

IV. TRENDS IN USE IN CERTAIN PESTICIDE CATEGORIES

Reported pesticide use in California in 1999 totaled 202,611,488 pounds, a decline of 11,733,417 pounds from 1998 and the lowest reported pounds applied statewide since 1996.

Production agriculture, the major category of reported pesticide use, was responsible for the overall decrease in use. Applications for production agriculture dropped by 12.2 million pounds. (Pounds applied for postharvest fumigation and miscellaneous categories increased, partially offsetting the decrease from production agriculture.)

Major crops and commodities that showed an overall decline in pesticide pounds applied included grapes (down 5.7 million pounds), winegrapes (3.7 million pounds), oranges (1.4 million pounds), almonds (1 million pounds), and cotton (940,000 pounds). Major crops with increased pounds applied included strawberries (up 1.5 million pounds), processing tomatoes (1.2 million pounds) and carrots (1 million 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, and other factors. All factors contributing to the 1999 decline cannot be pinpointed due to the preliminary nature of the data provided to compile this report.

One likely factor in decreased pesticide pounds applied could involve 1999 weather conditions, as indicated by a decline in fungicide use. These chemical applications usually can be associated with wet conditions that produce disease problems. For example, sulfur, a natural fungicide favored by both conventional and organic farmers, saw use decline by nearly 10 million pounds from 1998 to 1999. (Sulfur still accounted for about one-third of all pesticide pounds applied.)

It should also be noted that the decrease in pounds applied contrasts sharply with acreage for some crop categories in 1999. Specifically, fruit and vegetable acreage increased. These crops are usually associated with more intensive pesticide use, compared to field crops. According to the Agricultural Statistics Branch of the California Department of Food and Agriculture, harvested acreage of vegetables increased by about 73,000 acres in 1999 from the previous year, while harvested acres of fruit increased by about 70,000 acres.

Because the 1999 data are preliminary and errors have not been completely identified and corrected, the values should be viewed with caution. However, based on this preliminary data, some of the major statistical changes from 1998 to 1999 include:

- Use of insecticide organophosphate and carbamate chemicals, which includes compounds of high regulatory concern, declined by almost 800,000 pounds from 1998 to 1999. Areas treated with these pesticides declined by more than 758,000 cumulative acres.
- Chemicals categorized as ground water contaminants, another regulatory concern, declined by about 414,000 pounds applied. Area treated declined by 40,200 cumulative acres.

- Chemicals classified as carcinogens declined in overall acreage treated (down 1.9 million acres) and increased in pounds applied (up 2 million pounds). As measured in pounds, 25 carcinogenic chemicals declined in use. However, they were more than offset by increased use of two fumigants – metam sodium (up 3.6 million pounds) and 1,3-D (350,000 pounds) – which are of regulatory concern. DPR analysts found that more applications of metam sodium coincided with more pre-plant soil treatments for a few crops where planted acreage increased. These included carrots, potatoes, and processing tomatoes.
- Chemicals classified as reproductive toxins also showed an overall decline in acreage treated (down 606,000 acres) and increased pounds applied (up 5.3 million pounds). Some 21 reproductive toxins declined in pounds, but two fumigants -- metam sodium (up 3.6 million pounds) and methyl bromide (up 1.8 million pounds) – accounted for most of the increased poundage. DPR analysts linked more methyl bromide applications to an increase in strawberry acreage, and to one-time treatment of soil before winegrape plantings and replantings.
- Reduced-risk pesticides increased both in pounds applied and acres treated, while biopesticides increased in pounds and declined in acres treated from 1998 to 1999.

Although longer-term trends reveal an increase in pesticide pounds applied for production agriculture from 1994 to 1999, the increase is not statistically significant. That is, there is considerable variation in use from year to year due to many different circumstances. 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. Shorter periods of time may suggest trends, such as the increased pesticide use from 1994 to 1998. However, the overall decrease in pesticide pounds applied from 1998 to 1999, and the fact no other increases during any part of this time period were statistically significant, suggests no general increasing trend in pesticide use in California.

Pesticide use is reported as the number of pounds of active ingredient and the total number of acres treated. The data for pounds include both agricultural and non-agricultural 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 active ingredient, it is counted as three acres treated in the tables and graphs in Section IV of this report.) The active ingredient is the component in the pesticide product that kills or otherwise controls the target pest.

To improve data quality when calculating the total pounds of pesticides, DPR excluded values that were so large they were probably in error. (This process was continuing when the preliminary data was prepared for the 1999 report; a final, corrected report will be issued at the end of the year.) 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 pesticide active ingredient and the application is erroneously recorded as 100,000 pounds (a decimal point shift of three places to the right), an error of 999,900 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 pounds, and an error of 99.9 pounds is entered into the database. The procedure to exclude probable errors involved the development of complex error-checking algorithms, a data improvement process that is ongoing.

To provide an overview, pesticide use is summarized for eight different categories from 1991 to 1999 (Tables 3–10 and Figures 1–8). These categories classify pesticides according to certain characteristics, such as reproductive toxins, carcinogens, or reduced-risk characteristics.

However, the statistical summaries detailed in these 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 is Used” on page iv.) The different pesticide categories, described more fully, are:

- 1) pesticides listed on the State's Proposition 65 list of chemicals "known to cause reproductive toxicity";
- 2) pesticides listed by U.S. EPA as B2 carcinogens or on the State's Proposition 65 list of chemicals "known to cause cancer";
- 3) pesticides that are cholinesterase inhibitors, that is, organophosphate and carbamate chemicals;
- 4) pesticides on DPR's groundwater protection list [California Code of Regulations, Title 3, Division 6, Chapter 4, Subchapter 1, Article 1, Section 6800(a)] and norflurazon, which DPR is recommending be listed as a restricted material;
- 5) pesticides from DPR's toxic air contaminants list (California Code of Regulations, Title 3, Division 6, Chapter 4, Subchapter 1, Article 1, Section 6860);
- 6) oil pesticides, which may include some chemicals on the State's Proposition 65 list of chemicals “known to cause cancer” but which also serve as alternatives to high-toxicity pesticides;
- 7) active ingredients contained in pesticide products that have been given reduced-risk status by U.S. EPA;
- 8) biopesticides, which 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 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 with probable errors removed. The 1999 data are preliminary.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
1080 (SODIUM FLUOROACETATE)	1	<1	<1	<1	<1	1	<1	<1	<1
2,4-DB ACID	0	0	0	0	0	0	1,697	6,932	12,397
AMITRAZ	5,834	8,953	4,877	70,363	75,018	55,459	66,439	13,563	7,558
ARSENIC PENTOXIDE	201,059	262,017	150,200	86,445	83,814	205,089	64,372	50,899	245,238
ARSENIC TRIOXIDE	0	<1	<1	<1	<1	<1	<1	1	1
BENOMYL	116,961	125,777	536,594	141,586	189,943	148,433	114,406	227,690	132,662
BROMACIL, LITHIUM SALT	5,742	4,837	7,045	11,085	6,517	17,381	9,141	4,686	4,114
BROMOXYNIL OCTANOATE	79,023	106,724	112,643	127,154	119,407	148,480	115,368	120,877	121,111
CYANAZINE	275,809	340,945	501,962	532,688	641,057	566,632	470,838	277,313	179,743
CYCLOATE	44,451	49,041	51,715	51,035	49,138	44,628	55,459	62,753	49,020
DICLOFOP-METHYL	12,021	30,616	23,082	38,276	16,540	79,874	41,130	24,783	18,581
DISODIUM CYANODITHIOIMIDO CARBONATE	<1	0	0	0	0	0	0	0	0
EPTC	747,253	641,581	698,176	765,576	660,185	703,996	579,245	393,031	454,535
ETHYLENE OXIDE	29	7	1,471	3	0	0	0	31	2
FENOXAPROP ETHYL	0	0	0	5,023	3,731	3,974	3,895	1,504	1,938
FLUAZIFOP-BUTYL	12,660	18,361	21,356	19,772	20,451	15,095	15,253	14,724	14,379
HYDRAMETHYLNON	114	145	142	227	807	1,741	5,456	3,183	2,183
LINURON	64,063	73,577	230,827	79,950	84,937	84,335	84,621	82,170	77,317
METAM-SODIUM	4,873,276	8,554,646	8,588,969	11,122,361	14,975,528	15,253,924	14,969,732	13,729,306	17,310,884
METHYL BROMIDE	17,578,480	18,051,774	14,115,900	16,607,324	17,165,964	16,022,069	15,663,832	13,569,875	15,342,080
METIRAM	0	0	0	0	0	0	0	<1	0
MYCLOBUTANIL	40,394	57,288	86,712	69,941	85,525	89,087	94,375	129,773	93,337
NABAM	0	4	0	8	1	0	0	50	1
NICOTINE	3,259	898	457	457	228	298	258	83	92
NITRAPYRIN	605	332	175	150	639	114	49	407	150
OXADIAZON	17,179	18,122	19,269	20,488	21,458	25,260	23,196	21,959	18,729
OXYDEMETON-METHYL	115,179	118,285	117,416	111,347	120,101	106,612	115,781	89,789	123,502
OXYTHIOQUINOX	5,347	6,829	6,207	4,474	7,172	6,204	2,709	1,576	2,648
POTASSIUM DIMETHYL DITHIO CARBAMATE	0	0	21	47	0	0	15	24,795	0
RESMETHRIN	3,101	1,519	1,720	1,069	856	661	594	796	669
SODIUM DIMETHYL DITHIO CARBAMATE	0	4	0	337	1	0	0	8,279	355
STREPTOMYCIN SULFATE	0	1,988	5,110	6,165	9,619	9,494	9,605	14,950	9,417

Table 3A continued. The reported **pounds** of pesticides used which are on the State’s Proposition 65 list of chemicals that are “known to cause reproductive toxicity”.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
TAU-FLUVALINATE	3,944	4,632	3,730	4,723	3,787	4,137	3,040	2,827	3,249
TRIADIMEFON	45,968	48,645	29,699	24,147	20,692	17,370	12,204	12,919	4,596
TRIFORINE	17,713	29,268	41,848	32,574	39,729	24,877	6,562	2,752	544
VINCLOZOLIN	42,626	41,221	37,550	33,661	48,270	60,286	46,908	54,719	51,465
WARFARIN	1	1	1	<1	<1	1	1	1	1
Grand Total	24,312,094	28,598,038	25,394,875	29,968,455	34,451,115	33,695,511	32,576,184	28,948,997	34,282,498

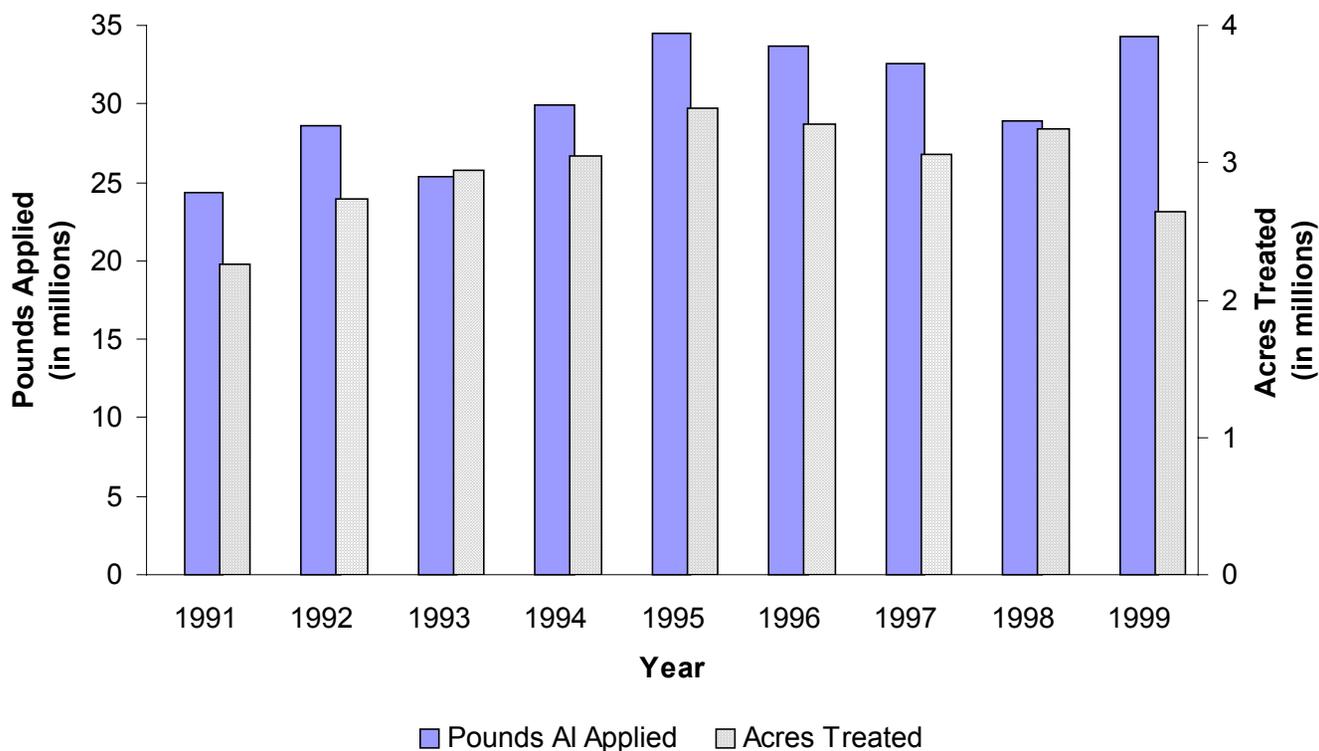
Table 3B. The reported **cumulative acres treated** with pesticides which are on the State’s Proposition 65 list of chemicals “known to cause reproductive toxicity”. Use includes primarily agricultural applications. The grand total for acres treated may be less than the sum of acres treated for all active ingredients because some products contain more than one active ingredient. Data are from the Department of Pesticide Regulation's Pesticide Use Reports with probable errors removed. The 1999 data is preliminary.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
1080 (SODIUM FLUOROACETATE)	241	0	0	53	32	25	0	0	0
2,4-DB ACID	0	0	0	0	0	0	2,599	12,167	20,056
AMITRAZ	4,126	6,327	3,391	137,434	174,867	129,857	161,651	28,945	14,684
ARSENIC PENTOXIDE	0	103	0	660	0	0	0	0	0
ARSENIC TRIOXIDE	0	0	0	0	0	0	0	0	0
BENOMYL	217,799	256,653	278,444	271,289	360,931	310,563	245,687	434,725	242,126
BROMACIL, LITHIUM SALT	0	<1	0	0	0	0	0	40	40
BROMOXYNIL OCTANOATE	153,791	222,988	204,241	245,715	224,276	277,062	224,250	240,997	259,149
CYANAZINE	154,286	206,875	263,463	284,812	365,520	325,627	288,087	185,082	128,985
CYCLOATE	21,806	23,172	21,600	22,571	20,685	19,597	25,986	29,761	24,429
DICLOFOP-METHYL	15,406	41,919	27,457	47,273	19,314	89,276	47,217	28,296	21,257
DISODIUM CYANODITHIOIMIDO CARBONATE	0	0	0	0	0	0	0	0	0
EPTC	282,029	238,804	246,970	273,441	241,587	232,820	208,093	141,511	150,672
ETHYLENE OXIDE	0	0	0	0	0	0	0	194	31
FENOXAPROP ETHYL	0	0	0	33,712	24,153	25,540	24,439	10,480	13,160
FLUAZIFOP-BUTYL	64,702	78,596	88,357	90,378	80,726	58,367	54,192	55,734	51,640
HYDRAMETHYLNON	0	0	2	0	3	36	35	289	1,615
LINURON	71,368	87,584	111,535	97,887	105,284	104,772	110,067	112,122	110,287
METAM-SODIUM	63,583	135,606	136,218	183,625	199,457	215,899	198,395	154,309	186,147
METHYL BROMIDE	103,092	124,739	89,220	106,694	107,933	96,507	103,068	90,107	104,662

Table 3B continued. The reported **cumulative acres treated** with pesticides which are on the State’s Proposition 65 list of chemicals “known to cause reproductive toxicity”.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
METIRAM	0	0	0	0	0	0	0	<1	0
MYCLOBUTANIL	426,456	574,972	859,361	692,036	841,178	814,268	866,360	1,225,372	878,986
NABAM	0	0	0	0	0	0	0	55	20
NICOTINE	2,789	2,005	348	382	237	167	128	57	36
NITRAPYRIN	1,277	698	434	261	1,493	147	105	851	329
OXADIAZON	2,706	1,317	1,094	1,812	2,400	2,213	1,832	1,933	3,393
OXYDEMETON-METHYL	238,216	235,570	235,013	226,433	253,868	220,824	244,056	186,964	252,012
OXYTHIOQUINOX	8,040	9,407	9,227	6,410	10,000	8,768	5,896	5,306	2,143
POTASSIUM DIMETHYL DITHIO CARBAMATE	0	0	0	6	0	0	0	0	0
RESMETHRIN	317	398	512	419	222	144	182	160	41
SODIUM DIMETHYL DITHIO CARBAMATE	0	0	0	0	0	0	0	253	20
STREPTOMYCIN SULFATE	0	19,260	49,236	58,703	84,111	84,999	89,336	131,936	76,558
TAU-FLUVALINATE	21,522	21,690	24,386	26,578	19,771	22,156	18,387	14,075	12,188
TRIADIMEFON	303,307	330,965	165,472	132,295	118,746	100,142	59,229	79,968	21,091
TRIFORINE	38,223	56,156	84,554	64,069	76,411	53,589	17,455	6,352	1,334
VINCLOZOLIN	68,951	59,653	49,042	49,519	66,672	82,968	67,373	69,067	63,982
WARFARIN	309	493	112	192	151	541	382	310	79
Grand Total	2,264,341	2,735,951	2,949,687	3,054,660	3,400,029	3,276,877	3,064,490	3,247,418	2,641,154

Figure 1. Use trends of pesticides which are on the State’s Proposition 65 list of chemicals that are “known to cause reproductive toxicity”. Reported pounds of active ingredient (AI) applied includes both agricultural and non-agricultural applications. The reported cumulative acres treated includes primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports with probable errors removed. The 1999 data are preliminary.



USE TRENDS OF PESTICIDES LISTED BY U.S. EPA AS CARCINOGENS OR BY DPR 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 with probable errors removed. The 1999 data are preliminary.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
1,3-DICHLOROPROPENE	13,555	23,998	47,694	2,122	409,821	1,956,846	2,400,930	2,911,385	3,261,667
ACIFLUORFEN, SODIUM SALT	<1	17	6	1	6	11	29	<1	10
ALACHLOR	88,586	82,046	44,957	42,854	41,119	45,733	51,259	46,264	29,570
ARSENIC ACID	98,800	72,182	13,014	27,571	37,206	53,777	59,835	52,558	48,029
ARSENIC PENTOXIDE	201,059	262,017	150,200	86,445	83,814	205,089	64,372	50,899	245,238
ARSENIC TRIOXIDE	0	<1	<1	<1	<1	<1	<1	1	1
CACODYLIC ACID	26,044	37,928	51,314	43,685	43,275	31,417	26,060	17,379	16,034
CAPTAN	253,452	295,542	483,507	608,658	734,314	918,588	799,878	1,559,136	983,670
CHLOROTHALONIL	656,775	824,171	826,918	832,288	1,125,790	1,053,319	779,328	1,181,163	761,593
CHROMIC ACID	279,852	364,900	209,555	120,822	117,092	286,521	89,931	71,109	343,543
CREOSOTE	318,174	304,448	479,417	871,469	444,461	491,044	259,086	1,752	4,873
DAMINOZIDE	7,696	7,636	7,763	6,775	6,763	7,944	11,028	10,306	9,603
DDVP	5,466	5,224	3,331	4,798	6,063	13,097	13,636	13,998	12,206
DIOCTYL PHTHALATE	10,057	11,164	10,827	11,748	11,838	10,268	8,457	4,749	3,108
DIPROPYL ISOCINCHOMERONATE	<1	10	<1	2	1	3	<1	<1	0
ETHYLENE OXIDE	29	7	1,471	3	0	0	0	31	2
FENOXYCARB	683	1,194	1,928	1,492	1,673	712	65	552	69
FOLPET	3	1	3	3	2	<1	<1	<1	0
FORMALDEHYDE	271,663	5,094	13,322	11,864	153,519	334,548	403,824	305,297	111,646
IPRODIONE	350,363	373,968	452,112	431,318	564,127	520,763	424,338	572,287	410,503
LINDANE	8,590	8,208	9,715	5,281	4,507	4,576	5,388	6,293	4,819
MANCOZEB	283,715	336,371	446,086	464,924	659,240	567,866	526,364	987,270	598,513
MANEB	352,155	464,469	625,326	912,903	1,257,122	1,328,318	1,081,124	1,596,876	1,050,135
METAM-SODIUM	4,873,276	8,554,646	8,588,969	11,122,361	14,975,528	15,253,924	14,969,732	13,729,306	17,310,884
METIRAM	0	0	0	0	0	0	0	<1	0
ORTHO-PHENYLPHENOL	1,335	2,839	6,232	11,027	14,892	10,349	15,962	11,248	8,548
ORTHO-PHENYLPHENOL, SODIUM SALT	36,658	64,940	63,741	46,825	30,830	33,539	25,389	32,315	29,030
OXADIAZON	17,179	18,122	19,269	20,488	21,458	25,260	23,196	21,959	18,729
OXYTHIOQUINOX	5,347	6,829	6,207	4,474	7,172	6,204	2,709	1,576	2,648
PARA-DICHLOROBENZENE	108	82	37	3	2	4	3	219	86
PCP	196,252	107,946	91,123	40	3	3	8	33	92

Table 4A continued. 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".

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
POTASSIUM DICHROMATE	2,458	1,705	106	596	380	41	50	103	319
PROPARGITE	1,291,184	1,702,328	1,653,855	1,742,736	1,770,065	1,743,278	1,816,028	1,385,327	1,484,523
PROPOXUR	4,374	3,187	2,674	2,667	3,296	1,341	1,760	1,604	1,491
PROPYLENE OXIDE	111,919	131,091	34,764	41,815	131,593	224,495	198,559	198,595	168,036
PROPYZAMIDE	118,828	109,266	110,123	111,797	113,761	106,811	99,292	104,292	101,845
SILICA AEROGEL	26,896	8,525	10,052	14,245	12,599	16,216	10,780	8,483	7,799
SODIUM DICHROMATE	0	0	0	0	0	180,478	182,185	122,647	32,699
THIODICARB	0	0	<1	0	13,679	122,927	156,002	114,785	60,316
VINCLOZOLIN	42,626	41,221	37,550	33,661	48,270	60,286	46,908	54,719	51,465
Grand Total	9,955,157	14,233,323	14,503,169	17,639,765	22,845,281	25,615,595	24,553,497	25,176,517	27,173,338

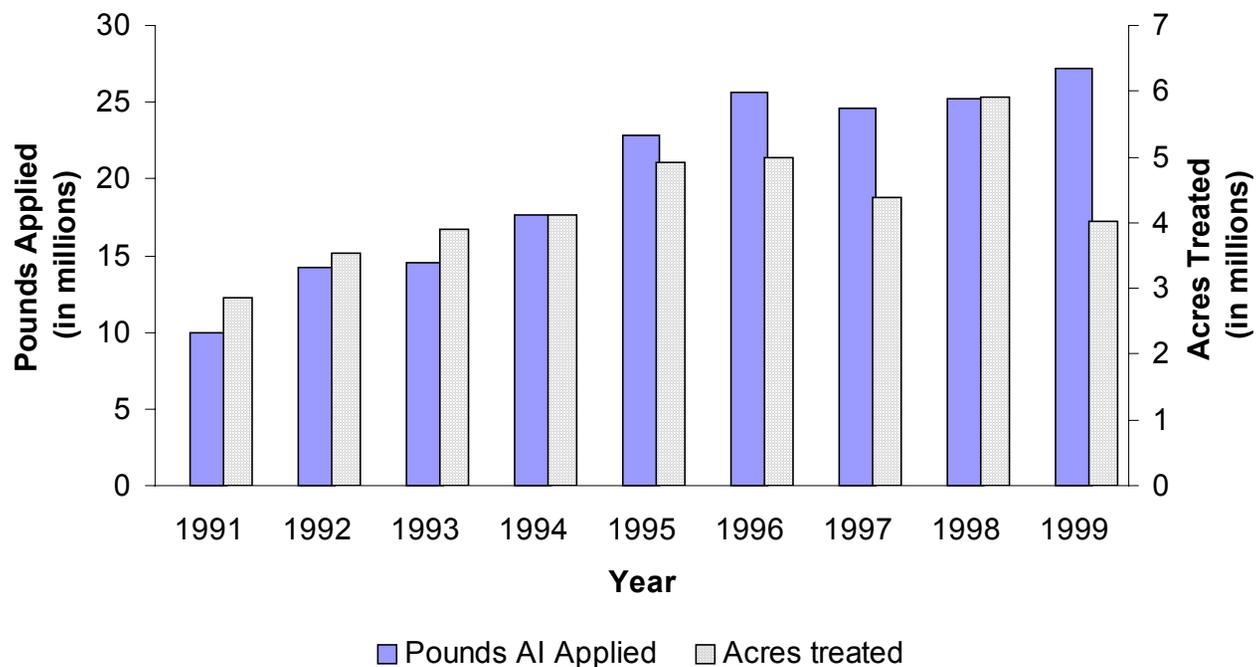
Table 4B. The reported **cumulative acres treated** with pesticides listed by U.S. EPA as B2 carcinogens or on the State's Proposition 65 list of chemicals "known to cause cancer". Use includes primarily agricultural applications. The grand total for acres treated is less than the sum of acres treated for all active ingredients because some products contain more than one active ingredient. Data are from the Department of Pesticide Regulation's Pesticide Use Reports with probable errors removed. The 1999 data are preliminary.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
1,3-DICHLOROPROPENE	91	447	823	33	4,174	17,223	22,193	27,059	30,608
ACIFLUORFEN, SODIUM SALT	0	4	7	2	8	<1	0	0	0
ALACHLOR	33,312	27,472	17,637	16,135	15,359	18,181	19,059	16,430	10,993
ARSENIC ACID	0	0	0	0	0	0	0	0	0
ARSENIC PENTOXIDE	0	103	0	660	0	0	0	0	0
ARSENIC TRIOXIDE	0	0	0	0	0	0	0	0	0
CACODYLIC ACID	206,243	283,516	326,027	304,060	315,336	251,414	192,816	126,912	111,057
CAPTAN	127,668	134,103	212,563	244,164	295,860	381,989	347,631	602,684	404,875
CHLOROTHALONIL	382,812	517,695	535,201	517,357	674,126	674,086	492,219	796,672	462,253
CHROMIC ACID	0	103	0	660	0	0	0	0	0
CREOSOTE	2	0	0	0	0	0	0	126	11
DAMINOZIDE	2,941	3,113	3,262	2,692	2,659	2,653	3,512	4,510	3,075
DDVP	5,530	2,960	683	1,888	1,887	1,499	2,596	3,692	973
DIOCTYL PHTHALATE	108,525	124,467	125,572	149,314	145,445	127,521	96,208	61,343	50,825
DIPROPYL ISOCINCHOMERONATE	0	0	2	50	10	0	0	0	0

Table 4B continued. 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”.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
ETHYLENE OXIDE	0	0	0	0	0	0	0	194	31
FENOXYCARB	30	674	1	5	11	5	<1	210	3,704
FOLPET	0	0	3	<1	0	1	2	0	0
FORMALDEHYDE	106	68	132	15	137	234	12	126	123
IPRODIONE	549,994	582,227	721,086	656,402	886,077	804,311	666,336	1,348,367	638,207
LINDANE	21,409	21,737	26,921	22,984	19,380	25,352	36,573	32,650	20,892
MANCOZEB	148,643	186,333	262,758	273,836	405,494	351,801	284,134	682,979	387,144
MANEB	216,990	290,011	373,116	512,009	652,122	731,079	624,123	942,083	630,560
METAM-SODIUM	63,583	135,606	136,218	183,625	199,457	215,899	198,395	154,309	186,147
METIRAM	0	0	0	0	0	0	0	<1	0
ORTHO-PHENYLPHENOL	40	732	6	4	8	67	75	645	543
ORTHO-PHENYLPHENOL, SODIUM SALT	733	111	52	88	47	652	0	20	599
OXADIAZON	2,706	1,317	1,094	1,812	2,400	2,213	1,832	1,933	3,393
OXYTHIOQUINOX	8,040	9,407	9,227	6,410	10,000	8,768	5,896	5,306	2,143
PARA-DICHLOROBENZENE	<1	0	<1	0	0	0	0	10	0
PCP	1	1	0	2	<1	15	4	190	0
POTASSIUM DICHROMATE	0	0	0	0	0	0	0	40	71
PROPARGITE	767,907	1,006,602	952,438	1,030,485	1,052,358	980,963	989,265	756,098	803,493
PROPOXUR	2	8	<1	14	5	9	73	45	39
PROPYLENE OXIDE	0	10	0	0	0	0	<1	0	573
PROPYZAMIDE	165,848	156,702	156,678	157,829	155,773	150,791	140,791	144,864	141,263
SILICA AEROGEL	5	<1	<1	1	1	1	5	<1	2
SODIUM DICHROMATE	0	0	0	0	0	0	0	0	0
THIODICARB	0	0	0	0	22,785	176,788	223,154	155,440	83,641
VINCLOZOLIN	68,951	59,653	49,042	49,519	66,672	82,968	67,373	69,067	63,982
Grand Total	2,882,110	3,545,185	3,910,546	4,132,055	4,927,592	5,006,485	4,414,279	5,934,006	4,041,220

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 includes both agricultural and reportable non-agricultural applications. The reported cumulative acres treated includes primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports with probable errors removed. The 1999 data are preliminary.



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 with probable errors removed. The 1999 data are preliminary.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
3-IODO-2-PROPYNYL BUTYL CARBAMATE	<1	0	<1	0	0	<1	0	1	0
ACEPHATE	346,072	380,706	331,453	371,862	458,012	355,350	343,840	384,091	307,687
ALDICARB	190,707	164,291	237,382	225,973	354,500	545,117	530,066	534,665	280,398
AZINPHOS METHYL	478,506	520,356	474,748	418,935	406,230	406,099	336,353	193,069	217,834
BENDIOCARB	16,218	20,150	9,740	4,431	1,526	1,674	259	125	103
BENSULIDE	73,225	57,944	55,639	64,796	69,271	94,587	129,784	192,136	242,111
BUTYLATE	71,571	90,218	121,979	108,686	67,179	87,612	84,268	69,805	75,517
CARBARYL	935,071	775,078	773,404	820,787	835,811	809,794	753,801	426,893	386,573
CARBOFURAN	320,489	287,629	289,581	278,108	242,999	220,622	183,321	161,588	138,212
CHLORPROPHAM	3,451	3,953	5,448	3,000	3,230	3,015	2,057	2,321	3,102
CHLORPYRIFOS	2,024,872	2,536,605	2,246,121	2,887,838	3,385,416	2,687,809	3,152,564	2,355,626	2,205,424
CYCLOATE	44,451	49,041	51,715	51,035	49,138	44,628	55,459	62,753	49,020
DDVP	5,466	5,224	3,331	4,798	6,063	13,097	13,636	13,998	12,206
DESMEDIPHAM	9,620	10,430	8,956	8,588	8,465	6,092	6,188	4,737	5,913
DIAZINON	949,751	1,306,574	1,412,733	1,358,358	1,216,935	1,093,121	955,108	900,596	920,785
DIMETHOATE	687,998	635,778	586,300	671,948	583,498	419,807	515,798	397,847	485,929
DISULFOTON	173,463	176,216	151,010	134,600	95,972	142,372	128,335	105,327	95,261
EPTC	747,253	641,581	698,176	765,576	660,185	703,996	579,245	393,031	454,535
ETHEPHON	807,506	608,613	859,439	848,134	982,776	951,415	882,802	762,217	736,033
ETHOPROP	77,274	41,512	62,143	51,270	51,104	27,955	23,842	27,949	26,196
FENAMIPHOS	182,331	186,312	232,396	178,781	187,242	189,379	156,280	125,459	107,512
FENTHION	1,298	1,089	146	186	413	141	176	29	19
FONOFOS	66,346	58,213	55,991	73,167	74,936	67,969	50,555	25,349	25,212
FORMETANATE HYDROCHLORIDE	173,892	200,592	182,061	152,622	104,012	106,168	97,907	77,723	64,973
MALATHION	869,360	779,204	708,469	749,317	801,496	673,379	773,782	645,889	692,491
METHAMIDOPHOS	309,889	283,562	330,178	240,959	500,055	260,255	312,067	244,269	138,988
METHIDATHION	323,457	385,998	451,826	367,447	321,605	328,328	309,154	178,451	177,406
METHIOCARB	6,247	4,613	3,686	4,126	2,672	2,120	4,769	5,384	3,241
METHOMYL	596,848	571,743	528,545	707,814	807,977	679,383	833,758	666,442	553,197

Table 5A continued. The reported **pounds** of cholinesterase inhibiting pesticides used.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
METHYL PARATHION	71,108	102,730	154,452	129,155	140,469	130,614	153,187	158,228	157,337
MOLINATE	1,133,846	1,375,411	1,518,002	1,496,227	1,377,257	1,356,258	1,170,699	1,006,025	913,015
NALED	171,127	160,012	180,642	457,723	700,676	351,267	615,314	260,048	294,521
OXAMYL	59,035	70,894	71,478	73,440	66,179	82,327	119,441	161,042	128,469
OXYDEMETON-METHYL	115,179	118,285	117,416	111,347	120,101	106,612	115,781	89,789	123,502
PEBULATE	281,591	219,766	191,529	235,690	244,181	202,634	184,015	185,696	227,646
PHENMEDIPHAM	9,706	10,632	9,062	8,863	8,771	6,612	6,621	5,836	6,709
PHORATE	193,982	217,399	151,250	159,146	135,887	160,854	139,725	149,707	113,203
PHOSALONE	3,996	703	180	99	52	27	33	11	0
PHOSMET	275,532	258,465	204,157	189,415	266,349	395,160	566,484	644,898	642,792
PROFENOFOS	6,595	39,708	51,239	263,884	245,420	184,264	150,575	40,433	49,575
PROPAMOCARB HYDROCHLORIDE	0	0	0	0	0	16,341	10,215	57,121	8,410
PROPETAMPHOS	32,886	24,235	23,804	38,307	77,985	23,249	17,338	9,970	5,792
PROPOXUR	4,374	3,187	2,674	2,667	3,296	1,341	1,760	1,604	1,491
S,S,S-TRIBUTYL PHOSPHOTRITHIOATE	798,052	757,765	920,837	892,441	866,726	760,809	626,684	440,382	347,760
SODIUM DIMETHYL DITHIO CARBAMATE	0	4	0	337	1	0	0	8,279	355
SULFOTEP	897	1,199	1,141	1,000	509	316	355	213	145
SULPROFOS	10,255	1,370	236	876	171	0	119	84	0
TETRACHLORVINPHOS	18,924	27,270	8,247	10,051	7,118	7,056	6,044	5,831	3,975
THIOBENCARB	73,164	175,805	252,423	406,085	559,610	618,412	894,287	724,926	735,080
THIODICARB	0	0	<1	0	13,679	122,927	156,002	114,785	60,316
TRICHLORFON	7,090	4,236	5,607	4,275	4,552	3,327	3,843	2,476	2,702
Grand Total	13,759,971	14,352,300	14,736,972	16,034,172	17,117,709	15,451,689	16,153,697	13,025,153	12,228,675

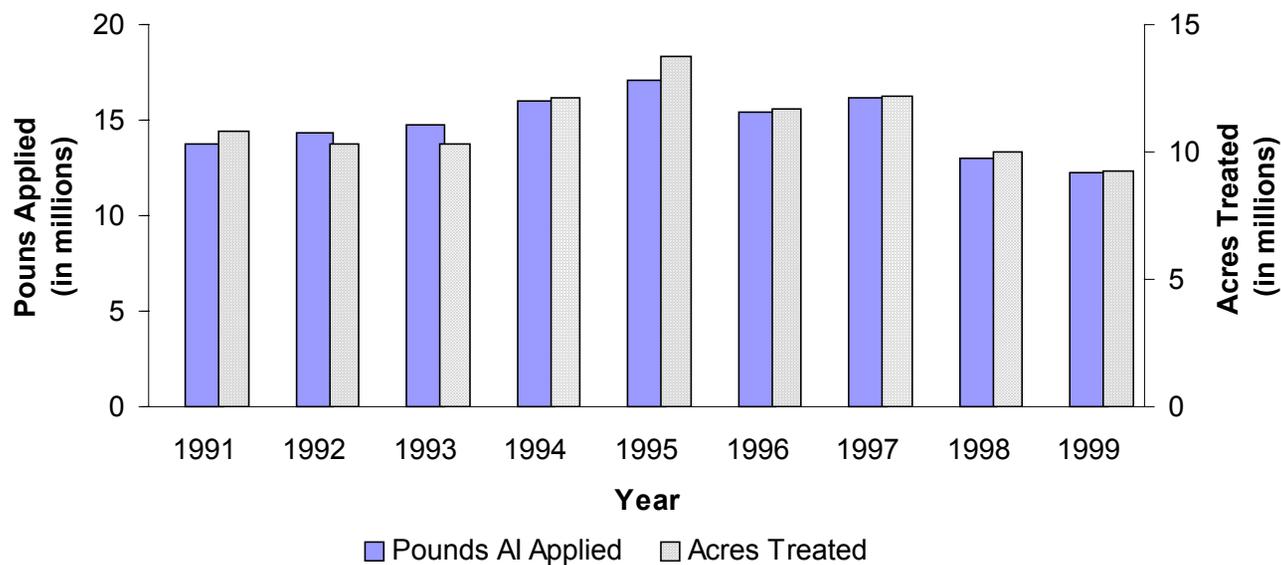
Table 5B. The reported **cumulative acres treated** with cholinesterase inhibiting pesticides. These pesticides are the currently registered organophosphate and carbamate active ingredients. Use includes primarily agricultural applications. The grand total for acres treated is less than the sum of acres 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 with probable errors removed.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
3-iodo-2-propynyl butyl carbamate	0	0	0	0	0	0	0	150	0
ACEPHATE	380,205	394,165	328,012	402,643	489,259	406,607	372,566	403,537	331,717
ALDICARB	195,378	153,672	254,372	256,428	355,717	490,499	442,029	397,890	266,398
AZINPHOS METHYL	362,047	357,655	324,769	293,466	274,347	277,745	233,406	134,334	140,907
BENDIOCARB	2,460	2,268	1,661	1,574	499	188	19	28	11
BENSULIDE	27,085	17,545	15,239	17,446	22,489	31,916	45,795	61,984	80,745
BUTYLATE	15,899	19,777	24,957	23,105	14,864	17,689	17,572	14,259	15,982
CARBARYL	290,073	322,588	285,046	291,147	305,452	312,058	292,721	197,664	217,356
CARBOFURAN	465,526	393,594	397,071	460,647	449,507	364,150	322,064	303,957	271,309
CHLORPROPHAM	187	118	482	20	0	4	26	106	151
CHLORPYRIFOS	1,119,058	1,130,628	1,163,147	1,910,520	2,824,142	1,869,874	2,223,551	1,669,859	1,400,437
CYCLOATE	21,806	23,172	21,600	22,571	20,685	19,597	25,986	29,761	24,429
DDVP	5,530	2,960	683	1,888	1,887	1,499	2,596	3,692	973
DESMEDIPHAM	53,139	59,693	58,486	62,171	71,577	51,183	61,368	56,272	71,022
DIAZINON	692,487	792,397	828,003	878,221	752,898	680,947	530,355	477,804	545,531
DIMETHOATE	1,267,141	1,031,266	1,005,411	1,205,884	1,193,214	955,445	1,097,751	871,305	1,078,836
DISULFOTON	144,397	155,955	127,555	114,949	87,291	147,078	124,319	100,935	86,004
EPTC	282,029	238,804	246,970	273,441	241,587	232,820	208,093	141,511	150,672
ETHEPHON	768,964	555,613	727,925	704,394	806,425	776,247	700,941	653,817	720,654
ETHOPROP	9,224	5,113	7,062	5,767	5,470	3,139	3,213	3,784	3,610
FENAMIPHOS	103,512	107,492	142,914	114,333	112,249	111,729	97,013	72,102	66,158
FENTHION	13	0	0	0	0	0	0	0	0
FONOFOS	56,882	47,038	50,046	58,852	59,041	55,207	36,123	16,926	14,937
FORMETANATE HYDROCHLORIDE	166,305	180,958	170,117	141,203	100,837	103,521	95,544	77,965	63,010
MALATHION	448,833	403,997	357,210	401,037	425,062	363,635	410,658	383,121	403,224
METHAMIDOPHOS	415,188	441,648	284,160	199,314	418,703	313,618	263,816	290,061	158,248
METHIDATHION	277,473	317,536	315,398	255,006	231,930	245,914	200,528	129,358	115,378
METHIOCARB	11,694	8,655	4,853	3,394	2,129	1,511	2,906	3,523	2,332
METHOMYL	1,145,546	969,920	932,435	1,215,586	1,425,295	1,145,115	1,376,868	1,118,188	883,434
METHYL PARATHION	126,351	135,774	171,353	137,691	129,976	125,729	125,638	128,675	119,929
MOLINATE	292,711	350,994	388,852	384,031	348,465	357,239	317,680	267,090	246,121

Table 5B continued. The reported **cumulative acres treated** with cholinesterase inhibiting pesticides.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
NALED	160,356	175,023	167,034	473,011	702,155	338,861	604,615	251,044	274,957
OXAMYL	106,355	97,332	106,553	115,085	106,205	122,353	176,793	225,380	177,061
OXYDEMETON-METHYL	238,216	235,570	235,013	226,433	253,868	220,824	244,056	186,964	252,012
PEBULATE	94,747	78,948	65,788	76,688	86,494	74,647	69,381	64,501	75,096
PHENMEDIPHAM	53,368	60,237	58,343	62,694	72,060	52,125	62,449	58,649	73,151
PHORATE	178,479	187,605	125,357	133,392	111,217	123,789	106,427	109,759	81,630
PHOSALONE	2,494	416	108	47	56	18	64	5	0
PHOSMET	209,297	174,281	150,436	136,500	172,539	214,416	236,611	312,707	254,423
PROFENOFOS	29,892	44,258	62,345	336,830	296,860	211,769	162,204	44,641	46,250
PROPAMOCARB HYDROCHLORIDE	0	0	0	0	0	23,793	14,677	81,050	7,734
PROPETAMPHOS	0	0	0	0	0	0	0	0	0
PROPOXUR	2	8	<1	14	5	9	73	45	39
S,S,S-TRIBUTYL PHOSPHOROTRITHIOATE	569,961	574,170	652,163	615,978	604,586	531,052	437,505	305,306	245,439
SODIUM DIMETHYL DITHIO CARBAMATE	0	0	0	0	0	0	0	253	20
SULFOTEP	2,071	903	1,191	884	537	408	251	241	167
SULPROFOS	18,224	1,252	1,273	896	299	0	83	80	0
TETRACHLORVINPHOS	1,381	2,072	553	780	519	674	356	3,109	343
THIOBENCARB	18,846	45,140	65,612	91,906	126,745	159,121	227,658	187,295	186,985
THIODICARB	0	0	0	0	22,785	176,788	223,154	155,440	83,641
TRICHLORFON	4,633	1,991	2,444	818	1,037	204	149	1,071	97
Grand Total	10,835,466	10,300,202	10,330,004	12,108,686	13,728,965	11,712,752	12,197,651	9,997,198	9,238,561

Figure 3A. Use trends of cholinesterase inhibiting pesticides pesticides, which includes pesticides with organophosphate and carbamate active ingredients. Reported pounds of active ingredient (AI) applied includes both agricultural and reportable non-agricultural applications. The reported cumulative acres treated includes primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports with probable errors removed. The 1999 data are preliminary.



USE TRENDS OF PESTICIDES ON DPR'S GROUNDWATER PROTECTION LIST AND NORFLURAZON

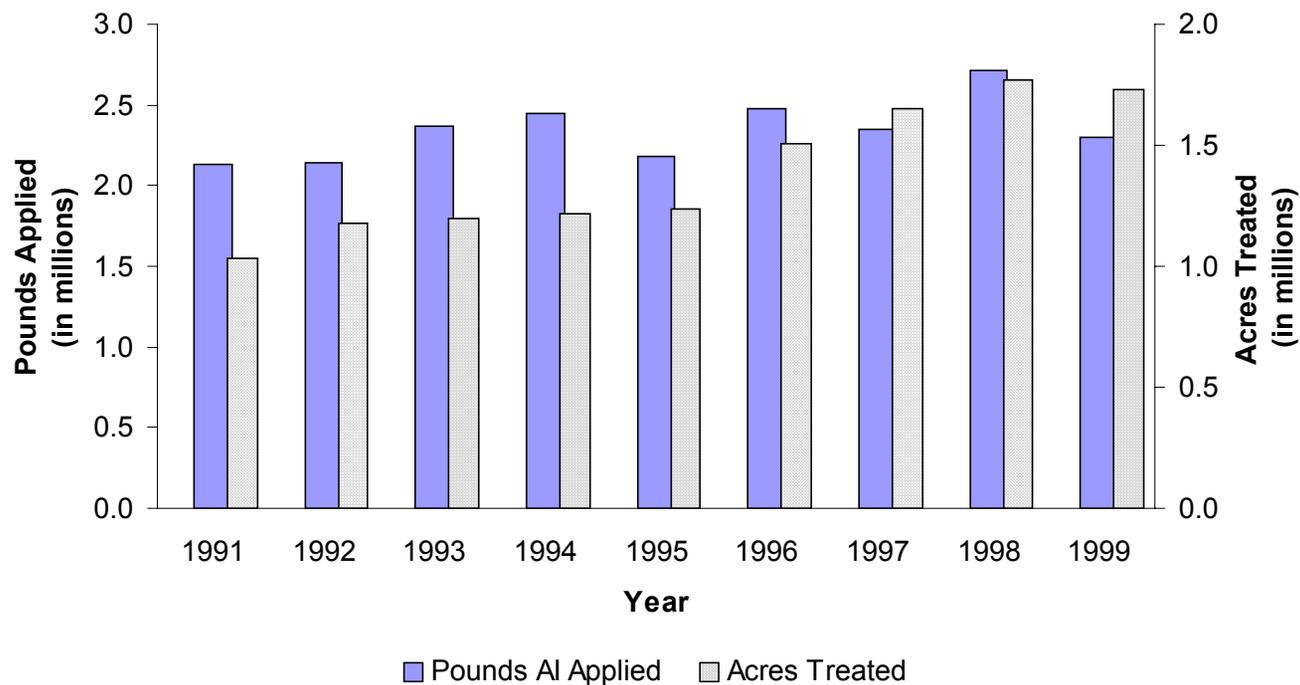
Table 6A. The reported **pounds** of pesticides on DPR's groundwater protection list. These pesticides are the currently registered active ingredients listed in the California Code of Regulations, Title 3, Division 6, Chapter 4, Subchapter 1, Article 1, Section 6800(a) and norflurazon. Use includes both agricultural and reportable non-agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports with probable errors removed. The 1999 data are preliminary.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
ATRAZINE	52,556	48,313	44,485	46,497	36,078	57,018	46,568	54,840	69,425
ATRAZINE, OTHER RELATED	2,792	2,567	2,365	2,480	1,932	3,062	2,502	2,943	3,699
BENTAZON, SODIUM SALT	1,100	846	1,017	1,175	655	1,518	1,907	1,757	1,907
BROMACIL	99,906	112,160	117,128	104,052	95,444	98,293	82,424	84,645	74,514
BROMACIL, DIMETHYLAMINE SALT	<1	0	0	0	0	0	0	0	0
BROMACIL, LITHIUM SALT	5,742	4,837	7,045	11,085	6,517	17,381	9,141	4,686	4,114
DIURON	1,079,083	916,083	1,074,854	1,234,507	1,054,409	1,265,426	1,228,114	1,504,268	1,161,035
NORFLURAZON	141,752	171,375	164,451	154,383	153,138	196,142	212,621	265,886	289,088
PROMETON	186	87	41	84	117	68	20	22	4
SIMAZINE	752,893	887,151	957,812	890,353	837,366	839,209	764,586	794,758	695,921
Grand Total	2,136,012	2,143,420	2,369,197	2,444,616	2,185,656	2,478,115	2,347,882	2,713,804	2,299,707

Table 6B. The reported **acres treated** in California with 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) and norflurazon. 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 with probable errors removed. The 1999 data are preliminary.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
ATRAZINE	21,374	21,425	23,617	32,065	22,234	32,043	27,257	37,556	39,864
ATRAZINE, OTHER RELATED	21,374	21,425	23,617	32,065	22,234	32,042	27,257	37,529	39,859
BENTAZON, SODIUM SALT	1,260	894	1,107	1,688	805	1,460	2,010	1,904	1,964
BROMACIL	69,584	82,090	78,423	65,421	66,289	62,206	58,722	57,136	53,858
BROMACIL, DIMETHYLAMINE SALT	0	0	0	0	0	0	0	0	0
BROMACIL, LITHIUM SALT	0	<1	0	0	0	0	0	40	40
DIURON	348,038	392,716	414,892	454,829	507,279	685,352	819,993	865,246	847,371
NORFLURAZON	117,279	143,942	142,274	139,498	133,585	179,015	186,991	214,144	220,761
PROMETON	48	3	11	8	23	27	8	85	18
SIMAZINE	544,287	616,551	615,003	589,560	573,735	607,228	613,237	647,072	616,689
Grand Total	1,123,242	1,279,047	1,298,945	1,315,134	1,326,184	1,599,373	1,735,475	1,860,712	1,820,424

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) and norflurazon. Reported pounds of active ingredient (AI) applied includes both agricultural and reportable non-agricultural applications. The reported cumulative acres treated includes primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports with probable errors removed. The 1999 data are preliminary.



USE TRENDS OF PESTICIDES ON DPR'S TOXIC AIR CONTAMINANTS 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 with probable errors removed. The 1999 data are preliminary.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
1,3-DICHLOROPROPENE	13,555	23,998	47,694	2,122	409,821	1,956,846	2,400,930	2,911,385	3,261,667
2,4-D	23,197	26,098	26,462	27,544	23,995	22,089	10,227	3,868	2,933
2,4-D, 2-ETHYLHEXYL ESTER	4,966	112	12	71	278	10	1,313	13,750	42,508
2,4-D, ALKANOLAMINE SALTS (ETHANOL AND ISOPROPANOL AMINES)	20,469	32,471	35,378	28,863	30,642	27,954	25,684	29,061	15,872
2,4-D, BUTOXYETHANOL ESTER	27,554	36,014	47,601	67,414	31,743	38,567	13,263	12,140	5,617
2,4-D, BUTOXYPROPYL ESTER	584	1,674	1,921	1,166	224	61	13	569	5
2,4-D, BUTYL ESTER	0	2	0	1	39	0	0	2,169	8
2,4-D, DIETHANOLAMINE SALT	3,695	5,950	1,572	714	1,938	3,003	24,809	14,965	6,373
2,4-D, DIMETHYLAMINE SALT	260,635	366,038	350,293	399,046	454,658	468,771	428,874	422,673	364,007
2,4-D, DODECYLAMINE SALT	1,347	86	0	5	16	8	58	75	730
2,4-D, HEPTYLAMINE SALT	0	0	0	0	86	<1	0	0	46
2,4-D, ISOOCTYL ESTER	4,022	2,545	2,659	1,212	13,466	7,822	60,356	46,603	17,146
2,4-D, ISOPROPYL ESTER	2,635	3,362	4,540	4,508	5,077	5,090	6,543	7,510	6,912
2,4-D, N-OLEYL-1,3-PROPYLENEDIAMINE SALT	8,047	1,708	670	672	37	35	0	3	7
2,4-D, OCTYL ESTER	0	0	0	0	15	0	0	0	0
2,4-D, PROPYL ESTER	3,303	3,394	2,515	2,326	2,032	1,774	1,575	999	1,818
2,4-D, TETRADECYLAMINE SALT	313	20	0	1	4	2	13	17	170
2,4-D, TRIETHYLAMINE SALT	78,395	117,451	107,782	121,241	105,656	93,876	34,610	5,688	2,281
2,4-D, TRIISOPROPYLAMINE SALT	74	20	10	24	6	2	3	5	6
ACROLEIN	204,625	227,022	298,535	336,993	362,773	322,578	341,245	264,207	327,385
ARSENIC ACID	98,800	72,182	13,014	27,571	37,206	53,777	59,835	52,558	48,029
ARSENIC PENTOXIDE	201,059	262,017	150,200	86,445	83,814	205,089	64,372	50,899	245,238
ARSENIC TRIOXIDE	0	<1	<1	<1	<1	<1	<1	1	1
CAPTAN	253,452	295,542	483,507	608,658	734,314	918,588	799,878	1,559,136	983,670
CAPTAN, OTHER RELATED	7,461	7,671	12,093	14,890	17,831	21,729	19,448	54,940	39,751
CARBARYL	935,071	775,078	773,404	820,787	835,811	809,794	753,801	426,893	386,573
CHLORINE	354,458	417,665	466,825	750,653	2,815,119	330,017	423,469	422,252	581,266
CHROMIC ACID	279,852	364,900	209,555	120,822	117,092	286,521	89,931	71,109	343,543
DDVP	5,466	5,224	3,331	4,798	6,063	13,097	13,636	13,998	12,206
ETHYLENE OXIDE	29	7	1,471	3	0	0	0	31	2

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

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
FORMALDEHYDE	271,663	5,094	13,322	11,864	153,519	334,548	403,824	305,297	111,646
HYDROGEN CHLORIDE	745	122	32	206	224	1,938	129	762	11,011
LINDANE	8,590	8,208	9,715	5,281	4,507	4,576	5,388	6,293	4,819
MANCOZEB	283,715	336,371	446,086	464,924	659,240	567,866	526,364	987,270	598,513
MANEB	352,155	464,469	625,326	912,903	1,257,122	1,328,318	1,081,124	1,596,876	1,050,135
META-CRESOL	3	3	5	2	2	3	6	8	11
METHANOL	2,511	768	1,920	100	27	0	0	0	3
METHOXYCHLOR	761	595	1,412	692	1,049	484	358	566	16
METHOXYCHLOR, OTHER RELATED	54	46	52	90	139	62	44	11	<1
METHYL BROMIDE	17,578,480	18,051,774	14,115,900	16,607,324	17,165,964	16,022,069	15,663,832	13,569,875	15,342,080
NAPHTHALENE	1	1	1	1	<1	0	1	333	<1
PARA-DICHLOROBENZENE	108	82	37	3	2	4	3	219	86
PARATHION	675,456	33,913	4,665	6,104	13,642	14,050	5,187	5,766	4,035
PCNB	90,070	89,999	87,672	91,601	109,755	83,087	89,548	88,036	65,755
PCP	196,252	107,946	91,123	40	3	3	8	33	92
PCP, OTHER RELATED	22,826	12,555	10,596	5	<1	<1	1	2	11
PCP, SODIUM SALT	10	0	2,361	0	0	0	0	2	0
PCP, SODIUM SALT, OTHER RELATED	1	0	329	0	0	0	0	0	0
PHOSPHORUS	159	167	132	29	34	58	14	12	9
POTASSIUM PERMANGANATE	0	238	0	0	0	0	0	243	0
PROPOXUR	4,374	3,187	2,674	2,667	3,296	1,341	1,760	1,604	1,491
PROPYLENE OXIDE	111,919	131,091	34,764	41,815	131,593	224,495	198,559	198,595	168,036
S,S,S-TRIBUTYL PHOSPHOROTRITHIOATE	798,052	757,765	920,837	892,441	866,726	760,809	626,684	440,382	347,760
SODIUM CYANIDE	197	120	1,597	1,754	1,347	1,338	2,197	3,280	1,109
SODIUM DICHROMATE	0	0	0	0	0	180,478	182,185	122,647	32,699
TRIFLURALIN	1,352,819	1,087,377	1,193,363	1,261,342	1,380,785	1,143,695	1,191,780	1,219,810	1,258,981
XYLENE	46,843	30,216	45,137	29,009	17,965	12,627	8,511	5,366	4,822
Grand Total	24,590,829	24,170,357	20,650,102	23,758,749	27,856,695	26,268,950	25,561,393	24,940,793	25,698,887

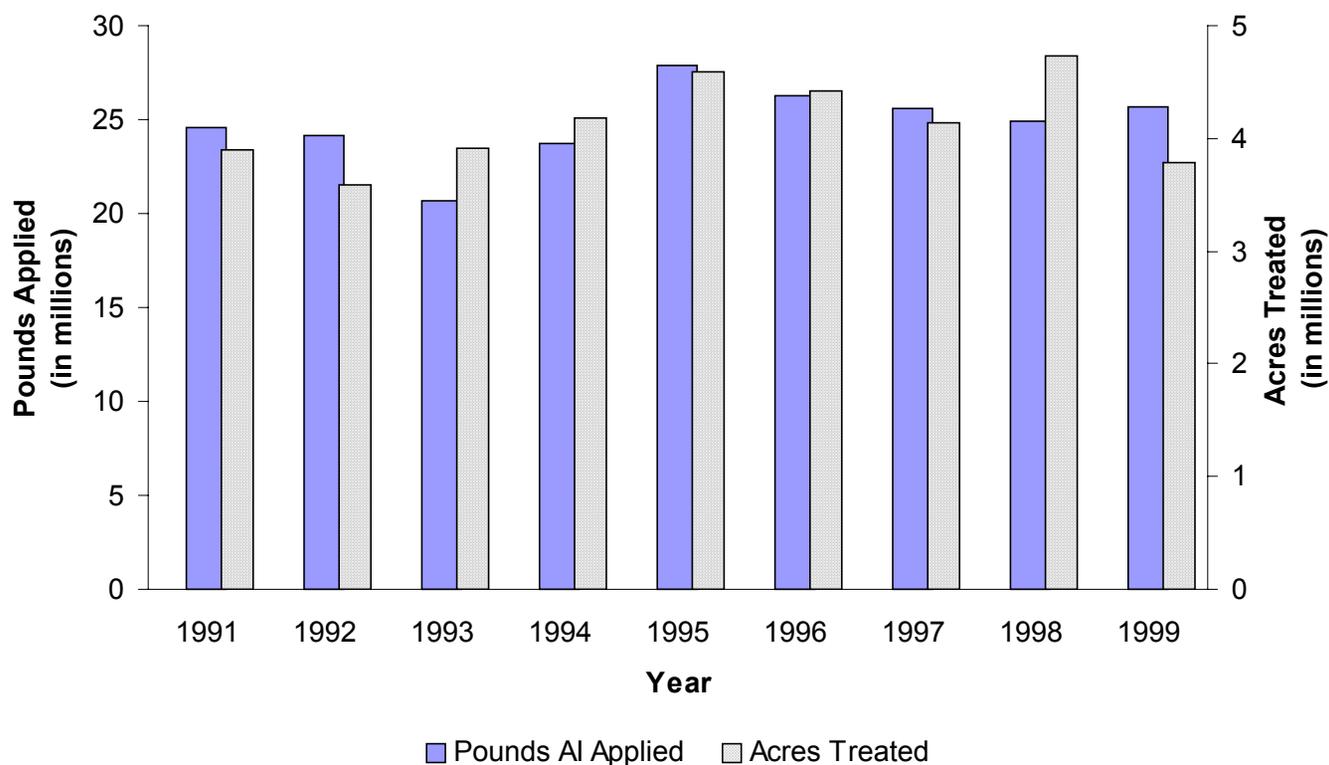
Table 7B. The reported **cumulative acres treated** in California with pesticides on DPR's toxic air contaminants list. These pesticides are the currently registered active ingredients listed in the California Code of Regulations, Title 3, Division 6, Chapter 4, Subchapter 1, Article 1, Section 6860. 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 with probable errors removed. The 1999 data are preliminary.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
1,3-DICHLOROPROPENE	91	447	823	33	4,174	17,223	22,193	27,059	30,608
2,4-D	115,952	167,271	156,294	156,563	151,453	137,230	50,709	11,649	7,227
2,4-D, 2-ETHYLHEXYL ESTER	3,552	28	80	65	385	160	729	6,867	7,624
2,4-D, ALKANOLAMINE SALTS (ETHANOL AND ISOPROPANOL AMINES)	13,147	29,351	33,132	26,138	22,298	21,872	20,055	22,117	11,673
2,4-D, BUTOXYETHANOL ESTER	22,483	31,154	35,573	46,343	29,933	35,599	13,504	13,798	7,198
2,4-D, BUTOXYPROPYL ESTER	5	52	63	100	5	2	51	105	37
2,4-D, BUTYL ESTER	0	0	0	0	0	0	0	307	37
2,4-D, DIETHANOLAMINE SALT	4,177	24,143	1,710	933	4,683	8,721	88,149	58,239	25,011
2,4-D, DIMETHYLAMINE SALT	258,308	395,276	388,083	474,599	524,146	540,728	527,870	477,967	410,044
2,4-D, DODECYLAMINE SALT	1,891	2	0	0	0	0	76	82	1,481
2,4-D, HEPTYLAMINE SALT	0	0	0	0	18	<1	0	0	29
2,4-D, ISOOCXYL ESTER	1,448	1,595	220	379	3,497	5,163	35,045	29,179	14,449
2,4-D, ISOPROPYL ESTER	28,741	48,471	61,243	63,244	72,878	69,081	87,492	101,141	95,474
2,4-D, N-OLEYL-1,3-PROPYLENEDIAMINE SALT	10,956	2,493	1,475	449	36	26	0	2	3
2,4-D, OCTYL ESTER	0	0	0	0	0	0	0	0	0
2,4-D, PROPYL ESTER	44,463	40,929	33,904	28,812	22,655	23,846	21,479	14,356	15,542
2,4-D, TETRADECYLAMINE SALT	1,891	2	0	0	0	0	76	82	1,481
2,4-D, TRIETHYLAMINE SALT	103,570	161,126	149,513	152,474	146,454	131,679	46,600	7,381	2,606
2,4-D, TRIISOPROPYLAMINE SALT	0	0	0	0	0	0	0	0	0
ACROLEIN	302	724	243	888	3,190	2,462	1,514	292	1,104
ARSENIC ACID	0	0	0	0	0	0	0	0	0
ARSENIC PENTOXIDE	0	103	0	660	0	0	0	0	0
ARSENIC TRIOXIDE	0	0	0	0	0	0	0	0	0
CAPTAN	127,668	134,103	212,563	244,164	295,860	381,989	347,631	602,684	404,875
CAPTAN, OTHER RELATED	123,826	132,927	210,620	244,097	295,831	381,989	347,235	602,585	404,655
CARBARYL	290,073	322,588	285,046	291,147	305,452	312,058	292,721	197,664	217,356
CHLORINE	2,800	700	4	0	290	0	1,005	1,329	1,611
CHROMIC ACID	0	103	0	660	0	0	0	0	0
DDVP	5,530	2,960	683	1,888	1,887	1,499	2,596	3,692	973
ETHYLENE OXIDE	0	0	0	0	0	0	0	194	31
FORMALDEHYDE	106	68	132	15	137	234	12	126	123
HYDROGEN CHLORIDE	0	0	0	1	0	1	0	16	0

Table 7B continued. The reported cumulative acres treated in California with pesticides on the toxic air contaminants list.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
LINDANE	21,409	21,737	26,921	22,984	19,380	25,352	36,573	32,650	20,892
MANCOZEB	148,643	186,333	262,758	273,836	405,494	351,801	284,134	682,979	387,144
MANEB	216,990	290,011	373,116	512,009	652,122	731,079	624,123	942,083	630,560
META-CRESOL	2,052	931	1,585	930	1,279	1,309	3,488	1,407	647
METHANOL	10	240	5	0	0	0	0	0	0
METHOXYCHLOR	320	679	233	220	30	19	131	194	140
METHOXYCHLOR, OTHER RELATED	99	187	1	70	5	9	52	5	0
METHYL BROMIDE	103,092	124,739	89,220	106,694	107,933	96,507	103,068	90,107	104,662
NAPHTHALENE	0	0	0	0	0	0	0	0	0
PARA-DICHLOROBENZENE	<1	0	<1	0	0	0	0	10	0
PARATHION	423,068	24,579	2,459	3,404	6,688	5,099	2,071	2,592	1,970
PCNB	62,867	63,638	61,114	55,371	53,079	44,187	29,169	39,090	28,288
PCP	1	1	0	2	<1	15	4	190	0
PCP, OTHER RELATED	1	1	0	2	<1	15	4	15	0
PCP, SODIUM SALT	0	0	0	0	0	0	0	20	0
PCP, SODIUM SALT, OTHER RELATED	0	0	0	0	0	0	0	0	0
PHOSPHORUS	10,479	15,047	7,751	3,435	1,908	69	790	965	3,786
POTASSIUM PERMANGANATE	0	0	0	0	0	0	0	20	0
PROPOXUR	2	8	<1	14	5	9	73	45	39
PROPYLENE OXIDE	0	10	0	0	0	0	<1	0	573
S,S,S-TRIBUTYL PHOSPHOROTRITHIOATE	569,961	574,170	652,163	615,978	604,586	531,052	437,505	305,306	245,439
SODIUM CYANIDE	191,856	18,000	0	82,520	6,040	3,020	84,800	53,285	0
SODIUM DICHROMATE	0	0	0	0	0	0	0	0	0
TRIFLURALIN	1,186,916	1,039,487	1,195,142	1,160,072	1,282,997	1,086,892	1,131,033	1,083,219	1,153,536
XYLENE	60,307	44,308	48,402	28,673	28,870	24,221	13,568	11,327	5,986
Grand Total	4,159,052	3,900,725	4,292,273	4,599,867	5,055,681	4,972,216	4,657,326	5,424,420	4,244,916

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 includes both agricultural and reportable non-agricultural applications. The reported cumulative acres treated includes primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports with probable errors removed. The 1999 data are preliminary.



USE TRENDS OF OIL PESTICIDES

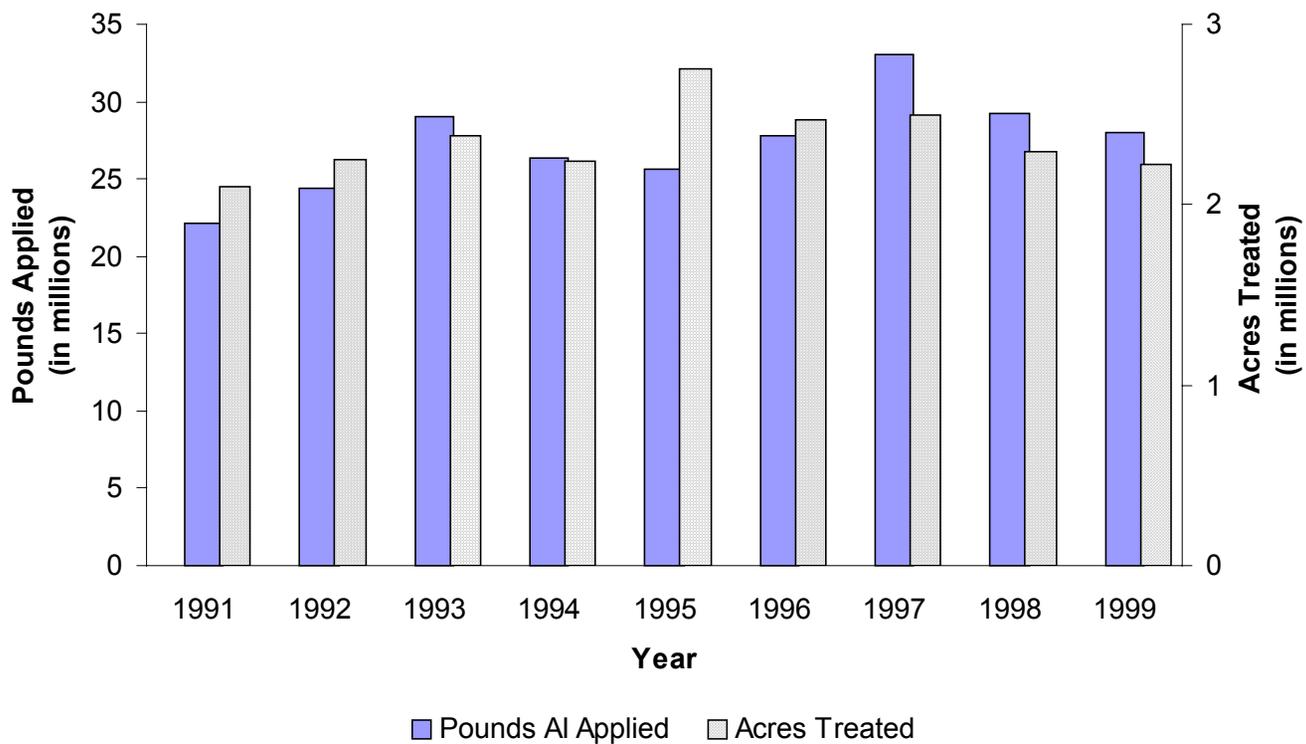
Table 8A. The reported **pounds** of oil pesticides. As a broad group, oil pesticides and other petroleum distillates are on U.S. EPA's list of B2 carcinogens or the State's Proposition 65 list of chemicals "known to cause cancer." However, these classifications do not distinguish among oil pesticides 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 with probable errors removed. The 1999 data are preliminary.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
MINERAL OIL	1,441,497	2,607,034	3,156,693	3,884,948	3,785,414	5,110,235	5,810,235	5,286,094	4,739,402
PETROLEUM DERIVATIVE RESIN	2,342	2,126	1,117	551	4	94	15	6	1
PETROLEUM DISTILLATES	2,571,237	2,763,671	3,200,539	2,279,777	2,459,518	1,711,402	1,798,960	1,612,875	2,394,396
PETROLEUM DISTILLATES, AROMATIC	142,595	103,146	81,291	64,529	31,535	14,631	13,961	35,085	98,839
PETROLEUM DISTILLATES, REFINED	91	10,842	21,107	63,524	45,967	38,396	45,094	60,337	112,495
PETROLEUM HYDROCARBONS	281,060	235,217	835,276	370,908	662,568	862,761	788,309	514,308	486,377
PETROLEUM NAPHTHENIC OILS	165	101	28	320	0	12	1	9	2
PETROLEUM OIL, UNCLASSIFIED	17,732,970	18,632,896	21,757,068	19,674,078	18,688,068	20,063,969	24,633,269	21,723,758	20,173,188
PETROLEUM SULFONATES	2	3	1	1	<1	4	1	<1	<1
Grand Total	22,171,959	24,355,035	29,053,120	26,338,637	25,673,073	27,801,503	33,089,845	29,232,472	28,004,700

Table 8B. The reported **cumulative acres treated** in California from 1991 to 1998 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 with probable errors removed. The 1999 data are preliminary.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
MINERAL OIL	777,118	873,871	841,244	795,403	825,003	655,058	635,013	615,564	623,095
PETROLEUM DERIVATIVE RESIN	1,579	482	2,089	1,321	3	191	50	13	1
PETROLEUM DISTILLATES	194,740	303,898	304,055	340,671	440,375	378,714	308,206	279,400	230,287
PETROLEUM DISTILLATES, AROMATIC	85,482	70,888	73,663	66,424	53,211	12,324	19,003	2,153	2,427
PETROLEUM DISTILLATES, REFINED	8	540	1,809	4,173	3,976	5,145	6,146	6,162	12,355
PETROLEUM HYDROCARBONS	446,726	403,588	525,361	429,456	724,415	759,453	714,126	640,560	577,026
PETROLEUM NAPHTHENIC OILS	369	509	12	540		73	0	50	37
PETROLEUM OIL, UNCLASSIFIED	601,456	597,185	631,281	603,690	703,859	663,575	811,902	753,904	776,699
PETROLEUM SULFONATES	1	<1	0	0	<1	<1	<1	0	<1
Grand Total	2,107,479	2,250,960	2,379,514	2,241,677	2,750,842	2,474,534	2,494,446	2,297,807	2,221,928

Figure 6. 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 includes both agricultural and reportable non-agricultural applications. The reported cumulative acres treated includes primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports with probable errors removed. The 1999 data are preliminary.



USE TRENDS OF REDUCED-RISK PESTICIDES

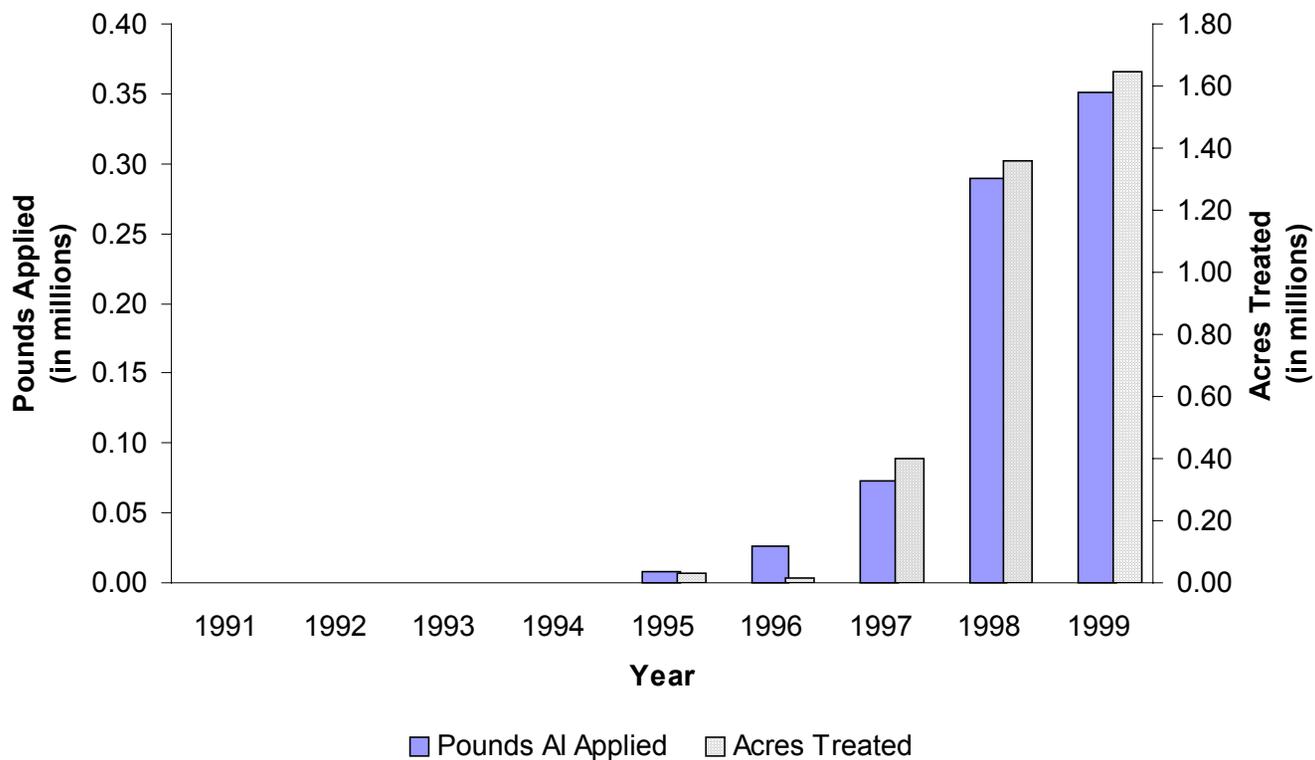
Table 9A. The reported **pounds** of reduced-risk pesticides applied in California. These active ingredients are contained in pesticide products that have been given reduced-risk status by U.S. EPA. Use includes both agricultural and non-agricultural applications. Zero values in early years likely indicate the pesticide was not yet registered for use. Data are from the Department of Pesticide Regulation's Pesticide Use Reports with probable errors removed. The 1999 data are preliminary.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
AZOXYSTROBIN	0	0	0	0	0	0	23,851	69,232	88,999
CARBO METHOXY ETHER CELLULOSE, SODIUM SALT	0	0	0	92	184	22,994	1,032	723	638
CINNAMALDEHYDE	0	0	0	0	0	0	<1	<1	6,743
CORN GLUTEN MEAL	0	0	0	0	0	0	0	0	348
CYPRODINIL	0	0	0	0	0	0	0	48,417	54,898
FIPRONIL	0	0	0	0	0	0	<1	1	2
FLUDIOXONIL	0	0	0	0	0	0	0	551	288
HEXAFLUMURON	0	0	0	0	<1	<1	<1	2	8
IRON PHOSPHATE	0	0	0	0	0	0	0	66	184
MEFENOXAM	0	0	0	0	0	43	29,078	59,960	55,400
METHYL ANTHRANILATE	0	0	0	0	0	6	184	49	57
POTASSIUM BICARBONATE	0	0	0	0	0	0	28	65,909	87,317
PYRIPROXYFEN	0	0	0	0	0	0	3,220	6,072	3,086
SODIUM BICARBONATE	250	0	29	0	0	0	0	0	<1
SPINOSAD	0	0	0	0	0	0	10,146	29,717	44,673
TEBUFENOZIDE	0	0	0	0	7,955	3,463	5,300	9,178	8,521
Grand Total	250	0	29	92	8,138	26,506	72,838	289,879	351,163

Table 9B. The reported **cumulative acres treated** in California with each reduced-risk pesticide. These active ingredients are contained in pesticide products that have been given reduced-risk status by U.S. EPA. Use includes primarily 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 with probable errors removed. The 1999 data are preliminary.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
AZOXYSTROBIN	0	0	0	0	0	0	28,421	340,507	445,905
CARBO METHOXY ETHER CELLULOSE, SODIUM SALT	0	0		61	113	235	328	83	77
CINNAMALDEHYDE	0	0	0	0	0	0	<1	0	2,408
CORN GLUTEN MEAL	0	0	0	0	0	0	0	0	0
CYPRODINIL	0	0	0	0	0	0	0	122,772	183,400
FIPRONIL	0	0	0	0	0	0	0	0	0
FLUDIOXONIL	0	0	0	0	0	0	0	0	1,102
HEXAFLUMURON	0	0	0	0	0	0	0	0	0
IRON PHOSPHATE	0	0	0	0	0	0	0	205	465
MEFENOXAM	0	0	0	0	0	40	153,858	360,994	334,801
METHYL ANTHRANILATE	0	0	0	0	0	0	0	0	0
POTASSIUM BICARBONATE	0	0	0	0	0	0	11	34,010	47,588
PYRIPROXYFEN	0	0	0	0	0	0	60,164	64,648	35,164
SODIUM BICARBONATE	0	0	0	0	0	0	0	0	0
SPINOSAD	0	0	0	0	0	0	128,313	384,192	543,511
TEBUFENOZIDE	0	0	0	0	32,418	14,449	28,620	53,705	50,102
Grand Total	0	0	0	61	32,531	14,724	399,715	1,361,117	1,644,525

Figure 7. Use trends of reduced-risk pesticides. These active ingredients are contained in pesticide products that have been given reduced-risk status by U.S. EPA. Reported pounds of active ingredient (AI) applied includes both agricultural and reportable non-agricultural applications. The reported cumulative acres treated includes primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports with probable errors removed. The 1999 data are preliminary.



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 with probable errors removed. The 1999 data are preliminary.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
(E)-4-TRIDECEN-1-YL-ACETATE	<1	<1	13	3	12	140	76	65	67
(E)-5-DECENOL	0	0	0	0	12	71	737	176	248
(E)-5-DECENYL ACETATE	0	0	0	0	58	339	3,508	844	1,193
(R,Z)-5-(1-DECENYL) DIHYDRO-2-(3H)-FURANONE	0	0	0	0	<1	0	0	<1	0
(Z)-4-TRIDECEN-1-YL-ACETATE	<1	7	4	<1	<1	4	2	2	2
(Z,E)-7,11-HEXADECADIEN-1-YL ACETATE	81	80	16	3	29	2	1	46	229
(Z,Z)-7,11-HEXADECADIEN-1-YL ACETATE	8	35	1	3	2	2	1	46	242
1-DECANOL	<1	1	4	1	1	1	<1	<1	<1
AGROBACTERIUM RADIOBACTER	<1	<1	2	4	6	14	28	20	6
AMPELOMYCES QUISQUALIS	0	0	0	0	<1	3	9	40	18
BACILLUS SPHAERICUS, SEROTYPE H-5A5B, STRAIN 2362	0	0	0	0	0	0	1,298	4,886	2,207
BACILLUS SUBTILIS GB03	0	0	0	0	0	0	<1	<1	<1
BACILLUS THURINGIENSIS (BERLINER)	3,528	3,734	1,071	476	1,562	536	179	751	166
BACILLUS THURINGIENSIS (BERLINER), SUBSP. AIZAWAI, GC-91 PROTEIN	0	0	711	1,936	5,115	6,520	7,406	4,273	2,959
BACILLUS THURINGIENSIS (BERLINER), SUBSP. AIZAWAI, SEROTYPE H-7	0	2	802	4,935	8,050	10,145	14,210	10,854	10,469
BACILLUS THURINGIENSIS (BERLINER), SUBSP. ISRAESENSIS, SEROTYPE H-14	3,391	6,070	9,236	4,619	6,827	4,059	4,423	12,963	4,962
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI, SEROTYPE 3A,3B	26,411	30,099	32,834	39,667	39,550	25,890	29,825	20,535	14,281
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI, STRAIN EG 2348	0	0	0	2,714	3,391	3,056	1,448	4,548	1,787
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI, STRAIN EG2371	1,564	3,327	8,291	7,042	7,466	3,468	2,752	1,633	212
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI, STRAIN SA-11	15,805	10,035	7,865	6,416	8,643	8,689	11,676	9,603	8,852
BACILLUS THURINGIENSIS (BERLINER), SUBSP. SAN DIEGO	38	53	44	10	1	3	26	8	34
BACILLUS THURINGIENSIS SUBSPECIES KURSTAKI STRAIN BMP 123	0	0	0	0	0	0	0	6	1

Table 10A continued. The reported **pounds** of biopesticides applied in California.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
BACILLUS THURINGIENSIS SUBSPECIES KURSTAKI, GENETICALLY ENGINEERED STRAIN EG7841 LEPIDOPTERAN ACTIVE TOXIN	0	0	0	0	0	257	15,619	12,522	12,819
BACILLUS THURINGIENSIS, SUBSP. AIZAWAI, STRAIN SD-1372, LEPIDOPTERAN ACTIVE TOXIN(S)	0	0	0	0	0	0	0	0	3
BACILLUS THURINGIENSIS, SUBSP. KURSTAKI, STRAIN HD-1	0	0	0	0	0	<1	57	20,771	21,532
BACILLUS THURINGIENSIS, VAR. KURSTAKI DELTA ENDOTOXINS CRY 1A(C) AND CRY 1C (GENETICALLY ENGINEERED) ENCAPSULATED IN PSEUDOMONAS FLUORESCENS (KILLED)	0	0	0	0	0	3,663	29,895	12,634	8,001
BEAUVERIA BASSIANA STRAIN GHA	0	0	0	0	0	1	573	1,243	915
CANDIDA OLEOPHILA ISOLATE I-182	0	0	0	0	0	0	305	103	55
CLARIFIED HYDROPHOBIC EXTRACT OF NEEM OIL	0	0	0	0	0	3,196	13,792	55,005	187,487
DIHYDRO-5-HEPTYL-2(3H)-FURANONE	<1	0	<1	<1	<1	<1	<1	<1	<1
DIHYDRO-5-PENTYL-2(3H)-FURANONE	<1	0	<1	<1	<1	<1	<1	<1	<1
E, E-8, 10-DODECADIEN-1-OL	0	98	98	214	1,067	253	431	220	11,630
E-11-TETRADECEN-1-YL ACETATE	0	0	0	0	0	0	3	2	995
E-8-DODECENYL ACETATE	18	503	7	25	38	27	46	57	64
ENCAPSULATED DELTA ENDOTOXIN OF BACILLUS THURINGIENSIS VAR. KURSTAKI IN KILLED PSEUDOMONAS FLUORESCENS	35	1,823	7,959	14,341	14,535	30,809	43,815	35,129	28,425
ENCAPSULATED DELTA ENDOTOXIN OF BACILLUS THURINGIENSIS VAR. SAN DIEGO IN KILLED PSEUDOMONAS FLUORESCENS	0	0	2	0	7	13	0	34	1
GLIOCLADIUM VIRENS GL-21 (SPORES)	0	0	0	0	15	144	156	104	86
LAGENIDIUM GIGANTEUM (CALIFORNIA STRAIN)	0	0	0	87	151	<1	134	859	499
METARHIZIUM ANISOPLIAE, VAR. ANISOPLIAE, STRAIN ESF1	0	0	0	1	1	<1	3	37	11
METHYL ANTHRANILATE	0	0	0	0	0	6	184	49	57
MYROTHECIUM VERRUCARIA, DRIED FERMENTATION SOLIDS & SOLUBLES	0	0	0	0	0	0	1,097	8,496	18,824
NOSEMA LOCUSTAE SPORES	<1	<1	<1	0	0	0	<1	<1	<1
PSEUDOMONAS FLUORESCENS, STRAIN A506	0	0	0	<1	206	3,044	3,639	3,660	2,100
PSEUDOMONAS SYRINGAE STRAIN ESC-11	0	0	0	0	0	0	0	34	0
PSEUDOMONAS SYRINGAE, STRAIN ESC-10	0	0	0	0	0	15	<1	<1	0
STREPTOMYCES GRISEOVIRIDIS STRAIN K61	0	0	0	<1	21	1	2	5	2
TRICHODERMA HARZIANUM RIFAI STRAIN KRL-AG2	0	0	0	0	0	65	39	60	121
Z-11-TETRADECEN-1-YL ACETATE	0	0	0	0	0	0	<1	<1	154
Z-8-DODECENOL	3	76	1	4	6	4	7	10	11
Z-8-DODECENYL ACETATE	307	8,729	125	435	659	447	777	888	980
Grand Total	51,189	64,674	69,088	82,935	97,433	104,888	188,180	223,221	342,709

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 with probable errors removed. The 1999 data are preliminary.

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
(E)-4-TRIDECEN-1-YL-ACETATE	<1	812	783	70	706	5,428	3,574	2,886	3,132
(E)-5-DECENOL	0	0	0	0	725	1,434	2,187	1,414	1,034
(E)-5-DECENYL ACETATE	0	0	0	0	725	1,434	2,187	1,414	1,034
(R,Z)-5-(1-DECENYL) DIHYDRO-2-(3H)-FURANONE	0	0	0	0	0	0	0	1	0
(Z)-4-TRIDECEN-1-YL-ACETATE	<1	812	783	70	706	5,428	3,574	2,886	3,132
(Z,E)-7,11-HEXADECADIEN-1-YL ACETATE	16,184	14,195	2,785	588	5,535	2,295	279	82	148
(Z,Z)-7,11-HEXADECADIEN-1-YL ACETATE	9,205	10,210	1,350	588	2,120	2,295	279	82	148
1-DECANOL	0	0	0	0	0	0	0	0	0
AGROBACTERIUM RADIOBACTER	1,637	1,139	3,233	2,517	2,110	6,048	1,284	5,954	1,517
AMPELOMYCES QUISQUALIS	0	0	0	0	366	4,566	18,628	15,039	7,985
BACILLUS SPHAERICUS, SEROTYPE H-5A5B, STRAIN 2362	0	0	0	0	0	0	104	84	39
BACILLUS SUBTILIS GB03	0	0	0	0	0	0	0	0	0
BACILLUS THURINGIENSIS (BERLINER)	62,423	42,489	18,233	18,412	12,305	8,368	6,286	4,437	767
BACILLUS THURINGIENSIS (BERLINER), SUBSP. AIZAWAI, GC-91 PROTEIN	0	0	14,233	42,378	108,867	137,786	146,197	82,473	59,179
BACILLUS THURINGIENSIS (BERLINER), SUBSP. AIZAWAI, SEROTYPE H-7	0	83	7,694	46,069	68,505	84,793	109,951	86,430	86,759
BACILLUS THURINGIENSIS (BERLINER), SUBSP. ISRAELENIS, SEROTYPE H-14	2,556	8,024	3,754	1,761	738	3,357	4,289	5,242	3,204
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI, SEROTYPE 3A,3B	405,239	384,803	388,663	400,394	574,228	435,707	486,699	342,525	254,535
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI, STRAIN EG 2348	0	0	0	16,675	27,972	22,742	11,590	22,097	9,345
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI, STRAIN EG2371	13,394	23,856	72,452	56,536	62,435	32,471	19,739	11,015	1,678
BACILLUS THURINGIENSIS (BERLINER), SUBSP. KURSTAKI, STRAIN SA-11	283,569	177,335	135,320	104,848	134,225	139,051	175,772	161,858	154,343
BACILLUS THURINGIENSIS (BERLINER), SUBSP. SAN DIEGO	0	10	8	3	0	4	100	6	20
BACILLUS THURINGIENSIS SUBSPECIES KURSTAKI STRAIN BMP 123	0	0	0	0	0	0	0	87	7

Table 10B continued. 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).

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
BACILLUS THURINGIENSIS SUBSPECIES KURSTAKI, GENETICALLY ENGINEERED STRAIN EG7841 LEPIDOPTERAN ACTIVE TOXIN	0	0	0	0	0	1,377	87,123	81,541	83,080
BACILLUS THURINGIENSIS, SUBSP. AIZAWAI, STRAIN SD-1372, LEPIDOPTERAN ACTIVE TOXIN(S)	0	0	0	0	0	0	0	0	32
BACILLUS THURINGIENSIS, SUBSP. KURSTAKI, STRAIN HD-1	0	0	0	0	0	24	2,718	202,653	216,792
BACILLUS THURINGIENSIS, VAR. KURSTAKI DELTA ENDOTOXINS CRY 1A(C) AND CRY 1C (GENETICALLY ENGINEERED) ENCAPSULATED IN PSEUDOMONAS FLUORESCENS (KILLED)	0	0	0	0	0	6,387	43,741	23,196	14,685
BEAUVERIA BASSIANA STRAIN GHA	0	0	0	0	0	3	1,459	2,991	2,500
CANDIDA OLEOPHILA ISOLATE I-182	0	0	0	0	0	0	0	0	0
CLARIFIED HYDROPHOBIC EXTRACT OF NEEM OIL	0	0	0	0	0	7,526	13,537	22,092	44,090
DIHYDRO-5-HEPTYL-2(3H)-FURANONE	0	0	0	0	0	0	20	0	0
DIHYDRO-5-PENTYL-2(3H)-FURANONE	0	0	0	0	0	0	20	0	0
E E-8,10-DODECADIEN-1-OL	0	755	2,719	3,001	3,880	3,811	3,696	4,300	4,514
E-11-TETRADECEN-1-YL ACETATE	0	0	0	0	0	0	13	2,171	54,460
E-8-DODECENYL ACETATE	2,275	2,126	3,112	4,539	3,870	6,045	9,932	11,791	23,555
ENCAPSULATED DELTA ENDOTOXIN OF BACILLUS THURINGIENSIS VAR. KURSTAKI IN KILLED PSEUDOMONAS FLUORESCENS	53	4,268	17,826	34,056	35,755	69,222	96,678	83,238	59,885
ENCAPSULATED DELTA ENDOTOXIN OF BACILLUS THURINGIENSIS VAR. SAN DIEGO IN KILLED PSEUDOMONAS FLUORESCENS	0	0	0	0	4	1	0	19	7
GLIOCLADIUM VIRENS GL-21 (SPORES)	0	0	0	0	1	21	14	29	12
LAGENIDIUM GIGANTEUM (CALIFORNIA STRAIN)	0	0	0	0	0	<1	0	0	0
METARHIZIUM ANISOPLIAE, VAR. ANISOPLIAE, STRAIN ESF1	0	0	0	0	0	0	0	0	0
METHYL ANTHRANILATE	0	0	0	0	0	0	0	0	0
MYROTHECIUM VERRUCARIA, DRIED FERMENTATION SOLIDS & SOLUBLES	0	0	0	0	0	0	104	1,514	3,348
NOSEMA LOCUSTAE SPORES	10	0	13	0	0	0	0	7	14

Table 10B continued. 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).

ACTIVE INGREDIENT	1991	1992	1993	1994	1995	1996	1997	1998	1999
PSEUDOMONAS FLUORESCENS, STRAIN A506	0	0	0	8	990	16,951	26,617	29,656	15,943
PSEUDOMONAS SYRINGAE STRAIN ESC-11	0	0	0	0	0	0	0	17	0
PSEUDOMONAS SYRINGAE, STRAIN ESC-10	0	0	0	0	0	0	0	0	0
STREPTOMYCES GRISEOVIRIDIS STRAIN K61	0	0	0	<1	13	20	115	34	27
TRICHODERMA HARZIANUM RIFAI STRAIN KRL-AG2	0	0	0	0	0	<1	69	369	484
Z-11-TETRADECEN-1-YL ACETATE	0	0	0	0	0	0	13	2,171	54,460
Z-8-DODECENOL	2,275	2,126	3,112	4,539	3,870	6,045	9,932	11,791	23,555
Z-8-DODECENYL ACETATE	2,275	2,126	3,112	4,539	3,870	6,045	9,932	11,791	23,555
Grand Total	801,095	675,168	679,184	741,592	1,054,520	1,016,684	1,298,453	1,237,387	1,213,006

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 includes both agricultural and reportable non-agricultural applications. The reported cumulative acres treated includes primarily agricultural applications. Data are from the Department of Pesticide Regulation's Pesticide Use Reports with probable errors removed. The 1999 data are preliminary.

