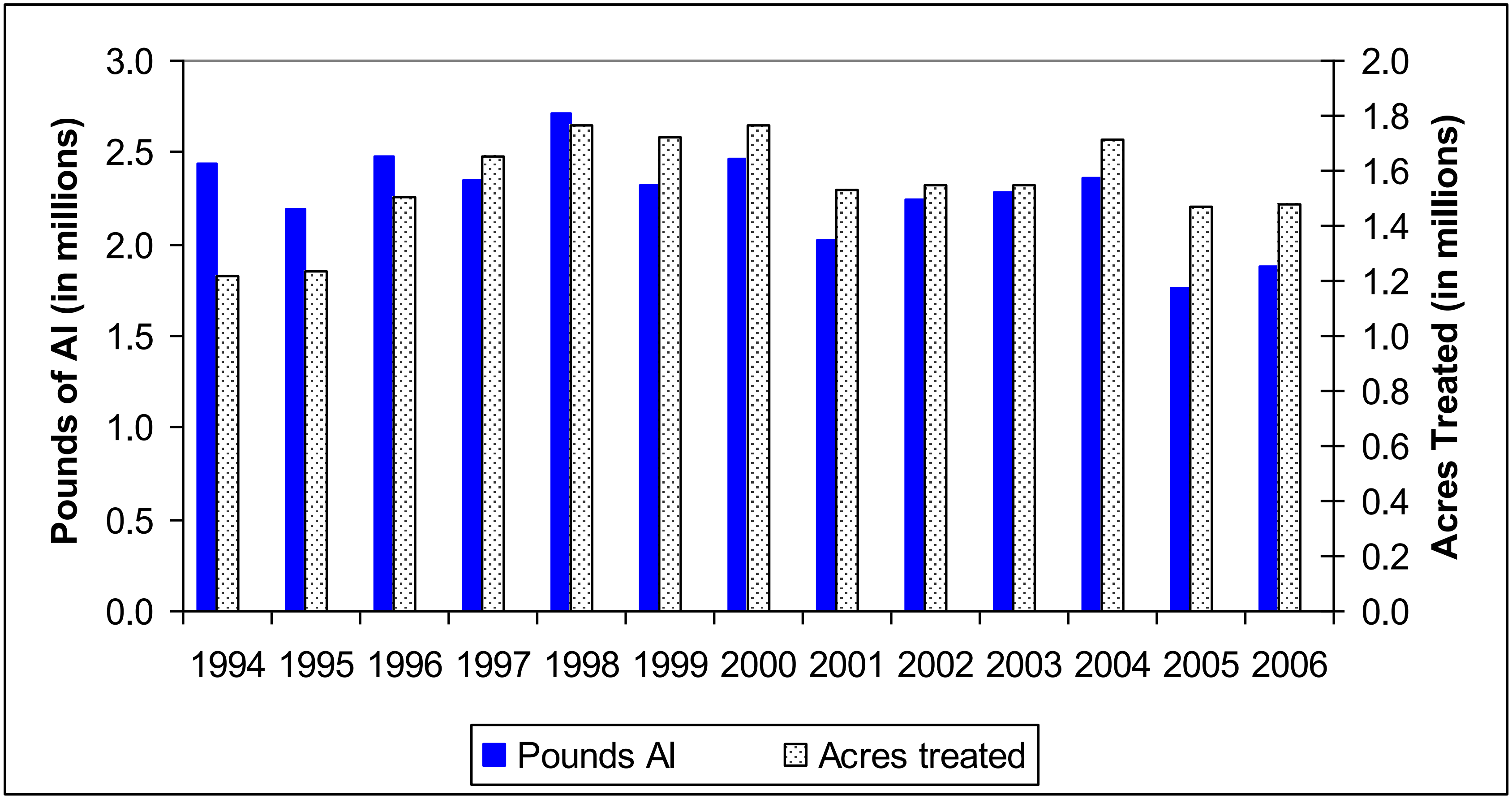
Table 6A. *The reported pounds of pesticides on the "a" part of DPR's groundwater protection list. These pesticides are the currently registered active ingredients listed in the California Code of Regulations, Title 3, Division 6, Chapter 4, Subchapter 1, Article 1, Section 6800(a). Use includes both agricultural and reportable non-agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
ATRAZINE	59,367	48,512	57,006	72,167	61,323	62,879	59,292	58,248	38,776	32,908	33,199
ATRAZINE, OTHER RELATED	1,238	1,025	1,289	1,509	1,282	1,314	1,237	1,213	812	693	688
BENTAZON, SODIUM SALT	1,518	1,907	1,757	1,876	1,210	393	1,045	1,216	1,370	2,272	2,633
BROMACIL	98,293	82,540	84,645	75,613	68,233	56,128	55,821	56,427	56,476	48,929	62,516
BROMACIL, LITHIUM SALT	17,381	9,141	4,686	4,162	4,478	3,217	4,016	3,025	1,801	1,059	2,529
DIURON	1,266,315	1,228,277	1,504,731	1,188,553	1,351,232	1,105,536	1,302,603	1,344,596	1,398,123	955,983	1,045,525
NORFLURAZON	196,142	212,621	265,886	286,214	259,328	208,667	187,927	146,408	139,960	94,037	105,215
PROMETON	68	20	22	4	28	2	21	2	20	3	8
SIMAZINE	841,067	766,185	795,103	696,768	713,757	585,400	632,901	670,916	729,850	623,806	631,600
Grand Total	2,481,387	2,350,228	2,715,125	2,326,865	2,460,871	2,023,534	2,244,862	2,282,050	2,367,186	1,759,691	1,883,913

Table 6B. *The reported cumulative acres treated with pesticides on the "a" part of DPR's groundwater protection list. These pesticides are the currently registered active ingredients listed in the California Code of Regulations, Title 3, Division 6, Chapter 4, Subchapter 1, Article 1, Section 6800(a). Use includes both agricultural and reportable non-agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
ATRAZINE	32,043	27,257	37,556	39,881	35,757	33,376	28,589	29,966	26,989	24,005	20,239
ATRAZINE, OTHER RELATED	32,042	27,257	37,529	39,876	35,757	33,376	28,589	29,966	26,989	24,005	20,239
BENTAZON, SODIUM SALT	1,460	2,010	1,904	1,968	1,502	432	1,094	987	1,279	2,218	2,217
BROMACIL	62,206	58,722	57,136	53,861	42,568	30,149	29,585	27,974	26,204	21,886	19,085
BROMACIL, LITHIUM SALT	0	0	40	40	30	0	0	0	0	0	0
DIURON	685,352	819,993	865,246	849,482	865,974	788,559	796,904	843,897	971,628	894,073	879,497
NORFLURAZON	179,015	186,991	214,144	217,178	230,848	192,305	161,746	125,619	125,802	81,589	90,910
PROMETON	27	8	85	18	51	0	174	49	171	6	168
SIMAZINE	607,228	613,237	647,117	611,626	620,696	515,419	561,349	546,678	588,016	463,244	479,621
Grand Total	1,599,373	1,735,475	1,860,757	1,813,930	1,833,183	1,593,616	1,608,031	1,605,137	1,767,075	1,511,025	1,511,976

Figure 4. *Use trends of pesticides on DPR's groundwater protection list. These pesticides are the currently registered active ingredients listed in the California Code of Regulations, Title 3, Division 6, Chapter 4, Subchapter 1, Article 1, Section 6800(a). Reported pounds of active ingredient (AI) applied include both agricultural and reportable non-agricultural applications. The reported cumulative acres treated include primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*



USE TRENDS OF PESTICIDES ON DPR'S TOXIC AIR CONTAMINATS LIST

Table 7A. *The reported pounds of pesticides on DPR's toxic air contaminants list applied in California. These pesticides are the currently registered active ingredients listed in the California Code of Regulations, Title 3, Division 6, Chapter 4, Subchapter 1, Article 1, Section 6860. Use includes both agricultural and reportable non-agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1,3-DICHLOROPROPENE	1,956,846	2,457,690	3,011,057	3,321,147	4,465,422	4,141,173	5,413,214	7,003,782	8,945,145	9,355,308	8,591,883
2,4-D	22,089	10,227	3,868	3,061	2,096	1,787	1,733	1,732	1,796	1,552	1,756
2,4-D, 2-ETHYLHEXYL ESTER	10	1,313	13,750	72,225	13,911	13,706	15,801	19,715	21,130	26,632	21,014
2,4-D, ALKANOLAMINE SALTS (ETHANOL AND ISOPROPANOL AMINES)	29,440	25,684	29,576	15,992	6,737	674	452	1,357	624	458	16
2,4-D, BUTOXYETHANOL ESTER	38,624	13,344	12,867	5,628	6,194	5,336	3,556	3,812	4,782	8,190	1,758
2,4-D, BUTOXYPROPYL ESTER	4	13	31	5	4	3	0	0	0	0	<1
2,4-D, BUTYL ESTER	0	0	2,180	8	0	<1	593	2	0	10	15
2,4-D, DIETHANOLAMINE SALT	3,003	24,809	14,939	5,843	13,004	6,667	8,080	8,831	5,022	3,961	2,947
2,4-D, DIMETHYLAMINE SALT	469,427	430,652	422,824	356,770	426,848	395,537	425,706	511,519	470,871	454,762	437,301
2,4-D, DODECYLAMINE SALT	8	58	75	730	0	257	322	0	0	0	0
2,4-D, HEPTYLAMINE SALT	<1	0	0	46	0	0	<1	0	0	0	0
2,4-D, ISOOCTYL ESTER	7,822	60,356	47,016	17,387	8,505	15,828	12,380	12,366	10,039	10,314	10,627
2,4-D, ISOPROPYL ESTER	5,090	6,543	7,533	6,879	7,886	6,584	7,833	8,319	9,066	10,825	10,526
2,4-D, N-OLEYL-1,3-PROPYLENEDIAMINE SALT	35	0	3	7	11	0	0	0	0	0	0
2,4-D, PROPYL ESTER	1,774	1,575	999	1,822	783	391	634	326	472	382	398
2,4-D, TETRADECYLAMINE SALT	2	13	17	170	0	60	75	0	0	0	0
2,4-D, TRIETHYLAMINE SALT	93,876	34,610	5,688	2,344	1,102	634	426	435	386	203	1,614
2,4-D, TRIISOPROPYLAMINE SALT	2	3	5	6	0	5	9	6	0	0	438
ACROLEIN	322,578	341,245	264,207	328,238	290,180	233,928	282,590	272,733	211,014	257,189	246,444

***Table** 7A (cont.). The reported pounds of pesticides on DPR's toxic air contaminants list applied in California.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
ALUMINUM PHOSPHIDE	105,291	90,585	68,919	123,633	119,776	99,856	169,218	119,512	131,303	135,751	148,735
ARSENIC ACID	53,777	59,835	52,558	48,029	11,906	12,023	4,976	318	223	68	3
ARSENIC PENTOXIDE	205,089	64,372	50,899	245,238	91,267	259,400	194,650	129,889	12,705	180,505	474,517
ARSENIC TRIOXIDE	<1	<1	1	1	<1	<1	<1	<1	<1	<1	<1
CAPTAN	919,016	801,899	1,542,556	966,020	643,826	399,146	395,575	498,445	370,418	468,413	508,883
CAPTAN, OTHER RELATED	21,636	19,341	35,925	22,219	14,654	9,014	9,020	11,309	8,271	10,540	11,747
CARBARYL	810,162	754,659	427,546	388,144	364,060	286,199	256,098	205,102	240,135	190,633	156,938
CHLORINE	816,318	509,787	431,546	628,546	654,541	296,469	502,944	619,735	516,546	613,837	730,986
CHROMIC ACID	286,521	89,931	71,109	343,543	128,642	363,225	272,300	182,022	17,753	252,176	662,927
DAZOMET	12,851	15,884	15,246	12,409	10,981	44,299	45,020	34,848	58,492	48,263	34,307
DDVP	13,097	13,636	13,998	12,325	12,680	12,833	8,477	3,446	3,807	4,914	6,527
ETHYLENE OXIDE	0	0	31	2	6	3	0	0	0	0	0
FORMALDEHYDE	334,548	416,823	349,785	111,714	55,300	28,612	14,035	18,690	111,151	48,968	73,392
HYDROGEN CHLORIDE	1,938	129	762	11,067	3,316	4,276	4,256	3,222	2,529	14,755	2,464
LINDANE	4,668	5,511	6,330	4,842	4,746	2,388	1,630	908	775	40	378
MAGNESIUM PHOSPHIDE	3,600	3,931	4,132	3,540	3,550	2,492	4,824	2,844	2,621	3,156	3,931
MANCOZEB	567,866	528,159	988,344	630,987	610,903	428,738	396,912	535,600	379,539	642,444	660,471
MANEB	1,328,368	1,082,071	1,596,466	1,045,567	1,202,545	816,548	851,819	1,026,804	954,085	1,122,684	1,175,427
META-CRESOL	3	6	8	11	14	1	1	1	2	1	<1
METAM-SODIUM	15,501,650	15,401,098	14,120,788	17,273,325	13,143,954	12,460,997	15,116,768	14,822,689	14,698,228	12,991,279	11,362,375
METHANOL	0	0	0	3	<1	0	0	0	0	0	0
METHOXYCHLOR	484	358	566	16	26	41	144	3	1	13	130
METHOXYCHLOR, OTHER RELATED	62	44	11	<1	0	<1	0	0	<1	<1	0

***Table 7A** (cont.)**.** The reported pounds of pesticides on DPR's toxic air contaminants list applied in California.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
METHYL BROMIDE	16,124,148	16,711,308	14,314,983	15,355,845	10,900,339	6,625,336	7,008,644	7,289,389	7,105,612	6,504,576	6,518,683
METHYL ISOTHIOCYANATE	0	353	220	616	3,323	2,871	3,512	547	1,357	1,549	1,073
METHYL PARATHION	130,614	153,737	158,248	157,439	75,075	59,620	53,955	73,365	71,525	78,821	84,785
NAPHTHALENE	0	1	333	<1	0	0	<1	23	0	<1	0
PARA-DICHLOROBENZENE	4	3	219	86	4	11	1	25	10	139	0
PARATHION	14,050	5,187	5,762	4,041	3,581	2,589	3,205	611	240	855	1,542
PCNB	87,968	89,548	88,036	67,424	62,809	50,937	43,450	38,989	34,176	37,942	32,609
PCP, OTHER RELATED	<1	1	2	11	54	2	2	<1	<1	<1	3
PCP, SODIUM SALT	0	0	2	0	0	<1	0	0	0	0	0
PENTACHLOROPHENOL	3	8	33	92	466	14	17	3	2	3	27
PHENOL	25	8	44	12	20	30	0	<1	9	71	<1
PHOSPHINE	0	0	0	0	0	44	901	1,141	1,664	2,688	2,774
PHOSPHORUS	58	14	12	9	22	3	1	1	1	<1	2
POTASSIUM N-METHYLDITHIOCARBAMATE	0	2,283	9,143	0	105,364	464,882	1,175,168	1,911,698	851,181	1,994,072	3,202,884
POTASSIUM PERMANGANATE	0	0	243	0	0	0	0	0	0	0	0
PROPOXUR	1,341	1,760	1,604	1,735	2,145	611	450	306	223	220	210
PROPYLENE OXIDE	224,495	198,559	198,595	172,556	118,381	99,727	99,674	99,396	151,484	147,324	130,016
S,S,S-TRIBUTYL PHOSPHOROTRITHIOATE	757,987	624,781	438,038	345,842	396,827	257,062	190,149	233,640	179,690	100,210	77,133
SODIUM CYANIDE	1,326	2,176	3,263	1,098	2,178	2,437	2,542	2,808	2,865	3,086	2,853
SODIUM DICHROMATE	180,478	182,185	122,647	32,699	122	329	633	217	0	0	0
SODIUM TETRATHIOCARBONATE	543,229	799,092	900,991	688,701	596,028	375,487	352,342	212,308	259,542	330,886	171,194
SULFURYL FLUORIDE	1,805,401	1,938,835	2,173,338	2,790,343	2,428,345	2,585,680	3,047,882	3,138,687	3,270,698	3,394,126	2,871,378
TRIFLURALIN	1,144,893	1,193,924	1,220,106	1,261,482	1,162,157	934,018	1,091,597	1,061,631	1,023,142	1,027,804	1,032,495
XYLENE	12,619	8,511	5,362	4,847	4,292	9,544	2,680	4,349	2,109	1,598	1,418
ZINC PHOSPHIDE	1,217	2,343	1,200	5,447	1,609	1,116	981	1,253	1,924	2,371	3,794
Grand Total	44,967,436	45,180,809	43,256,585	46,899,815	38,182,518	31,821,482	37,499,855	40,130,710	40,146,388	40,486,568	39,475,747

Table 7B. *The reported cumulative acres treated in California with pesticides on DPR's toxic air contaminants list. These pesticides are the currently registered active ingredients listed in the California Code of Regulations, Title 3, Division 6, Chapter 4, Subchapter 1, Article 1, Section 6860. Use includes primarily agricultural applications. The grand total for acres treated is less than the sum of acres treated for all active ingredients because some products contain more than one active ingredient. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1,3-DICHLOROPROPENE	17,223	22,193	27,059	29,430	33,244	30,817	42,172	48,944	56,618	51,486	48,870
2,4-D	137,230	50,709	11,649	7,791	5,134	3,952	2,304	2,562	3,377	1,466	2,963
2,4-D, 2-ETHYLHEXYL ESTER	160	729	6,867	7,624	8,460	6,919	10,260	22,426	20,642	21,360	15,303
2,4-D, ALKANOLAMINE SALTS (ETHANOL AND ISOPROPANOL AMINES)	21,872	20,055	22,117	11,843	5,711	359	264	630	1,475	403	6
2,4-D, BUTOXYETHANOL ESTER	35,599	13,504	13,810	7,198	7,158	5,633	2,655	2,539	3,835	2,951	1,739
2,4-D, BUTOXYPROPYL ESTER	2	51	93	37	5	9	0	0	0	0	0
2,4-D, BUTYL ESTER	0	0	307	37	24	1	101	0	0	8	1
2,4-D, DIETHANOLAMINE SALT	8,721	88,149	58,239	23,884	49,377	27,705	36,290	39,046	22,729	18,739	13,826
2,4-D, DIMETHYLAMINE SALT	540,728	527,870	477,967	411,858	496,014	475,796	491,242	595,235	553,369	567,143	522,231
2,4-D, DODECYLAMINE SALT	0	76	82	1,481	0	262	276	0	0	0	0
2,4-D, HEPTYLAMINE SALT	<1	0	0	29	0	0	0	0	0	0	0
2,4-D, ISOOCTYL ESTER	5,163	35,045	29,179	14,449	5,711	16,375	6,964	9,476	7,502	6,532	7,638
2,4-D, ISOPROPYL ESTER	69,081	87,492	101,141	100,837	103,938	88,849	108,908	116,840	117,870	144,377	145,749
2,4-D, N-OLEYL-1,3-PROPYLENEDIAMINE SALT	26	0	2	3	0	0	0	0	0	0	0
2,4-D, PROPYL ESTER	23,846	21,479	14,356	15,542	11,278	5,200	7,468	5,509	8,680	5,261	5,660
2,4-D, TETRADECYLAMINE SALT	0	76	82	1,481	0	262	276	0	0	0	0
2,4-D, TRIETHYLAMINE SALT	131,679	46,600	7,381	2,638	1,391	1,257	688	1,035	677	243	815
2,4-D, TRIISOPROPYLAMINE SALT	0	0	0	0	0	0	0	0	0	0	0
ACROLEIN	2,462	1,514	292	3,981	873	1,409	2,206	642	575	73	18
ALUMINUM PHOSPHIDE	80,217	535,817	74,441	1,034,732	1,271,647	67,422	70,367	73,869	74,762	63,289	78,533

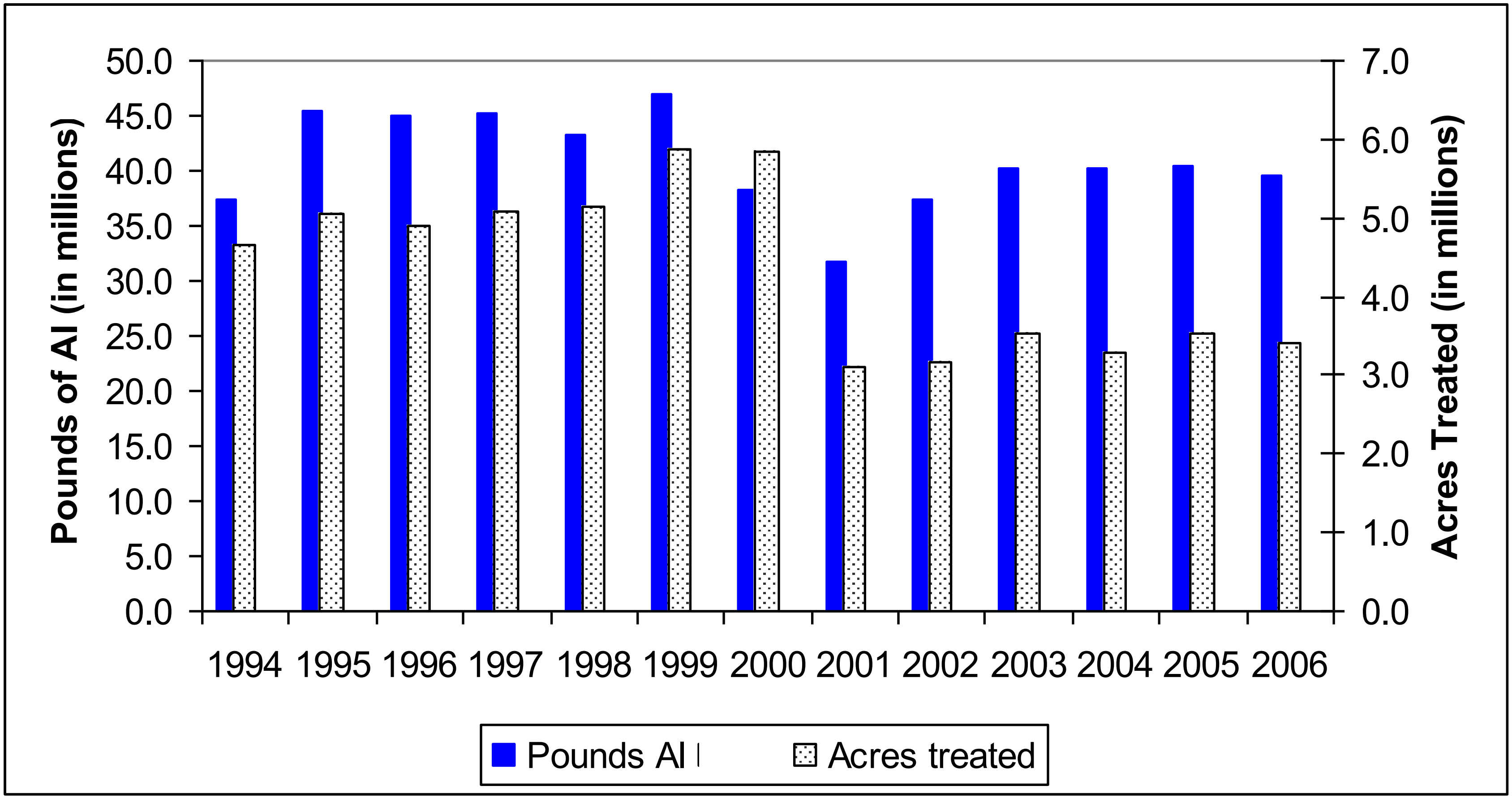
Table 7B (cont.). The reported cumulative acres treated in California with pesticides on DPR's toxic air contaminants list.

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
ARSENIC ACID	0	0	0	0	0	0	0	0	0	0	0
ARSENIC PENTOXIDE	0	0	0	0	709,893	56	0	0	48	0	0
ARSENIC TRIOXIDE	0	0	0	0	0	0	1	<1	0	1	0
CAPTAN	381,989	347,631	602,684	404,731	309,989	215,969	215,412	271,140	211,028	252,040	262,912
CAPTAN, OTHER RELATED	381,989	347,235	602,585	404,511	309,337	215,958	215,362	270,968	209,571	251,846	262,836
CARBARYL	312,058	292,721	197,664	216,991	196,464	147,612	106,616	97,811	103,261	99,086	87,749
CHLORINE	0	1,764	1,329	46,611	37,220	95	150	650	2,137	0	431
CHROMIC ACID	0	0	0	0	709,893	56	0	0	0	0	0
DAZOMET	863	1,099	3,589	243	223	224	136	326	298	113	124
DDVP	1,499	2,596	3,692	2,180	2,336	3,954	4,327	2,576	1,637	7,445	1,526
ETHYLENE OXIDE	0	0	194	31	41	0	0	0	0	0	0
FORMALDEHYDE	234	12	126	123	47	53	33	18	23	2	265
HYDROGEN CHLORIDE	1	0	16	0	0	27	590	273	1	17	18
LINDANE	25,352	36,573	32,650	20,930	14,640	13,832	8,010	8,828	9,437	557	9
MAGNESIUM PHOSPHIDE	19	26	184	616,017	46	373	7	167	1	23	29
MANCOZEB	351,801	284,136	683,756	387,300	363,305	228,275	197,196	276,093	194,219	370,266	348,061
MANEB	731,079	624,121	941,308	629,897	611,756	535,105	554,904	660,011	601,360	730,254	675,530
META-CRESOL	1,309	3,488	1,407	657	3,142	517	267	244	288	164	50
METAM-SODIUM	215,899	198,395	154,309	186,300	146,847	125,263	141,415	142,406	128,427	97,562	101,880
METHANOL	0	0	0	0	14	0	0	0	0	0	0
METHOXYCHLOR	19	131	194	140	197	88	24	0	44	26	395
METHOXYCHLOR, OTHER RELATED	9	52	5	0	0	0	0	0	<1	0	0
METHYL BROMIDE	96,507	113,195	90,107	102,115	75,832	60,892	53,140	55,254	57,385	45,700	50,608
METHYL ISOTHIOCYANATE	0	0	47	100	0	0	0	0	0	0	0
METHYL PARATHION	125,729	125,638	128,675	119,315	43,773	39,449	37,514	51,252	48,640	49,771	51,184
NAPHTHALENE	0	0	0	0	0	0	20	0	0	2	0
PARA-DICHLOROBENZENE	0	0	10	0	0	0	0	0	0	0	0
PARATHION	5,099	2,071	2,592	1,976	4,025	2,977	7,026	1,006	392	717	713
PCNB	44,187	29,169	39,090	28,324	28,649	25,832	9,533	7,759	3,817	3,001	1,496

Table 7B *(cont.)****.*** *The reported cumulative acres treated in California with pesticides on DPR's toxic air contaminants list.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
PCP, OTHER RELATED	15	4	15	0	59	38	0	0	20	3	1
PCP, SODIUM SALT	0	0	20	0	0	0	0	0	0	0	0
PENTACHLOROPHENOL	15	4	190	0	59	38	0	0	20	3	1
PHENOL	718	37	275	459	5	501	0	25	310	239	0
PHOSPHINE	0	0	0	0	0	0	0	0	349	22	23
PHOSPHORUS	69	790	965	5,113	2,847	252	0	0	0	23	0
POTASSIUM N-METHYLDITHIOCARBAMATE	0	21	50	0	534	2,321	9,073	12,887	10,229	19,670	27,299
POTASSIUM PERMANGANATE	0	0	20	0	0	0	0	0	0	0	0
PROPOXUR	9	73	45	39	26	4	23	1	7	8	<1
PROPYLENE OXIDE	0	<1	0	573	0	0	<1	0	22	185	20
S,S,S-TRIBUTYL PHOSPHOROTRITHIOATE	531,052	437,505	305,306	245,470	282,844	187,153	129,570	158,604	133,535	74,538	51,658
SODIUM CYANIDE	3,020	84,800	53,285	0	0	0	0	0	0	0	0
SODIUM DICHROMATE	0	0	0	0	0	0	0	0	0	0	0
SODIUM TETRATHIOCARBONATE	27,736	35,473	34,488	24,947	21,002	13,574	11,559	6,832	8,497	7,977	6,170
SULFURYL FLUORIDE	0	12	0	17	4	0	0	50	2	0	78
TRIFLURALIN	1,086,892	1,131,033	1,083,219	1,159,648	1,039,472	800,893	944,407	903,654	920,545	886,258	895,172
XYLENE	24,221	13,568	11,327	3,325	6,208	9,665	4,533	7,502	3,375	2,722	1,824
ZINC PHOSPHIDE	22,801	26,756	18,833	38,101	16,349	11,069	7,234	8,387	14,150	9,038	15,284
Grand Total	5,446,199	5,591,485	5,839,312	6,321,059	6,937,041	3,374,342	3,440,523	3,863,476	3,535,186	3,792,608	3,686,696

Figure 5. *Use trends of pesticides on DPR's toxic air contaminants list. These pesticides are the currently registered active ingredients listed in the California Code of Regulations, Title 3, Division 6, Chapter 4, Subchapter 1, Article 1, Section 6860. Reported pounds of active ingredient (AI) applied include both agricultural and reportable non-agricultural applications. The reported cumulative acres treated include primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*



USE TRENDS OF FUMIGANT PESTICIDES

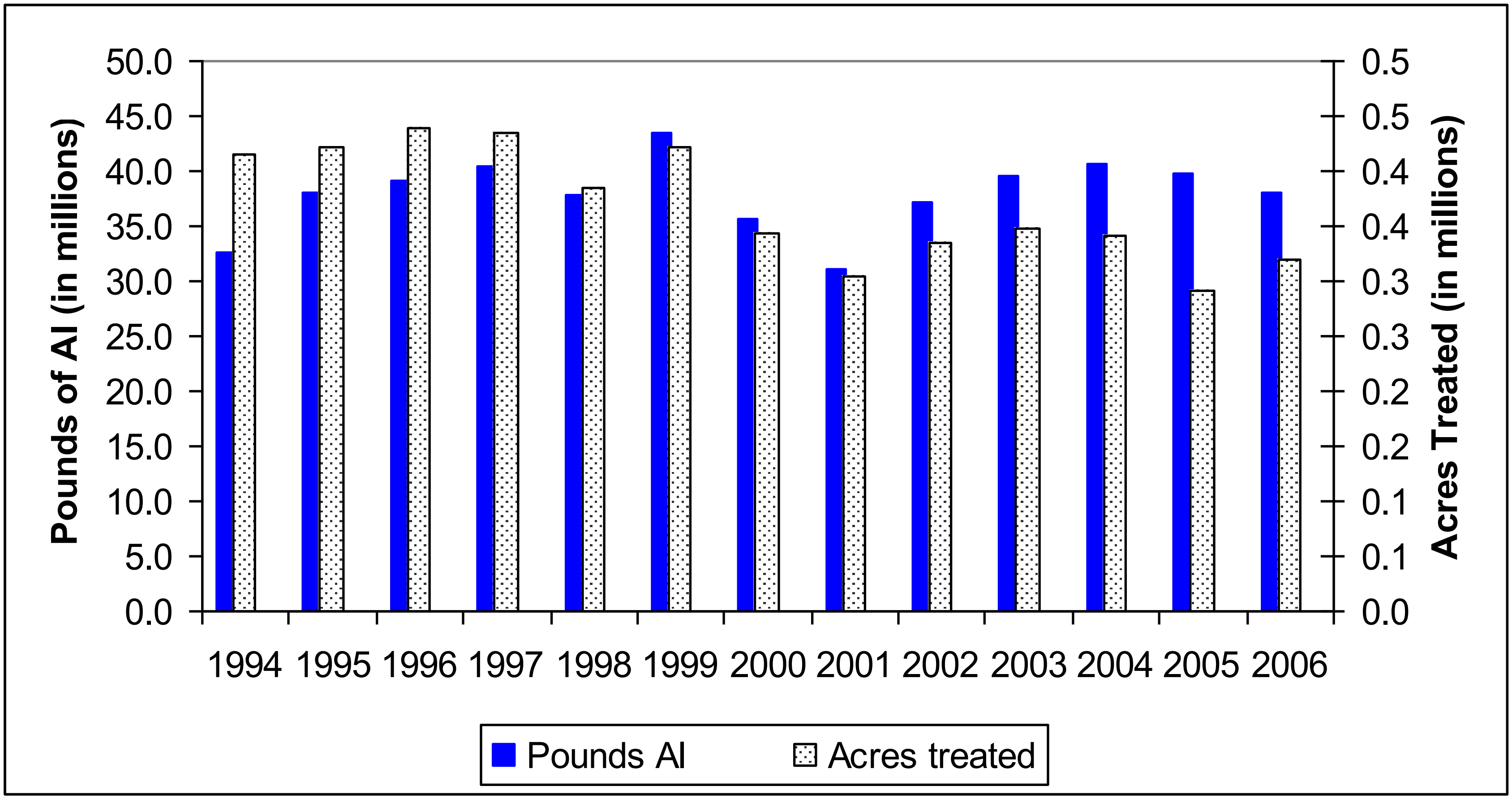
Table 8A. *The reported pounds of fumigant pesticides used. Use includes both agricultural and reportable non-agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1,2-DICHLOROPROPANE, 1,3-DICHLOROPROPENE AND RELATED C3 COMPOUNDS	104	12,375	243	927	87	110	331	393	22	0	182
1,3-DICHLOROPROPENE	1,956,846	2,457,690	3,011,057	3,321,147	4,465,422	4,141,173	5,413,214	7,003,782	8,945,145	9,355,308	8,591,883
ALUMINUM PHOSPHIDE	105,291	90,585	68,919	123,633	119,776	99,856	169,218	119,512	131,303	135,751	148,735
CARBON TETRACHLORIDE	10	3	38	<1	111	2	5	1	<1	0	0
CHLOROPICRIN	2,814,318	2,781,325	3,071,470	3,657,582	3,799,464	4,278,136	4,672,412	4,928,278	5,140,637	4,870,792	5,018,831
DAZOMET	12,851	15,884	15,246	12,409	10,981	44,299	45,020	34,848	58,492	48,263	34,307
ETHYLENE DIBROMIDE	<1	1	5	<1	147	2,593	<1	<1	3	0	0
ETHYLENE DICHLORIDE	25	8	1	<1	3	4	11	0	1	0	0
METAM-SODIUM	15,501,650	15,401,098	14,120,788	17,273,325	13,143,954	12,460,997	15,116,768	14,822,689	14,698,228	12,991,279	11,362,375
METHYL BROMIDE	16,124,148	16,711,308	14,314,983	15,355,845	10,900,339	6,625,336	7,008,644	7,289,389	7,105,612	6,504,576	6,518,683
POTASSIUM N-METHYLDITHIOCARBAMATE	0	2,283	9,143	0	105,364	464,882	1,175,168	1,911,698	851,181	1,994,072	3,202,884
PROPYLENE OXIDE	224,495	198,559	198,595	172,556	118,381	99,727	99,674	99,396	151,484	147,324	130,016
SODIUM TETRATHIOCARBONATE	543,229	799,092	900,991	688,701	596,028	375,487	352,342	212,308	259,542	330,886	171,194
SULFURYL FLUORIDE	1,805,401	1,938,835	2,173,338	2,790,343	2,428,345	2,585,680	3,047,882	3,138,687	3,270,698	3,394,126	2,871,378
Grand Total	39,088,370	40,409,047	37,884,816	43,396,468	35,688,402	31,178,281	37,100,689	39,560,982	40,612,349	39,772,378	38,050,468

Table 8B. *The reported cumulative acres treated with fumigant pesticides. Use includes both agricultural and reportable non-agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1,2-DICHLOROPROPANE, 1,3-DICHLOROPROPENE AND RELATED C3 COMPOUNDS	144	164	70	207	136	370	44	45	9	0	32
1,3-DICHLOROPROPENE	17,223	22,193	27,059	29,430	33,244	30,817	42,172	48,944	56,618	51,486	48,870
ALUMINUM PHOSPHIDE	80,217	64,617	74,441	76,332	64,112	67,422	70,367	73,869	74,762	63,289	78,533
CARBON TETRACHLORIDE	0	0	23	0	20	0	0	0	0	0	0
CHLOROPICRIN	57,903	52,413	59,694	61,323	58,132	60,083	53,786	51,791	53,737	50,272	51,018
DAZOMET	863	1,099	3,589	243	223	224	136	326	298	113	124
ETHYLENE DIBROMIDE	0	0	20	<1	21	52	0	0	0	0	0
ETHYLENE DICHLORIDE	0	0	0	0	0	0	0	0	0	0	0
METAM-SODIUM	215,899	198,395	154,309	186,300	146,847	125,263	141,415	142,406	128,427	97,562	101,880
METHYL BROMIDE	96,507	113,195	90,107	102,115	75,832	60,892	53,140	55,254	57,385	45,700	50,608
POTASSIUM N-METHYLDITHIOCARBAMATE	0	21	50	0	534	2,321	9,073	12,887	10,229	19,670	27,299
PROPYLENE OXIDE	0	<1	0	573	0	0	<1	0	22	185	20
SODIUM TETRATHIOCARBONATE	27,736	35,473	34,488	24,947	21,002	13,574	11,559	6,832	8,497	7,977	6,170
SULFURYL FLUORIDE	0	12	0	17	4	0	0	50	2	0	78
Grand Total	496,493	487,582	443,849	481,486	400,106	361,020	381,693	392,404	389,985	336,254	364,632

Figure 6. *Use trends of fumigant pesticides. Reported pounds of active ingredient (AI) applied include both agricultural and reportable non-agricultural applications. The reported cumulative acres treated include primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*



USE TRENDS OF OIL PESTICIDES

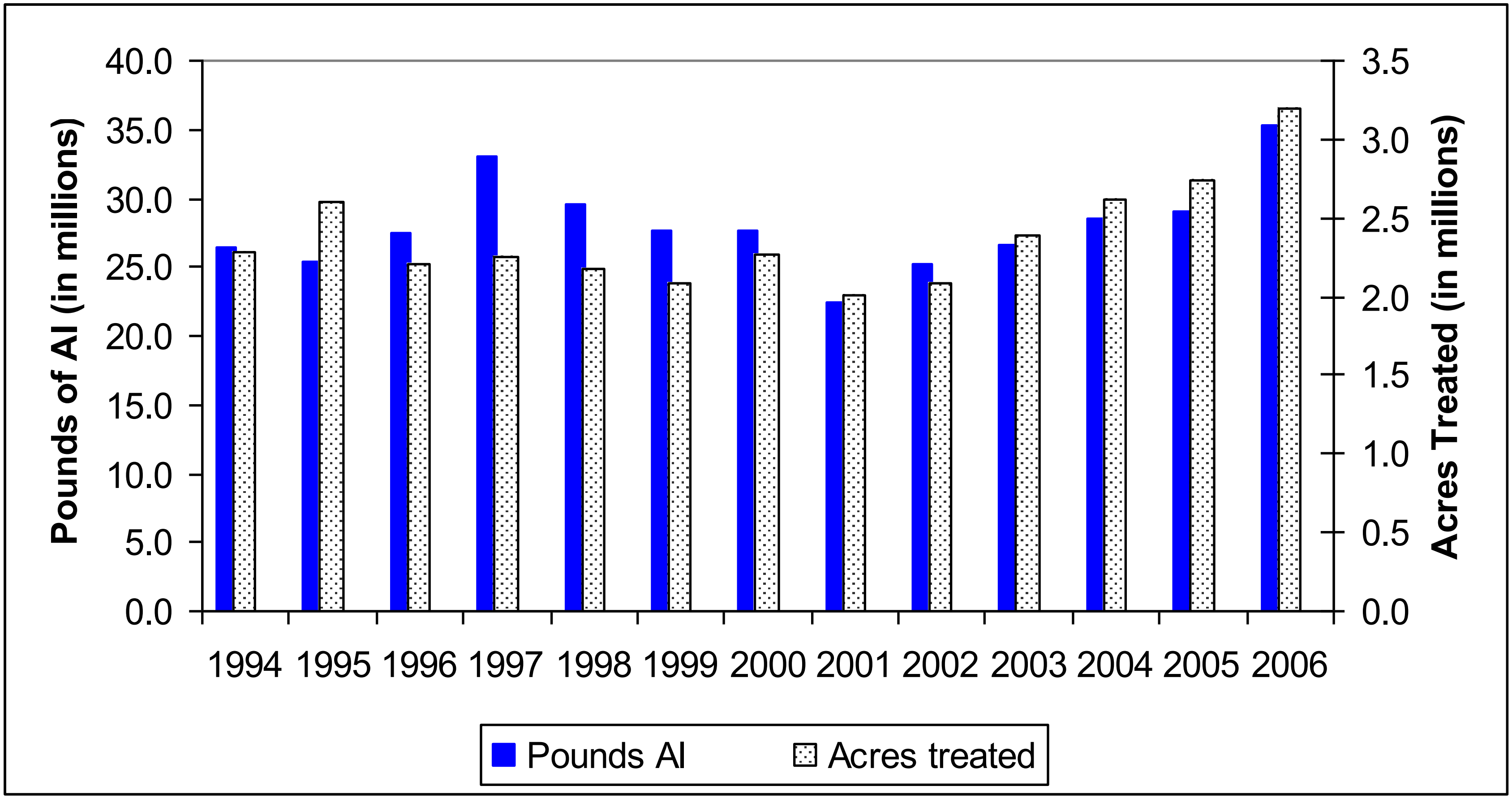
Table 9A. *The reported pounds of oil pesticides. As a broad group, oil pesticides and other petroleum distillates are on U.S. EPA's list of B2 carcinogens or the State's Proposition 65 list of chemicals "known to cause cancer." However, these classifications do not distinguish among oil pesticides that may not qualify as carcinogenic due to their degree of refinement. Many such oil pesticides also serve as alternatives to high-toxicity chemicals. For this reason, oil pesticide data was classified separately in this report. Use includes both agricultural and reportable non-agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
COAL TAR HYDROCARBONS	0	0	0	0	0	50	<1	0	0	0	0
HYDROTREATED PARAFFINIC SOLVENT	77,886	97,382	88,353	79,480	102,361	189,538	206,552	283,768	320,019	244,114	252,092
ISOPARAFFINIC HYDROCARBONS	36,904	39,007	81,780	75,575	65,032	45,763	22,479	23,707	30,125	31,183	18,997
KEROSENE	125,830	101,373	90,108	70,398	84,564	49,037	20,973	17,144	14,243	7,983	11,366
MINERAL OIL	7,015,286	7,817,478	6,920,065	6,015,658	5,866,268	5,405,244	6,934,964	8,200,682	9,056,464	9,186,082	11,256,378
MINERAL OIL, PETROLEUM DISTILLATES, SOLVENT REFINED LIGHT	0	0	0	0	0	0	0	0	0	0	169
NAPHTHA, HEAVY AROMATIC	143	83	0	0	0	29	0	2	53	0	0
PETROLEUM DERIVATIVE RESIN	94	15	6	1	3	1	<1	1	1	4	5
PETROLEUM DISTILLATES	1,712,167	1,816,628	1,625,537	2,421,987	2,289,723	1,730,640	1,526,848	1,878,407	1,597,605	2,035,987	3,863,753
PETROLEUM DISTILLATES, ALIPHATIC	0	0	0	0	<1	7	49,237	15,163	30,638	34,152	34,017
PETROLEUM DISTILLATES, AROMATIC	14,630	14,376	35,085	9,925	10,610	2,851	6,182	2,916	5,486	2,092	2,136
PETROLEUM DISTILLATES, REFINED	38,444	47,929	61,294	114,467	928,119	846,418	318,728	371,411	1,023,900	779,702	1,173,405
PETROLEUM HYDROCARBONS	165,176	87,646	24,333	7,278	8,063	3,185	1,019	985	642	956	1,574
PETROLEUM NAPHTHENIC OILS	12	1	9	2	3	91	325	208	24	48	158
PETROLEUM OIL, PARAFFIN BASED	305,871	267,704	270,998	310,791	371,155	418,474	281,516	364,770	433,848	405,894	556,854
PETROLEUM OIL, UNCLASSIFIED	17,920,454	22,700,273	20,334,019	18,541,147	17,998,487	13,668,208	15,929,777	15,527,171	15,932,497	16,232,606	18,194,847
PETROLEUM SULFONATES	4	1	<1	<1	1	<1	<1	0	0	0	<1
Grand Total	27,412,900	32,989,896	29,531,588	27,646,708	27,724,387	22,359,538	25,298,602	26,686,335	28,445,546	28,960,803	35,365,750

Table 9B. *The reported cumulative acres treated in California with oil pesticides. (See qualifying comments on U.S. EPA B2 carcinogen and Proposition 65 listing with Table 8A.) Uses include primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
COAL TAR HYDROCARBONS	0	0	0	0	0	0	0	0	0	0	0
HYDROTREATED PARAFFINIC SOLVENT	103,410	121,606	109,419	93,111	124,688	192,297	220,789	306,243	327,022	252,863	270,374
ISOPARAFFINIC HYDROCARBONS	79,287	72,279	164,561	139,939	134,149	92,768	53,847	56,120	67,795	55,920	39,757
KEROSENE	289,469	240,080	223,822	179,961	227,734	199,672	194,210	291,162	264,266	314,821	348,050
MINERAL OIL	244,044	240,507	226,710	204,895	204,621	226,195	246,310	337,986	407,046	478,286	595,506
MINERAL OIL, PETROLEUM DISTILLATES, SOLVENT REFINED LIGHT	0	0	0	0	0	0	0	0	0	0	959
NAPHTHA, HEAVY AROMATIC	0	0	0	0	0	11	0	0	0	0	0
PETROLEUM DERIVATIVE RESIN	191	50	13	1	0	0	0	0	0	10	0
PETROLEUM DISTILLATES	381,514	339,492	295,807	232,305	283,634	221,743	210,498	237,198	244,673	171,158	180,454
PETROLEUM DISTILLATES, ALIPHATIC	0	0	0	0	0	5,104	44,494	26,131	25,904	22,723	34,136
PETROLEUM DISTILLATES, AROMATIC	12,324	19,003	2,153	7,088	6,299	1,900	3,935	1,808	519	385	658
PETROLEUM DISTILLATES, REFINED	5,145	6,146	6,162	12,495	42,145	48,446	35,413	39,830	79,589	117,570	200,567
PETROLEUM HYDROCARBONS	10,560	7,105	2,970	3,993	2,790	4,029	3,269	2,869	108	430	260
PETROLEUM NAPHTHENIC OILS	73	0	50	37	0	5,119	13,241	11,314	2,484	358	11,125
PETROLEUM OIL, PARAFFIN BASED	464,308	443,059	432,587	470,300	466,132	448,032	417,941	488,928	555,670	605,289	721,204
PETROLEUM OIL, UNCLASSIFIED	610,423	763,348	710,417	734,320	771,049	572,825	657,135	615,742	653,743	717,903	806,242
PETROLEUM SULFONATES	<1	<1	0	<1	10	0	0	0	0	0	0
Grand Total	2,200,748	2,252,675	2,174,672	2,078,446	2,263,251	2,018,141	2,101,083	2,415,332	2,628,818	2,737,716	3,209,293

Figure 7. *Use trends of oil pesticides. As a broad group, oil pesticides and other petroleum distillates are on U.S. EPA's list of B2 carcinogens or the State's Proposition 65 list of chemicals "known to cause cancer." However, these classifications do not distinguish among oil pesticides that may not qualify as carcinogenic due to their degree of refinement. Many such oil pesticides also serve as alternatives to high-toxicity chemicals. For this reason, oil pesticide data was classified separately in this report. Reported pounds of active ingredient (AI) applied include both agricultural and reportable non-agricultural applications. The reported cumulative acres treated include primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*



USE TRENDS OF BIOPESTICIDES

Table 10A. *The reported pounds of biopesticides applied in California. Biopesticides include microorganisms and naturally occurring compounds, or compounds essentially identical to naturally occurring compounds that are not toxic to the target pest (such as pheromones). Use includes both agricultural and non-agricultural applications. Zero values in early years likely indicate the pesticide was not yet registered for use. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
(E)-4-TRIDECEN-1-YL-ACETATE	140	76	65	67	263	182	247	254	131	68	103
(E)-5-DECENOL	133	737	176	246	5	2	2	295	5	<1	4
(E)-5-DECENYL ACETATE	638	3,508	844	1,183	26	9	12	889	23	<1	17
(R,Z)-5-(1-DECENYL) DIHYDRO-2-(3H)-FURANONE	0	0	<1	0	<1	0	0	0	<1	<1	0
(S)-KINOPRENE	137	121	1,261	357	245	311	327	418	359	289	201
(Z)-11-HEXADECEN-1-YL ACETATE	0	0	0	0	0	0	35	10	10	5	6
(Z)-11-HEXADECENAL	0	0	0	0	0	0	35	10	10	5	6
(Z)-4-TRIDECEN-1-YL-ACETATE	4	2	2	2	9	6	8	8	4	2	3
(Z)-9-DODECENYL ACETATE	0	0	0	0	0	0	0	0	0	<1	<1
(Z,E)-7,11-HEXADECADIEN-1-YL ACETATE	2	1	46	229	3	13	2	0	0	0	0
(Z,Z)-7,11-HEXADECADIEN-1-YL ACETATE	2	1	46	242	3	<1	3	0	0	0	0
1-DECANOL	1	<1	<1	<1	<1	<1	0	0	0	0	0
1-METHYLCYCLOPROPENE	0	0	0	0	0	<1	<1	<1	<1	<1	<1
1-NAPHTHALENEACETAMIDE	99	115	283	333	217	213	88	119	113	55	29
ACETIC ACID	3	1	2	3	1	<1	<1	<1	<1	<1	0
AGROBACTERIUM RADIOBACTER	14	28	20	7	2	1	4	3	2	<1	4
AGROBACTERIUM RADIOBACTER, STRAIN K1026	0	0	0	0	<1	<1	1	<1	<1	<1	6
ALLYL ISOTHIOCYANATE	0	<1	0	0	<1	<1	<1	<1	<1	<1	<1
AMINO ETHOXY VINYL GLYCINE HYDROCHLORIDE	0	0	8	1	<1	1	1	0	0	24	696
AMPELOMYCES QUISQUALIS	3	9	40	4	4	2	<1	<1	<1	<1	<1
ASPERGILLUS FLAVUS STRAIN AF36	0	0	0	0	0	0	0	0	0	<1	0
AZADIRACHTIN	816	843	654	16,770	1,215	1,523	1,474	1,366	2,915	1,340	2,397
BACILLUS PUMILUS, STRAIN QST 2808	0	0	0	0	0	0	0	<1	2	3,546	5,636

***Table 10A** (cont.). The reported pounds of biopesticides applied in California.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
BACILLUS SPHAERICUS, SEROTYPE H-5A5B, STRAIN 2362	0	1,298	4,886	2,274	2,749	7,941	4,667	10,158	14,187	34,154	45,430
BACILLUS SUBTILIS GB03	0	<1	<1	<1	<1	1	4	5	7	15	14
BACILLUS THURINGIENSIS (BERLINER)	520	182	751	24	76	115	16	11	12	16	35
BACILLUS THURINGIENSIS (BERLINER), SUBSP. AIZAWAI, GC-91 PROTEIN	6,529	7,406	4,282	3,017	4,419	3,953	3,980	5,024	4,088	11,255	9,377
BACILLUS THURINGIENSIS (BERLINER), SUBSP. AIZAWAI, SEROTYPE H-7	10,182	14,210	10,854	10,427	9,067	5,511	3,889	7,548	3,014	2,335	1,752
BACILLUS THURINGIENSIS (BERLINER), SUBSP. ISRAELENSIS, SEROTYPE H-14	4,615	4,459	13,180	5,038	88,039	24,711	8,266	11,376	9,311	11,927	14,394
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI STRAIN SA-12	0	0	0	0	1,562	1,510	4,962	5,754	3,510	6,884	3,397
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI, SEROTYPE 3A,3B	26,051	30,286	21,683	15,244	14,477	31,046	3,423	6,161	3,916	1,931	2,271
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI, STRAIN EG 2348	3,205	1,467	5,207	2,191	2,140	2,743	1,481	222	107	211	281
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI, STRAIN EG2371	3,468	2,752	1,633	213	139	58	19	39	2	5	1
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI, STRAIN SA-11	8,691	11,682	9,616	8,730	9,831	11,840	13,787	12,883	14,637	41,187	49,603
BACILLUS THURINGIENSIS (BERLINER), SUBSP. SAN DIEGO	3	26	8	34	18	8	1	2	1	<1	2
BACILLUS THURINGIENSIS SUBSPECIES KURSTAKI STRAIN BMP 123	0	0	6	1	33	79	164	130	10	1	3
BACILLUS THURINGIENSIS SUBSPECIES KURSTAKI, GENETICALLY ENGINEERED STRAIN EG7841 LEPIDOPTERAN ACTIVE TOXIN	257	15,619	12,522	12,831	16,773	8,739	681	1,503	344	338	3,872
BACILLUS THURINGIENSIS VAR. KURSTAKI STRAIN M-200	0	0	0	0	<1	<1	0	<1	0	0	0
BACILLUS THURINGIENSIS VAR. KURSTAKI, GENETICALLY ENGINEERED STRAIN EG7826	0	0	0	0	6,482	14,734	439	1,527	930	1,919	1,384
BACILLUS THURINGIENSIS, SUBSP. AIZAWAI, STRAIN ABTS-1857	0	0	0	0	0	0	10,540	21,956	27,075	33,336	28,814

Table 10A (cont.)**.** The reported pounds of biopesticides applied in California.

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
BACILLUS THURINGIENSIS, SUBSP. AIZAWAI, STRAIN SD-1372, LEPIDOPTERAN ACTIVE TOXIN(S)	0	0	0	3	158	498	1,322	562	347	315	432
BACILLUS THURINGIENSIS, SUBSP. ISRAELENSIS, STRAIN AM 65-52	0	0	0	0	0	271	9,485	29,326	23,001	41,734	59,018
BACILLUS THURINGIENSIS, SUBSP. KURSTAKI, STRAIN ABTS-351, FERMENTATION SOLIDS AND SOLUBLES	0	0	0	0	0	3,021	15,491	38,034	46,754	57,985	53,224
BACILLUS THURINGIENSIS, SUBSP. KURSTAKI, STRAIN HD-1	6	835	21,037	23,660	22,309	17,828	10,655	7,173	4,731	3,185	6,110
BACILLUS THURINGIENSIS, VAR. KURSTAKI DELTA ENDOTOXINS CRY 1A(C) AND CRY 1C (GENETICALLY ENGINEERED) ENCAPSULATED IN PSEUDOMONAS FLUORESCENS (KILLED)	3,663	29,895	12,634	8,055	7,166	2,211	258	54	5	3	<1
BEAUVERIA BASSIANA STRAIN GHA	1	573	1,250	923	915	678	1,041	715	863	824	570
CANDIDA OLEOPHILA ISOLATE I-182	414	726	216	55	0	0	0	0	0	0	0
CANOLA OIL	0	0	0	0	1	5	<1	1	4	1	4
CAPSICUM OLEORESIN	46	2	17	104	3	73	3	5	49	2	2
CASTOR OIL	1	40	174	24	557	297	504	1,281	363	79	37
CINNAMALDEHYDE	0	<1	<1	6,764	10,334	4,704	806	238	326	34	12
CLARIFIED HYDROPHOBIC EXTRACT OF NEEM OIL	3,227	14,316	55,528	94,591	110,342	83,664	301,512	60,498	84,880	111,921	95,146
CODLING MOTH GRANULOSIS VIRUS	0	0	0	0	0	0	0	0	0	0	<1
CONIOTHYRIUM MINITANS STRAIN CON/M/91-08	0	0	0	0	0	0	103	171	198	6	11
CYTOKININ	0	0	<1	0	<1	<1	0	<1	0	0	0
DIHYDRO-5-HEPTYL-2(3H)-FURANONE	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
DIHYDRO-5-PENTYL-2(3H)-FURANONE	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
E,E-8,10-DODECADIEN-1-OL	253	431	848	21,029	7,090	6,390	5,107	1,802	1,113	2,195	2,126
E-11-TETRADECEN-1-YL ACETATE	0	3	163	548	397	65	122	132	91	79	99
E-8-DODECENYL ACETATE	28	49	57	66	92	73	61	113	122	110	225
ENCAPSULATED DELTA ENDOTOXIN OF BACILLUS THURINGIENSIS VAR. KURSTAKI IN KILLED PSEUDOMONAS FLUORESCENS	31,043	44,554	35,129	28,435	17,792	6,442	2,948	445	114	7	6

__Table 10A__ (cont.)__.__ The reported pounds of biopesticides applied in California.

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
ENCAPSULATED DELTA ENDOTOXIN OF BACILLUS THURINGIENSIS VAR. SAN DIEGO IN KILLED PSEUDOMONAS FLUORESCENS	13	0	34	1	6	1	6	0	2	1	0
ESSENTIAL OILS	0	<1	11	<1	<1	<1	<1	<1	1	<1	4
ETHYLENE	0	0	1	5,073	6	6	3	24	32	0	0
EUCALYPTUS OIL	0	0	0	0	0	0	0	0	0	50	<1
EUGENOL	0	0	3	0	<1	0	0	0	3	<1	<1
FARNESOL	53	38	30	36	37	15	10	9	7	10	4
GAMMA AMINOBUTYRIC ACID	0	0	0	0	0	23	3,102	6,077	8,402	8,081	4,201
GARLIC	5,115	8,989	10,203	7,113	904	1,490	667	295	174	203	89
GERANIOL	0	0	0	0	0	0	0	0	0	0	<1
GERMAN COCKROACH PHEROMONE	0	0	0	0	0	0	<1	<1	<1	<1	<1
GIBBERELLINS	21,271	23,404	23,085	19,775	20,956	19,435	24,946	20,415	20,372	23,443	22,746
GIBBERELLINS, POTASSIUM SALT	<1	1	1	15	<1	1	<1	<1	1	<1	15
GLIOCLADIUM VIRENS GL-21 (SPORES)	144	156	104	86	60	314	110	48	30	19	1
GLUTAMIC ACID	0	0	0	0	0	23	3,102	6,077	8,402	8,081	4,201
HYDROGEN PEROXIDE	0	0	1	15	82	1,754	2,713	2,618	2,822	5,552	17,522
HYDROPRENE	1,131	9,305	1,486	1,609	1,703	1,380	1,656	1,043	1,309	2,910	11,956
IBA	16	16	43	9	12	18	16	13	19	11	31
LAGENIDIUM GIGANTEUM (CALIFORNIA STRAIN)	<1	134	859	499	0	1	0	0	58	<1	0
LAURYL ALCOHOL	85	207	463	7,287	941	302	249	256	295	872	386
LINALOOL	391	358	631	229	197	173	274	280	174	176	163
METARHIZIUM ANISOPLIAE, VAR. ANISOPLIAE, STRAIN ESF1	<1	3	37	15	18	15	22	<1	<1	<1	<1
METHOPRENE (POST 1997 SEE CHEM CODE 5026)	3,213	29,905	3,030	10,285	14,312	2,483	5,117	7,875	8,874	9,900	6,820
METHYL ANTHRANILATE	6	184	49	57	50	37	85	34	534	151	449
METHYL SALICYLATE	0	0	0	0	0	<1	0	0	0	0	<1
MUSCALURE	3	4	2	2	3	2	1	11	10	14	15
MYRISTYL ALCOHOL	18	42	94	1,502	191	62	51	52	60	176	78
MYROTHECIUM VERRUCARIA, DRIED FERMENTATION SOLIDS & SOLUBLES, STRAIN AARC-0255	0	1,097	8,496	18,824	20,869	45,917	36,104	47,037	39,789	27,977	25,039

***Table 10A** (cont.)**.** The reported pounds of biopesticides applied in California.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
NAA	18	21	240	14	24	10	6	5	9	13	9
NEROLIDOL	43	31	24	29	30	12	8	7	6	8	3
NITROGEN, LIQUIFIED	423,124	430,214	1,003,749	424,897	391,469	478,466	561,505	321,182	79,369	82,298	54,887
NONANOIC ACID	16,009	14,713	11,729	13,303	12,580	14,890	11,559	7,886	7,224	8,845	11,129
NONANOIC ACID, OTHER RELATED	843	774	617	700	662	784	608	415	380	466	586
NOSEMA LOCUSTAE SPORES	0	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
OIL OF ANISE	0	0	0	0	0	<1	<1	<1	<1	<1	<1
OIL OF BERGAMOT	0	0	0	0	0	0	0	0	0	0	<1
OIL OF CEDARWOOD	0	0	0	0	0	0	0	0	0	0	0
OIL OF CITRONELLA	0	13	5	11	1	33	0	10	0	<1	<1
OIL OF LEMONGRASS	0	0	0	0	0	0	0	2	0	<1	<1
OXYPURINOL	0	0	0	0	<1	<1	0	0	0	<1	0
PAECILOMYCES FUMOSOROSEUS APOPKA STRAIN 97	0	0	0	0	0	5	0	0	0	0	0
PERFUME	0	0	<1	<1	<1	<1	<1	<1	<1	<1	<1
POLY-D-GLUCOSAMINE	0	0	0	0	0	0	0	0	<1	0	0
POLYHEDRAL OCCLUSION BODIES (OB'S) OF THE NUCLEAR POLYHEDROSIS VIRUS OF HELICOVERPA ZEA (CORN EARWORM)	0	0	0	0	0	0	0	1	1	0	0
POTASSIUM BICARBONATE	0	28	65,909	92,785	130,446	121,796	180,072	283,920	159,772	388,854	162,299
PROPYLENE GLYCOL	62,599	61,414	68,506	54,833	63,611	56,899	60,567	50,356	44,235	47,765	42,329
PSEUDOMONAS FLUORESCENS, STRAIN A506	3,044	3,639	3,660	2,084	103	1,102	1,361	1,972	841	896	1,004
PSEUDOMONAS SYRINGAE STRAIN ESC-11	0	0	34	0	0	0	<1	0	20	<1	<1
PSEUDOMONAS SYRINGAE, STRAIN ESC-10	15	<1	<1	0	0	0	0	0	0	0	<1
PUTRESCENT WHOLE EGG SOLIDS	7	15	19	136	112	140	184	186	110	60	67
QST 713 STRAIN OF DRIED BACILLUS SUBTILIS	0	0	0	0	882	7,201	18,957	17,323	16,619	14,039	17,132
S-METHOPRENE	127	1,806	2,652	409	371	366	867	762	530	1,138	1,390
SODIUM BICARBONATE	0	0	0	5	22	230	2,063	0	126	0	0
SODIUM LAURYL SULFATE	9	6	14	8	2	9	<1	<1	3	15	272
SOYBEAN OIL	26,167	44,702	18,578	59,695	40,963	27,651	31,726	33,006	50,301	20,587	70,398

Table 10A *(cont.)***.** *The reported pounds of biopesticides applied in California.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
STREPTOMYCES GRISEOVIRIDIS STRAIN K61	1	2	5	2	5	2	1	1	<1	<1	1
STREPTOMYCES LYDICUS WYEC 108	0	0	0	0	0	0	0	0	0	0	<1
SUCROSE OCTANOATE	0	0	0	0	0	0	0	0	0	0	2
THYME	0	0	0	0	0	0	0	0	0	0	171
TRICHODERMA HARZIANUM RIFAI STRAIN KRL-AG2	65	39	60	121	125	116	55	43	37	16	24
XANTHINE	0	0	0	0	<1	<1	0	0	0	<1	0
Z,E-9,12-TETRADECADIEN-1-YL ACETATE	0	0	0	0	0	0	<1	0	0	0	0
Z-11-TETRADECEN-1-YL ACETATE	0	<1	18	85	61	9	18	19	14	12	14
Z-8-DODECENOL	5	8	10	12	16	13	11	20	22	19	41
Z-8-DODECENYL ACETATE	461	818	888	1,009	1,435	1,127	935	1,737	1,874	1,692	3,397
Z-9-TETRADECEN-1-OL	0	0	0	0	0	0	<1	0	0	0	0
Grand Total	668,192	818,342	1,440,509	986,295	1,038,221	1,025,787	1,356,716	1,039,242	700,553	1,023,681	845,638

Table 10B. *The reported cumulative acres treated in California with each biopesticide. Biopesticides includes microorganisms and naturally occurring compounds, or compounds essentially identical to naturally occurring compounds that are not toxic to the target pest (such as pheromones). Use includes primarily agricultural applications. The grand total for acres treated is less than the sum of acres for all active ingredients because some products contain more than one active ingredient. Zero values in early years likely indicate the pesticide was not yet registered for use. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
(E)-4-TRIDECEN-1-YL-ACETATE	5,428	3,574	2,886	3,132	12,571	9,159	11,739	10,902	5,555	3,226	4,870
(E)-5-DECENOL	1,434	2,187	1,414	1,034	784	1,316	1,206	1,360	809	71	385
(E)-5-DECENYL ACETATE	1,434	2,187	1,414	1,034	784	1,316	1,206	1,360	809	71	385
(R,Z)-5-(1-DECENYL) DIHYDRO-2-(3H)-FURANONE	0	0	1	0	0	0	0	0	15	0	0
(S)-KINOPRENE	341	179	2,610	888	600	847	872	755	1,864	494	440
(Z)-11-HEXADECEN-1-YL ACETATE	0	0	0	0	0	0	1,053	476	365	164	183
(Z)-11-HEXADECENAL	0	0	0	0	0	0	1,053	476	365	164	423
(Z)-4-TRIDECEN-1-YL-ACETATE	5,428	3,574	2,886	3,132	12,571	9,159	11,739	10,902	5,555	3,226	4,870
(Z)-9-DODECENYL ACETATE	0	0	0	0	0	0	0	0	0	570	96
(Z,E)-7,11-HEXADECADIEN-1-YL ACETATE	2,295	279	82	148	171	128	87	0	0	0	0
(Z,Z)-7,11-HEXADECADIEN-1-YL ACETATE	2,295	279	82	148	171	128	87	0	0	0	0
1-DECANOL	0	0	0	0	0	0	0	0	0	0	0
1-METHYLCYCLOPROPENE	0	0	0	0	0	3	<1	9	4	8	2
1-NAPHTHALENEACETAMIDE	1,784	1,820	5,211	5,418	4,135	3,690	1,705	2,355	2,201	1,100	650
ACETIC ACID	12,119	5,776	9,038	13,693	3,618	1,182	1,146	734	290	60	0
AGROBACTERIUM RADIOBACTER	6,048	1,284	5,954	1,517	1,072	514	500	365	493	306	698
AGROBACTERIUM RADIOBACTER, STRAIN K1026	0	0	0	0	4	325	355	716	524	292	335
ALLYL ISOTHIOCYANATE	0	2	0	0	0	1	0	36	0	20	0
AMINO ETHOXY VINYL GLYCINE HYDROCHLORIDE	0	0	75	142	1	6	10	0	0	229	6,392
AMPELOMYCES QUISQUALIS	4,566	18,628	15,039	8,363	7,156	2,193	540	332	697	247	10
ASPERGILLUS FLAVUS STRAIN AF36	0	0	0	0	0	0	0	0	0	258	0
AZADIRACHTIN	76,386	70,086	64,239	103,078	71,386	73,876	92,145	79,581	64,488	55,657	67,939
BACILLUS PUMILUS, STRAIN QST 2808	0	0	0	0	0	0	0	1	4	34,748	64,333
BACILLUS SPHAERICUS, SEROTYPE H-5A5B, STRAIN 2362	0	104	84	39	0	0	0	0	0	0	0
BACILLUS SUBTILIS GB03	0	0	0	0	0	0	0	0	379	23	3
BACILLUS THURINGIENSIS (BERLINER)	7,377	6,109	4,437	301	533	644	535	2	441	100	2,939
BACILLUS THURINGIENSIS (BERLINER), SUBSP. AIZAWAI, GC-91 PROTEIN	137,786	146,197	82,473	60,262	74,287	71,531	73,992	90,283	63,504	62,244	39,077

***Table 10B** (cont)**.** The reported cumulative acres treated in California with each biopesticide.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
BACILLUS THURINGIENSIS (BERLINER), SUBSP. AIZAWAI, SEROTYPE H-7	84,793	109,951	86,430	85,564	65,943	41,378	31,487	54,037	24,160	19,190	15,784
BACILLUS THURINGIENSIS (BERLINER), SUBSP. ISRAELENSIS, SEROTYPE H-14	3,357	4,289	5,242	3,221	2,435	931	824	2,114	1,048	3,480	543
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI STRAIN SA-12	0	0	0	0	9,474	11,773	43,337	54,540	28,485	34,533	29,505
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI, SEROTYPE 3A,3B	435,707	486,699	342,525	249,709	245,114	141,868	56,879	65,654	69,454	31,406	42,265
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI, STRAIN EG 2348	23,733	11,768	22,097	14,541	14,702	21,987	10,416	1,931	737	1,625	2,913
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI, STRAIN EG2371	32,471	19,739	11,015	1,684	849	439	134	338	19	54	7
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI, STRAIN SA-11	139,051	175,772	161,858	152,834	143,664	168,496	180,621	158,448	123,796	156,026	125,255
BACILLUS THURINGIENSIS (BERLINER), SUBSP. SAN DIEGO	4	100	6	20	18	7	2	3	1	0	0
BACILLUS THURINGIENSIS SUBSPECIES KURSTAKI STRAIN BMP 123	0	0	87	7	687	1,913	6,279	3,013	268	20	93
BACILLUS THURINGIENSIS SUBSPECIES KURSTAKI, GENETICALLY ENGINEERED STRAIN EG7841 LEPIDOPTERAN ACTIVE TOXIN	1,377	87,123	81,541	83,094	118,628	55,515	5,061	8,479	1,766	1,160	6,684
BACILLUS THURINGIENSIS VAR. KURSTAKI STRAIN M-200	0	0	0	0	2	0	0	1	0	0	0
BACILLUS THURINGIENSIS VAR. KURSTAKI, GENETICALLY ENGINEERED STRAIN EG7826	0	0	0	0	30,603	76,935	2,571	8,493	6,457	8,724	3,021
BACILLUS THURINGIENSIS, SUBSP. AIZAWAI, STRAIN ABTS-1857	0	0	0	0	0	0	13,835	34,164	38,718	47,071	41,456
BACILLUS THURINGIENSIS, SUBSP. AIZAWAI, STRAIN SD-1372, LEPIDOPTERAN ACTIVE TOXIN(S)	0	0	0	32	1,561	4,718	10,897	4,989	3,465	3,025	4,235
BACILLUS THURINGIENSIS, SUBSP. ISRAELENSIS, STRAIN AM 65-52	0	0	0	0	0	0	5	1	3	313	4,809
BACILLUS THURINGIENSIS, SUBSP. KURSTAKI, STRAIN ABTS-351, FERMENTATION SOLIDS AND SOLUBLES	0	0	0	0	0	6,938	33,146	75,373	94,559	109,681	100,402

***Table 10B** (cont)**.** The reported cumulative acres treated in California with each biopesticide.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
BACILLUS THURINGIENSIS, SUBSP. KURSTAKI, STRAIN HD-1	24	2,718	202,653	217,136	199,385	170,574	110,540	62,367	44,536	29,129	23,062
BACILLUS THURINGIENSIS, VAR. KURSTAKI DELTA ENDOTOXINS CRY 1A(C) AND CRY 1C (GENETICALLY ENGINEERED) ENCAPSULATED IN PSEUDOMONAS FLUORESCENS (KILLED)	6,387	43,741	23,196	14,779	14,742	4,622	546	111	7	<1	0
BEAUVERIA BASSIANA STRAIN GHA	3	1,459	2,991	25,510	3,405	2,853	3,702	2,887	4,019	3,531	2,743
CANDIDA OLEOPHILA ISOLATE I-182	0	0	0	0	0	0	0	0	0	0	0
CANOLA OIL	0	0	0	0	2	2	2	2	<1	2	5
CAPSICUM OLEORESIN	582	443	2,762	1,799	261	254	149	318	379	71	247
CASTOR OIL	0	<1	0	<1	1	0	0	0	0	0	2
CINNAMALDEHYDE	0	<1	<1	2,418	4,139	1,534	295	105	137	18	10
CLARIFIED HYDROPHOBIC EXTRACT OF NEEM OIL	7,526	13,537	22,092	45,247	49,142	36,602	34,157	38,357	51,009	69,051	73,105
CODLING MOTH GRANULOSIS VIRUS	0	0	0	0	0	0	0	0	0	0	1,479
CONIOTHYRIUM MINITANS STRAIN CON/M/91-08	0	0	0	0	0	0	935	1,301	1,781	26	63
CYTOKININ	0	0	82	0	3	0	0	0	0	0	0
DIHYDRO-5-HEPTYL-2(3H)-FURANONE	0	20	0	0	0	0	0	0	0	0	0
DIHYDRO-5-PENTYL-2(3H)-FURANONE	0	20	0	0	0	0	0	0	0	0	0
E,E-8,10-DODECADIEN-1-OL	3,811	3,696	4,300	4,514	10,407	10,381	11,841	21,255	17,383	21,896	20,728
E-11-TETRADECEN-1-YL ACETATE	0	13	2,171	54,460	38,834	14,063	16,870	10,335	8,836	7,351	6,637
E-8-DODECENYL ACETATE	6,045	9,932	11,791	23,549	22,721	33,383	33,602	39,198	41,752	33,419	37,363
ENCAPSULATED DELTA ENDOTOXIN OF BACILLUS THURINGIENSIS VAR. KURSTAKI IN KILLED PSEUDOMONAS FLUORESCENS	69,222	96,678	83,238	59,905	32,372	15,188	7,529	1,160	143	33	9
ENCAPSULATED DELTA ENDOTOXIN OF BACILLUS THURINGIENSIS VAR. SAN DIEGO IN KILLED PSEUDOMONAS FLUORESCENS	1	0	19	7	6	4	<1	0	1	1	0
ESSENTIAL OILS	0	0	0	0	6	268	0	0	1	0	0
ETHYLENE	0	0	0	2	0	0	0	0	7	0	0
EUCALYPTUS OIL	0	0	0	0	0	0	0	0	0	150	0
EUGENOL	0	0	1	0	0	0	0	0	15	0	0
FARNESOL	22,113	16,837	12,543	43,212	25,673	8,495	6,584	5,451	4,294	4,369	1,246
GAMMA AMINOBUTYRIC ACID	0	0	0	0	0	320	43,682	87,153	117,477	114,189	58,586
GARLIC	6,586	24,333	12,403	7,376	4,725	2,407	2,756	828	259	513	363

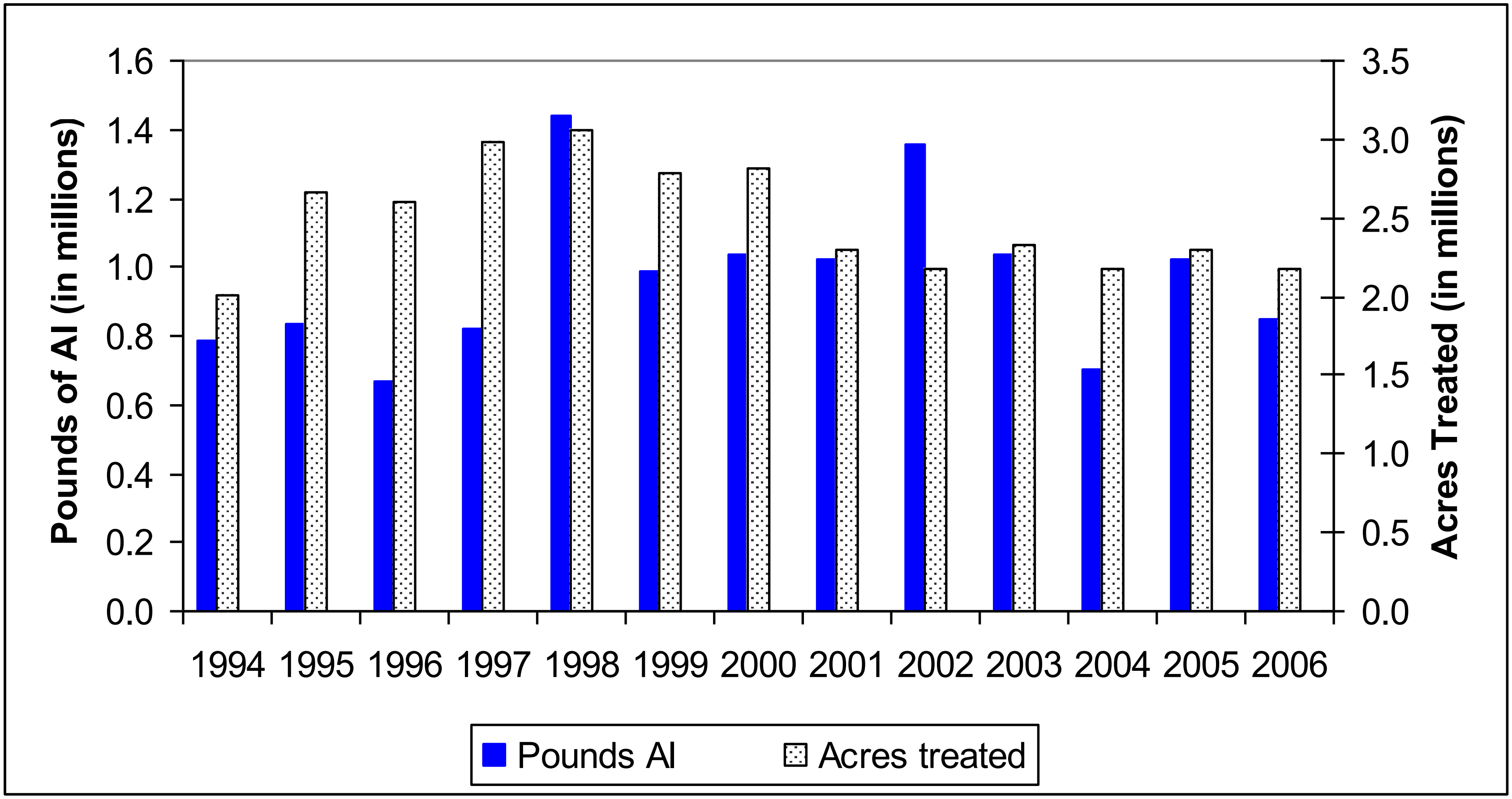
***Table 10B** (cont)**.** The reported cumulative acres treated in California with each biopesticide.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
GERANIOL	0	0	0	0	0	0	0	0	0	0	0
GERMAN COCKROACH PHEROMONE	0	0	0	0	0	0	0	0	0	6	0
GIBBERELLINS	416,073	455,572	487,195	439,529	464,780	387,488	423,337	431,001	414,093	462,231	456,670
GIBBERELLINS, POTASSIUM SALT	101	184	70	1,429	8	188	22	59	170	65	348
GLIOCLADIUM VIRENS GL-21 (SPORES)	21	14	29	12	8	768	6	0	0	18	<1
GLUTAMIC ACID	0	0	0	0	0	320	43,682	87,153	117,477	114,189	58,586
HYDROGEN PEROXIDE	0	0	0	5	21	485	636	802	1,057	985	9,950
HYDROPRENE	0	0	1	1	<1	1	0	0	<1	<1	7
IBA	104	410	1,319	1,236	266	124	244	252	1,566	79	27,670
LAGENIDIUM GIGANTEUM (CALIFORNIA STRAIN)	<1	0	0	0	0	0	0	0	24	2	0
LAURYL ALCOHOL	1,798	2,858	2,886	2,666	8,038	6,429	4,635	4,791	6,009	6,719	5,488
LINALOOL	0	0	0	0	0	0	0	0	0	0	0
METARHIZIUM ANISOPLIAE, VAR. ANISOPLIAE, STRAIN ESF1	0	0	0	0	0	0	0	0	0	0	0
METHOPRENE (POST 1997 SEE CHEM CODE 5026)	65	11	23	58	38	50	0	359	1	0	157
METHYL ANTHRANILATE	0	0	0	0	0	0	81	56	1,458	448	1,557
METHYL SALICYLATE	0	0	0	0	0	0	0	0	0	0	0
MUSCALURE	1,439	699	979	292	473	189	121	2,283	307	2,715	476
MYRISTYL ALCOHOL	1,798	2,858	2,886	2,666	8,038	6,429	4,635	4,791	6,009	6,719	5,488
MYROTHECIUM VERRUCARIA, DRIED FERMENTATION SOLIDS & SOLUBLES, STRAIN AARC-0255	0	104	1,514	3,348	3,173	4,392	3,926	4,390	8,348	4,680	4,478
NAA	41	364	542	788	172	102	72	75	1,096	49	26,799
NEROLIDOL	22,113	16,837	12,543	43,212	25,673	8,495	6,584	5,451	4,294	4,369	1,246
NITROGEN, LIQUIFIED	0	0	0	0	0	0	0	0	0	0	0
NONANOIC ACID	518	294	645	573	496	495	443	476	1,075	675	877
NONANOIC ACID, OTHER RELATED	518	294	645	573	496	495	443	476	1,075	675	877
NOSEMA LOCUSTAE SPORES	0	0	7	14	2	9	0	35	37	1	0
OIL OF ANISE	0	0	0	0	0	0	0	0	0	0	0
OIL OF BERGAMOT	0	0	0	0	0	0	0	0	0	0	0
OIL OF CEDARWOOD	0	0	0	0	0	0	0	0	0	0	0
OIL OF CITRONELLA	0	6	80	24	1	0	0	0	0	0	0
OIL OF LEMONGRASS	0	0	0	0	0	0	0	36	0	20	0
OXYPURINOL	0	0	0	0	0	0	0	0	0	0	0

***Table 10B** (cont)**.** The reported cumulative acres treated in California with each biopesticide.*

AI	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
PAECILOMYCES FUMOSOROSEUS APOPKA STRAIN 97	0	0	0	0	0	13	0	0	0	0	0
PERFUME	0	0	0	0	70	0	0	0	0	0	0
POLY-D-GLUCOSAMINE	0	0	0	0	0	0	0	0	<1	0	0
POLYHEDRAL OCCLUSION BODIES (OB'S) OF THE NUCLEAR POLYHEDROSIS VIRUS OF HELICOVERPA ZEA (CORN EARWORM)	0	0	0	0	0	0	0	293	742	0	0
POTASSIUM BICARBONATE	0	11	34,010	52,110	60,330	52,654	74,151	106,988	64,994	143,968	61,272
PROPYLENE GLYCOL	1,054,935	1,116,317	1,208,619	961,979	1,057,786	812,714	746,000	763,898	778,321	754,665	738,308
PSEUDOMONAS FLUORESCENS, STRAIN A506	16,951	26,617	29,656	15,760	1,443	11,668	13,126	16,945	6,559	7,176	11,929
PSEUDOMONAS SYRINGAE STRAIN ESC-11	0	0	17	0	0	0	0	0	0	0	0
PSEUDOMONAS SYRINGAE, STRAIN ESC-10	0	0	0	0	0	0	0	0	0	0	0
PUTRESCENT WHOLE EGG SOLIDS	0	0	0	0	0	0	0	0	0	0	0
QST 713 STRAIN OF DRIED BACILLUS SUBTILIS	0	0	0	0	2,154	15,205	40,786	54,547	58,871	56,342	64,560
S-METHOPRENE	0	0	505	<1	567	951	166	21	49	2,395	9,552
SODIUM BICARBONATE	0	0	0	8	0	0	0	0	100	0	0
SODIUM LAURYL SULFATE	0	0	48	0	16	0	29	0	0	0	0
SOYBEAN OIL	16,839	22,476	10,427	13,609	12,837	11,254	18,627	15,359	9,870	6,344	3,675
STREPTOMYCES GRISEOVIRIDIS STRAIN K61	20	115	34	27	83	50	17	14	5	20	29
STREPTOMYCES LYDICUS WYEC 108	0	0	0	0	0	0	0	0	0	0	50
SUCROSE OCTANOATE	0	0	0	0	0	0	0	0	0	0	4
THYME	0	0	0	0	0	0	0	0	0	0	0
TRICHODERMA HARZIANUM RIFAI STRAIN KRL-AG2	<1	69	369	456	885	1,048	293	466	833	406	285
XANTHINE	0	0	0	0	0	0	0	0	0	0	0
Z,E-9,12-TETRADECADIEN-1-YL ACETATE	0	0	0	0	0	0	13	0	0	0	0
Z-11-TETRADECEN-1-YL ACETATE	0	13	2,171	54,460	38,834	14,063	16,870	10,335	8,836	7,351	6,637
Z-8-DODECENOL	6,045	9,932	11,791	23,549	22,721	33,383	33,602	39,198	41,752	33,419	37,363
Z-8-DODECENYL ACETATE	6,045	9,932	11,791	23,549	22,721	33,383	33,602	39,198	41,752	33,419	37,363
Z-9-TETRADECEN-1-OL	0	0	0	0	0	0	13	0	0	0	0
Grand Total	2,652,936	3,037,120	3,109,776	2,934,883	2,961,477	2,412,710	2,334,813	2,532,799	2,410,114	2,513,482	2,368,347

Figure 8. *Use trends of biopesticides. Biopesticides include microorganisms and naturally occurring compounds, or compounds essentially identical to naturally occurring compounds that are not toxic to the target pest (such as pheromones). Reported pounds of active ingredient (AI) applied include both agricultural and reportable non-agricultural applications. The reported cumulative acres treated include primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports.*



V. TRENDS IN PESTICIDE USE IN CERTAIN COMMODITIES

This summary describes possible reasons for changes in pesticide use from 2005 to 2006 for the following commodities: (1) almonds, (2) cotton, (3) wine grapes, (4) table and raisin grapes, (5) alfalfa, (6) processing tomatoes, (7) oranges, (8) head lettuce, (9) rice, (10) peaches and nectarines, (11) strawberries, and (12) carrots. These 12 commodities were chosen because each were treated with more than 5 million pounds of active ingredients (AI) or cumulatively treated on more than 2 million acres. Collectively, this represents 66 percent of all reported pesticide pounds used (74 percent of all pounds used on agricultural fields) and 71 percent of the acres treated in 2006.

Information used to develop this section was drawn from several publications and phone interviews with pest control advisors, growers, University of California Cooperative Extension farm advisors and specialists, researchers, and commodity association representatives. DPR staff analyzed the information, using their extensive knowledge of pesticides, California agriculture, pests, and pest management practices to draw conclusions about possible explanations for changes in pesticide use. However, it is important to note these explanations are based on anecdotal information, not rigorous statistical analyses.

Reported pesticide use in California in 2006 totaled 190 million pounds, a decrease of 6 million pounds from 2005 (-2.9 percent). The AIs with the largest uses by pounds were sulfur, petroleum and mineral oils, metam-sodium, copper compounds, and 1,3-dichloropropene (1,3-D). By pounds, sulfur accounted for 24 percent of all reported pesticide use in 2006 and accounted for most of the decrease in pesticide use from 2005 to 2006. Sulfur use decreased by 15 million pounds (-25 percent) but was still the most highly used pesticide in 2006 by pounds applied. Sulfur is a natural fungicide favored by both conventional and organic farmers and is used mostly to control powdery mildew on grapes. Other pesticides that declined in use include the fumigant metam-sodium (1.6 million pound decrease, -13 percent), the fungicide copper (310,000 pound decrease, -3 percent), and the fumigant 1,3-D (763,000 pound decrease, -8 percent).

In contrast, some pesticide use increased. Non-adjuvant pesticides with the greatest increase in pounds applied were oil (6.4 million pound increase, 22 percent), the fumigant potassium n-methyldithiocarbamate (also called metam-potassium) (1.2 million pound increase, 61 percent), and the herbicide glyphosate (733,000 pound increase, 11 percent). Most oils are low risk pesticides frequently used to control insects and mites. In 2006 oils were used mostly on almonds and oranges. About 40 percent of the total pounds of metam-sodium were on carrots, with processing tomatoes and potato accounting for another 30 percent. Metam-potassium was used mostly on carrots and processing tomatoes and glyphosate on rights of way and almonds.

Different pesticides are used at different rates. In California, most pesticides are applied at rates of around 1 to 2 pounds per acre. However, fumigants are usually applied at rates of hundreds of pounds per acre. Thus, comparing use by pounds will emphasize fumigants. Comparing use among different pesticides using acres treated gives a different picture.

Although pounds of pesticides decreased, acres treated increased by 4 million (3.7 percent). By acres treated, the non-adjuvant pesticides with the greatest use in 2006 were sulfur, glyphosate, oils, copper compounds, and oxyfluorfen. Most of the increase in total acres treated was from increased use of oil, pyraclostrobin, and carfentrazone-ethyl, which are usually considered low risk. Pyraclostrobin is a fungicide used mostly on almonds and grapes. The herbicide carfentrazone-ethyl was used mostly on almonds and small grains by acres treated. Most of the acres treated with copper are on grapes to control downy mildew and summer bunch rot. The herbicide oxyfluorfen is often applied with glyphosate in almonds.

DPR data analyses have shown that pesticide use varies from year to year depending upon pest problems, weather, acreage and types of crops planted, economics, and other factors. From the end of February through most of April 2006 the weather was cool and rainy so diseases of many crops were worse than in most recent years, except for 2005, when the weather was similar. Use of herbicides and insecticides were generally higher in 2006 than 2005, but pounds of fumigants were less. Prices for most of the 12 crops improved in 2006 and acres planted or harvested for a little over half decreased.

In the following tables, use is given by pounds of AI applied and by acres treated. Acres treated means the cumulative number of acres treated; the acres treated in each application are summed even when the same field is sprayed more than once in a year. (For example, if the same acre is treated three times in a calendar year with an individual AI, it is counted as three acres treated).

Almonds

Almonds are California's largest tree nut crop in total dollar value and acreage. They are the largest horticultural export from the United States. Approximately 6,000 almond growers produce nearly 100 percent of the commercial domestic supply and more than 75 percent of worldwide production. Nearly 80 countries import California almonds. The United States is by far the largest market for almonds; overseas, Germany and Spain remain the two top markets followed by India, Japan and China, representing 50 percent of all California almond exports. There are three distinct almond growing regions in California, the Sacramento Valley, Central San Joaquin Valley and Southern San Joaquin Valley. Weather conditions and pest pressure can vary greatly from the northern region to the south.

Table 11A. *Total reported pounds of all active ingredients (AIs), acres treated, acres planted, and prices for almonds each year from 2002 to 2006. Planted acres from 2001 to 2005 are from CDFA 2006; planted acres in 2006 are from NASS, May 2007a; marketing year average prices from 2001 to 2006 from NASS, July 2007b.*

	2002	2003	2004	2005	2006
Lbs AI	11,943,154	13,351,612	16,200,416	17,172,983	21,257,929
Acres Treated	5,522,331	6,353,573	7,316,371	8,898,987	11,215,120
Acres Planted	605,000	610,000	640,000	680,000	730,000
Price $/lb	$1.11	$1.57	$2.21	$2.81	$1.87

Table 11B. *Percent difference from previous year for reported pounds of all AIs, acres treated, acres planted, and prices for almonds from 2002 to 2006.*

	2002	2003	2004	2005	2006
Lbs AI	17	12	21	6	24
Acres Treated	8	15	15	22	26
Acres Planted	1	1	5	6	7
Price $/lb	22	41	41	27	-33

Figure 9. Acres of almonds treated by all AIs in the major types of pesticides from 1994 to 2006.

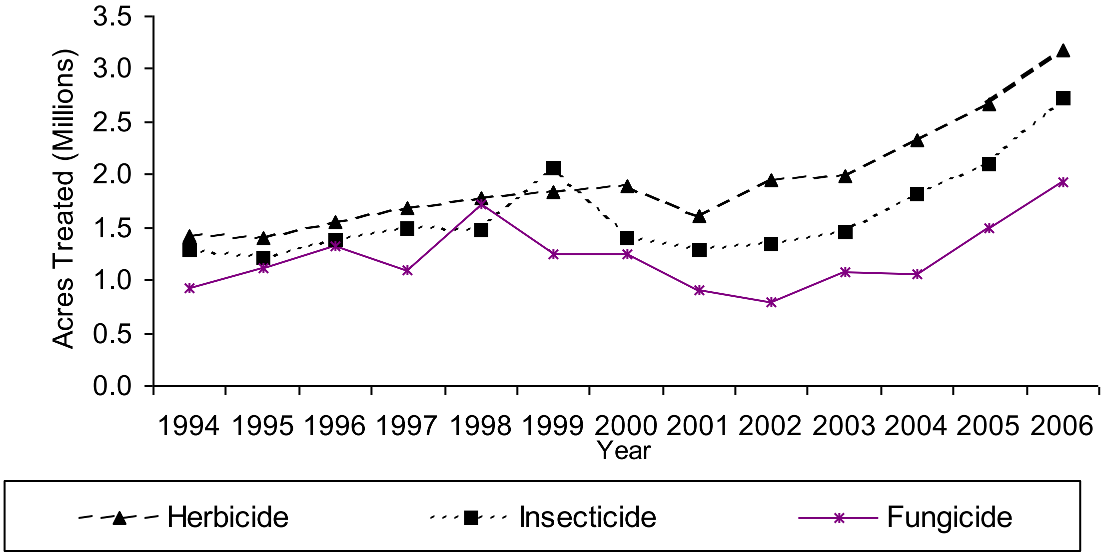


Table 11C. The non-adjuvant pesticides with the largest change in acres treated of almonds from 2005 to 2006. This table shows acres treated with AI each year from 2002 to 2006, the change in acres treated and percent change from 2005 to 2006.

AI	AI TYPE	2002	2003	2004	2005	2006	Change	Pct Change
PYRACLOSTROBIN	FUNGICIDE	0	0	74,064	266,613	473,210	206,597	77
BOSCALID	FUNGICIDE	0	0	74,064	266,613	473,210	206,597	77
CHLORPYRIFOS	INSECTICIDE	92,361	120,255	153,321	155,355	293,471	138,115	89
OIL	INSECTICIDE	380,687	381,802	483,367	544,607	679,011	134,404	25
GLYPHOSATE	HERBICIDE	931,671	947,935	1,034,569	1,223,314	1,342,067	118,753	10
CARFENTRAZONE-ETHYL	HERBICIDE	0	0	0	6,178	118,188	112,010	1,813
ABAMECTIN	INSECTICIDE	263,215	261,299	342,920	426,347	514,391	88,044	21
ESFENVALERATE	INSECTICIDE	113,672	138,497	144,053	146,702	210,652	63,950	44
OXYFLUORFEN	HERBICIDE	497,148	498,675	585,731	631,310	695,139	63,829	10
PARAQUAT DICHLORIDE	HERBICIDE	197,330	176,178	242,179	286,201	349,159	62,958	22
PYRIMETHANIL	FUNGICIDE	0	0	0	0	57,070	57,070	
MANEB	FUNGICIDE	38,207	47,617	37,858	18,257	73,091	54,834	300
ZIRAM	FUNGICIDE	81,964	101,140	61,926	104,207	155,830	51,623	50
COPPER	FUNGICIDE	124,113	150,598	180,138	171,807	221,200	49,392	29
PROPARGITE	INSECTICIDE	128,836	137,299	116,550	111,887	64,687	-47,200	-42

Pounds of pesticide active ingredients in almonds increased by 24 percent from 2005 to 2006 and acres treated increased by 26 percent. Use of insecticides, fungicides, and herbicides all increased, though fungicide use increased by the greatest percent. Part of the increase in pesticide use can be explained by 7 percent increase in planted acres. In addition, even though almond prices decreased in 2006, the average price returns to growers remains strong, and growers in 2006 anticipated a price increase. Historically, when growers anticipate higher prices they are more inclined to apply pesticides to protect the crop.

Fungicide use increased primarily because wet and cool conditions prevailed in March and April in all growing regions. These conditions resulted in problems with rust, scab, and anthracnose. Some growers reported as many as five applications of fungicide, which is a bit unusual. The most commonly used fungicides and the fungicides with the largest increase in use, were pyraclostrobin and boscalid, which are both present in the same pesticide product. These were used to manage scab and anthracnose. Maneb and captan were used primarily for rust.

In the Sacramento Valley insect pressure was light in 2006 and insecticide use per acre planted remained nearly constant. Most of the increased insecticide use occurred in the San Joaquin Valley region where San Jose Scale (SJS) and peach twig borer (PTB) got lots of attention with the use of oils, methidathion, and diflubenzuron in the dormant season. Buprofezin also showed an increase. PCAs are realizing that this buprofezin does well in the dormant season for SJS and will use it to a greater extent as a replacement for OPs and carbamates. Diflubenzuron and buprofezin are insect growth regulators and have low toxicity to mammals.
A significant infestation of the leaffooted plant bug, particularly in the central and southern region resulted in the increased use of chlorpyrifos. In addition, chlorpyrifos, phosmet and methoxyfenozide are replacing the use of azinphos-methyl. The 89 percent increase in chlorpyrifos is likely due to its use to control SJS, ants and navel orangeworm (NOW), as well as the leaffooted bug. Some growers reported two applications to control NOW at hull split which is a bit unusual. Again, this is likely due in part to the perceived value of almonds in 2006 and growers wanting to protect their investment. However, growers in all regions reported use of winter sanitation to reduce over-wintering populations of NOW. Abamectin showed an increase, however, this could be explained at least partially by the corresponding reduction in use of propargite, both of which are used to control mites.

Due to the long wet spring weeds were a problem resulting in increased use of paraquat dichloride and glyphosate. The use of carfentrazone-ethyl and glufosinate-ammonium showed big increases due to some weed species becoming resistant to glyphosate. The use of pendimethalin continues to increase on non-bearing acreage due to the big increase in almond acreage planted. Tank mixes with glyphosate and oxyfluorfen, or glyphosate and oryzalin have been a standard herbicide mix for years. Growers sometimes will use oxyfluorfen at a low rate to take advantage of its contact action as a boost for glyphosate Also, oryzalin was in short supply for several years. It is now available again and use is increasing.

The use of the fumigant 1,3–D decreased in 2006, and methyl bromide use stayed about the same as 2005. This could be attributed to fewer newly planted orchards in 2006 than in 2005. Newly planted acreage normally requires a one-time preplant fumigation.

Cotton

Cotton is grown for fiber, oil, and animal feed and is one of the five most widely grown crops in California. Two main kinds of cotton are grown: upland and Pima. Pima cotton acreage has been increasing and upland cotton decreasing. In 2006 the acres of these two kinds of cotton were nearly the same. However, total cotton acres planted decreased by 15 percent from 2005 to 2006. Some upland cotton has also been genetically modified to be tolerant to the herbicide glyphosate (Roundup); acres planted with Roundup Ready cotton decreased by 34 percent from 2005 to 2006. Most cotton is grown in the southern San Joaquin Valley, but a small percentage is grown in Imperial and Riverside counties and several counties in the Sacramento Valley.

Table 12A. *Total reported pounds of all active ingredients (AIs), acres treated, acres planted, and prices for cotton each year from 2002 to 2006. Planted acres from 2001 to 2005 are from CDFA 2006; planted acres in 2006 are from NASS, June 2007; marketing year average prices from 2001 to 2004 are from NASS, July 2003, July 2004, and July 2006; 2005 and 2006 prices are from NASS, July 2007b.*

	2002	2003	2004	2005	2006
Lbs AI	7,257,808	7,278,615	7,171,060	7,005,542	5,469,481
Acres Treated	8,661,444	10,529,041	10,422,661	11,416,289	9,655,117
Acres Planted Upland Cotton	480,000	550,000	560,000	430,000	285,000
Acres Planted Pima Cotton	210,000	150,000	215,000	230,000	275,000
Acres Planted Roundup-Ready	124,800	148,500	218,400	172,000	114,000
Acres Planted Total	690,000	700,000	775,000	660,000	560,000
Price Upland $/lbs	$0.573	$0.745	$0.516	$0.604	$0.572
Price Pima $/lbs	$0.860	$1.230	$0.882	$1.260	$1.040
Price All	$0.660	$0.849	$0.618	$0.833	$0.802

Table 12B. *Percent difference from previous year for reported pounds of all AIs, acres treated, acres planted, and prices for cotton from 2002 to 2006.*

	2002	2003	2004	2005	2006
Lbs AI	-11	0	-1	-2	-22
Acres Treated	-14	22	-1	10	-15
Acres Planted Upland Cotton	-24	15	2	-23	-34
Acres Planted Pima Cotton	-13	-29	43	7	20
Acres Planted Roundup-Ready	-27	19	47	-21	-34
Acres Planted Total	-21	1	11	-15	-15
Price Upland $/lbs	38	30	-31	17	-5
Price Pima $/lbs	0	43	-28	43	-17
Price All	23	29	-27	35	-4

Figure 10. *Acres of cotton treated by all AIs in the major types of pesticides from 1994 to 2006.*

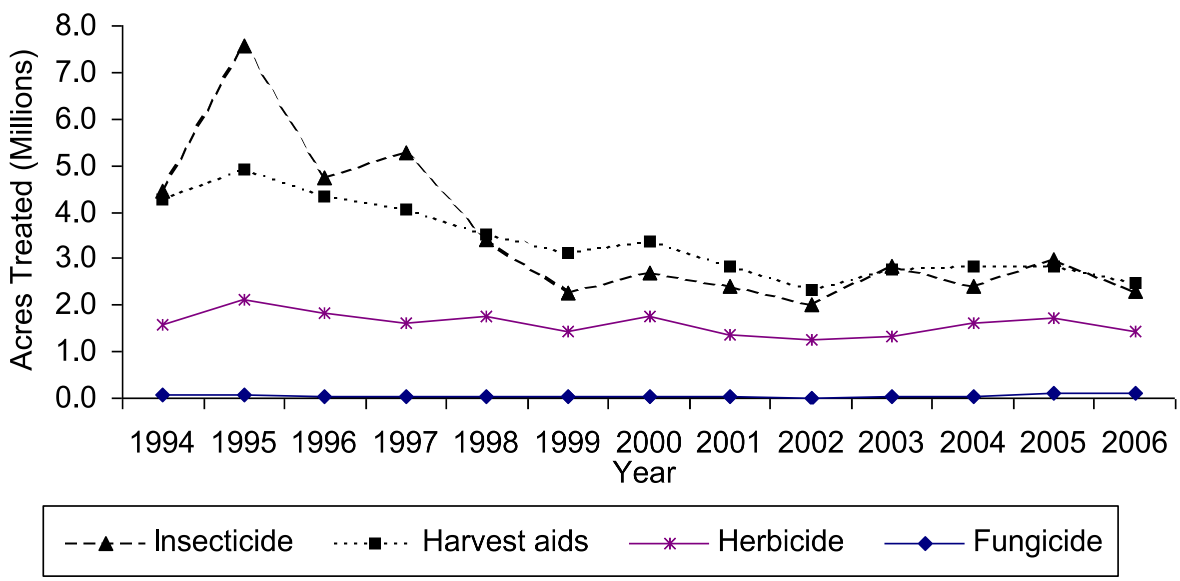


__Table 12C__. The non-adjuvant pesticides with the largest change in acres treated of cotton from 2005 to 2006. This table shows acres treated with AI each year from 2002 to 2006, the change in acres treated and percent change from 2005 to 2006.

AI	AI TYPE	2002	2003	2004	2005	2006	Change	Pct Change
GLYPHOSATE	HERBICIDE	412,541	487,283	583,138	613,245	428,185	-185,060	-30
CHLORPYRIFOS	INSECTICIDE	245,178	313,248	223,129	390,194	256,566	-133,629	-34
ACETAMIPRID	INSECTICIDE	47,145	295,867	348,107	372,307	284,365	-87,942	-24
ETHEPHON	HARVEST AID	428,940	476,805	572,142	563,771	482,511	-81,259	-14
OXYFLUORFEN	HERBICIDE	125,476	170,894	174,150	231,272	158,052	-73,220	-32
MEPIQUAT CHLORIDE	HARVEST AID	416,462	711,204	553,951	653,612	581,541	-72,070	-11
ABAMECTIN	INSECTICIDE	273,756	325,161	337,191	320,683	249,671	-71,012	-22
SODIUM CHLORATE	HARVEST AID	382,088	382,872	341,291	243,709	174,434	-69,276	-28
IMIDACLOPRID	INSECTICIDE	94,686	99,787	61,010	152,302	88,571	-63,731	-42
INDOXACARB	INSECTICIDE	71,435	335,642	137,503	307,177	244,855	-62,323	-20
ALDICARB	INSECTICIDE	220,649	227,236	215,381	213,611	154,682	-58,929	-28
DICOFOL	INSECTICIDE	98,904	111,501	128,987	109,258	53,177	-56,081	-51
UREA DIHYDROGEN SULFATE	HARVEST AID	208,348	275,002	343,362	366,171	314,811	-51,360	-14
THIAMETHOXAM	INSECTICIDE	204,996	224,453	181,915	222,692	173,601	-49,091	-22
OXAMYL	INSECTICIDE	57,019	75,540	93,895	138,340	92,916	-45,424	-33

Both cotton acres planted and acres treated decreased by 15 percent from 2005 to 2006. Pounds of AI applied to cotton decreased by 22 percent. Acres treated and pounds of AI of all AI types decreased. Harvest aids decreased by 13 percent in acres treated and 22 percent by pounds of AI; insecticide use decreased by 23 percent in acres and 28 percent in pounds, and herbicide use decreased by 17 percent in acres and 19 percent in pounds. Although acres treated with fungicides decreased by 10 percent, the pounds of fungicides increased by 46 percent; this difference occurs because the increase in fungicides was mostly from seed treatments, which are not reported in acres treated. The decrease in acres treated with harvest aids and herbicides was close to the decrease in acres planted, but insecticide use had a larger decrease. The spring of 2006 was cool and wet, which delayed cotton planting. However, after the slow start the weather warmed and the cotton crop benefited throughout most of the season, except for an exceptionally hot period in late July.

The most used insecticide by acres treated in 2006 was acetamiprid followed by chlorpyrifos, abamectin, and indoxacarb. Use of all of the top 10 insecticides decreased. The only increases were with some lesser-used insecticides. The largest percent decreases were with the miticides dicofol and propargite (-51 percent and -76 percent), but imidacloprid also had a large decrease (-42 percent). Before 2006 the main miticides were abamectin, dicofol, and propargite but in 2006 there was a switch to the newer and lower risk miticides etoxazole and spiromesifen, although abamectin was still the most used miticide.

The decrease in was primarily due to few pest problems in most areas in 2006 and the fewer acres planted. Aphids were present for most of the growing season but not in large enough numbers to cause concern except for a few fields. Whiteflies were present here and there and similarly most fields did not need to be treated. Lygus bugs were only a significant problem in southern San Joaquin Valley. Beet armyworm, western yellow-striped armyworm, and cabbage looper were present in some fields. Thrips were a problem in many areas in the spring.

Acetamiprid, chlorpyrifos, imidacloprid, and endosulfan were used mostly for aphids and whiteflies; indoxacarb and methoxyfenozide were used mostly on beet armyworm and other lepidopteran pests.

The herbicides with most acres treated in 2006 were glyphosate, oxyfluorfen, trifluralin, and pyrithiobac-sodium. Most of the major herbicides (top 15 AIs by acres treated) also decreased except for paraquat dichloride (acres increased by 99 percent), flumioxazin (acres increased 58 percent), carfentrazone-ethyl (acres increased 8 percent), sethoxydim (acres increased 27 percent), and diuron (acres increased 17 percent). Some of these AIs are used both as harvest aids and herbicides; here it is assumed if use occurred between August and November it was used as a harvest aid, otherwise as an herbicide. In the past several years, until 2006, use of glyphosate has been increasing. Glyphosate use decreased in 2006 primarily from a decreased use in March, which was cold and wet, delaying cotton planting.

Fungicides are not widely used in cotton, but their use by pounds has been increasing dramatically each year between 2003 and 2006. The main fungicides used in 2006 by pounds were myclobutanil, azoxystrobin, and TCMTB. The increase from 2005 to 2006 was mostly from myclobutanil, which was used primarily as a seed treatment for seedling diseases, and therefore its use in acres treated is low. Azoxystrobin is applied to cotton fields at planting to control seedling diseases. TCMTB, like myclobutanil, is also applied as a seed treatment. Fungicide use increased in 2006 because the cool, wet spring was conducive to seedling diseases.

Growers are increasingly concerned about a new strain of the fungus *Fusarium oxysporum* f. sp. *vasinfectum*. This new strain, known as race 4, is a much more serious disease than the other kinds of Fusarium, which have not caused major problems. Once a field is infected, it is there permanently and cannot be eradicated. Fungicides are not effective against this disease. The only real solution is the development of resistant cotton varieties.

The major harvest aids in 2006 were mepiquat chloride, ethephon, thidiazuron, and diuron. Use of nearly all harvest aids decreased from 2005 to 2006, although use per acres planted of most of the major harvest aids increased slightly. The exceptions were a 10 percent increase of acres treated with pyraflufen-ethyl and a 9 percent increase in cyclanilide. The largest percent decreases were endothall (-41 percent in acres treated) and S,S,S-tributyl phosphorotrithioate (-31 percent).

Wine grapes

In 2006, about 60 percent of California vineyard acreage produced wine grapes. There are four major wine grape production regions: 1) North Coast (Lake, Mendocino, Napa, Sonoma, and Solano counties); 2) Central Coast (Alameda, Monterey, San Luis Obispo, Santa Barbara, San Benito, Santa Cruz, and Santa Clara counties); 3) Northern San Joaquin Valley (San Joaquin, Calaveras, Amador, Sacramento, Merced, Stanislaus, and Yolo counties); and 4) Southern San Joaquin Valley (Fresno, Kings, Tulare, Kern, and Madera counties). Factors that influence changes in pesticide use on wine grapes include weather, topography, pest pressures (which vary by region), competition from newer pesticide products, application restrictions, efforts by growers to reduce costs, and increasing emphasis on sustainable farming. The pooled figures in this report may not reflect differences in pesticide use patterns in individual production regions.

Table 13A. *Total reported pounds of all active ingredients (AIs), acres treated, acres planted, and prices for wine grapes each year from 2002 to 2006. Planted acres from 2001 to 2005 are from CDFA 2006; planted acres in 2006 are from NASS, March 2007; marketing year average prices from 2001 to 2006 from NASS, July 2007b.*

	2002	2003	2004	2005	2006
Lbs AI	24,088,800	23,426,720	23,794,839	29,875,627	21,380,150
Acres Treated	6,749,530	6,652,676	6,572,971	8,053,802	7,266,619
Acres Planted	556,000	529,000	513,000	522,000	527,000
Price $/ton	$535	$530	$570	$582	$582

Table 13B. *Percent difference from previous year for reported pounds of all AIs, acres treated, acres planted, and prices for wine grapes from 2002 to 2006.*

	2002	2003	2004	2005	2006
Lbs AI	6	-3	2	26	-28
Acres Treated	3	-1	-1	23	-10
Acres Planted	-2	-5	-3	2	1
Price $/ton	-10	-1	8	2	0

Figure 11. *Acres of wine grapes treated by all AIs in the major types of pesticides from 1994 to 2006.*

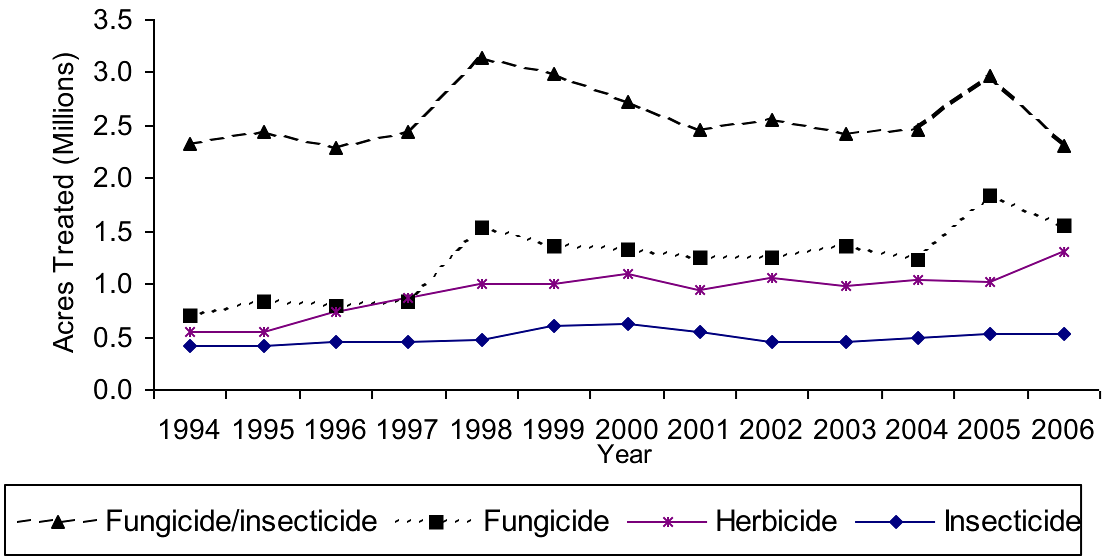


Table 13C. The non-adjuvant pesticides with the largest change in acres treated of wine grapes from 2005 to 2006. This table shows acres treated with AI each year from 2002 to 2006, the change in acres treated and percent change from 2005 to 2006.

AI	AI TYPE	2002	2003	2004	2005	2006	Change	Pct Change
SULFUR	FUNGICIDE/ INSECTICIDE	2,550,143	2,398,324	2,441,989	2,893,938	2,114,037	-779,901	-27
OIL	INSECTICIDE	56,395	61,789	83,408	131,159	228,846	97,688	74
GLUFOSINATE-AMMONIUM	HERBICIDE	9,012	13,108	18,816	19,720	89,518	69,798	354
TEBUCONAZOLE	FUNGICIDE	144,971	128,260	120,445	167,614	98,576	-69,038	-41
POTASSIUM BICARBONATE	FUNGICIDE	56,345	80,316	34,376	90,240	35,307	-54,933	-61
TRIFLOXYSTROBIN	FUNGICIDE	151,533	158,052	140,201	208,845	155,117	-53,728	-26
QUINOXYFEN	FUNGICIDE	0	0	49,248	65,605	116,372	50,767	77
COPPER	FUNGICIDE	273,486	303,831	284,670	403,449	356,569	-46,879	-12
FENARIMOL	FUNGICIDE	76,301	94,567	54,776	101,952	55,885	-46,066	-45
FLUMIOXAZIN	HERBICIDE	0	0	0	31,324	72,447	41,124	131
PARAQUAT DICHLORIDE	HERBICIDE	161,770	138,634	131,414	134,194	162,763	28,568	21
MYCLOBUTANIL	FUNGICIDE	278,048	267,895	266,726	280,241	253,956	-26,285	-9
CYPRODINIL	FUNGICIDE	41,739	51,839	33,193	66,454	41,081	-25,374	-38
SIMAZINE	HERBICIDE	118,631	103,773	115,281	103,491	126,971	23,479	23
CARFENTRAZONE-ETHYL	HERBICIDE	0	0	0	1,085	21,944	20,859	1,923

Total wine grape acres treated with pesticides fell by 10 percent and total pounds of pesticide applied decreased by 28 percent from 2005 to 2006, even though total acres planted increased slightly. This decrease was due chiefly to less application of fungicides and fungicide/insecticides (mainly sulfur). Total acres treated with those two groups of pesticides decreased by 15 and 23 percent, respectively. In contrast, total acres treated increased by 27 percent for herbicides and remained nearly the same for insecticides.

In 2006, an unseasonably warm January and a February with record high temperatures were followed by a long, wet, cool spring. Rain delayed spring field work and caused early bunch rot in some regions. Warm June weather became a record-breaking heat wave in late July. August and September were cool along the central coast, and late September showers fell along the north coast and in the San Joaquin Valley. The harvest was delayed by 2-3 weeks in cooler areas, but largely concluded in October. Rains in northern California in early November caused mildew in some of the remaining crop, but damage was not severe or widespread. Wine grape quality was above average to excellent and the harvest was 17 percent smaller than the record-breaking 2005 crop. Nevertheless, the holdover from last year's bumper crop and winery imports of inexpensive bulk wine kept demand for most wine grape varieties low and the overall price flat. In many cases, wineries accepted only contract tonnages and standards were high. Some wine grape growers sold grapes (especially red varieties other than pinot noir) at low prices for concentrate, or left their fruit to raisin on the vine.

Acres treated with insecticides remained nearly the same from 2005 to 2006 even though there were spreading infestations of vine mealybug (VMB). The major insecticides and miticides applied in 2006 by acres treated were imidacloprid, methoxyfenozide, chlorpyrifos, fenpropathrin, oils, the miticide bifenazate, and *Bacillus thuringiensis* (*Bt*) products.

Imidacloprid and chlorpyrifos were being used in eradication and management programs for VMB in 21 counties. An important trend was a switch from higher to lower risk insecticides. The area treated with acetamiprid, a low risk chemical that can be applied to foliage against sucking insects including VMB, doubled to nearly 24,000 acres. Methoxyfenozide and *Bt* products, also low risk chemicals, control moths. Fenpropathrin is applied against leafhoppers, sharpshooters, and moths. In 2006, acreage treated with oils increased greatly (Table 13C). They have many attractive, broad-spectrum properties and are low-risk. Increasingly mixed with fungicides, oils can replace a surfactant and eradicate mildew growth, as well as suppressing mites and insects such as grape leafhoppers. Bifenazate is a selective alternative to older, higher-risk miticides, which have longer worker re-entry periods.

Use of sulfur and many fungicides decreased from 2005 to 2006 (Table 13C), not because mildew and fungus disease pressure was low in 2006, but because diseases were less severe than in 2005. Growers may be substituting other fungicides for sulfur because of air quality concerns, and many of the alternatives can be applied less frequently and at lower rates. Most materials applied for *Botrytis* infections early in the year also control mildew. However, use of some fungicides increased. Acres treated with lime sulfur in early 2006 against overwintering disease inoculum increased by 67 percent. Total area treated with quinoxyfen for powdery mildew control also rose sharply in 2006. Quinoxyfen is a relatively new fungicide that is being rotated into resistance management programs. Sulfur, copper products, myclobutanil, boscalid, pyraclostrobin, and trifloxystrobin were the most-used fungicides in terms of acres treated.

A long, wet spring produced vigorous weed growth in 2005, which led to a larger weed seed bank going into an equally weed-friendly spring 2006. These conditions may have prompted wine grape growers to apply herbicides to more acres in 2006. Herbicides used most in wine grapes by acres treated were glyphosate products, oxyfluorfen, paraquat, and simazine. Acres treated with glyphosate, a broad-spectrum post-emergence herbicide, declined slightly, perhaps because some vineyard weeds have begun showing resistance. Use of several herbicides that control glyphosate-resistant weeds rose significantly during 2006. Simazine application increased in spite of restrictions for ground water protection. The newer broad spectrum pre-emergence herbicide flumioxazin and the post-emergence herbicides paraquat, glufosinate-ammonium, and carfentrazone-ethyl also registered large increases in acres treated (Table 13C).

Fumigants applied for wine grape production rose 15 percent in 2006 in terms of total acres treated. That increase was almost completely due to wider use of aluminum phosphide for rodent control. Two wet springs in a row may have improved rodent habitat, increasing populations. In contrast, there was a significant decline in acres treated with two major soil fumigants: the preplant fumigant 1,3-dichloropropene, which controls nematodes, and sodium tetrathiocarbonate, which is used against nematodes, phylloxera, and root rots.

Plant growth regulators (PGR) are not as widely used in wine grapes as they are in table and raisin grapes. Total area treated with PGR decreased by 13 percent in 2006 to about 7,700 acres.

Table and raisin grapes

Table and raisin grapes comprised approximately 40 percent of California's total grape acreage in 2006, the rest being wine grapes. These categories shift depending on market conditions, since some grape varieties can be used for more than one purpose. Commercial production of table grapes is centered in the Southern San Joaquin Valley. The Coachella Valley is California's other significant table grape production area. In an average year, the state produces 850,000 to 890,000 tons of table grapes, about 8 percent coming from the Coachella Valley. The Southern San Joaquin Valley region includes Fresno, Madera, Tulare, Kern, and Kings counties; the Coachella Valley region includes Riverside, Imperial, and San Bernardino counties. Thompson Seedless is the leading raisin grape variety, and in most years roughly a third of the raisin grape crop is crushed for wine or concentrate. California produced about 300,000 tons of raisins in 2006. Almost all were from the Southern San Joaquin Valley, although a few raisins are produced in the Northern San Joaquin Valley region (San Joaquin, Calaveras, Amador, Sacramento, Merced, and Stanislaus counties).

Table 14A. *Total reported pounds of all active ingredients (AIs), acres treated, acres planted, and prices for raisin and table grapes each year from 2002 to 2006. Planted acres from 2001 to 2005 are from CDFA 2006; planted acres in 2006 are from NASS, March 2007; marketing year average prices from 2001 to 2006 from NASS, July 2007b.*

	2002	2003	2004	2005	2006
Lbs AI	22,899,333	21,510,214	21,400,439	23,263,479	17,768,582
Acres Treated	5,978,578	5,953,300	5,684,603	6,597,761	6,278,817
Acres Planted Raisin	252,000	260,000	248,000	246,000	240,000
Acres Planted Table	97,000	93,000	92,000	93,000	93,000
Acres Planted Total	349,000	353,000	340,000	339,000	333,000
Price Raisin $/ton	$152	$170	$306	$261	$283
Price Table $/ton	$616	$601	$695	$442	$902
Price All	$281	$284	$411	$311	$456

Table 14B. *Percent difference from previous year for reported pounds of all AIs, acres treated, acres planted, and prices for raisin and table grapes from 2002 to 2006.*

	2002	2003	2004	2005	2006
Lbs AI	17	-6	-1	9	-24
Acres Treated	5	0	-5	16	-5
Acres Planted Raisin	4	3	-5	-1	-2
Acres Planted Table	-1	-4	-1	1	0
Acres Planted Total	3	1	-4	0	-2
Price Raisin $/ton	-18	12	80	-15	8
Price Table $/ton	1	-2	16	-36	104
Price All	-9	1	45	-24	47

Figure 12. *Acres of raisin and table grapes treated by all AIs in the major types of pesticides from 1994 to 2006.*

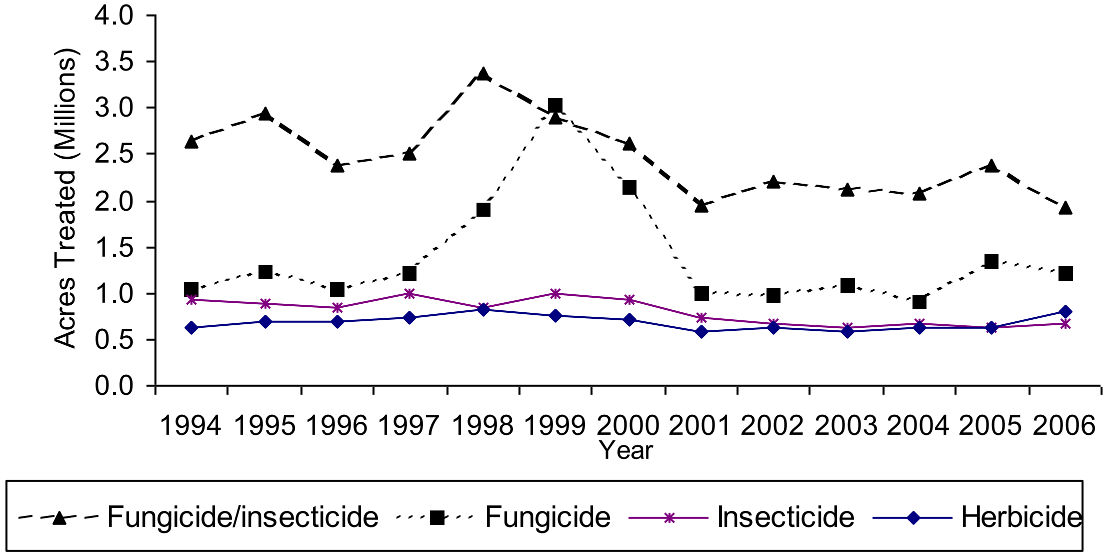


Table 14C. *The non-adjuvant pesticides with the largest change in acres treated of raisin and table grapes from 2005 to 2006. This table shows acres treated with AI each year from 2002 to 2006, the change in acres treated and percent change from 2005 to 2006.*

AI	AI TYPE	2002	2003	2004	2005	2006	Change	Pct Change
SULFUR	FUNGICIDE/ INSECTICIDE	2,226,759	2,184,408	2,100,190	2,405,052	1,944,399	-460,654	-19
GLYPHOSATE	HERBICIDE	254,273	250,732	241,439	249,007	289,777	40,770	16
GLUFOSINATE-AMMONIUM	HERBICIDE	987	4,334	8,719	15,610	47,166	31,556	202
TEBUCONAZOLE	FUNGICIDE	99,604	115,047	118,992	130,058	99,435	-30,623	-24
PARAQUAT DICHLORIDE	FUNGICIDE	144,281	145,936	131,109	141,247	170,747	29,500	21
COPPER	FUNGICIDE	277,429	343,046	259,926	348,476	377,960	29,483	8
BOSCALID	FUNGICIDE	0	4	62,621	144,447	121,559	-22,888	-16
PYRACLOSTROBIN	FUNGICIDE	0	4	62,621	144,439	121,556	-22,883	-16
SIMAZINE	HERBICIDE	138,485	122,159	128,252	90,997	112,317	21,320	23
TRIFLUMIZOLE	FUNGICIDE	51,500	43,789	14,470	34,816	13,650	-21,166	-61
CYPRODINIL	FUNGICIDE	65,842	61,276	37,414	68,297	48,364	-19,934	-29
FLUMIOXAZIN	HERBICIDE	0	0	0	35,247	53,825	18,578	53
POTASSIUM BICARBONATE	FUNGICIDE	10,520	12,476	11,398	33,188	15,068	-18,120	-55
FENARIMOL	FUNGICIDE	72,308	74,980	64,033	62,342	44,841	-17,500	-28
TRIFLOXYSTROBIN	FUNGICIDE	85,033	95,491	77,027	128,721	113,851	-14,870	-12

Two percent fewer acres were planted to table and raisin grapes in 2006, but total acres treated with the major categories of pesticides and total pounds of pesticide active ingredients applied decreased more – by 5 and 24 percent, respectively. The decrease was due to fewer acres being treated with fungicides (-9 percent) and fungicide/insecticides (mostly sulfur, -19 percent). In contrast, total acres treated with herbicides were up 25 percent from 2005, and acres treated with insecticides increased by 6 percent.

In 2006, an unseasonably warm January and a February with record-breaking high temperatures were followed by a long, wet, cool spring. Low temperatures slowed vine development and put the table grape season a few weeks behind normal. Although it rained in late May, the month was generally drier and warmer and canopy growth was good. June hot weather became a record-breaking heat wave in late July, which caused mite outbreaks in some locations, slowed table grape maturity, and had a negative impact on color development in some districts. Some exposed bunches of Red Globe table grapes sustained heat damage. Raisin harvesting was over by November, but the table grape harvest continued into December with vines covered in plastic to protect the fruit from rain. In general, table and raisin grapes were of good size and quality but the harvest was about 20 percent smaller than in 2005. The smaller crop was due at least in part to raisin grape vine removal and the cool, cloudy spring of 2005, which affected the development of flower primordia for the 2006 crop. Thompson Seedless, a primary raisin and table grape variety, is particularly sensitive to fluctuations in light and temperature. Favorable supply and demand conditions led to an increase in price per ton for both table and raisin grapes, while a continuing oversupply of wine grapes depressed winery demand and price. As a result, few table and raisin grapes were sold to vintners, and a high proportion was used for fresh-market fruit or raisins.

Insect pressure was higher in 2006 than in the previous year. The major insecticides applied by acres treated were imidacloprid, cryolite, methoxyfenozide, *Bt* products, and spinosad. Imidacloprid is used against small sucking insects: mealybugs, scales, phylloxera, leafhoppers, sharpshooters, and thrips. It is a newer, relatively expensive alternative to chlorpyrifos for control of vine mealybug, a spreading invasive pest. Acres treated with imidacloprid and chlorpyrifos increased in 2006 by 17 and 29 percent, respectively. Cryolite, methoxyfenozide, and *Bt* all control moths. Spinosad is a newer, low-risk alternative to cryolite that is effective against moths and thrips and can be used in organic production.

Fungicide use decreased from 2005 to 2006, even though disease pressure was high in 2006, primarily because in 2005 disease pressure was even higher. Fungicides most used for table and raisin grape production in 2006 by acres treated were sulfur, copper, myclobutanil, boscalid, pyraclostrobin, trifloxystrobin and tebuconazole. Most of these as well as potassium bicarbonate, triflumizole, and fenarimol provide good to excellent control of powdery mildew, which is the main reason for fungicide use in San Joaquin and Coachella Valley vineyards. Table 14C shows decreases in acres treated with several of those fungicides and cyprodinil, which is effective against *Botrytis* bunch rot. In contrast, the use of copper, most effective against downy mildew and summer bunch rot, increased. Most copper applications were made during early rains and after the May rainstorm, which caused bunch rot problems in susceptible varieties. Acres treated also rose with lime sulfur. It was applied during January through March to control overwintering disease inoculum.

Increased herbicide use reflected the second consecutive long, wet spring. The pressure growers felt in 2005 to cut costs by skimping on weed control may have been reduced in 2006 by the higher commodity prices. The most-used herbicides by acres treated were glyphosate, paraquat, simazine, oxyfluorfen, oryzalin, and flumioxazin. Flumioxazin is a lower-risk alternative to simazine, which is regulated to protect ground water. The use of nearly all herbicides increased; herbicides with the greatest increase in acres treated include glyphosate, glufosinate-ammonium, simazine, and flumioxazin (Table 14C). Glufosinate-ammonium is a post-emergence broad-spectrum herbicide that controls some glyphosate-resistant weeds. It and carfentrazone-ethyl, a post-emergence herbicide for broadleaf weeds, were both applied to significant acreage in 2006, their second year of availability.

Total vineyard acres treated with fumigants was almost unchanged in 2006. The two most-used soil fumigants are sodium tetrathiocarbonate for nematodes and phylloxera and the preplant nematicide 1,3-dichloropropene. A total of 34 acres were treated with methyl bromide before planting. Methyl bromide applied for postharvest treatment of grapes for export was reduced by almost two-thirds in 2006, to about 9000 pounds. Use of sulfur dioxide, the major postharvest fungicide applied to table grapes, was down 38 percent by weight. These reductions may reflect the smaller crop and the late harvest.

Raisin and table grape acres treated with plant growth regulators (PGR) and total pounds of PGR applied were about the same as in 2005. The most-used PGR was gibberellin, with over 340,000 acres treated. It is a low-dose compound sprayed between mid-May and early June to reduce fruit set and increase fruit size. About 59,000 acres were treated with ethephon to improve the color of red grapes. Far fewer acres (less than 8,500 for each chemical) were treated with forchlorfenuron, which is used in the same way as gibberellin but is more expensive, and with hydrogen cyanamide, which is sprayed during the dormant period to promote increased and uniform bud break in areas like the Coachella Valley that have warmer winters.

Alfalfa

Alfalfa hay is produced for animal feed in California. Most counties produce some alfalfa hay, but half of the state's production comes from Kern, Imperial, Tulare, Merced, and Fresno counties. Harvested alfalfa acres increased in 2006 by 5 percent compared to 2005, but the price per ton of alfalfa hay decreased in 2006 by 15 percent due to financial problems in the dairy industry. The total pounds of pesticide active ingredient applied increased in 2006 by 4 percent compared to 2005. However, the acres treated with pesticides increased in 2006 by 7 percent compared to 2005. The dairy industry is still the biggest market for alfalfa hay production.

Table 15A. *Total reported pounds of all active ingredients (AIs), acres treated, acres planted, and prices for alfalfa each year from 2002 to 2006. Harvested acres from 2001 to 2005 are from CDFA 2006; harvested acres in 2006 are from NASS, June 2007; marketing year average prices from 2001 to 2004 are from NASS, July 2003, July 2004, July 2005, July 2006; 2005 and 2006 prices from NASS July 2007b.*

	2002	2003	2004	2005	2006
Lbs AI	3,052,713	2,933,189	2,668,916	2,856,692	2,976,922
Acres Treated	4,621,099	4,867,186	4,170,614	5,167,935	5,524,820
Acres Harvested	1,160,000	1,090,000	1,050,000	1,000,000	1,050,000
Price $/ton	$98.00	$93.00	$116.00	$136.00	$116.00

Table 15B. *Percent difference from previous year for reported pounds of all AIs, acres treated, acres planted, and prices for alfalfa from 2002 to 2006.*

	2002	2003	2004	2005	2006
Lbs AI	4	-4	-9	7	4
Acres Treated	1	5	-14	24	7
Acres Harvested	15	-6	-4	-5	5
Price $/ton	-18	-5	25	17	-15

Figure 13. *Acres of alfalfa treated by all AIs in the major types of pesticides from 1994 to 2006.*

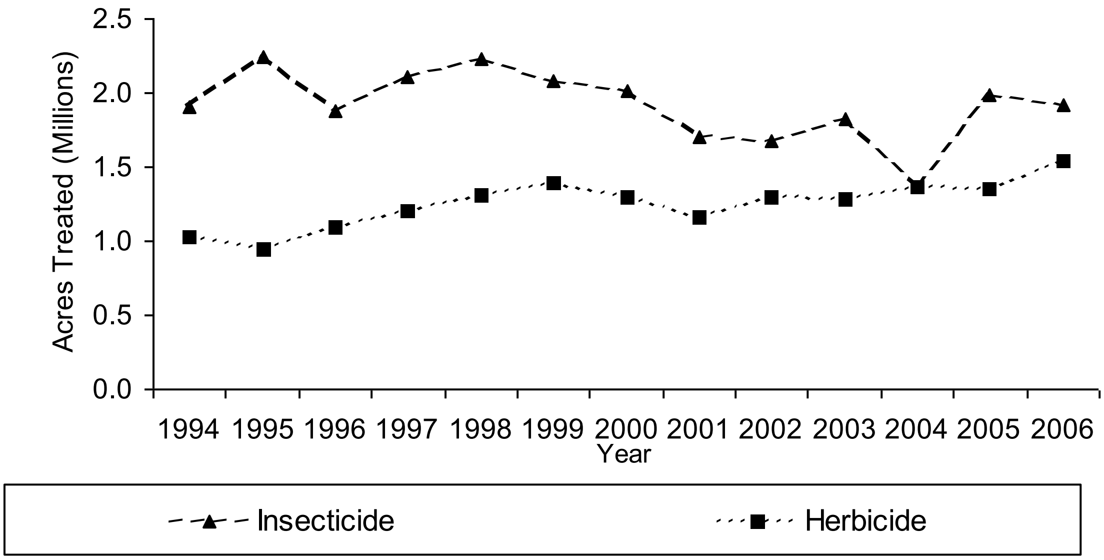


Table 15C. *Of the non-adjuvant pesticides, the top 12 AIs by greatest change (either positive or negative) in acres treated from 2005 to 2006; shown are acres treated of each AI year from 2002 to 2006 and change from 2005 to 2006.*

AI	AI TYPE	2002	2003	2004	2005	2006	Change	Pct Change
INDOXACARB	INSECTICIDE	96,735	253,988	122,368	336,866	479,896	143,030	42
CHLORPYRIFOS	INSECTICIDE	401,531	540,581	378,147	547,013	441,757	-105,257	-19
METHOMYL	INSECTICIDE	86,611	137,236	48,062	135,197	78,910	-56,287	-42
IMAZETHAPYR, AMMONIUM SALT	HERBICIDE	12,631	6,749	9,947	54,352	98,301	43,949	81
PARAQUAT DICHLORIDE	HERBICIDE	192,568	221,728	258,297	216,114	250,727	34,613	16
GLYPHOSATE	HERBICIDE	15,573	20,609	17,292	19,930	51,590	31,660	159
IMAZETHAPYR	HERBICIDE	104,000	51,462	64,304	34,850	3,636	-31,214	-90
DIURON	HERBICIDE	175,347	197,645	204,643	157,109	185,468	28,360	18
HEXAZINONE	HERBICIDE	120,833	154,445	159,010	133,672	159,800	26,127	20
CLETHODIM	HERBICIDE	83,210	64,183	71,192	87,365	109,225	21,860	25
4(2,4-DB), DIMETHYLAMINE SALT	HERBICIDE	34,555	31,037	50,436	63,515	84,501	20,987	33
IMAZAMOX, AMMONIUM SALT	HERBICIDE	33,831	58,935	71,896	97,810	118,573	20,763	21
CARBOFURAN	INSECTICIDE	92,465	78,453	46,532	53,049	34,469	-18,579	-35
SETHOXYDIM	HERBICIDE	35,577	38,184	40,335	47,174	29,707	-17,467	-37
EPTC	HERBICIDE	53,681	25,827	29,332	37,151	20,699	-16,451	-44

Statewide, insecticide use decreased by 10 percent in pounds of AI and by 3 percent in acres treated in 2006 when compared to 2005. This decrease was accompanied by the 5 percent increase of acres harvested. The decrease in acres treated with insecticides was mainly associated with the decreased uses of chlorpyrifos (-19 percent), methomyl (-42 percent), and carbofuran (-35 percent). The decrease in pounds of insecticides was mainly associated with similar active ingredients. Indoxacarb, on the other hand, showed an increase in acres treated by 42 percent in 2006 when compared to 2005. Other insecticides seem to be stable both in pounds and acres treated from 2005 to 2006. The reasons for the statewide decrease for insecticide use in pounds and acres treated may be due to less insect pressure of western yellow striped armyworm, beet armyworm, alfalfa caterpillar, and Egyptian alfalfa weevil in 2006 vs. 2005.

The decrease in chlorpyrifos and methomyl pounds and acres treated was mainly in the Sacramento and San Joaquin Valleys. The decrease in carbofuran was mainly in the Sacramento, San Joaquin, and Imperial Valleys. In contrast, indoxacarb use increased in the San Joaquin Valley. Indoxacarb is designated by the EPA as a "reduced-risk" pesticide on alfalfa and is considered an organophosphate (OP) replacement.

Statewide, herbicide use in pounds and acres treated increased by 10 percent and 15 percent respectively, in 2006 when compared to the use in 2005. This increase may be due to increased weed pressure from the wet spring. Use of most of the top 20 high use herbicides increased, except for sethoxydim, EPTC, and 2,4-DB acid. The increased use of paraquat dichloride may be a supplement to diquat dibromide, a desiccant used in seed production. Seed growers desiccate seed fields prior to harvest. In 2006, seed growers got the registration for a tank mix of paraquat dichloride and diquat dibromide, which the growers used with great success, and only one application was necessary in most situations.

The increase of the herbicides was mainly associated with the Sacramento and San Joaquin Valleys. Glyphosate increased mainly in the San Joaquin Valley, possibly because of the introduction of genetically modified Roundup Ready (glyphosate) alfalfa varieties. Although the reasons for selecting certain herbicides were unclear, efforts to use materials that are less likely to contaminate groundwater may have played a role in this reduction.

Fungicide use increased in 2006 both in pounds (249 percent) and acres treated (43 percent). The trend may reflect the wet spring in 2006. However, for alfalfa, fungicide use is not as significant as it is for herbicides and insecticides.

Processing tomatoes

Processing tomato growers planted 283,000 acres in 2006, a six percent increase over 2005. 105,200 acres of processing tomatoes are grown in Fresno County (37 percent of the crop), followed by San Joaquin County (35,000 acres), Yolo County (34,000 acres), and Kings County (21,000 acres).

Table 16A. *Total reported pounds of all active ingredients (AIs), acres treated, acres planted, and prices for processing tomatoes each year from 2002 to 2006. Planted acres from 2001 to 2006 are from NASS, May 2007b; marketing year average prices from 2001 to 2003 are from NASS, January 2004; from 2004 to 2006 from NASS, January 2007.*

	2002	2003	2004	2005	2006
Lbs AI	10,697,673	10,972,337	11,531,330	11,297,315	12,259,858
Acres Treated	2,064,929	2,662,371	2,505,256	2,777,416	2,960,870
Acres Planted	296,000	289,000	301,000	267,000	283,000
Lbs/acres treated	5.18	4.12	4.60	4.07	4.14
Lbs/acres planted	36.14	37.97	38.31	42.31	43.32
Price $/ton	$56.80	$57.20	$57.40	$59.60	$62.70

Table 16B. *Percent difference from previous year for reported pounds of all AIs, acres treated, acres planted, and prices for processing tomatoes from 2002 to 2006.*

	2002	2003	2004	2005	2006
Lbs AI	34	3	5	-2	9
Acres Treated	8	29	-6	11	7
Acres Planted	15	-2	4	-11	6
Lbs/acres treated	24	-20	12	-12	2
Lbs/acres planted	17	5	1	10	2
Price $/ton	-1	1	0	4	5

Figure 14. *Acres of processing tomatoes treated by all AIs in the major types of pesticides from 1994 to 2006.*

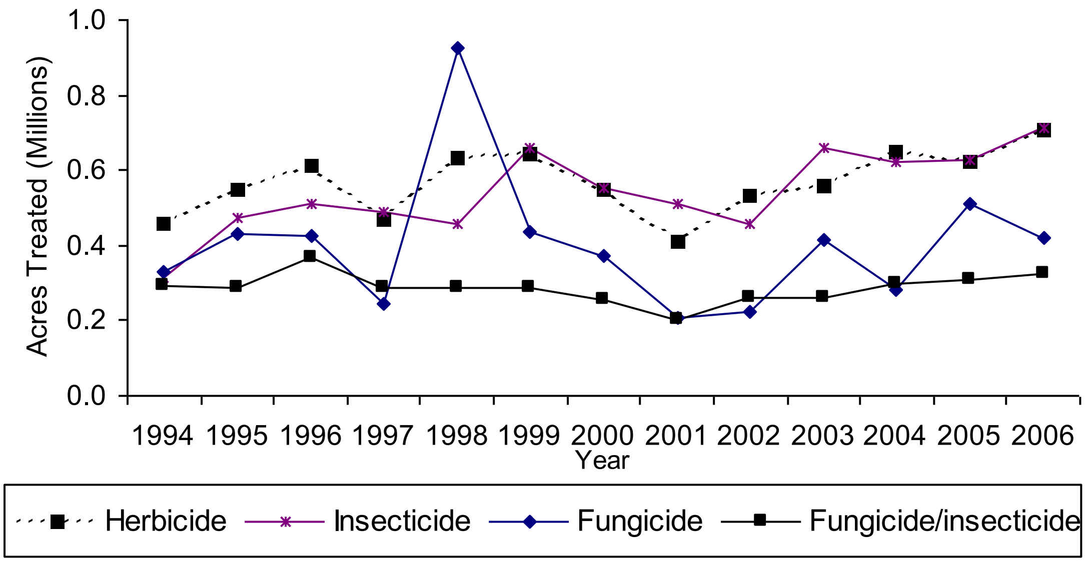


Table 16C. *The non-adjuvant pesticides with the largest change in acres treated of processing tomatoes from 2005 to 2006. This table shows acres treated with AI each year from 2002 to 2006, the change in acres treated and percent change from 2005 to 2006.*

AI	AI TYPE	2002	2003	2004	2005	2006	Change	Pct Change
COPPER	FUNGICIDE	24,478	99,683	21,096	136,762	74,136	-62,626	-46
BACILLUS THURINGIENSIS	INSECTICIDE	52,633	82,832	53,599	60,234	32,216	-28,018	-47
EMAMECTIN BENZOATE	INSECTICIDE	0	0	22,500	29,288	56,975	27,687	95
ETHEPHON	PLANT GROWTH REGULATOR	37,342	33,124	8,307	27,950	54,475	26,525	95
MANEB	FUNGICIDE	2,310	36,448	9,625	41,186	16,988	-24,198	-59
S-METOLACHLOR	HERBICIDE	68,019	81,643	142,195	145,364	168,872	23,507	16
METHOXYFENOZIDE	INSECTICIDE	0	0	33,893	71,046	93,152	22,106	31
TRIFLURALIN	HERBICIDE	178,589	182,458	196,807	182,284	202,127	19,843	11
IMIDACLOPRID	INSECTICIDE	16,326	21,660	30,045	23,559	42,070	18,512	79
GLYPHOSATE	HERBICIDE	64,791	89,765	97,571	101,177	118,161	16,985	17
ENDOSULFAN	INSECTICIDE	15,019	25,724	22,986	22,578	6,611	-15,967	-71
MANCOZEB	FUNGICIDE	16,914	36,316	9,433	63,256	47,973	-15,283	-24
LAMBDA-CYHALOTHRIN	INSECTICIDE	45,891	44,501	60,669	56,655	69,821	13,166	23
MYCLOBUTANIL	FUNGICIDE	5,008	8,692	19,310	19,042	31,505	12,463	65
CHLOROTHALONIL	FUNGICIDE	101,880	108,230	94,490	101,997	114,304	12,307	12

Planted acres increased by 6 percent from 2005 and pounds of pesticide AI used on the crop increased by 9 percent, considered a moderate increase given the early season rain and later heat problems. Pounds of AI per acre planted increased to the highest level in 5 years as growers try to protect a crop that increased in value by 4 percent in 2005 and another 5 percent in 2006—to $62.70 per ton. As in past years, sulfur and metam-sodium accounted for over 80 percent of the total pounds of pesticide active ingredient applied to tomatoes in 2006.

The number of acres treated with insecticide increased from 2005 to 2006, partly due to pressure from lepidopterous pests, fleabeetles and continuing concerns about leafhopper vectored curly top virus. However, the actual pounds of insecticides applied decreased because of a switch to low use rate insecticides. Imidacloprid was used 79 percent more acres in 2006 (42,070 treated acres) for curly top management, but pounds of AI increased to 4,289 pounds, accounting for less than 3 percent of all pounds of insecticide used on processing tomatoes. Emamectin benzoate had a large increase in number of treated acres, from 29,288 acres in 2005 to 56,975 acres in 2006, but pounds of AI used only increased from 272 to 551 pounds, or less than 0.3 percent of total pounds of insecticide used. Lepidopteran pests and stinkbugs were a major concern that caused an overall increase in the use of pyrethroids early in the year (permethrin, esfenvalerate and lambda-cyhalothrin) followed by indoxacarb, methoxyfenozide and tebufenozide later in the season. Dimethoate remains the highest use insecticide in pounds AI in 2006, increasing slightly from 2005 (41,768 pounds) to 42,235 pounds.

Overall, pounds of herbicides increased in 2006 due to early rain. Tomato growers were forced to switch to postemergence herbicides—glyphosate, paraquat and oxyfluorfen—in wet fields to control emerged weeds. Transplant tomatoes continue to increase over direct seeded, resulting in increased pounds of s-metalochlor (17 percent) and metribuzin (37 percent) and decreased pounds of napropamide (-22 percent) and pebulate (-81 percent). Pounds of the fumigant metam-sodium for preplant weed control increased 12 percent. Over 70 percent of the metam-sodium was applied January and February.

Sulfur was used for russet mite and powdery mildew during May, June, July and August. Acres treated with sulfur increased slightly in 2006, while total pounds applied decreased from 7,882,610 pounds in 2005 to 7,793,831 pounds in 2006. Chlorothalonil use increased in acres treated, up 12,307 acres or 12 percent, and in pounds of AI applied, also increasing 12 percent over 2005—from 173,983 to 194,879, mostly for late season disease management to limit defoliation and resulting sunburn. Over 75 percent of the chlorothalanil was applied during August and September in 2006.

Oranges

Oranges are the thirteenth highest value crop grown in California. Eighty-six percent of California oranges are grown in the San Joaquin Valley (Fresno, Kern and Tulare counties) with over half of the total in Tulare county alone. The rest are grown in the interior region (five percent in Riverside and San Bernardino counties) and on the south coast (about seven percent of the state's acreage, mostly in Ventura and San Diego).

Table 17A. *Total reported pounds of all active ingredients (AIs), acres treated, acres planted, and prices for oranges each year from 2002 to 2006. Bearing acres from 2000-01 to 2004-05 are from CDFA 2006; bearing acres in 2005-06 are from NASS, September 2006; marketing year average prices (equivalent P.H.D.) in 1999-00 to 2001-01 are from NASS, July 2003; prices in 2001-02 to 2002-03 are from NASS, July 2005; prices from 2003-04 to 2005-06 are from NASS, July 2007b. A box is about 75 pounds of oranges.*

	2002	2003	2004	2005	2006
Lbs AI	6,948,489	7,237,084	9,604,523	12,333,275	12,203,476
Acres Treated	1,929,371	2,067,982	2,249,087	2,627,278	2,517,084
Acres Bearing	195,000	189,500	184,000	182,000	181,000
Price $/box	$10.85	$7.51	$11.01	$9.36	$10.00

Table 17B *Percent difference from previous year for reported pounds of all AIs, acres treated, acres planted, and prices for oranges from 2002 to 2006.*

	2002	2003	2004	2005	2006
Lbs AI	10	4	33	28	-1
Acres Treated	11	7	9	17	-4
Acres Planted	-2	-3	-3	-1	-1
Price $/ton	15	-31	47	-15	7

Figure 15. *Acres of oranges treated by all AIs in the major types of pesticides from 1994 to 2006.*

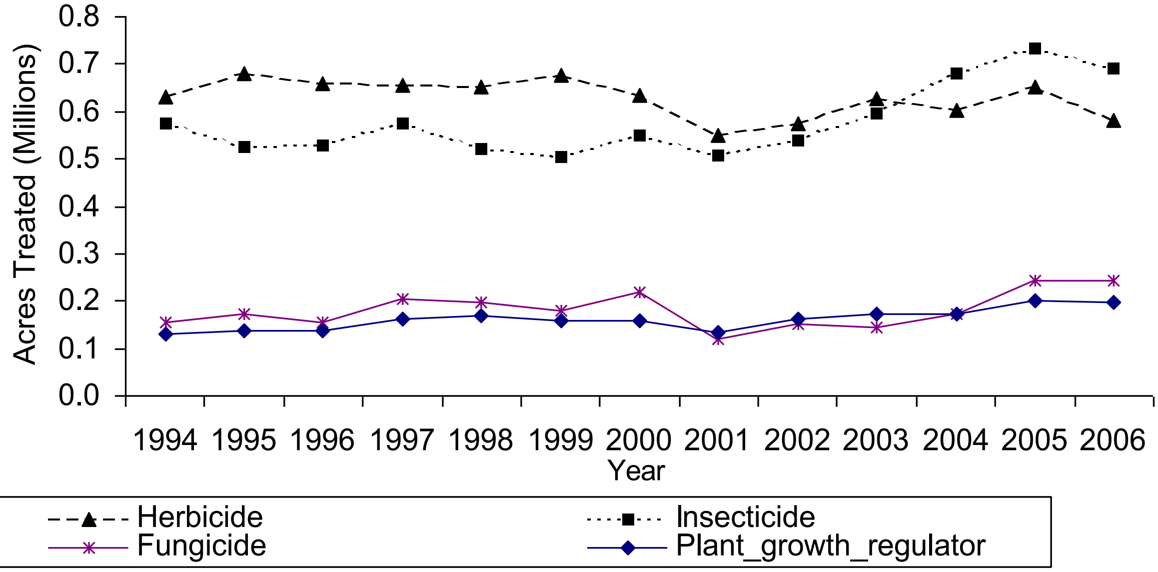


Table 17C. *The non-adjuvant pesticides with the largest change in acres treated of oranges from 2005 to 2006. This table shows acres treated with AI each year from 2002 to 2006, the change in acres treated and percent change from 2005 to 2006.*

AI	AI TYPE	2002	2003	2004	2005	2006	Change	Pct Change
GLYPHOSATE	HERBICIDE	344,718	388,946	366,938	398,359	350,929	-47,429	-12
CHLORPYRIFOS	INSECTICIDE	67,025	48,447	106,658	102,810	77,842	-24,969	-24
SIMAZINE	HERBICIDE	92,174	95,349	93,651	101,451	81,011	-20,440	-20
DIURON	HERBICIDE	102,198	100,289	95,155	100,494	82,708	-17,786	-18
BACILLUS THURINGIENSIS	INSECTICIDE	21,943	24,049	31,601	42,872	27,834	-15,038	-35
PENDIMETHALIN	HERBICIDE	2,256	1,922	3,474	4,459	16,073	11,614	260
ACEQUINOCYL	INSECTICIDE	0	0	0	2,920	13,666	10,746	368
LIMONENE	INSECTICIDE/ADJUVANT	7,413	6,650	4,005	27,698	37,067	9,369	34
IMIDACLOPRID	INSECTICIDE	9,893	14,414	12,689	4,209	13,502	9,293	221
OIL	INSECTICIDE	145,229	156,938	202,753	205,507	196,535	-8,973	-4
CARFENTRAZONE-ETHYL	HERBICIDE	0	0	0	237	9,004	8,767	3,695
PYRIDABEN	INSECTICIDE	7,214	10,877	5,888	17,097	10,453	-6,644	-39
DIPHACINONE	OTHER	41,988	30,610	44,803	25,865	31,537	5,673	22
COPPER	FUNGICIDE	147,364	135,245	163,517	234,484	239,651	5,167	2
DICOFOL	INSECTICIDE	3,106	5,192	3,816	5,545	537	-5,008	-90

Acres treated with all pesticides in oranges dropped slightly (-4 percent) in 2006 although the pounds per acre treated increased by almost the same amount (3 percent). The largest decrease was in the amount of herbicides used. The number of bearing acres continued to decrease, a trend since 2001.

The year began with widespread precipitation, interfering with the citrus harvest. After a dry period, the wet weather resumed during March and April. This caused a decrease in fruit quality. A rapid warming and drying trend in June caused some concern about fruit drop. Cold temperatures in late December 2006 enhanced fruit appearance at first but then frosty weather caused some ice marks.

Overall, acres treated with insecticides decreased by 6 percdent between 2005 and 2006. The majority of this came from decreases in the use of chlorpyrifos and *Bacillus thuringiensis* followed by oil, pyridaben, and dicofol. Slightly offsetting these declines were increases in acequinocyl and imidacloprid. Oil, spinosad, chlorpyrifos, cyfluthrin, pyriproxyfen, and *Bacillus thuringiensis* were the most widely used insecticides by acres treated. Chlorpyrifos is a broad-spectrum insecticide used on many citrus pests. Imidacloprid is used primarily for glassy-winged sharpshooter control although some growers are using it for citricola scale control. *Bacillus thuringiensis* is used for caterpillar pests and its decreased use is tied to the lower pest pressure from lepidopteran pests. Pyridaben is used for mite control and the decline in use is probably tied to the increase in use of acequinocyl, a newer miticide. Dicofol, an older miticide, has resistance issues and its use is being replaced with acequinocyl as well. Spinosad is used for citrus thrips. Oil is a broad-spectrum insecticide for mites and scales and is also used as an adjuvant in pesticide treatments. Use of these chemicals decreased by 3 percent and 4 percent respectively. Cyfluthrin is used for citrus thrips and katydids. Acres treated with this insecticide increased by 7 percent. These differences in use maybe caused by one chemical being substituted for another.

Acres treated with fungicides did not change appreciably between 2005 and 2006
Copper was the most widely used fungicide and its use increased by 2 percent. Copper is used to prevent *Phytophthora gummosis*, *Phytophthora* root rot, and fruit diseases such as brown rot and Septoria spot. These diseases are exacerbated by wet weather.

Acres treated with herbicides decreased by almost 11 percent between 2005 and 2006. Glyphosate was used most, followed by diuron and simazine. Glyphosate is used to control weeds post-emergence. Diuron and simazine are used for pre-emergent weed control. Decreased use of simazine and diuron is partially due to ground water regulations. The new use of pendimethalin and carfentreazone-ethyl as replacements also accounts for some of the decreased use.

Head Lettuce

Head lettuce is grown in four regions in the state: the central coastal area (Monterey, San Benito, Santa Cruz, and Santa Clara counties); the southern coastal area (Santa Barbara and San Luis Obispo counties); the San Joaquin Valley (Fresno, Kings, and Kern counties); and the southern deserts (Imperial and Riverside counties). In 2004, 59 percent of all California head lettuce was planted in the central coastal area, 17 percent in the southern coastal area, 12 percent in the San Joaquin Valley, and 11 percent in the southern deserts. California produces 70 to 75 percent of the head lettuce grown in the United States annually. In this analysis, the central and southern coastal areas are combined.

Table 18A. *Total reported pounds of all active ingredients (AIs), acres treated, acres planted, and prices for head lettuce each year from 2002 to 2006. Harvested acres from 2001 to 2005 are from CDFA 2006; harvested acres in 2006 are from NASS, January 2007; marketing year average prices from 2001 to 2006 from NASS, July 2007b.*

	2002	2003	2004	2005	2006
Lbs AI	1,683,844	1,731,653	1,619,094	1,826,524	1,881,094
Acres Treated	2,022,839	2,043,869	2,227,683	2,360,578	2,312,044
Acres Harvested	130,000	132,000	131,000	131,000	125,000
Lbs/treated	0.83	0.85	0.73	0.77	0.81
Lbs/planted	12.95	13.12	12.36	13.94	15.05
Price $/lb	$14.90	$21.00	$15.10	$15.80	$17.60

Table 18B. *Percent difference from previous year for reported pounds of all AIs, acres treated, acres planted, and prices for head lettuce from 2002 to 2006.*

	2002	2003	2004	2005	2006
Lbs AI	18	3	-7	13	3
Acres Treated	-3	1	9	6	-2
Acres Harvested	2	2	-1	0	-5
Lbs/treated	21	2	-14	6	5
Lbs/planted	16	1	-6	13	8
Price $/lb	-19	41	-28	5	11

Figure 16. *Acres of head lettuce treated by all AIs in the major types of pesticides from 1994 to 2006.*

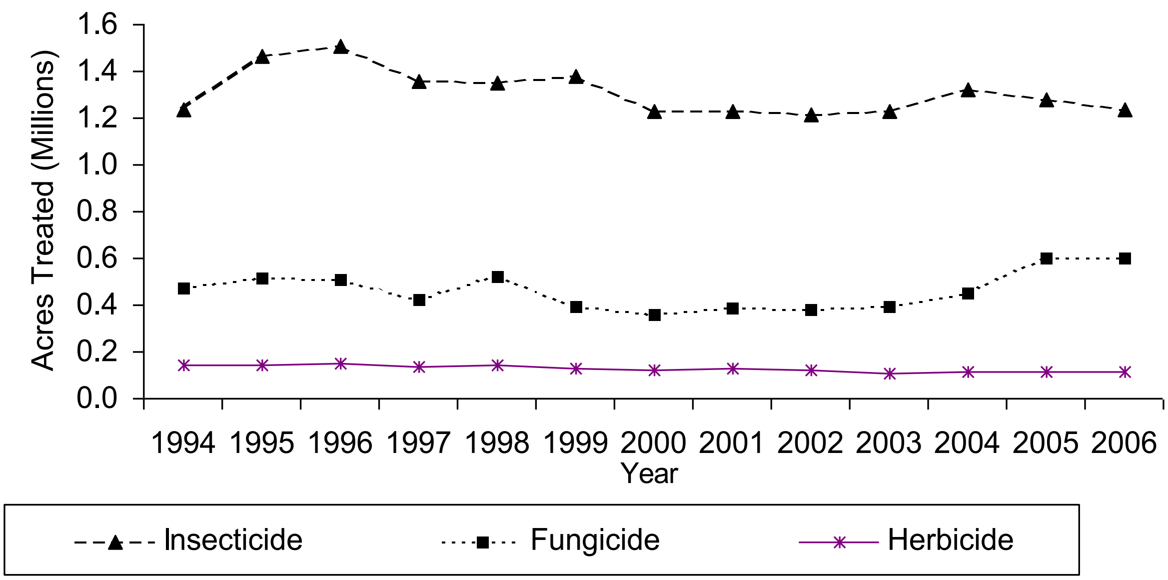


***Table 18C**. The non-adjuvant pesticides with the largest change in acres treated of head lettuce from 2005 to 2006. This table shows acres treated with AI each year from 2002 to 2006, the change in acres treated and percent change from 2005 to 2006.*

AI	AI TYPE	2002	2003	2004	2005	2006	Change	Pct Change
PYRACLOSTROBIN	FUNGICIDE	0	0	0	0	24,247	24,247	
FAMOXADONE	FUNGICIDE	0	0	0	45,541	30,001	-15,540	-34
CYMOXANIL	FUNGICIDE	0	0	0	45,541	30,001	-15,540	-34
BOSCALID	FUNGICIDE	0	0	8,475	22,228	36,550	14,321	64
ENDOSULFAN	INSECTICIDE	17,930	16,258	17,918	15,727	29,426	13,699	87
ACEPHATE	INSECTICIDE	115,617	95,768	94,933	83,107	69,729	-13,378	-16
LAMBDA-CYHALOTHRIN	INSECTICIDE	85,790	83,039	82,101	89,198	75,830	-13,368	-15
METHOMYL	INSECTICIDE	69,701	56,422	43,002	63,791	76,378	12,587	20
DIMETHOATE	INSECTICIDE	54,294	59,728	69,680	61,097	49,833	-11,263	-18
ESFENVALERATE	INSECTICIDE	25,927	26,709	32,367	34,763	24,186	-10,577	-30
PERMETHRIN	INSECTICIDE	155,347	145,723	123,483	130,178	119,604	-10,574	-8
ABAMECTIN	INSECTICIDE	58,407	49,292	50,525	35,835	44,561	8,725	24
EMAMECTIN BENZOATE	INSECTICIDE	36,458	40,132	50,718	50,698	42,156	-8,543	-17
MANEB	FUNGICIDE	228,538	230,529	232,101	234,446	225,987	-8,459	-4
INDOXACARB	INSECTICIDE	42,177	57,659	36,789	31,926	24,403	-7,523	-24

Pesticide use on head lettuce fluctuated from 2002 through 2006 (Table 18A). Pounds of AI increased 3 percent from 2005 to 2006 but acres treated decreased 2 percent. There was a 5 percent decrease from 2005 to 2006 in acres of head lettuce harvested. Acres treated with fungicides remained nearly the same in 2006 as in 2005, herbicides increased 1 percent, while insecticides declined 4 percent (Figure 16). In contrast, by pounds fungicides decreased by 5 percent, herbicides increased by 12 percent, and insecticides increased by 1 percent. Although use of fumigants accounts for only 0.2 percent of total acres treated, they account for 36 percent of the total pounds of AI applied to head lettuce.

Major pesticides with the largest increase in acres treated were pyraclostrobin, boscalid, endosulfan, methomyl, and abamectin (Table 18C). Major pesticides with the largest decrease were famoxadone, cymoxanil, acephate, λ-cyhalothrin, dimethoate, esfenvalerate, permethrin, emamectin benzoate, maneb, and indoxacarb. During 2006, the top insecticides used (by acres treated) were diazinon, spinosad, permethrin, (S)-cypermethrin, and imidacloprid. The main fungicides used were maneb, dimethomorph, fosetyl-al, boscalid, cymoxanil and famoxadone. Three herbicides dominated — propyzamide (pronamide), bensulide, and benefin. Metam-sodium was the main fumigant used, followed by 1,3–dichloropropene, chloropicrin, and methyl bromide.

From 2006 to 2005, insecticide use—as measured by acres treated—declined by 6 percent in the southern deserts, and 4 percent in the coastal areas and San Joaquin Valley. The insecticides spinosad and (S)-cypermethrin are used to manage larvae of beet armyworm and cabbage looper, primarily pests in the southern deserts. Use of these insecticides, as measured by acres treated, decreased in the southern deserts in 2006. However, use of indoxacarb, a selective insecticide for worm pests, increased in the southern deserts, due to sporadic worm pressure in late fall. Indoxacarb use decreased by over 20 percent in all other regions. Emamectin benzoate, used for worm pests, is a synthetically modified form of abamectin. Its use decreased in all lettuce-growing areas, particularly the coastal area. Methomyl, used for worms, increased by 62 percent in the San Joaquin Valley, but decreased by 9 percent in the coastal area. Use of permethrin, which is primarily used for controlling seedling pests in the southern deserts such as crickets, earwigs, cutworms, and sowbugs, remained flat. Diazinon use decreased by 8 percent in the southern deserts, where it is often used for stand-establishment pests such as crickets, darkling ground beetles, earwigs, and sowbugs.

Diazinon is a preplant treatment applied for soil pests, and until 2005 was recommended for symphylans, which show up in some coastal fields. A recent trial showed better control by the pyrethroids λ-cyhalothrin and (S)-cypermethrin. However, use of diazinon increased by 3 percent in the coastal area, and that of λ-cyhalothrin decreased by 15 percent. In contrast, use of S-cypermethrin increased by 26 percent. Throughout California from 2005 to 2006, use of dimethoate, acephate, and the neonicotinoid insecticide, imidacloprid, decreased on lettuce aphids by 18, 16 and 4 percent, respectively; however endosulfan use jumped 87 percent. While use of endosulfan decreased by 38 percent in the southeast deserts, it increased in the central San Joaquin Valley by 89 percent. Endosulfan is also rotated into use for loopers. Insecticides such as abamectin have replaced permethrin to manage leafminers. Abamectin use in 2006 increased by 31 percent in the coastal area and 16 percent in the San Joaquin Valley due to mounting leafminer pressure. In 2005, abamectin use had fallen off from previous years because leafminer pressure had dropped.

Fungicide use by acres treated decreased 4 percent from 2005 to 2006. Several active ingredients—both old chemistry and reduced risk, are rotated for downy mildew, a disease that has many pathovars. In 2006, maneb was the dominant fungicide used in head lettuce production, primarily to control downy mildew and prevent anthracnose. In general, use of maneb declined from 2005 to 2006, as did that of dimethomorph, fosetyl-al, and famoxidone/cymoxanil. Use of fosetyl-al decreased in all lettuce-growing areas except the San Joaquin Valley, possibly due to rotation to counter the prevalent downy mildew pathovars. A new reduced-risk product for downy mildew registered in 2005 contains equal amounts of the active ingredients cymoxanil and famoxadone. After its honeymoon year in 2005, the product was rotated out, except in the southern deserts where its use in 2006 covered four times more acreage than in 2005. (See sulfur below for powdery mildew.)

Lettuce drop (Sclerotinia drop) is another fungal disease with a shift in popular active ingredients. Use of iprodione fell in the coastal area and southern deserts from 2005 to 2006, but rose in the San Joaquin Valley. Use of boscalid, a new reduced-risk material, continued to rise in all lettuce-growing areas. Dicloran use fell, except in the southern deserts, where it had never been used. (See also chloropicrin below.) Sulfur is applied as a foliar treatment for powdery mildew, and along with the reduced-risk fungicide, azoxystrobin, is the only labeled product used to manage this disease. Sulfur use increased from 2005 to 2006 in the San Joaquin Valley (over 16,000 acres covered), while that of azoxystrobin increased by 159 percent (almost 5,000 acres covered).

Herbicide use by acres treated increased by one percent from 2005 to 2006, possibly due to wet spring weather throughout the state. Use of propyzamide (pronamide), applied as a postplant–preemergence herbicide, increased statewide by 3 percent from 2005 to 2006, except in the southern deserts, where use decreased by 5 percent. As consistent with its use for the past ten years, propyzamide was applied to many more acres than the preemergent, bensulide, which targets small-seeded annual grasses and is not as effective as propyzamide in the coastal areas.

Use of benefin, a pre-plant herbicide popular in the San Joaquin Valley, decreased statewide from 2005 to 2006.

Nematodes are not economic pests of head lettuce, so soil is primarily fumigated to control soil-borne diseases. In 2006, fumigants, mostly metam-sodium, were used on about 0.2 percent of all lettuce acreage. Each lettuce-growing area had a unique assortment of fumigants. Metam-sodium was used exclusively in the San Joaquin Valley; 1,3–dichloropropene primarily in the deserts; and methyl bromide entirely in the coastal area. Although mainly used to eliminate soil-borne diseases, metam-sodium also controls weeds in lettuce fields, if somewhat unreliably. Chloropicrin is used to reduce soil populations of Verticillium wilt and lettuce drop alone or when combined with methyl bromide or 1,3–dichloropropene. In 2006, chloropicrin was used mainly in the coastal area, and use decreased by 8 percent.

Rice

California's Sacramento Valley contains more than 95 percent of the state's rice acreage. The remainder is in north to central San Joaquin Valley. The leading rice-producing counties are Colusa, Sutter, Butte, Glenn, and Yolo. Approximately 500,000 acres in the Sacramento Valley are of a soil type restricting the crops to rice or pasture. The remainder of the acreage has greater crop flexibility.

Table 19A. *Total reported pounds of all active ingredients (AIs), acres treated, acres planted, and prices for rice each year from 2002 to 2006. Planted acres from 2001 to 2005 are from CDFA, 2006; planted acres in 2006 are from NASS, June 2007; marketing year average prices from 2001 to 2004 are from NASS, July 2003, July 2004, and July 2006; 2005 and 2006 prices are from NASS, July 2007b. "cwt" stands for "hundredweight", that is, 100 pounds.*

	2002	2003	2004	2005	2006
Lbs AI	5,968,987	6,493,071	6,624,181	5,131,500	5,456,428
Acres Treated	2,195,511	2,229,602	2,756,203	1,996,823	2,100,355
Acres Planted	533,000	509,000	595,000	528,000	526,000
Price $/cwt	$6.32	$10.40	$7.34	$10.10	$11.60

Table 19B. *Percent difference from previous year for reported pounds of all AIs, acres treated, acres planted, and prices for rice from 2002 to 2006.*

	2002	2003	2004	2005	2006
Lbs AI	0	9	2	-23	6
Acres Treated	17	2	24	-28	5
Acres Planted	13	-5	17	-11	0
Price $/cwt	20	65	-29	38	15

Figure 17. Acres of rice treated by all AIs in the major types of pesticides from 1994 to 2006.

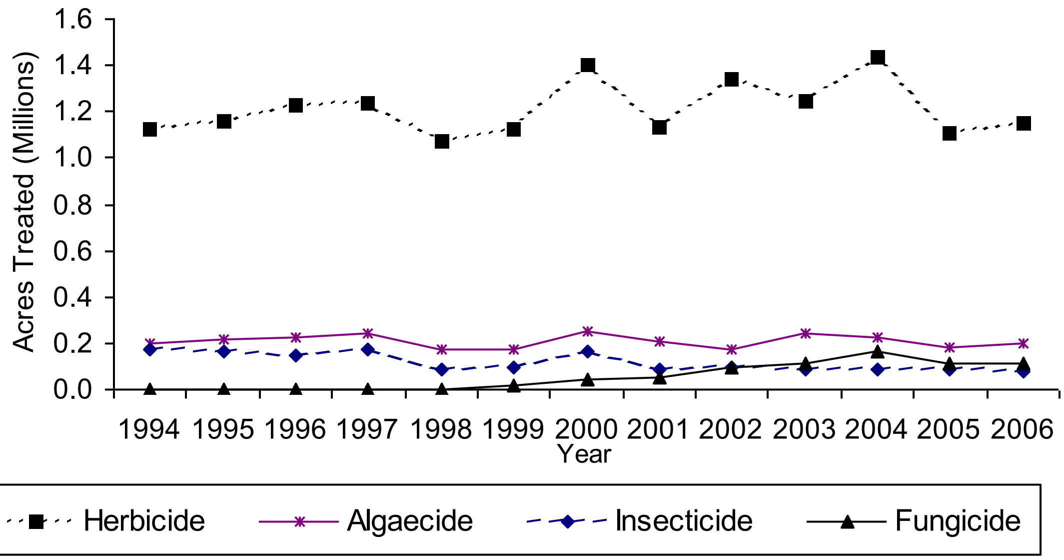


Table 19C. The non-adjuvant pesticides with the largest change in acres treated of rice from 2005 to 2006. This table shows acres treated with AI each year from 2002 to 2006, the change in acres treated and percent change from 2005 to 2006.

AI	AI TYPE	2002	2003	2004	2005	2006	Change	Pct Change
CLOMAZONE	HERBICIDE	945	56,629	85,850	71,315	119,166	47,851	67
THIOBENCARB	HERBICIDE	222,414	154,928	136,132	118,786	79,109	-39,677	-33
CYHALOFOP BUTYL	HERBICIDE	31,695	93,349	201,215	78,238	107,917	29,679	38
COPPER SULFATE	ALGAECIDE	170,647	242,611	227,340	179,268	199,927	20,658	12
(S)-CYPERMETHRIN	INSECTICIDE	25	22,924	30,535	21,814	38,257	16,444	75
LAMBDA-CYHALOTHRIN	INSECTICIDE	80,174	54,979	49,901	54,627	39,618	-15,010	-27
PROPANIL	HERBICIDE	353,402	312,139	376,499	307,673	317,521	9,848	3
TRICLOPYR, TRIETHYLAMINE SALT	HERBICIDE	264,351	242,478	309,007	236,598	245,837	9,239	4
CARFENTRAZONE-ETHYL	HERBICIDE	16,426	70,814	45,883	25,749	33,442	7,693	30
MOLINATE	HERBICIDE	222,044	134,120	89,593	40,535	33,044	-7,491	-18
GLYPHOSATE	HERBICIDE	29,736	31,081	26,961	17,271	11,070	-6,200	-36
FENOXAPROP-P-ETHYL	HERBICIDE	5,805	6,469	3,989	22,572	28,253	5,681	25
2,4-D	HERBICIDE	24,155	22,914	20,960	17,914	12,893	-5,021	-28
PENOXSULAM	HERBICIDE	0	0	0	73,058	77,151	4,093	6
HALOSULFURON-METHYL	HERBICIDE	50	112	3,272	5,135	1,661	-3,475	-68

Total pesticide use (as pounds AI) in rice has generally increased since 1993. Pesticide use increased approximately 5 percent from 2005 to 2006 in terms of acres treated, and increased approximately 6 percent in terms of pounds AI applied. The increase occurred despite a slight decrease in rice acres planted of approximately 2000 acres. In 2006, there were no major shifts in pest pressure. Herbicides accounted for most of the pesticide use; approximately 70 percent of non-adjuvant pesticide acres treated has been with herbicides. Herbicide use increased by approximately 4 percent from 2005 to 2006. Insecticide use has been decreasing generally and fungicide use increasing since 1993; from 2005 to 2006 acres treated with insecticides decreased 2 percent and fungicides decreased 3 percent. Major pesticides with the largest increases in acres treated include clomazone, cyhalofop butyl, copper, s-cypermethrin, and propanil. Pesticides with the largest percentage decreases in use include thiobencarb, lambda-cyhalothrin, molinate, glyphosate, and oxyfluorfen.

Lambda-cyhalothrin is the most widely used insecticide by acres treated and its use remains steady, with a 27 percent decrease in 2006 due to the increasing popularity of s-cypermethrin. The insecticide s-cypermethrin was first registered on rice in 2002. Growers are gradually learning about this AI which is why there was a significant increase in 2006. Both insecticides are used primarily for rice water weevil control and secondarily for armyworm control. Insect pressure is low for California rice and these insecticides are used on approximately 10 percent of all rice planted in California.

Copper sulfate is the only algaecide registered for use on California rice, and one of the few products acceptable for organic rice production. The product doubles as a control for tadpole shrimp, which is very important to organic rice growers. Several factors could have contributed to the 12 percent increase in use of copper sulfate: 1) algae resistance to copper sulfate, 2) unusual weather patterns in 2006 (wet early winter and in March and April with excessively hot July), and 3) a steady growing increase in organic rice production (4-5 percent of the total acreage).

The major herbicides by acres treated in rice in 2006 were propanil, triclopyr, clomazone, cyhalofop butyl, thiobencarb, and penoxsulam. Use of nearly all the major herbicides increased slightly, except for thiobencarb, bispyribac-sodium, and molinate. Reasons for this include the decreased use of molinate for watergrass control (it is being phased-out) and the decreased use of thiobencarb for sprangletop control (due to its narrow timing window for effectiveness and watergrass resistance). Resistance also accounts for the increases in use of clomazone and propanil. Loss of into-the-water molinate and the reduced use of thiobencarb prompts the use of foliar herbicides (cyhalofop and propanil); these herbicides require draining the field or lowering the water level, which in turn increases sprangletop incidence and growers' increased use of cyhalofop-butyl. Glyphosate is used as a preplant herbicide in rice. The 36 percent decrease in glyphosate use was due to the late and shortened planting season due to adverse weather conditions.

Peaches and Nectarines

California ranks first in the U.S for peach and nectarine production. Nearly all nectarines are grown in California—35,500 acres—with a small amount, 1,400 acres, in Washington. The state accounts for 72 percent of the U.S. peach crop but only 47 percent of the U.S. acres planted to peaches. Clingstone peaches, largely grown in the Sacramento Valley, are used exclusively for processing into canned and frozen products (including baby food) and juice. Most fresh market peaches and nectarines are produced in the central San Joaquin Valley. Peach acreage decreased by 9 percent in 2006, while nectarine acreage declined slightly. A USDA tree-pull program resulted in the removal of over 5,000 cling peach acres in winter 2005, accounting for most of the decline. This USDA action was done as a response to peach and nectarine overproduction.

Table 20A. *Total reported pounds of all active ingredients (AI), acres treated, acres planted, and prices for peaches and nectarines each year from 2002 to 2006. Bearing acres for peaches and nectarines from 2001 to 2005 are from CDFA 2006; bearing acres in 2006 are from NASS, July 2007a; marketing year average prices for fresh (freestone) peach from 2001 to 2005 are from NASS July 2003, July 2004, July 2006; 2005 and 2006 prices are from NASS July 2007b; prices for nectarines years 2001 to 2006 from NASS, July 2007b.*

	2002	2003	2004	2005	2006
Lbs AI	6,708,063	6,481,024	6,438,443	6,513,056	6,785,316
Acres Treated	1,619,645	1,513,195	1,519,265	1,581,849	1,695,390
Acres Bearing Peach	68,000	68,000	69,000	66,400	61,000
Acres Bearing Nectarine	36,500	36,500	36,500	36,500	35,500
Acres Bearing Total	104,500	104,500	105,500	102,900	96,500
Price $/ton Peach	$418.00	$406.00	$341.00	$540.00	$597.00
Price $/ton Nectarine	$382.00	$436.00	$342.00	$507.00	$522.00
Price $/ton Total	$405.43	$416.48	$341.35	$528.29	$569.41

Table 20B. *Percent difference from previous year for reported pounds of all AIs, acres treated, acres planted, and prices for peaches and nectarines from 2002 to 2006.*

	2002	2003	2004	2005	2006
Lbs AI	12	-3	-1	1	4
Acres Treated	0	-7	0	4	7
Acres Bearing Peach	3	0	1	-4	-8
Acres Bearing Nectarine	0	0	0	0	-3
Acres Bearing Total	2	0	1	-2	-6
Price $/ton Peach	-2	-3	-16	58	11
Price $/ton Nectarine	-18	14	-22	48	3
Price $/ton Total	-8	3	-18	55	8

Figure 18. *Acres of peaches and nectarines treated by all AIs in the major types of pesticides from 1994 to 2006.*

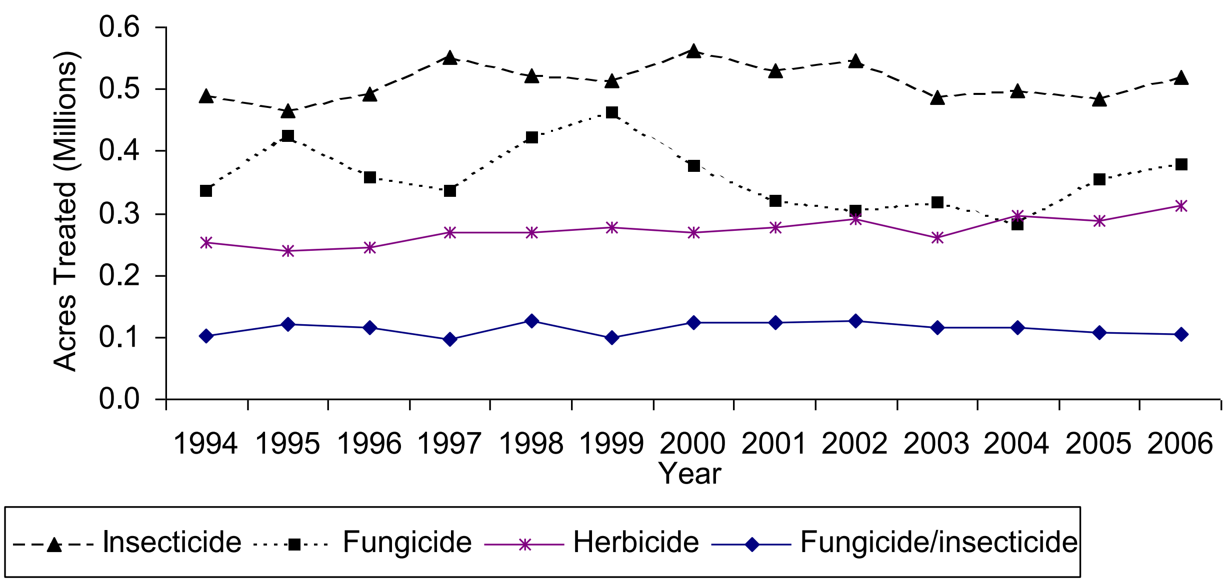


Table 20C. *The non-adjuvant pesticides with the largest change in acres treated of peaches and nectarines from 2005 to 2006.*

AI	AI TYPE	2002	2003	2004	2005	2006	Change	Pct Change
ZIRAM	FUNGICIDE	35,605	32,187	35,472	39,451	57,398	17,946	45
PYRACLOSTROBIN	FUNGICIDE	0	0	7,336	19,967	29,696	9,729	49
BOSCALID	FUNGICIDE	0	0	7,336	19,967	29,696	9,729	49
COPPER	FUNGICIDE	86,931	88,582	84,728	79,751	70,499	-9,252	-12
PHOSMET	INSECTICIDE	56,985	42,303	48,084	32,253	41,204	8,952	28
PROPICONAZOLE	FUNGICIDE	35,987	44,169	42,514	72,555	81,151	8,596	12
GLYPHOSATE	HERBICIDE	130,779	119,709	141,044	143,569	152,132	8,562	6
PYRIMETHANIL	FUNGICIDE	0	0	0	0	7,353	7,353	
MYCLOBUTANIL	FUNGICIDE	15,841	9,358	9,376	19,126	12,440	-6,686	-35
CARFENTRAZONE-ETHYL	HERBICIDE	0	0	0	0	6,592	6,592	
METHOXYFENOZIDE	INSECTICIDE	0	0	7,417	10,037	16,481	6,444	64
SPINOSAD	INSECTICIDE	30,630	27,368	24,132	24,587	30,925	6,338	26
OIL	INSECTICIDE	106,920	107,352	106,449	110,464	116,715	6,252	6
FENBUCONAZOLE	FUNGICIDE	21,004	19,936	7,961	10,196	3,967	-6,229	-61
ESFENVALERATE	INSECTICIDE	100,373	92,192	98,028	95,817	101,573	5,756	6

Despite a decline in acreage from 2005, use of pesticides (pounds AI) increased, likely the result of increased disease pressure from a wet spring, and an 8 percent increase in crop prices due to a decline in production of 18 percent. Growers in 2006 were intent on protecting the small crop they had.

As in past years, oil accounted for over 92 percent of insecticide use and around half of all pesticides used in 2006 (pounds of AI). Other insecticides used in significant amounts included phosmet, chlorpyrifos and diazinon, all increasing in 2006 by 26 percent, 12 percent and 3 percent, respectively. In some cases, growers may be switching among effective OP insecticides based on local water sampling results. Peach twig borer populations are increasing, as pyrethroids become less effective, forcing growers to again consider dormant applications of chlorpyrifos and diazinon. Chlorpyrifos use was heaviest in December 2006—a 43 percent increase compared to 2005—and January 2006 (2 percent increase). Diazinon use peaked in January at 19,487 pounds of AI or 75 percent of the total diazinon use in 2006. Phosmet use targeted Oriental fruit moth and Katydid, with most use occurring in April through July (97,419 pounds AI; 97 percent of total 2006 use). With more and more growers selling to overseas markets, the use of phosmet should be expected to increase for control of lepidopteran pests of increasing concern. Spinosad use increased in terms of AI (3,311 pounds, up 29 percent) and acre treated (30,925 acres, up 26 percent).

The long wet spring resulted in increased use of fungicides as growers tried to protect against brown rot and peach leaf curl. Propiconizole, a low use rate pesticide used on more acres than any other fungicide, increased 12 percent to 81,151 acres treated, though in terms of actual pounds applied, it was fourth at 14,994 pounds, following copper (577,776 pounds), ziram (314,581 pounds), and iprodione (22,186 pounds). Propiconizole is a broad-spectrum systemic fungicide that controls brown rot blossom blight, fruit brown rot and powdery mildew in stone fruit and has the advantage of a 0-day preharvest interval that allows late-season application for disease protection. Ziram pounds increased 37 percent. Pyraclostrobin/boscalid was used on 49 percent more acres in 2006, continuing a trend begun in 2004. Pristine is effective on shot hole, brown rot, and powdery mildew. Growers continue to be concerned with resistance management and rotate fungicides each year and within the year. Pyrimethanil was a new low risk fungicide used on 7,353 acres with 1,896 pounds in 2006. Although copper is still widely applied, its use continues to decline in pounds AI and acres treated, down 5 and 12 percent respectively. The reason may be due to growers forgoing adding expensive copper products with their dormant oil applications.

Herbicide use was influenced by the wet weather. Contact herbicides in general increased in use, led by glyphosate which increased 20 percent, from 161,780 pounds in 2005 to 193,236 pounds, easily outpacing the preplant herbicide oryzalin, which increased 9 percent. Glyphosate accounted for over 60 percent of herbicides used in 2006. Other contact-preemergence herbicides also increased. Paraquat was up 7 percent, 2,4-D up 8 percent and oxyfluorfen, often applied with glyphosate, increased 7 percent. Glyphosate was used on 152,132 acres, a 6 percent increase in treated acres compared to 2005.

Strawberries

California produces 88 percent of the total U.S. production of 2,400 million pounds of strawberries. California produced 21 million tons valued at more than $1,194, million. Strawberries are grown mostly for fresh market. Depending on market prices, some are processed. California strawberry production occurs primarily along the central and southern coast, with small but significant production occurring in the Central Valley.

Table 21A. *Total reported pounds of all active ingredients (AIs), acres treated, acres planted, and prices for strawberries each year from 2002 to 2006. Harvested acres from 2001 to 2005 are from CDFA 2007; harvested acres in 2006 are from NASS, July 2007a; marketing year average prices from 2001 to 2006 from NASS, July 2007b. "cwt" stands for "hundredweight", that is, 100 pounds.*

	2002	2003	2004	2005	2006
Lbs AI	8,230,420	9,193,671	9,566,367	9,228,548	9,381,163
Acres Treated	1,003,904	1,266,617	1,241,172	1,279,092	1,291,574
Acres Harvested	28,500	29,600	33,200	34,300	35,800
Price $/cwt	$67.40	$72.80	$62.20	$62.60	$64.80

Table 21B. *Percent difference from previous year for reported pounds of all AIs, acres treated, acres planted, and prices for strawberries from 2002 to 2006.*

	2002	2003	2004	2005	2006
Lbs AI	4	12	4	-4	2
Acres Treated	14	26	-2	3	1
Acres Harvested	8	4	12	3	4
Price $/cwt	-5	8	-15	1	4

Figure 19. Acres of strawberries treated by all AIs in the major types of pesticides from 1994 to 2006.

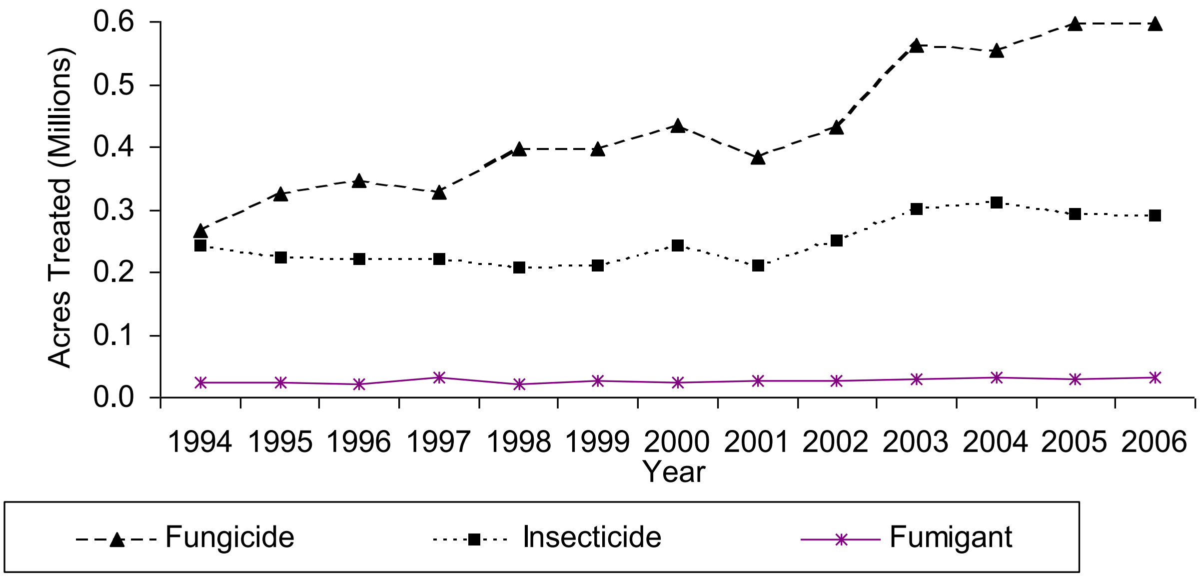


Table 21C. The non-adjuvant pesticides with the largest change in acres treated of strawberries from 2005 to 2006. This table shows acres treated with AI each year from 2002 to 2006, the change in acres treated and percent change from 2005 to 2006.

AI	AI TYPE	2002	2003	2004	2005	2006	Change	Pct Change
PYRIMETHANIL	FUNGICIDE	0	0	0	0	30,419	30,419	
CAPTAN	FUNGICIDE	136,565	182,297	149,227	174,707	151,721	-22,986	-13
BACILLUS THURINGIENSIS	INSECTICIDE	38,519	54,141	46,042	49,546	33,769	-15,776	-32
MALATHION	INSECTICIDE	41,151	41,134	48,708	37,523	28,453	-9,070	-24
AZOXYSTROBIN	FUNGICIDE	23,938	28,835	23,581	17,894	10,789	-7,105	-40
THIAMETHOXAM	INSECTICIDE	0	0	0	0	6,830	6,830	
SPIROMESIFEN	INSECTICIDE	0	0	0	4,417	10,491	6,073	137
METHOXYFENOZIDE	INSECTICIDE	0	0	0	5,474	10,979	5,505	101
BOSCALID	FUNGICIDE	0	8	28,072	52,115	56,963	4,847	9
BIFENTHRIN	INSECTICIDE	12,161	16,622	13,469	14,428	19,184	4,756	33
CYPRODINIL	FUNGICIDE	16,317	25,470	21,213	33,324	28,606	-4,718	-14
FLUDIOXONIL	FUNGICIDE	16,317	25,470	21,213	33,324	28,606	-4,718	-14
POTASSIUM BICARBONATE	FUNGICIDE	3,452	5,477	11,034	9,682	5,098	-4,584	-47
HARPIN PROTEIN	PGR	9,424	9,112	14,589	9,941	5,398	-4,543	-46
SULFUR	FUNGICIDE	91,964	108,330	130,906	124,754	129,056	4,302	3

The amount of strawberry acres treated with pesticides increased 1 percent continuing the upward trend since 2001. Pounds applied increased 2 percent from 2005 to 2006 but remained less than peak application seen in 2004. Pounds of pesticide per acre treated increased 4 percent from 2005 to 2006. Fungicides, followed by insecticides, account for the largest proportion of pesticides applied by acres treated. By acres treated, use of fungicides remained about the same, insecticides decreased by 1 percent and herbicides increased by 9 percent. The major pesticides with greatest increase in acres treated from 2005 to 2006 were pyrimethanil, spiromesifen, methoxyfenozide, boscalid, and bifenthrin. The major pesticides with greatest decreased use by acres treated were captan, *Bacillus thuringiensis*, malathion, azoxystrobin, thiamethoxam, fludioxonil and potassium bicarbonate.

The major diseases in strawberries are botrytis and powdery mildew. Fungicides continue to be the most used pesticides, as measured by acres treated. The major fungicides by acres treated in 2006 were captan, sulfur, pyraclostrobin, boscalid, fenhexamid, myclobutanil, pyrimethanil, triflumizole, cyprodinil, fludioxonil, thiophanate-methyl, borax, thiram, azoxystrobin, and mefenoxam. In general, fungicides effective against Botrytis fruit rot decreased, and those effective against powdery mildew increased between 2005 and 2006. Dryer conditions in January and February decreased Botrytis risk. The older registered fungicides (captan, thiram, thiophanate-methyl, and benomyl) and the newly registered pyrimethanil, fenhexamid, fludioxonil, cyprodinil, and boscalid are generally used to control Botrytis fruit rot. Acres treated with all of these products decreased in 2006 except boscalid, which increased by 9 percent and pyrimethanil. Boscalid use increased primarily in the costal counties during late winter due to delayed fruit ripening, and because it is also effective against powdery mildew. Pyrimethanil became available in December 2005 and was used to treat 30,419 acres 2006.

Conventional strawberry growers primarily used sulfur, myclobutanil, boscalid, and pyraclostrobin to control powdery mildew. Sulfur is inexpensive and is also used by organic growers. Sulfur, myclobutanil, and triflumizole use increased insignificantly in 2006. Use of azoxystrobin continued to decline because of replacement by boscalid and pyraclostrobin, which are very effective against powdery mildew. Pyraclostrobin is frequently used in combination with boscalid. Both acres treated with these two products and pounds of active ingredient increased in 2005 from 2004 and again in 2006 from 2005. Use of mefenoxam, effective against *Phytophthora fragariae* (red stele) and *P. cactorum* (leather rot and crown rot), increased in 2006 over 2005, a continuation of the upward trend since 2002.

The major insect pests in strawberries are lygus bugs in the northern growing areas. Worms (various moth and beetle larvae) especially cutworms and beet armyworms continue to be particularly troublesome in the southern growing areas. The major insecticides used in 2006 by acres treated were spinosad, *Bacillus thuringiensis* (*Bt*), malathion, bifenazate, fenpropathrin, bifenthrin, naled, and methomyl. Acres treated with malathion, methomyl, and naled, the major broad-spectrum insecticides decreased because of replacement by bifenthrin, methoxyfenozide and spiromesifen. Bifenthrin use increased primarily because wet spring weather allowed weeds and other vegetation to persist longer resulting in larger summer populations of lygus bugs. Spinosad continued in 2006 to be the primary pesticide used to control worms (moth and beetle larvae) and against thrips. *Bt* (all forms) decreased by 32 percent primarily due to replacement by spinosad, which also is a biological but has a longer residual action and is generally more effective so does not need to be applied as frequently as *Bt*. However, *Bt* and the newly registered methoxyfenozide and spiromesifen continue to be widely used to control cutworm and beet armyworm. Fenpropathrin and spiromesifen are used in combination with malathion to control whitefly. Bifenthrin and pyriproxyfen are also effective against white flies. Pyriproxyfen is an insect growth regulator registered in 2002. Lower use of pyriproxyfen was due to partial replacement by spiromesefen and by bifenazate which is also an effective miticide. Perhaps due to recent reductions in cost, imidacloprid use increased by 41 percent as generic products have become available.

Increased two-spotted spider mite pressure and increased concern about cyclamen mite resulted in increased use of bifenazate, and hexathiazox, as well as the newly registered spiromesifen, etoxazole, and acequinocyl. Most conventional growers continue to use bifenazate since its introduction in 2003. Use of bifenazate and hexythiazox increased almost to 2004 levels after declines in 2005, while use of spiromesifen, etoxazole and acequinocyl increased by 137 percent, 15 percent and 94 percent respectively.

Strawberry production relies on several fumigants. Acres treated with fumigants increased by 9 percent, including chloropicrin, 1-3 dchloropropene, and methyl bromide while metam sodium and metam potassium decreased. Fumigants usually are applied at higher rates than other pesticide types, such as fungicides and insecticides. Fumigants are applied at high rates, in part, because they treat a volume of space rather than a surface area such as leaves and stems of plants. Thus, the pounds applied are large relative to other pesticide types even though the number of applications or number of acres treated may be relatively small. Fumigants accounted for about 88 percent of all pesticide AIs by pounds applied in strawberries in 2006. Methyl bromide use (pounds) increased in 2006 by 5 percent over the 2005. However, this level remained 3 percent below the level used in 2004 despite a 7 percent increase in acres harvested. Metam sodium is generally more effective in controlling weeds, but less effective than 1,3-D or 1,3-D plus chloropicrin against soil-borne diseases and nematodes.

Carrots

California is the largest producer of carrots in the United States accounting for about 80 percent of the U.S. production of 1,188,360 metric tons of fresh market and 34 percent of the 435,550 tons of processing carrots in 2006. California produced more than 21.2 million tons of carrots with a total crop value of more than $190 million. California has four main production regions for carrots: the San Joaquin Valley (Kern County), with significant production in Cuyama Valley (San Luis Obispo and Santa Barbara counties); the low desert (Imperial and Riverside counties); the high desert (Los Angeles County); and the central coast (Monterey County). The San Joaquin Valley accounts for more than half the state's acreage.

Table 22A. *Total reported pounds of all active ingredients (AIs), acres treated, acres planted, and prices for carrots each year from 2002 to 2006. Harvested acres of all carrots from 2001 to 2005 are from CDFA 2007; harvested acres in 2006 are from NASS, January 2007; marketing year average prices from 2001 to 2006 from NASS, July 2007b. "cwt" stands for "hundredweight", that is, 100 pounds.*

	2002	2003	2004	2005	2006
Lbs AI	7,858,606	8,614,858	8,076,808	9,028,977	7,682,706
Acres Treated	436,119	446,590	503,062	535,867	442,642
Acres Harvested	71,100	71,500	70,800	71,100	73,500
Price $/cwt	$20.30	$20.40	$21.50	$21.70	$21.10

Table 22B. *Percent difference from previous year for reported pounds of all AIs, acres treated, acres harvested, and prices for carrots from 2002 to 2006.*

	2002	2003	2004	2005	2006
Lbs AI	19	10	-6	12	-15
Acres Treated	19	2	13	7	-17
Acres Harvested	-2	1	-1	0	3
Price $/cwt	12	0	5	1	-3

Figure 20. *Acres of carrots treated by all AIs in the major types of pesticides from 1994 to 2006.*

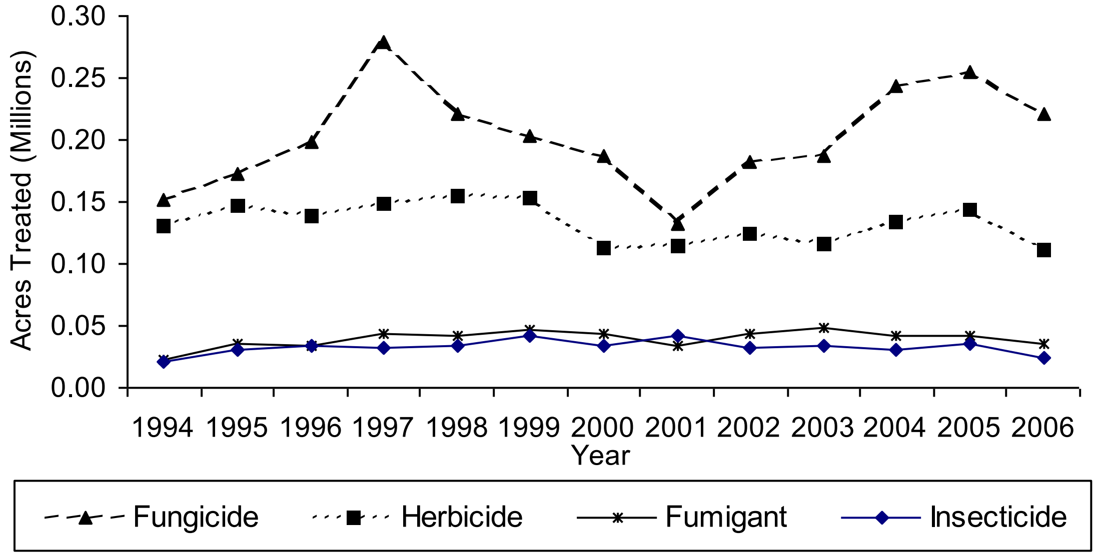


Table 22C. *The non-adjuvant pesticides with the largest change in acres treated of carrots from 2005 to 2006. This table shows acres treated with AI each year from 2002 to 2006, the change in acres treated and percent change from 2005 to 2006.*

AI	AI TYPE	2002	2003	2004	2005	2006	Change	Pct Change
LINURON	HERBICIDE	71,277	65,773	75,820	82,576	62,885	-19,691	-24
MEFENOXAM	FUNGICIDE	87,549	80,526	102,335	97,826	80,529	-17,297	-18
SULFUR	FUNGICIDE	17,445	16,976	28,074	46,214	32,289	-13,925	-30
TRIFLURALIN	HERBICIDE	36,923	39,179	39,912	41,197	33,368	-7,829	-19
METAM-SODIUM	FUMIGANT	32,857	35,037	28,373	31,915	24,735	-7,180	-22
MEFENOXAM, OTHER RELATED	FUNGICIDE	83,231	73,197	97,132	56,537	49,760	-6,777	-12
IPRODIONE	FUNGICIDE	31,256	29,185	30,034	34,140	28,273	-5,867	-17
OIL	FUNGICIDE/ INSECTICIDE	2,066	2,296	2,285	6,637	1,065	-5,572	-84
ESFENVALERATE	INSECTICIDE	9,971	11,690	6,417	14,192	10,095	-4,097	-29
CHLOROTHALONIL	FUNGICIDE	17,401	18,853	18,934	20,776	16,858	-3,918	-19
FLUAZIFOP-P-BUTYL	HERBICIDE	13,472	7,414	11,169	15,462	12,259	-3,203	-21
COPPER	FUNGICIDE	16,570	20,785	28,311	26,881	29,277	2,396	9
POTASSIUM N-METHYLDITHIO CARBAMATE	FUMIGANT	185		556	821	2,851	2,030	247
AZOXYSTROBIN	FUNGICIDE	12,061	8,250	8,405	6,269	8,231	1,962	31
CARBARYL	INSECTICIDE	1,352	156	2,279	1,914		-1,914	-100

While total acres of carrots harvested increased by 3 percent, pesticide used (as acres treated) in carrots decreased by 17 percent in 2006 after yearly increases since 2001 and pounds of AI applied decreased by 15 percent from 2005 to 2006. All major pesticide types declined in terms of acres treated. Acres treated with fumigants declined by 15 percent, fungicide use declined 13 percent, herbicide use decreased by 22 percent, and insecticide use decreased by 33 percent. Pesticides used most (as measured by acres treated) were mefenoxam, linuron, trifluralin, sulfur, copper compounds, iprodione, metam-sodium, pyraclostrobin, and chlorothalonil. The major pesticides with increased acres treated were copper compounds, metam-potassium, azoxystrobin, and pyraclostrobin. The major pesticides with decreased acres treated were linuron, mefenoxam, sulfur, oil, trifluralin, and metam-sodium.

Cumulatively, the most used pesticide category for carrots, as measured by acres treated, was fungicides. From 2005 to 2006 acres treated with fungicides decreased 13 percent while pounds decreased by 19 percent. The most applied fungicides in 2006 by acres treated were mefenoxam, sulfur, copper compounds, iprodione, and pyraclostrobin (registered in 2003). Alternaria leaf blight, a foliar disease, is generally controlled by iprodione, chlorothalonil, pyraclostrobin, or azoxystrobin. Azoxystrobin and pyraclostrobin are strobilurins with the same mode of action. In terms of acres treated, pyraclostrobin increased 8 percent and azoxystrobin increased in use 31 percent while iprodione decreased 17 percent and chlorothalonil use decreased 19 percent. Alternaria leaf blight has become less of a problem recently because of the introduction of resistant carrot varieties. Cavity spot is a major, troublesome soilborne fungal disease that is commonly controlled by applying mefenoxam or metam sodium (a soil fumigant). Growers used less mefenoxam (-18 percent) and metam-sodium (-22 percent) by acres treated. These declines were greater than the decline in acres planted. Powdery mildew is primarily controlled by sulfur, which is inexpensive and especially popular with organic growers. Sulfur use decreased in most regions in 2006 because weather conditions decreased powdery mildew infections. Acres treated declined by 91 percent in Los Angeles County because of fewer planted acres.

In terms of acres treated, the main herbicides used in carrot production were linuron, trifluralin, and fluazifop-p-butyl. The two most important are linuron and trifluralin. Linuron, a postemergence herbicide that provides good control of broadleaf weeds and small grasses declined by 24 percent. Trifluralin, a preemergence herbicide, used by carrot growers to complement linuron for weed management, declined by 19 percent. In addition, fluazifop-p-butyl, a selective postemergence phenoxy herbicide used for control of annual and perennial grasses declined 21 percent.

Carrot production relies on the fumigants metam sodium, 1,3-D, and to a lesser extent, chloropicrin. These fumigants are used at high rates in terms of pounds of AI to control soil-borne pests. Methyl bromide is no longer used on carrots. In 2006, fumigants accounted for about 78 percent of the total pounds of pesticide AIs applied to carrots. This figure is unchanged from 2005, while acres treated with fumigants declined 17 percent. Use of both 1,3-D and metam sodium declined (-14 and –22 percent acres treated, respectively). Both are used to manage nematodes, depending on population levels. At low to moderate levels of infestation, metam sodium is usually used. If nematode levels are high, fields are treated with 1,3-D. Both metam-sodium and 1,3-D usage were down in 2006 probably because nematodes were less of a problem and because of partial replacement by metam-potassium.

Insects are not generally a major problem in carrot production, except for white flies that are controlled with esfenvalerate and methomyl. The major insecticides used in 2006 in terms of acres treated were esfenvalerate, diazinon, methomyl, cyfluthrin, oil, and spinosad. In 2006, methomyl use by acres treated increased by 92 percent while all other major insecticides decreased. This carbamate pesticide is effective against cutworms and leafhoppers as well as whiteflies. Acres treated with esfenvalerate, generally used to control white fly and flea beetle but also against leafhoppers and cutworms, decreased by 29 percent. Spinosad use against armyworms, loopers, saltmarsh caterpillars, and cutworms decreased by 65 percent. Oil use decreased by 84 percent. Cyfluthrin, a pyrethroid used to control cutworm and crown root aphids, decreased by 42 percent. Diazinon use against cutworms and wireworms declined 13 percent. Carbaryl use was absent in 2006. Foliar spray formulations of carbaryl have been used for control of armyworms, leafhoppers, and flea beetles, while bait formulations primarily for saltmarsh caterpillars and cutworms.

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