

**2018 STATUS REPORT
PESTICIDE CONTAMINATION
PREVENTION ACT**

Annual Report



California Environmental Protection Agency
DEPARTMENT OF PESTICIDE REGULATION

Report PCPA18

**2018 Status Report
Pesticide Contamination
Prevention Act**

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Report PCPA18

EXECUTIVE SUMMARY

SUMMARY

Food and Agricultural Code (FAC) section 13144(b) requires the Department of Pesticide Regulation (DPR) to annually post the following information to DPR's website:

- A list of pesticide active ingredients (A.I.s) registered for agricultural use with groundwater protection data gaps.
- A list of the pesticide A.I.s on the Groundwater Protection List (GWPL).
- The sales and use information for pesticide A.I.s on the GWPL.

As part of the registration process, DPR obtains environmental fate data for each A.I., which includes information on the mobility and persistence of that pesticide. Pesticides that exceed the specific numerical values (SNVs) established by DPR have a greater potential to contaminate groundwater because they are both mobile and persistent in the environment. If the pesticide, when applied, has the potential to pollute groundwater, then it is placed on the GWPL as per FAC section 13145(d).

The 2018 Status Report lists 105 A.I.s that are on the GWPL. This report includes the mean physical-chemical values (with respect to the SNVs), registration status, current California sales and use data, and mode of action for each listed A.I.

There are no data gaps for the currently registered agricultural pesticides; the data requirements for registration are satisfied.

BACKGROUND

The Pesticide Contamination Prevention Act (PCPA) of 1985 added sections 13141–13152 to the FAC and established a set of data requirements for identifying potential groundwater contaminants. As required by the PCPA, registrants of agricultural use pesticides must provide DPR with data on the environmental fate of the A.I.s in their products. DPR established threshold values, or SNVs, for water solubility, soil adsorption, hydrolysis half-life, aerobic soil metabolism half-life, and anaerobic soil metabolism half-life. SNVs provide a basis for estimating the relative risk of groundwater contamination posed by agricultural use pesticides.

As required by the PCPA (FAC section 13145[d]), DPR established the Groundwater Protection List (GWPL) (Title 3, California Code of Regulations [3 CCR] section 6800) to identify pesticides that have been found in groundwater and those that pose a risk to groundwater when applied. 3 CCR section 6800(a) includes pesticides that have been detected in groundwater in California and whose use is regulated to mitigate or prevent further pollution. 3 CCR section 6800(b) includes registered agricultural use pesticides that exceed the SNVs and are applied or injected

into the soil or require flood or furrow irrigation within 72 hours after the application. DPR monitors for pesticides included in 3 CCR section 6800(b) to determine whether they have migrated to groundwater. If any are found to have migrated to groundwater as a result of agricultural use, the PCPA establishes procedures for modifying or canceling the use of such pesticides to mitigate or prevent further pollution.

Effective 2015, the PCPA was amended and directs the development of a peer reviewed method, using the SNVs, that estimates a pesticide's potential for groundwater contamination (FAC section 13145[e]). This method is under review and will supersede the current process for placing pesticides on the GWPL.

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REPORT REQUIREMENTS PURSUANT TO THE PESTICIDE CONTAMINATION PREVENTION ACT

Food and Agricultural Code (FAC) section 13144(b) requires DPR to annually post the following information to the department's website for pesticides registered for agricultural use in California:

1. A list of each pesticide A.I., other specified ingredient, or degradation product of a pesticide A.I. for which there is a groundwater protection data gap.
2. The Groundwater Protection List established pursuant to subdivision (d) of Section 13145 (Table 1).
3. Provide for each pesticide A.I. listed pursuant to number 2, the amount sold in California for the most recent year of available data and where and for what purpose the pesticide was used (Table 2).

The information is presented in two sections: (1) Status of the Groundwater Protection Data Gaps and (2) Physical-Chemical Parameters, Sales, Use, and Mode of Action for Pesticide Active Ingredients on the GWPL, which lists the properties of pesticides identified as potential groundwater pollutants and the SNVs established by DPR.

SECTION 1: STATUS OF THE GROUNDWATER PROTECTION DATA GAPS

In 1985, the PCPA required registrants to submit mobility, persistence, and environmental fate data, as stipulated in FAC section 13143(a), for then-registered agricultural pesticides or face penalties. At that time 147 pesticides were subject to the data call-in. As of 2002, all of those historical data gaps have been filled.

If a registrant of an agricultural use pesticide lacks the data required by the PCPA, they may apply for an interim registration, as stipulated in FAC sections 13161-13170. DPR can defer, for up to three years, the submission of no more than three of the following registration data requirements:

- Efficacy
- Octanol-water partition coefficient (KOW)
- Soil photolysis
- Field dissipation
- PCPA study that must be repeated to correct errors or conducted under California conditions or guidelines, providing the weight of evidence from all other submitted data support a scientific judgment in favor of interim registration

Except for efficacy data, the deferral of any of the other data results in a “groundwater protection data gap” as defined in FAC section 13142(f). Currently, there are no interim registrations for agricultural use products and, therefore, no groundwater protection data gaps.

SECTION 2: PHYSICAL-CHEMICAL PARAMETERS, SALES, USE, AND MODE OF ACTION FOR ACTIVE INGREDIENTS EXCEEDING THE SPECIFIC NUMERICAL VALUES

FAC section 13144(a) requires DPR to establish thresholds known as SNVs for water solubility, K_{oc} , hydrolysis half-life, aerobic soil metabolism half-life, anaerobic soil metabolism half-life, and field dissipation half-life. These parameters are correlated with the potential of a pesticide to leach to groundwater; pesticides found in groundwater tend to be more mobile and persistent than those not found in groundwater. Water solubility and K_{oc} are considered indicators of the mobility of an A.I. within the soil, while the half-lives for hydrolysis, aerobic and anaerobic soil metabolism, and field dissipation are considered indicators of the persistence of the A.I. in the soil.

Statistical comparison procedures were used to calculate the SNVs. Based on nationwide groundwater studies, a list of pesticide A.I.s was created and separated into two groups: (1) A.I.s that had been detected in groundwater as a result of legal agricultural use (leachers) and (2) A.I.s that had been sampled for and not found in groundwater as a result of legal agricultural use (nonleachers). Values for the physical-chemical parameters of A.I.s in each group were determined from the open literature and DPR-approved studies submitted by pesticide registrants in fulfillment of the data call-in requirements in FAC section 13143. The

data for each parameter were tested for their usefulness in discriminating between leachers and nonleachers by determining whether the means of the two groups were significantly different. The tests showed that the means of the data for water solubility, hydrolysis half-life, K_{oc} , and the anaerobic soil metabolism half-life for chemicals identified as leachers were significantly different from the means of chemicals identified as nonleachers. The SNVs for these properties were established as those values that would accurately identify as leachers 90 percent of the chemicals found in groundwater due to agricultural use (Wilkerson and Kim, 1986). The means of the two groups for aerobic soil metabolism, however, were not significantly different. Because the PCPA requires DPR to establish an SNV for each physical-chemical parameter, the SNV for the aerobic soil metabolism half-life was set at a value that minimized its importance in the discrimination procedure. Details on the establishment and subsequent revisions to the SNVs can be found in prior reports (Johnson, 1991; Johnson, 1989; Johnson, 1988). The SNVs currently in regulation (3 CCR section 6804) are:

- | | |
|---|------------------------------|
| (a) Water solubility | 3 ppm |
| (b) K_{oc} | 1,900 cm^3/g |
| (c) Hydrolysis half-life | 14 days |
| (d) Aerobic soil metabolism half-life | 610 days |
| (e) Anaerobic soil metabolism half-life | 9 days |

No values have been established for field dissipation because of insufficient data. In 1989, the SNVs were established by regulation in 3 CCR section 6804 and were last updated in 1993.

DPR typically receives multiple studies for each physical-chemical parameter, which are then averaged together before being compared to their respective SNV. The data included in these studies are evaluated thoroughly and only those that meet certain conditions are included in the average. For solubility, only studies conducted at 20°C are considered. Hydrolysis studies must be carried out between 19°C and 31°C and at a pH between 6.0 and 8.0. Soil adsorption, aerobic soil metabolism, and anaerobic soil metabolism do not have similar requirements. These criteria were chosen to reflect ambient, environmental conditions; experiments carried out under extreme temperatures or pH might not be an accurate reflection of a pesticide's fate in the field.

Currently, A.I.s are placed on the GWPL if they have the potential to pollute groundwater using SNVs for physical and chemical characteristics identified in FAC section 13144(a) and if the following are true about their application method:

- applied to or injected into the soil by ground-based application equipment or by chemigation, or
- the application is followed, within 72 hours, by flood or furrow irrigation

As part of the 2015 PCPA amendment, DPR is reevaluating its procedure for placing A.I.s on the GWPL by developing a peer reviewed method to determine groundwater pollution capability. This effort will also update the SNVs.

Table 1. Pesticide active ingredients on the Groundwater Protection List and their respective mean physical-chemical values.

Active Ingredient	Registered (R) or Not Registered (NR)	Solubility (ppm) SNV > 3	K _{oc} (cm ³ /g) SNV < 1,900	Aerobic metabolism (days) SNV > 610	Anaerobic metabolism (days) SNV > 9	Hydrolysis (days) SNV > 14
2,4-D, 2-ethylhexyl ester	R	1	46	34	333	1
2,4-D, diethanolamine salt	R	657,000	46	34	333	39 ^a
2,4-D, dimethylamine salt	R	657,000	46	34	333	39 ^a
2,4-D, isooctyl ester	R	1	46	34	333	1
Acephate	R	818,000	3	3	6	169
Alachlor	NR	200	131	20	5	30 ^a
Aldicarb	NR	5,870	239	2	2	28 ^a
Aminocyclopyrachlor	R	4,650	32	66	Stable	30 ^a
Aminocyclopyrachlor, potassium salt	R	4,650	32	66	Stable	30 ^a
Aminopyralid, triisopropanolamine salt	R	205,000	15	204	363	31 ^a
Atrazine	R	33	93	146	159	30 ^a
Azoxystrobin	R	6	581	112	119	31 ^a
Bensulfuron methyl	R	281	332	75	168	103
Bensulide	R	6	16,600	432	1,890	220
Bentazon, sodium salt	R	530	116	40	365	30 ^a
Bispyribac-sodium	R	73,000	272	50	101	476
Boscalid	R	5	772	347	303	30 ^a
Bromacil	R	929	17	347	73	30 ^a
Carbaryl	R	116	375	6	87	12
Chlorantraniliprole	R	1	330	523	184	30
Chloropicrin	R	2,000	25	3	<10	191 ^a
Chlorothalonil	R	1	1,790	35	8	49 ^a
Chlorsulfuron	R	28,300	35	28	162	1,230
Clomazone	R	1,100	244	66	19	34 ^a
Clothianidin	R	259	160	214	27	33 ^a
Cycloate	R	95	12,900	43	109	30 ^a
Cyprodinil	R	16	1,470	126	183	32 ^a
Dazomet	R	3,630	W ^b	1	14	1
Diazinon	R	60	1,580	40	16	138
Dicamba, diglycolamine salt	R	675,000	5	10	88	30 ^a

Active Ingredient	Registered (R) or Not Registered (NR)	Solubility (ppm) SNV > 3	K _{oc} (cm ³ /g) SNV < 1,900	Aerobic metabolism (days) SNV > 610	Anaerobic metabolism (days) SNV > 9	Hydrolysis (days) SNV > 14
Dicamba, dimethylamine salt	R	675,000	5	10	88	30 ^a
Dicamba, sodium salt	R	675,000	5	10	88	30 ^a
Dichlobenil	R	21	0	91	1,040	1,810
Dicloran	R	6	804	549	66	72 ^a
Dimethenamid-P	R	1,450	223	20	53	30 ^a
Dimethoate	R	39,800	11	2	22	68
Dimethomorph	R	12	1,360	75	26	30 ^a
Dinotefuran	R	39,800	30	51	77	365
Dithiopyr	R	1	1,040	871	21,700	30 ^a
Diuron	R	36	499	372	995	1,290
EPTC	R	345	170	42	65	30 ^a
Ethofumesate	R	50	150	93	Stable	2,900
Ethoprop	R	843	161	34	130	449
Fenamidone	R	8	388	7	1,120	411
Flazasulfuron	R	1	168	57	24	17
Fludioxonil	R	2	1,610	102	365	30 ^a
Fluopicolide	R	3	337	415	561	330
Flutolanil	R	10	905	852	5,650	30 ^a
Fosetyl-al	R	136,000	325	1	2	30 ^a
Fosthiazate	R	10	55	34	32	135
Halosulfuron-methyl	R	1,650	124	51	23	14
Hexazinone	R	29,800	642	222	232	56 ^a
Imazamox, ammonium salt	R	4,410	58	134	213	30 ^a
Imazapyr, isopropylamine salt	R	11,300	348	507	30	30 ^a
Imazethapyr, ammonium salt	R	351	54	2,410	568	30 ^a
Imidacloprid	R	514	262	997	27	30 ^a
Indaziflam	R	3	496	99	180	30 ^a
Iprodione	R	12	W	64	32	5
Isoxaben	R	2	351	205	30	1,270
Linuron	R	77	341	22	102	262
Malathion	R	125	291	3	30	6

Active Ingredient	Registered (R) or Not Registered (NR)	Solubility (ppm) SNV > 3	K _{oc} (cm ³ /g) SNV < 1,900	Aerobic metabolism (days) SNV > 610	Anaerobic metabolism (days) SNV > 9	Hydrolysis (days) SNV > 14
Mefenoxam (Metalaxyl-M)	R	26,000	163	60	W	1,000
Mesotrione	R	9,840	56	18	7	30 ^a
Metalaxyl	R	8,410	163	62	68	1,000
Metaldehyde	R	190	35	67	223	6,150
Metconazole	R	30	1710	639	120	33
Methiocarb	R	27	655	64	64	24
Methomyl	R	54,700	43	46	1	30 ^a
Metolachlor	R	493	190	26	61	200
Metribuzin	R	1,030	106	140	276	4,760
Myclobutanil	R	164	518	66	62	30 ^a
Napropamide	R	74	726	455	51	35 ^a
Nitrapyrin	R	72	333	30	59	8
Norflurazon	R	34	617	172	348	2,650
Orthosulfamuron	R	629	538	25	58	24
Oryzalin	R	3	807	63	10	28 ^a
Penoxsulam	R	470	119	57	8	30 ^a
Phorate	R	29	543	3	14	3
Prometon	R	715	124	459	61	1,130
Prometryn	R	33	277	274	316	28 ^a
Propamocarb hydrochloride	R	101,000	619	77	92	30 ^a
Propanil	R	152	518	2	3	5,000
Propiconazole	R	100	656	72	211	30 ^a
Propyzamide	R	13	889	392	762	42 ^a
Prothioconazole	R	768	1760	1	71	30 ^a
Pyraclostrobin	R	20	9,300	136	3	30 ^a
Pyrazon	NR	380	13,800	124	489	30 ^a
Rimsulfuron	R	3,750	49	21	18	7
S-metolachlor	R	480	185	38	61	200
Siduron	R	22	201	895	3,770	30 ^a
Simazine	R	6	340	110	71	28 ^a
Sulfentrazone	R	400	169	331	3,300	291

Active Ingredient	Registered (R) or Not Registered (NR)	Solubility (ppm) SNV > 3	K_{oc} (cm³/g) SNV < 1,900	Aerobic metabolism (days) SNV > 610	Anaerobic metabolism (days) SNV > 9	Hydrolysis (days) SNV > 14
Sulfometuron-methyl	R	4,250	89	52	116	30 ^a
Tebuconazole	R	32	1,000	597	1,260	28 ^a
Tebuthiuron	R	2,600	90	1,220	1,520	395 ^a
Thiamethoxam	R	4,100	64	229	19	6,080
Thiencarbazone-methyl	R	342	100	36	60	146
Thiobencarb	R	28	530	37	306	160 ^a
Thiophanate-methyl	R	25	225	1	2	41
Triadimefon	R	64	365	6	23	1,760
Triallate	R	3	60	47	20	1,170
Triclopyr, butoxyethyl ester	R	7	62	13	27	7
Triclopyr, triethylamine salt	R	234,000	62	13	1,600	274 ^a
Triflumizole	R	18	1,240	23	67	116
Triticonazole	R	8	523	220	235	30 ^a

^aNo degradation occurred during the study. The half-life is greater than the value listed, which is the length of the study.

^bStudy has been waived.

Table 2. Pesticide sales and use reported during 2017 for pesticide active ingredients on the Groundwater Protection List and a description of their use (CDPR, 2019a; CDPR, 2019b; Meister, 2012; Tomlin, 2003).

Active Ingredient (A.I.)	Registered (R) or Not Registered (NR)	Pounds A.I. Sold	Pounds A.I. Applied	Use	Description
2,4-D, 2-ethylhexyl ester	R	40,536	19,382	Herbicide	Selective, systemic
2,4-D, diethanolamine salt	R	7,701	2,977	Herbicide	Selective, systemic
2,4-D, dimethylamine salt	R	1,019,397	305,705	Herbicide	Selective, systemic
2,4-D, isooctyl ester	R	18,948	361	Herbicide	Selective, systemic
Acephate	R	275,475	192,149	Insecticide	Contact, systemic
Alachlor	NR	0	9	Herbicide	Pre-emergent
Aldicarb	NR	0	0	Insecticide	Broad spectrum
Aminocyclopyrachlor	R	254	1,601	Herbicide	Selective, systemic
Aminocyclopyrachlor, potassium salt	R	2,700	1,390	Herbicide	Selective, systemic
Aminopyralid, triisopropanolamine salt	R	35,874	28,672	Herbicide	Broadleaf control
Atrazine	R	40,560	21,175	Herbicide	Selective, residual
Azoxystrobin	R	241,655	238,414	Fungicide	Foliar
Bensulfuron methyl	R	1,104	736	Herbicide	Selective
Bensulide	R	336,584	285,292	Herbicide	Selective, pre-emergent
Bentazon, sodium salt	R	9,884	8,193	Herbicide	Selective, pre-emergent
Bispyribac-sodium	R	6,640	3,236	Herbicide	Selective, post-emergent
Boscalid	R	106,756	184,557	Fungicide	Broad spectrum
Bromacil	R	23,663	19,290	Herbicide	Pre-emergent
Carbaryl	R	204,396	107,453	Insecticide	Broad spectrum
Chlorantraniliprole	R	184,222	138,431	Insecticide	Soil, foliar
Chloropicrin	R	31,827,346	8,788,404	Fumigant	Space, commodity, soil
Chlorothalonil	R	1,692,956	1,240,392	Fungicide	Broad spectrum, protectant
Chlorsulfuron	R	1,038	3,393	Herbicide	Selective
Clomazone	R	55,198	49,239	Herbicide	Broad spectrum, pre-emergent
Clothianidin	R	58,513	25,951	Insecticide	Systemic
Cycloate	R	46,966	49,844	Herbicide	Selective, preplant
Cyprodinil	R	219,181	194,315	Fungicide	Systemic
Dazomet	R	104,686	47,513	Fumigant	Preplant

Active Ingredient (A.I.)	Registered (R) or Not Registered (NR)	Pounds A.I. Sold	Pounds A.I. Applied	Use	Description
Diazinon	R	133,428	72,612	Insecticide/nematicide	Soil/foliar/seed
Dicamba, diglycolamine salt	R	72,709	31,522	Herbicide	Selective, systemic
Dicamba, dimethylamine salt	R	87,075	7,640	Herbicide	Selective, systemic
Dicamba, sodium salt	R	10,011	4,730	Herbicide	Selective, systemic
Dichlobenil	R	74,931	112,081	Herbicide	Selective, cellulose
Dicloran	R	34,395	29,959	Fungicide	Pre/post-harvest
Dimethenamid-P	R	11,717	11,487	Herbicide	Selective, pre-emergent
Dimethoate	R	116,003	223,288	Insecticide/acaricide	Systemic
Dimethomorph	R	40,818	36,496	Fungicide	Selective, post-emergent
Dinotefuran	R	35,770	21,215	Insecticide	Selective, systemic
Dithiopyr	R	57,202	37,348	Herbicide	Pre/post-emergent
Diuron	R	827,609	179,467	Herbicide	Selective, general
EPTC	R	364,775	259,784	Herbicide	Selective
Ethofumesate	R	90,643	15,355	Herbicide	Selective
Ethoprop	R	3,616	2,134	Insecticide/nematicide	Soil
Fenamidone	R	39,618	35,964	Fungicide	Broad spectrum, foliar, soil
Flazasulfuron	R	1,865	1,357	Herbicide	Systemic, pre/post-emergent
Fludioxonil	R	48,054	39,606	Fungicide	Contact
Fluopicolide	R	30,325	6,513	Fungicide	Foliar, soil
Flutolanil	R	8,646	6,124	Fungicide	Systemic
Fosetyl-AL, technical	R	204,347	187,328	Fungicide	Systemic, preventative
Fosthiazate	R	0	0	Nematicide	Systemic
Halosulfuron-methyl	R	4,876	4,655	Herbicide	Pre/post-emergent
Hexazinone	R	11,582	49,391	Herbicide	Contact, residual
Imazamox, ammonium salt	R	7,508	4,977	Herbicide	Selective, post-emergent
Imazapyr, isopropylamine salt	R	38,371	33,597	Herbicide	Broad-spectrum, systemic
Imazethapyr, ammonium salt	R	8,651	5,530	Herbicide	Selective, pre/post-emergent
Imidacloprid	R	676,647	414,648	Insecticide	Systemic
Indaziflam	R	49,388	30,544	Herbicide	Soil, pre-emergent
Iprodione	R	2,147,152	260,521	Fungicide	Contact
Isoxaben	R	53,983	39,478	Herbicide	Soil, pre-emergent

Active Ingredient (A.I.)	Registered (R) or Not Registered (NR)	Pounds A.I. Sold	Pounds A.I. Applied	Use	Description
Linuron	R	72,860	52,166	Herbicide	Selective
Malathion	R	742,717	334,893	Insecticide	Nonsystemic foliar
Mefenoxam	R	153,155	102,771	Fungicide	Seed treatment, soil, foliar
Mesotrione	R	937	11,323	Herbicide	Foliar, pre/post-emergent
Metalaxyl	R	600	206	Fungicide	Seed treatment, soil, foliar
Metaldehyde	R	76,728	43,195	Molluscicide	Contact
Metconazole	R	133,864	45,671	Fungicide	Systemic
Methiocarb	R	3,384	2,803	Insecticide/acaricide	Nonsystemic
Methomyl	R	290,116	234,580	Insecticide	Broad spectrum
Metolachlor	R	76,848	78,819	Herbicide	Selective, pre-emergent
Metribuzin	R	25,848	22,395	Herbicide	Selective, systemic
Myclobutanil	R	109,861	56,694	Fungicide	Systemic, broad spectrum
Napropamide	R	26,895	20,828	Herbicide	Selective, pre-emergent
Nitrapyrin	R	0	0	Nitrification inhibitor	Selective
Norflurazon	R	700	6,819	Herbicide	Selective, preplant
Orthosulfamuron	R	315	90	Herbicide	Selective, post-emergent
Oryzalin	R	668,940	337,994	Herbicide	Selective, pre-emergent
Penoxsulam	R	10,623	7,810	Herbicide	Post-emergent
Phorate	R	38,160	29,897	Insecticide	Systemic, soil
Prometon	R	136	1	Herbicide	Pre/post-emergent
Prometryn	R	44,254	41,900	Herbicide	Selective, pre/post-emergent
Propamocarb hydrochloride	R	73,576	66,035	Fungicide	Selective
Propanil	R	2,303,405	1,647,008	Herbicide	Contact, post-emergent
Propiconazole	R	333,955	166,350	Fungicide	Foliar
Propyzamide	R	122,544	107,284	Herbicide	Pre-, post-emergent
Prothioconazole	R	0	0	Fungicide	Foliar, soil, seed treatment
Pyraclostrobin	R	135,939	154,102	Fungicide	Foliar, respiration inhibitor
Pyrazon	NR	0	1	Herbicide	Pre/early post-emergent
Rimsulfuron	R	56,328	26,061	Herbicide	Selective, systemic
S-metolachlor	R	497,456	334,888	Herbicide	Selective, preplant
Siduron	R	2,227	1,304	Herbicide	Selective, pre-emergent

Active Ingredient (A.I.)	Registered (R) or Not Registered (NR)	Pounds A.I. Sold	Pounds A.I. Applied	Use	Description
Simazine	R	210,201	127,182	Herbicide	Selective
Sulfentrazone	R	40,479	6,541	Herbicide	Selective, pre/post-emergent
Sulfometuron-methyl	R	5,155	10,979	Herbicide	Contact, residual
Tebuconazole	R	2,551,099	97,827	Fungicide	Systemic
Tebuthiuron	R	14,682	13,556	Herbicide	Nonselective
Thiamethoxam	R	89,246	46,879	Insecticide	Systemic
Thiencarbazone-methyl	R	146	21	Herbicide	Selective, post-emergent
Thiobencarb	R	1,013,097	603,226	Herbicide	Pre/post-emergent
Thiophanate-methyl	R	189,688	161,315	Fungicide	Systemic, broad spectrum
Triadimefon	R	1,620	1,167	Fungicide	Systemic
Triallate	R	1,300	1,568	Herbicide	Selective, pre-emergent
Triclopyr, butoxyethyl ester	R	132,013	64,942	Herbicide	Systemic, post-emergent
Triclopyr, triethylamine salts	R	207,129	140,089	Herbicide	Systemic, post-emergent
Triflumizole	R	11,513	39,914	Fungicide	Systemic, broad spectrum
Triticonazole	R	900	690	Fungicide	Systemic, broad spectrum
Total	102	52,324,585	19,373,205		

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