



WASHINGTON'S AGRICULTURAL VEGETABLE CHEMICAL USAGE, 2006

NATIONAL AGRICULTURAL STATISTICS SERVICE

United States Department of Agriculture

Washington Field Office • Olympia, WA 98507

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STRAWBERRIES

Results of the 2006 Vegetable Chemical Use Survey are presented in the following tables. The survey was designed to collect data on chemical applications made from the end of the 2005 harvest through completion of the 2006 harvest from a sampling of vegetable growers in Washington. Targeted crops in Washington included asparagus, processing carrots, processing sweet corn, dry onions, processing green peas, and strawberries. The probability nature of the survey allowed for estimates that are representative of chemical use on all targeted vegetables in the state.

Survey results include estimates of total area treated, number of applications, rates per application and per crop year, and total pounds of chemicals applied. Data are summarized for the primary nutrients and for the active ingredients of pesticides and other chemicals applied. Pesticide data were collected for specific formulations of active ingredients (trade name products) and then converted to active ingredient. Therefore, the estimates associated with a particular active ingredient may represent applications of several trade name products. Pesticide application rates also reflect partial coverage applications as a result of band, spot, and alternate row spraying techniques. Four states were surveyed for **strawberries** in 2006: California, Florida,

Oregon and Washington. Surveyed acreage totaled 47,700 acres and Washington accounted for 3 percent of total surveyed acreage.

Nitrogen was applied to 97 percent of the strawberry acreage in the four Program States in 2006: California, Florida, Oregon, and Washington. Phosphate, potash, and sulfur applications were made on 91, 94, and 22 percent of the acreage, respectively. Herbicides were used to treat 22 percent of the planted acres.

Sulfentrazone was the most commonly applied on 7 percent of the acreage; followed by **Glyphosate isopropylamine salt** and **Napropamide**, both applied to 5 percent of the acreage. Insecticides were applied to 80 percent of the acres with **Spinosad** and **Methyl bromide** being the most utilized active ingredients, covering 45 and 39 percent of the acreage, respectively. **Bifenazate** and **Methomyl** were applied to 36 percent of the acreage. Fungicides were applied to 89 percent of the acres. **Captan** was the most commonly applied fungicide, at 76 percent; followed by **Pyraclostrobin** on 64 percent; and **Sulfur** on 61 percent of the acreage. Other Chemicals were used to treat 53 percent of the acres. **Chloropicrin**, the most commonly used Other Chemical, was used on 43 percent of the acreage.

STRAWBERRIES: FERTILIZER APPLICATIONS, TOTAL ACREAGE & PERCENTAGE RECEIVING APPLICATIONS, MAJOR STATES & TOTAL, 2004 & 2006

State	Planted Acreage		Area Receiving 1/							
			Nitrogen		Phosphate		Potash		Sulfur	
	2004	2006	2004	2006	2004	2006	2004	2006	2004	2006
	Acres		Percent							
California	33,200	35,800	-	97	-	92	-	93	-	20
Florida	7,100	7,400	-	98	-	86	-	98	-	17
Oregon	3,300	3,100	-	97	-	91	-	96	-	48
Washington 2/	-	1,400	-	97	-	97	-	80	-	27
TOTAL	43,600	47,700	-	97	-	91	-	94	-	22

1/ Refers to acres receiving one or more applications of a specific fertilizer ingredient.

2/ Washington was not a program state in the 2004 Vegetable Chemical Use Survey.

STRAWBERRIES: PESTICIDE APPLICATIONS, TOTAL ACREAGE & PERCENTAGE RECEIVING APPLICATIONS, MAJOR STATES & TOTAL, 2004 & 2006

State	Planted Acreage		Area Receiving 1/							
			Herbicide		Insecticide		Fungicide		Other	
	2004	2006	2004	2006	2004	2006	2004	2006	2004	2006
	Acres		Percent							
California	33,200	35,800	2	13	68	80	73	87	36	60
Florida	7,100	7,400	53	27	96	98	98	98	97	35
Oregon	3,300	3,100	83	90	66	43	80	88	8	**
Washington 2/	-	1,400	-	88	-	67	-	94	-	**
TOTAL	43,600	47,700	16	22	72	80	77	89	44	53

** Insufficient reports to publish data for pesticide class.

1/ Refers to acres receiving one or more applications of a specific pesticide class.

2/ Washington was not a program state in the 2004 Vegetable Chemical Use Survey.

STRAWBERRIES: AGRICULTURAL CHEMICAL APPLICATIONS, WASHINGTON, 2004 & 2006 1/

Agricultural Chemical 2/	Area Applied 3/		Applications		Rate Per Application		Rate Per Crop Year		Total Applied	
	2004	2006	2004	2006	2004	2006	2004	2006	2004	2006
Fertilizers	Percent		Number		Pounds Per Acre				1,000 Pounds	
Nitrogen	-	97	-	9.9	-	42	-	412	-	557.9
Phosphate	-	97	-	9.1	-	79	-	721	-	978.0
Potash	-	80	-	9.9	-	63	-	622	-	694.7
Sulfur	-	27	-	6.5	-	23	-	149	-	56.8
Herbicides										
Napropamide	-	9	-	1.0	-	1.915	-	1.915	-	0.2
Oxyfluorfen	-	-	-	-	-	-	-	-	-	-
Sulfentrazone	-	71	-	1.0	-	0.215	-	0.220	-	0.2
Insecticides										
Bifenthrin 4/	-	58	-	1.1	-	0.096	-	0.104	-	0.1
Endosulfan	-	-	-	-	-	-	-	-	-	-
Fungicides										
Boscalid	-	49	-	1.2	-	0.019	-	0.024	-	4/
Benomyl	-	-	-	-	-	-	-	-	-	-
Captan	-	73	-	1.5	-	1.840	-	2.708	-	2.8
Cyprodinil	-	64	-	1.1	-	0.325	-	0.344	-	0.3
Fenhexamid	-	9	-	1.0	-	0.736	-	0.752	-	0.1
Fludioxonil	-	64	-	1.1	-	0.217	-	0.229	-	0.2
Iprodione	-	-	-	-	-	-	-	-	-	-
Myclobutanil	-	10	-	1.0	-	0.063	-	0.066	-	4/
Pyraclostrobin	-	49	-	1.2	-	0.001	-	0.001	-	4/
Vinclozolin	-	-	-	-	-	-	-	-	-	-

1/ Planted acres in 2006 for Washington was 1,400 acres.

2/ Insufficient reports to publish data for the following agricultural chemicals: 2006: Herbicides: Clethodim, Clopyralid, DCPA, Paraquat, Pendimethalin, Sethoxydim, Simazine, Terbacil. Insecticides: Abamectin, Bifenazate, Bt subsp. kurstaki, Diazinon, Endosulfan, Fenbutatin-oxide, Hexythiazox, Imidacloprid, Oxydemeton-methyl, Thiamethoxam. Fungicides: Azoxystrobin, Copper hydroxide, Fosetyl-al, Pyrimethanil, Thiram. Other Chemicals: Metaldehyde.

3/ Refers to acres receiving one or more applications of a specific agricultural chemical.

4/ Total applied is less than 50 pounds.

Note: Data may not multiply across due to rounding.

STRAWBERRIES: AGRICULTURAL CHEMICAL APPLICATIONS, PROGRAM STATES, 2004 & 2006 1/

Agricultural Chemical 2/	Area Applied 3/		Applications		Rate Per Application		Rate Per Crop Year		Total Applied	
	2004	2006	2004	2006	2004	2006	2004	2006	2004	2006
Fertilizers	Percent		Number		Pounds Per Acre				1,000 Pounds	
Nitrogen	-	97	12.3	103.5	12	8	147	853	6,091	40,283.9
Phosphate	-	91	11.0	89.1	8	6	83	575	2,997	25,540.0
Potash	-	94	12.6	94.7	8	10	107	917	3,878	41,510.2
Sulfur	-	22	-	41.7	-	5	-	191	-	2,033.8
Herbicides										
Clethodim	1	1	1.2	1.1	0.13	0.148	0.16	0.158	2/	0.1
Glyphosate iso. salt	-	5	1.5	1.9	1.88	1.101	2.87	2.112	7.6	5.2
Napropamide	4	5	1.0	1.2	3.53	1.185	3.53	1.433	6.2	3.4
Paraquat	4	2	1.5	1.3	0.46	0.447	0.68	0.594	1.3	0.5
Pendimethalin	-	*	-	1.0	-	0.991	-	0.991	-	0.1
Simazine	4	4	1.0	1.1	1.05	0.918	1.07	0.993	2.0	1.9
Sulfentrazone	2	7	1.0	1.1	0.25	0.274	0.25	0.304	0.2	1.0
Terbacil	-	2	-	1.0	-	0.224	-	0.224	-	0.2
Insecticides										
Abamectin	23	13	1.9	1.4	0.02	0.016	0.03	0.022	0.3	0.1
Azadirachtin	2	9	2.5	4.1	0.02	0.012	0.05	0.049	2/	0.2
Bifenazate	19	36	1.5	1.4	0.48	0.493	0.70	0.683	6.0	11.8
Bifenthrin	12	15	2.7	1.7	0.11	0.310	0.29	0.518	1.5	3.6
Bt (Bacillus thur.) 4/	27	-	3.7	-	-	-	-	-	-	-
Carbaryl	-	9	-	1.3	-	1.275	-	1.601	-	6.6
Chlorpyrifos	-	7	-	1.2	-	0.881	-	1.032	-	3.7
Diazinon	6	4	2.4	1.5	0.62	0.867	1.48	1.301	4.1	2.7
Endosulfan	4	2	1.1	1.2	1.76	1.063	1.98	1.314	3.3	1.6
Fenbutatin-oxide	4	-	1.5	-	0.67	-	1.02	-	1.8	-
Fenpropathrin	18	-	1.9	-	0.29	-	0.54	-	4.3	-
Hexythiazonx	20	13	1.1	1.1	0.18	0.170	0.21	0.193	1.8	1.2
Imidacloprid	-	2	-	1.1	-	0.414	-	0.460	-	0.4
Malathion	23	28	2.2	1.7	1.76	1.883	3.83	3.158	38.5	41.6
Methomyl	27	36	3.2	2.3	0.68	0.797	2.17	1.857	25.8	32.2
Methyl bromide	-	39	-	1.0	-	186.473	-	195.700	-	3,639.6
Naled	10	11	2.4	2.0	0.68	0.891	1.64	1.776	7.3	9.2
Oxydemeton-methyl	-	*	-	1.0	-	0.500	-	0.500	-	0.1
Spinodad	23	45	2.1	1.8	0.09	0.087	0.19	0.158	1.9	3.4
Thiamethoxam	-	10	-	1.2	-	0.061	-	0.071	-	0.4

See footnotes on page four.



STRAWBERRIES: AGRICULTURAL CHEMICAL APPLICATIONS, PROGRAM STATES, 2004 & 2006 1/ (continued)

Agricultural Chemical 2/	Area Applied 3/		Applications		Rate Per Application		Rate Per Crop Year		Total Applied	
	2004	2006	2004	2006	2004	2006	2004	2006	2004	2006
	Percent		Number		Pounds Per Acre				1,000 Pounds	
Fungicides										
Azoxystrobin	29	26	2.2	1.6	0.18	0.192	0.40	0.314	5.2	3.9
Boscalid	19	58	1.5	1.8	0.32	0.020	0.46	0.036	3.9	1.0
Captan	62	76	5.8	6.5	1.74	1.957	10.17	12.680	276.0	460.1
Chlorothalonil	2	-	1.7	-	1.05	-	1.78	-	1.4	-
Copper hydroxide	2	1	2.0	2.8	0.48	0.521	0.97	1.454	0.7	0.9
Cyprodinil	18	47	1.5	2.0	0.29	0.312	0.44	0.632	3.5	14.3
Fenhexamid	29	54	2.8	1.7	0.64	0.668	1.78	1.143	22.8	29.2
Fludioxonil	18	47	1.5	2.0	0.19	0.208	0.30	0.421	2.4	9.5
Fosetyl-al	5	12	1.4	1.4	2.33	2.969	3.29	4.055	6.5	23.9
Iprodione	1	-	1.0	-	0.62	-	0.64	-	0.2	-
Mefenoram	7	-	1.4	-	0.36	-	0.51	-	1.6	-
Metalaxyl	3	-	1.0	-	0.61	-	0.63	-	0.7	-
Myclobutanil	20	33	1.4	1.3	0.10	0.105	0.13	0.141	1.2	2.2
Phosphorous acid	-	*	-	1.6	-	1.586	-	2.577	-	0.6
Potassium bicarbon.	5	2	3.3	2.1	1.75	1.805	5.72	3.809	11.9	4.2
Pyraclostrobin	24	64	1.9	1.9	0.17	0.023	0.31	0.043	3.3	1.3
Pyrimethanil	-	31	-	1.3	-	0.569	-	0.725	-	10.8
Sulfur	52	61	3.2	4.7	4.09	3.351	13.19	15.895	295.3	461.9
Thiophanate-methyl	11	20	4.0	3.3	0.70	0.696	2.78	2.306	13.4	21.8
Thiram	19	19	3.4	6.9	1.50	1.606	5.11	11.125	42.9	102.0
Triflumizole	11	27	1.9	1.9	0.23	0.242	0.43	0.451	2.1	5.7
Other Chemicals										
Chloropicrin	32	43	1.1	1.1	102.18	117.797	116.31	135.000	1,603.5	2,744.9
Harpin protein	5	3	2.7	2.0	0.01	0.011	0.04	0.023	0.1	**
Hydrogen peroxide	1	1	2.2	1.1	1.53	2.074	3.42	2.362	1.8	0.9
Metaldehyde	1	3	1.7	1.2	0.69	0.797	1.21	0.934	0.4	1.5
Methyl bromide	33	-	1.1	-	177.34	-	188.37	-	2,708.9	-

1/ Planted acres in 2006 for the 4 major states were 47,700 acres. States included in 2006 were CA, FL, OR, and WA.

2/ Insufficient reports to publish data for the following agricultural chemicals: 2006: Herbicides: 2,4-D, dimeth.salt, Clopyralid, DCPA, Diuron, Glufosinate-ammonium, Metribuzin, Oxyfluorfen, Sethoxydim. Insecticides: Azinphos-methyl, Benzoic acid, Bt subsp. aizawai, Bt subsp. kurstaki, Chlorethoxyfos, Dicofol, Dimethoate, Esfenvalerate, Ethyl parathion, Etoxazole, Fenbutatin-oxide, Fenpropathrin, Neem oil, clar. hyd., Piperonyl butoxide, Potassium salts, Pyrethrins, Pyriproxfen, Rotenone, Spiromesifen. Fungicides: Bacillus pumilus, Bacillus subtilis, Bacillus subtilis, Benomyl, Borax decahydrate, Chlorothalonil, Copper resinate, Dodine, Iprodione, Mefenoxam, Streptomycin. Other Chemicals: Dichloropropene, Flumetralin, Iron phosphate, Maleic hydrazide, Metam-sodium.

3/ Refers to acres receiving one or more applications of a specific agricultural chemical.

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

* Area applied is less than 0.5 percent. ** Total applied is less than 50 pounds.

Note: Data may not multiply across due to rounding.

