2014 STATUS REPORT
PESTICIDE CONTAMINATION PREVENTION ACT

Annual Report

California Environmental Protection Agency
DEPARTMENT OF PESTICIDE REGULATION

Report PCPA14

2014 Status Report
Pesticide Contamination
Prevention Act

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Report PCPA14

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 Web site:

- A list of pesticide active ingredients (A.I.s) registered for agricultural use with ground water 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 SNVs established by DPR have a greater potential to contaminate ground water because they are both mobile and persistent in the environment. If the pesticide, when applied, has the potential to pollute ground water, then it is placed on the GWPL as per FAC section 13145(d).

The 2014 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. Only one pesticide, pyrazon, has been deregistered in 2014.

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 ground water 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 ground water 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 ground water and those that pose a risk to ground water when applied. 3 CCR section 6800(a) includes pesticides that have been detected in ground water 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 pesticides included in 3 CCR section 6800(b) to determine whether they have

migrated to ground water. If any are found to have migrated to ground water 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.

DPR is currently developing a peer reviewed method, using updated SNVs, to determine a pesticide's ground water pollution potential.

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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 Web site 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 ground water protection data gap.

2. The Groundwater Protection List established pursuant to subdivision (d) of Section 13145.

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.

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 ground water 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 studies.
- Octanol-water partition coefficient (KOW).
- Soil photolysis.
- A field dissipation study.
- A study required by the PCPA that will be redone to correct errors or a study conducted under California conditions or guidelines, if 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. Missing values in the database, indicated by a NA (not available) in Table 1, arise from deficiencies in the upkeep of the database itself, not data gaps, and are currently under investigation.

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 ground water; pesticides found in ground water tend to be more mobile and persistent than those not found in ground water. 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 ground water studies, a list of pesticide A.I.s was created and separated into two groups:
(1) A.I.s that had been detected in ground water as a result of legal agricultural use (leachers) and (2) A.I.s that had been sampled for and not found in ground water 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 identify as leachers 90 percent of the chemicals found in ground water 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}	1900 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 ground water using the SNVs established 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.

DPR is reevaluating its procedure for placing A.I.s on the GWPL by developing a peer reviewed method to determine ground water pollution capability. This effort will also update the SNVs.

Table 1 is a list of A.I.s that exceed the SNVs and their respective mean physical-chemical values. PCPA section 13144(b) also requires DPR to provide for each A.I. in Table 1 the amount sold in California and where and for what purpose it was used. The 2013 pesticide sales[1] and use data[2] are shown in Table 2. Information on the A.I.s and their modes of action can be found in Table 3.

1. For more information on the amount of pesticides sold, please go to DPR's "Reports of Pesticides Sold in California" website, available at < http://www.cdpr.ca.gov/docs/mill/nopdsold.htm >.

2. For more information on where pesticides are applied, and in what amounts, please go to DPR's "Pesticide Use Reporting" website, available at <http://www.cdpr.ca.gov/docs/pur/purmain.htm>.

Table 1. A.I.s on the GWPL and their respective mean physical-chemical values.

A.I.	Currently Registered	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	X	1	46	34	333	1
2,4-D, diethanolamine salt	X	657,000	46	34	333	39[a]
2,4-D, dimethylamine salt	X	657,000	46	34	333	39[a]
2,4-D, isooctyl ester	X	1	46	34	333	1
Acephate	X	818,000	3	3	6	169
Alachlor	X	200	131	20	5	30[a]
Aldicarb		5,870	239	2	2	28[a]
Aminocyclopyrachlor	X	4,650	32	66	Stable	30[a]
Aminocyclopyrachlor, potassium salt	X	>4,650	32	66	Stable	30[a]
Aminopyralid, triisopropanolamine salt	X	205,000	15	204	363	31[a]
Atrazine	X	33	93	146	159	30[a]
Azoxystrobin	X	6	581	112	119	31[a]
Bensulfuron methyl	X	281	332	75	168	103
Bensulide	X	6	16,600	432	1,890	220
Bentazon, sodium salt	X	530	116	40	365	30[a]
Bispyribac-sodium	X	73,000	272	50	101	476
Boscalid	X	5	772	347	303	30[a]
Bromacil	X	929	17	347	73	30[a]
Carbaryl	X	116	375	6	87	12
Chlorantraniliprole	X	1	330	523	184	30
Chloropicrin	X	2,000	25	3	<10	191[a]
Chlorothalonil	X	1	1,790	35	8	49[a]
Chlorsulfuron	X	28,300	35	28	162	1,230
Clomazone	X	1,100	244	66	19	34[a]
Clothianidin	X	259	160	214	27	33[a]
Cycloate	X	95	12,900	43	109	30[a]
Cyprodinil	X	16	1,470	126	183	32[a]
Dazomet	X	3,630	W[b]	1	14	1
Diazinon	X	60	1,580	40	16	138
Dicamba, diglycolamine salt	X	675,000	5	10	88	30[a]
Dicamba, dimethylamine salt	X	675,000	5	10	88	30[a]

A.I.	Currently Registered	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, sodium salt	X	675,000	5	10	88	30[a]
Dichlobenil	X	21	0	91	1,040	1,810
Dicloran	X	6	804	549	66	72[a]
Dimethenamid-P	X	1,450	223	20	53	30[a]
Dimethoate	X	39,800	11	2	22	68
Dimethomorph	X	12	1,360	75	26	30[a]
Dinotefuran	X	39,800	30	51	77	365
Dithiopyr	X	1	1,040	871	21,700	30[a]
Diuron	X	36	499	372	995	1,290
EPTC	X	345	170	42	65	30[a]
Ethofumesate	X	50	150	93	Stable	2,900
Ethoprop	X	843	161	34	130	449
Fenamidone	X	8	388	7	1,120	411
Flazasulfuron	X	1	168	57	24	17
Fludioxonil	X	2	1,610	102	365	30[a]
Fluopicolide	X	3	337	415	561	330
Flutolanil	X	10	905	852	5,650	30[a]
Fosetyl-al	X	136,000	325	1	2	30[a]
Fosthiazate	X	10	55	34	32	135
Halosulfuron-methyl	X	1,650	124	51	23	14
Hexazinone	X	29,800	642	222	232	56[a]
Imazamox, ammonium salt	X	4,410	58	134	213	30[a]
Imazapyr, isopropylamine salt	X	11,300	348	507	30	30[a]
Imazethapyr, ammonium salt	X	351	54	2,410	568	30[a]
Imidacloprid	X	514	262	997	27	30[a]
Indaziflam	X	3	496	99	180	30[a]
Iprodione	X	12	W	64	32	5
Isoxaben	X	2	351	205	30	1,270
Linuron	X	77	341	22	102	262
Malathion	X	125	291	3	30	6
Mefenoxam (Metalaxyl-M)	X	26,000	163	60	W	1,000
Mesotrione	X	9,840	56	18	7	30[a]
Metalaxyl	X	8,410	163	62	68	1,000

A.I.	Currently Registered	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
Metaldehyde	X	190	35	67	223	6,150
Metconazole	X	30	1710	639	120	33
Methiocarb	X	27	655	64	64	24
Methomyl	X	54,700	43	46	1	30[a]
Metolachlor	X	493	190	26	61	200
Metribuzin	X	1,030	106	140	276	4,760
Myclobutanil	X	NA	518	66	62	30[a]
Napropamide	X	74	726	455	51	35[a]
Nitrapyrin	X	72	333	30	59	8
Norflurazon	X	34	617	172	348	2,650
Orthosulfamuron	X	629	538	25	58	24
Oryzalin	X	3	807	63	10	28[a]
Penoxsulam	X	470	119	57	8	30[a]
Phorate	X	29	543	3	14	3
Prometon	X	715	124	459	61	1,130
Prometryn	X	33	277	274	316	28[a]
Propamocarb hydrochloride	X	101,000	619	77	92	30[a]
Propanil	X	152	518	2	3	5,000
Propiconazole	X	100	656	72	211	30[a]
Propyzamide	X	13	889	392	762	42[a]
Prothioconazole	X	768	1760	1	71	30[a]
Pyraclostrobin	X	20	9,300	136	3	30[a]
Pyrazon		380	13,800	124	489	30[a]
Rimsulfuron	X	3,750	49	21	18	7
S-metolachlor	X	480	185	38	61	200
Siduron	X	22	201	895	3,770	30[a]
Simazine	X	6	340	110	71	28[a]
Sulfentrazone	X	400	169	331	3,300	291
Sulfometuron-methyl	X	4,250	89	52	116	30[a]
Tebuconazole	X	32	1,000	597	1,260	28[a]
Tebuthiuron	X	2,600	90	1,220	1,520	395[a]
Thiamethoxam	X	4,100	64	229	19	6,080
Thiencarbazone-methyl	X	342	100	36	60	146

A.I.	Currently Registered	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
Thiobencarb	X	28	530	37	306	160[a]
Thiophanate-methyl	X	25	225	1	2	41
Triadimefon	X	64	365	6	23	1,760
Triallate	X	3	60	47	20	1,170
Triclopyr, butoxyethyl ester	X	7	62	13	27	7
Triclopyr, triethylamine salt	X	234,000	62	13	1,600	274[a]
Triflumizole	X	18	1,240	23	67	116
Triticonazole	X	8	523	220	235	30[a]

[a] No degradation occurred during the study. The half-life is greater than the value listed, which is the length of the study.
[b] Study has been waived.

Table 2. Pesticide sales and use reported during 2013 for A.I.s on the GWPL (CDPR, 2015a; CDPR, 2015b).

A.I.	Currently Registered	Pounds A.I. Sold	Pounds A.I. Applied
2,4-D, 2-ethylhexyl ester	X	60,708	25,694
2,4-D, diethanolamine salt	X	5,436	2,875
2,4-D, dimethylamine salt	X	732,090	352,105
2,4-D, isooctyl ester	X	34,033	2,156
Acephate	X	186,871	185,157
Alachlor	X	14,385	6,562
Aldicarb		0	1,487
Aminocyclopyrachlor	X	0	0
Aminocyclopyrachlor, potassium salt	X	0	0
Aminopyralid, triisopropanolamine salt	X	25,992	28,950
Atrazine	X	24,668	23,763
Azoxystrobin	X	193,947	159,355
Bensulfuron methyl	X	3,271	2,889
Bensulide	X	331,862	285,471
Bentazon, sodium salt	X	11,183	8,250
Bispyribac-sodium	X	9,879	4,185
Boscalid	X	238,159	230,262
Bromacil	X	91,268	68,294
Carbaryl	X	192,878	117,367
Chlorantraniliprole	X	100,360	89,681
Chloropicrin	X	8,510,087	8,218,442
Chlorothalonil	X	1,400,939	1,113,110
Chlorsulfuron	X	3,855	3,154
Clomazone	X	160,901	128,612
Clothianidin	X	24,082	15,203
Cycloate	X	38,843	30,619
Cyprodinil	X	128,312	170,005
Dazomet	X	52,102	63,920
Diazinon	X	102,627	61,746
Dicamba, diglycolamine salt	X	74,136	53,265
Dicamba, dimethylamine salt	X	47,605	13,189
Dicamba, sodium salt	X	10,725	7,427
Dichlobenil	X	40,060	15,495
Dicloran	X	45,000	39,473
Dimethenamid-P	X	5,609	3,291
Dimethoate	X	348,863	270,159
Dimethomorph	X	29,203	8,514
Dinotefuran	X	19,007	12,965
Dithiopyr	X	117,540	29,139
Diuron	X	743,080	413,159
EPTC	X	293,532	187,349
Ethofumesate	X	21,383	19,643

A.I.	Currently Registered	Pounds A.I. Sold	Pounds A.I. Applied
Ethoprop	X	654	2,454
Fenamidone	X	31,954	27,830
Flazasulfuron	X	12	235
Fludioxonil	X	58,096	38,741
Fluopicolide	X	19,509	4,929
Flutolanil	X	13,255	6,807
Fosetyl-al	X	217,531	235,324
Fosthiazate	X	0	0
Halosulfuron-methyl	X	20,178	2,926
Hexazinone	X	93,161	87,014
Imazamox, ammonium salt	X	7,551	5,145
Imazapyr, isopropylamine salt	X	63,964	39,706
Imazethapyr, ammonium salt	X	8,019	5,424
Imidacloprid	X	525,617	375,979
Indaziflam	X	34,541	18,306
Iprodione	X	420,722	257,294
Isoxaben	X	27,965	43,612
Linuron	X	75,070	52,525
Malathion	X	597,264	446,779
Mefenoxam (Metalaxyl-M)	X	106,164	60,459
Mesotrione	X	1,273	379
Metalaxyl	X	301	363
Metaldehyde	X	137,844	48,891
Metconazole	X	40,485	26,469
Methiocarb	X	4,188	3,678
Methomyl	X	275,690	260,483
Metolachlor	X	294,355	135,555
Metribuzin	X	38,369	29,057
Myclobutanil	X	71,476	61,130
Napropamide	X	24,358	16,369
Nitrapyrin	X	0	2
Norflurazon	X	34,734	29,946
Orthosulfamuron	X	630	304
Oryzalin	X	951,839	588,653
Penoxsulam	X	7,865	7,133
Phorate	X	35,636	30,909
Prometon	X	1,209	34
Prometryn	X	64,667	54,975
Propamocarb hydrochloride	X	105,205	94,353
Propanil	X	3,314,013	2,422,472
Propiconazole	X	152,354	92,434
Propyzamide	X	55,662	42,022
Prothioconazole	X	0	0
Pyraclostrobin	X	151,496	133,408
Pyrazon		0	1

A.I.	Currently Registered	Pounds A.I. Sold	Pounds A.I. Applied
Rimsulfuron	X	16,217	15,591
S-metolachlor	X	351,172	266,238
Siduron	X	4,888	1,929
Simazine	X	320,463	300,201
Sulfentrazone	X	78,183	17,119
Sulfometuron-methyl	X	13,698	17,623
Tebuconazole	X	84,215	48,578
Tebuthiuron	X	14,300	7,580
Thiamethoxam	X	42,938	30,479
Thiencarbazone-methyl	X	11	2
Thiobencarb	X	372,556	289,946
Thiophanate-methyl	X	122,469	103,499
Triadimefon	X	2,522	1,614
Triallate	X	6,600	4,353
Triclopyr, butoxyethyl ester	X	137,149	61,416
Triclopyr, triethylamine salt	X	191,614	118,586
Triflumizole	X	52,272	54,732
Triticonazole	X	898	583
Total	103	24,371,522	19,602,960

Table 3. Description of use for A.I.s on the GWPL (Meister, 2012; Tomlin, 2003).

A.I.	Use	Description
2,4-D, 2-ethylhexyl ester	Herbicide	Selective, systemic
2,4-D, diethanolamine salt	Herbicide	Selective, systemic
2,4-D, dimethylamine salt	Herbicide	Selective, systemic
2,4-D, isooctyl ester	Herbicide	Selective, systemic
Acephate	Insecticide	Contact, systemic
Alachlor	Herbicide	Pre-emergent
Aldicarb	Insecticide	Broad spectrum
Aminocyclopyrachlor	Herbicide	Selective, systemic
Aminocyclopyrachlor, potassium salt	Herbicide	Selective, systemic
Aminopyralid, triisopropanolamine salt	Herbicide	Broadleaf control
Atrazine	Herbicide	Selective, residual
Azoxystrobin	Fungicide	Foliar
Bensulfuron methyl	Herbicide	Selective
Bensulide	Herbicide	Selective, pre-emergent
Bentazon, sodium salt	Herbicide	Selective, pre-emergent
Bispyribac-sodium	Herbicide	Selective, post-emergent
Boscalid	Fungicide	Broad spectrum
Bromacil	Herbicide	Pre-emergent
Carbaryl	Insecticide	Broad spectrum
Chlorantraniliprole	Insecticide	Soil, foliar
Chloropicrin	Warning agent/ fumigant	Space, commodity, soil
Chlorothalonil	Fungicide	Broad spectrum, protectant
Chlorsulfuron	Herbicide	Selective
Clomazone	Herbicide	Broad spectrum, pre-emergent
Clothianidin	Insecticide	Systemic
Cycloate	Herbicide	Selective, preplant
Cyprodinil	Fungicide	Systemic
Dazomet	Fungicide/ nematicide/ herbicide/ slimicide	Preplant
Diazinon	Insecticide/ nematicide	Soil/foliar/seed
Dicamba, diglycolamine salt	Herbicide	Selective, systemic
Dicamba, dimethylamine salt	Herbicide	Selective, systemic
Dicamba, sodium salt	Herbicide	Selective, systemic

A.I.	Use	Description
Dichlobenil	Herbicide	Selective, cellulose
Dicloran	Fungicide	Pre/post-harvest
Dimethenamid-P	Herbicide	Selective, pre-emergent
Dimethoate	Insecticide/ acaricide	Systemic
Dimethomorph	Fungicide	Selective, post-emergent
Dinotefuran	Insecticide	Selective, systemic
Dithiopyr	Herbicide	Pre/post-emergent
Diuron	Herbicide	Selective, general
EPTC	Herbicide	Selective
Ethofumesate	Herbicide	Selective
Ethoprop	Insecticide/ nematicide	Soil
Fenamidone	Fungicide	Broad spectrum, foliar, soil
Flazasulfuron	Herbicide	Systemic, pre/post-emergent
Fludioxonil	Fungicide	Contact
Fluopicolide	Fungicide	Foliar, soil
Flutolanil	Fungicide	Systemic
Fosetyl-AL, technical	Fungicide	Systemic, preventative
Fosthiazate	Nematicide	Systemic
Halosulfuron-methyl	Herbicide	Pre/post-emergent
Hexazinone	Herbicide	Contact, residual
Imazamox, ammonium salt	Herbicide	Selective, post-emergent
Imazapyr, isopropylamine salt	Herbicide	Broad-spectrum, systemic
Imazethapyr, ammonium salt	Herbicide	Selective, pre/post-emergent
Imidacloprid	Insecticide	Systemic
Indaziflam	Herbicide	Soil, pre-emergent
Iprodione	Fungicide	Contact
Isoxaben	Herbicide	Soil, pre-emergent
Linuron	Herbicide	Selective
Malathion	Insecticide	Nonsystemic foliar
Mefenoxam	Fungicide	Seed treatment, soil, foliar
Mesotrione	Herbicide	Foliar, pre/post-emergent
Metalaxyl	Fungicide	Seed treatment, soil, foliar
Metaldehyde	Molluscicide	Contact
Metconazole	Fungicide	Systemic

A.I.	Use	Description
Methiocarb	Insecticide/ acaricide	Nonsystemic
Methomyl	Insecticide	Broad spectrum
Metolachlor	Herbicide	Selective, pre-emergent
Metribuzin	Herbicide	Selective, systemic
Myclobutanil	Fungicide	Systemic, broad spectrum
Napropamide	Herbicide	Selective
Nitrapyrin	Nitrification inhibitor	Selective
Norflurazon	Herbicide	Selective, preplant
Orthosulfamuron	Herbicide	Selective, post-emergent
Oryzalin	Herbicide	Selective, pre-emergent
Penoxsulam	Herbicide	Post-emergent
Phorate	Insecticide	Systemic, soil
Prometon	Herbicide	Pre/post-emergent
Prometryn	Herbicide	Selective, pre/post-emergent
Propamocarb hydrochloride	Fungicide	Selective
Propanil	Herbicide	Contact, post-emergent
Propiconazole	Fungicide	Foliar
Propyzamide	Herbicide	Pre-, post-emergent
Prothioconazole	Fungicide	Foliar, soil, seed treatment
Pyraclostrobin	Fungicide	Foliar, respiration inhibitor
Pyrazon	Herbicide	Pre/early post-emergent
Rimsulfuron	Herbicide	Selective, systemic
S-metolachlor	Herbicide	Selective, preplant
Siduron	Herbicide	Selective, pre-emergent
Simazine	Herbicide	Selective
Sulfentrazone	Herbicide	Selective, pre/post-emergent
Sulfometuron-methyl	Herbicide	Contact, residual
Tebuconazole	Fungicide	Systemic
Tebuthiuron	Herbicide	Nonselective
Thiamethoxam	Insecticide	Systemic
Thiencarbazone-methyl	Herbicide	Selective, pre/post-emergent
Thiobencarb	Herbicide	Pre/post-emergent
Thiophanate-methyl	Fungicide	Systemic, broad spectrum
Triadimefon	Fungicide	Systemic

A.I.	Use	Description
Triallate	Herbicide	Selective, pre-emergent
Triclopyr, butoxyethyl ester	Herbicide	Systemic, post-emergent
Triclopyr, triethylamine salts	Herbicide	Systemic, post-emergent
Triflumizole	Fungicide	Systemic, broad spectrum
Triticonazole	Fungicide	Systemic, broad spectrum

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