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**Method for Prioritizing Urban Pesticides for Monitoring  
California's Urban Surface Waters**

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**Introduction**

A key mission of the California Department of Pesticide Regulation (DPR) Environmental Monitoring Branch (EM) is to monitor pesticide residues in surface waters with urban runoff inputs. Recent monitoring efforts have identified urban runoff as a major contributor of pesticides to California surface waters (Ensminger et al., 2012). Pesticide use is in constant flux, as new active ingredients are introduced into the market place, while others are placed under regulatory restrictions through changes in labeling or cancellation. This creates a challenge for regulators to determine high priority pesticides that have the greatest potential for contaminating surface waters through offsite transport. The purpose of this evaluation was to establish a systematic approach of prioritizing pesticides based on pesticide use and aquatic toxicity data to focus our monitoring efforts in urban areas.

**Use Types and Chemical Groups Excluded**

It is unrealistic to evaluate every registered pesticide. However, a system can be developed that is broad in scope to include pesticides that have potential to threaten water quality of California surface waters. Pertinent pesticide information was compiled using the International Union of Pure and Applied Chemistry (IUPAC) pesticide properties database and

the Pesticide Action Network (PAN) pesticide database. Pesticides of use types (A) or chemical groups (B) with low probability to impair surface water quality were screened and removed from the prioritization scheme (Table 1 and 2, respectively). These AIs are typically lacking associated benchmarks or sufficient aquatic toxicity data. Pesticides with additional classifications (i.e. insecticide, herbicide) not included in Table 1 or Table 2 were not assigned a screening code and advanced through the prioritization process. There were 216 AIs designated as type A (Appendix 1) and 164 as type B (Appendix 2). These pesticides will not be evaluated further for prioritization regardless of use patterns. However, they may be incorporated into future evaluations if changes in label use or new toxicity information becomes available.

**Table 1.** Screen “A” – Categories of chemical use excluded from prioritization

Adjuvant	Microbiocide	Solvent
Bait	Other product constituent	Sterilant
Breakdown product	Pheromone	Surfactant
Dye	Plant Growth Regulator	Synergist
Fragrance	Repellent	Unclassified
Fumigant	Soap/Surfactant	Wood Preservative

**Table 2.** Screen “B” – Chemical group excluded from prioritization

Animal derived	Inorganic	Oil – essential
Botanical	Inorganic compound	Oil – vegetable
Fatty acid	Inorganic salt mixture	Petroleum derivative
Fatty acid ester	Microbial	Plant derived
Heavy metal	Micro-organism derived	Soap

### Use Pattern Evaluation

Use patterns are complex and dependent on several variables. Pesticide use can vary annually due to variance in pest stressors. While certain pesticides are phased out though

cancellation or label restrictions, others are new on the market and have little associated use data. Urban use determination is complicated by the fact that use by homeowners is not recorded in the statewide pesticide use reporting system (PUR). To estimate pesticide use in urban centers, the PUR database was queried for statewide annual use based on the site codes representative of those applied by pest control operators (PCO) in urban environments: Structural Pest Control (10), Landscape Maintenance (30) and Rights of Way (40). Amount of product applied was converted to pounds of active ingredient prior to the use analysis. Copper containing pesticides, as well as, 2,4-D formulations (acids and esters) were grouped due to similarities in chemistry and toxic endpoints (Appendix 3). The three-year average of the most currently available use data (2009-2011) was ranked and pesticides were designated a use score based on the interval system from the highest total AI amount used to the lowest:

<b>Interval (top %)</b>	<b>Use Score</b>
2	5
4	4
8	3
16	2
70	1

### **Toxicity Evaluation**

The potential toxicity to aquatic species was evaluated using aquatic benchmarks derived by the US EPA Office of Pesticide Programs (OPP) (US EPA, 2010). For pesticides lacking associated benchmarks, OPP benchmark equivalents were used. OPP aquatic life benchmark equivalents are toxicological reference values derived for pesticides that have no benchmark values officially posted on the US EPA OPP “Aquatic Life Benchmark” database. DPR’s surface water program derived the benchmark equivalents based on OPP’s method, using acute

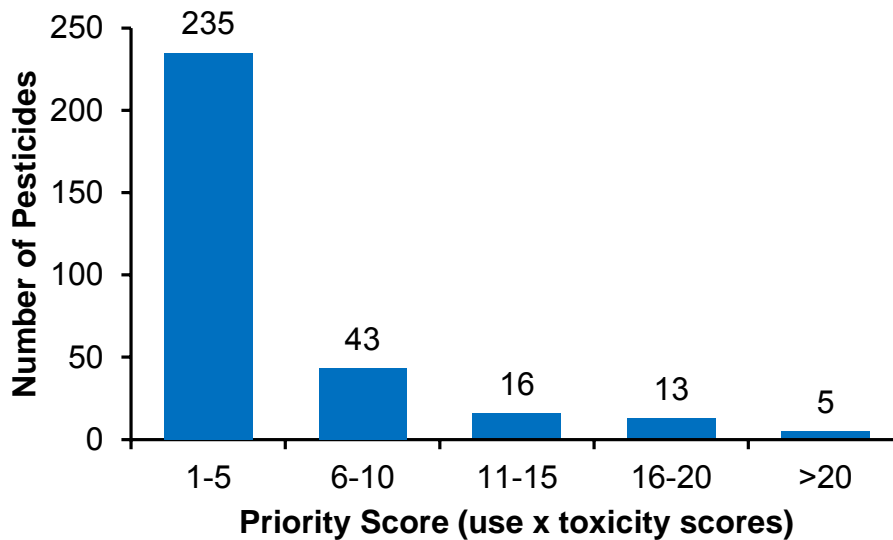
toxicity values for fish, invertebrate, non-vascular and vascular plant endpoints from the International Union of Pure and Applied Chemistry Pesticide Properties database (IUPAC, 2010). Similarly to aquatic benchmarks, the derived equivalents were calculated by using 96-hour LC<sub>50</sub> values times a LOC (level of concern). The LOC is set as 0.5 for fish and invertebrates, and 1.0 for vascular and non-vascular plants. The lowest benchmark or equivalent value among all the taxa was given a score using the following brackets:

<b>Effective Dose (µg/L)</b>	<b>Toxicity Score</b>
< 0.001	8
0.0011 – 0.01	7
0.011 – 0.1	6
0.11 – 1	5
1.1 – 10	4
11 – 100	3
101 – 1000	2
> 1000	1

### **Prioritization**

A final score was calculated for each pesticide by multiplying use scores by the toxicity score. A total of 313 pesticides with reported urban use between 2009 and 2011 had associated aquatic benchmarks. An additional 173 pesticides had reported use but no toxicity data and therefore not carried through to final prioritization (Appendix 4). These pesticides were scored by use only, which will aid in prioritizing toxicity data needs. The remaining pesticides were ranked based on final score (Table 3). Scores were bracketed based on monitoring priority: very low (1-5), low (6-10), medium (11-15), high (16-20) and very high (>21). Most pesticides fall into the lowest priority bracket (Figure 1), with only 34 pesticides (11%) given a medium, high or very high score. Of these, 25 are either currently or were previously monitored by the Surface Water Program in California urban streams. The analytical laboratory utilized by DPR typically

only reports the parent compound concentration. Therefore, there is no distinction between forms (i.e. esters, salts) of the applied pesticide.



**Figure 1. Number of pesticides with final scores in designated brackets**

The prioritization model is a tool designed to assist DPR surface water monitoring staff identify pesticides with current high use patterns and associated toxicity. Decisions to add or remove a chemical from future EM sampling plans will be evaluated using professional judgment based on additional information such as previous monitoring results, regional use patterns and physicochemical properties of the pesticide.

**Table 3.** Final score to prioritize pesticides for monitoring with reported use (2009-2011) and associated benchmarks. Yellow highlighted pesticides are currently monitored, greens previously monitored, and whites not monitored.

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used [Score]	Toxicity Benchmark [Score]	Acute Flag	Tox Ref	Final Score
Permethrin	2008	Insecticide	Pyrethroid	167,704 [5]	0.01 [7]		EPA	35
Bifenthrin	2300	Insecticide	Pyrethroid	85,852 [5]	0.075 [6]		EPA	30
Oxyfluorfen	1973	Herbicide	Diphenyl ether	131,911 [5]	0.29 [5]		EPA	25
Cyhalothrin (lambda)	2297	Insecticide	Pyrethroid	8,173 [3]	0.0035 [7]		EPA	21
Copper-based pesticides	60	Fungicide, Algaecide, Insecticide, Molluscicide	Inorganic-Copper	530,418 [5]	2.05 [4]		EPA	20
Diuron	231	Herbicide	Urea	274,649 [5]	2.4 [4]		EPA	20
Acrolein	3	Algaecide, Fumigant	Aldehyde	120,384 [5]	7 [4]		EPA	20
Cypermethrin	2171	Insecticide	Pyrethroid	58,543 [4]	0.195 [5]		EPA	20
Fipronil	3995	Insecticide	Pyrazole	43,480 [4]	0.11 [5]		EPA	20
Diquat dibromide	229	Herbicide	Bipyridylum	41,778 [4]	0.75 [5]		EPA	20
Cyfluthrin	2223	Insecticide	Pyrethroid	24,437 [3]	0.0125 [6]		EPA	18
Cyfluthrin (beta)	3956	Insecticide	Pyrethroid	7,749 [3]	0.034 [6]		IUPAC	18
Deltamethrin	3010	Insecticide	Pyrethroid	6,937 [3]	0.055 [6]		EPA	18
Chlorothalonil	677	Fungicide	Substituted Benzene	85,807 [4]	1.8 [4]		EPA	16
Pendimethalin	1929	Herbicide	2,6-Dinitroaniline	58,863 [4]	5.2 [4]		EPA	16
Bromacil	83	Herbicide	Uracil	38,799 [4]	6.8 [4]		EPA	16
Prodiamine	2236	Herbicide	2,6-Dinitroaniline	26,377 [4]	3 [4]		IUPAC	16
Sulfometuron-methyl	2149	Herbicide	Sulfonylurea	11,857 [3]	0.48 [5]		EPA	15
Flumioxazin	5802	Herbicide	Unclassified	10,523 [3]	0.852 [5]		IUPAC	15
Malathion	367	Insecticide	Organophosphorus	9,600 [3]	0.3 [5]		EPA	15
Oryzalin	1868	Herbicide	2,6-Dinitroaniline	74,409 [4]	15.4 [3]		EPA	12

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used [Score]	Toxicity Benchmark [Score]	Acute Flag	Tox Ref	Final Score
Triclopyr, butoxyethyl ester	2170	Herbicide	Chloropyridinyl, Glycol Ether	48,385 [4]	70 [3]		EPA	12
Imidacloprid	3849	Insecticide	Neonicotinoid	40,314 [4]	35 [3]		EPA	12
Mancozeb	211	Fungicide	Dithiocarbamate, Inorganic-Zinc	38,750 [4]	47 [3]		EPA	12
2, 4-D acids and salts	636	Herbicide	Phenoxy acid or ester	35,965 [4]	13.1 [3]		EPA	12
2,4-D esters	802	Herbicide	Chlorophenoxy acid or ester	31,454 [4]	66 [3]		EPA	12
Chlorfenapyr	3938	Insecticide	Pyrazole	10,663 [3]	2.915 [4]		EPA	12
Hexazinone	1871	Herbicide	Triazinone	8,274 [3]	7 [4]		EPA	12
Oxadiazon	2017	Herbicide	Unclassified	6,624 [3]	5.2 [4]		EPA	12
Sulfentrazone	5923	Herbicide	Triazolone	5,953 [3]	1.8 [4]		EPA	12
Chlorsulfuron	2143	Herbicide	Sulfonylurea	3,772 [2]	0.055 [6]		EPA	12
Dichlorvos	187	Insecticide, Breakdown product	Organophosphorus	2,301 [2]	0.035 [6]		EPA	12
Chlorpyrifos	253	Insecticide, Nematicide	Organophosphorus	2,175 [2]	0.05 [6]		EPA	12
Esfenvalerate	2321	Insecticide	Pyrethroid	576 [2]	0.025 [6]		EPA	12
Carbaryl	105	Insecticide, Plant growth regulator, Nematicide	Carbamate	3,764 [2]	0.85 [5]		EPA	10
Paraquat dichloride	1601	Herbicide	Bipyridylum	2,979 [2]	0.396 [5]		EPA	10
Dithiopyr	2308	Herbicide	Pyridinecarboxylic acid	19,551 [3]	20 [3]		IUPAC	9
Dichlobenil	112	Herbicide	Substituted Benzene	15,334 [3]	30 [3]		EPA	9

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used [Score]	Toxicity Benchmark [Score]	Acute Flag	Tox Ref	Final Score
Simazine	531	Herbicide	Triazine	14,127 [3]	36 [3]		EPA	9
PCNB	464	Fungicide, Nematicide, Algacide	Substituted Benzene	11,155 [3]	50 [3]		EPA	9
Imazapyr, isopropylamine salt	2257	Herbicide	Imidazolinone	10,756 [3]	24 [3]	A	EPA	9
Iprodione	2081	Fungicide	Dicarboximide	10,592 [3]	50 [3]		EPA	9
Propiconazole	2276	Fungicide	Azole	7,368 [3]	21 [3]		EPA	9
Hydroprene	2244	Insect growth regulator	Juvenile hormone mimic	6,431 [3]	65 [3]		IUPAC	9
Tebuthiuron	1810	Herbicide	Urea	5,230 [3]	50 [3]		EPA	9
Halosulfuron-methyl	3919	Herbicide	Sulfonylurea	3,457 [2]	5.3 [4]		IUPAC	8
Trifluralin	597	Herbicide	2,6-Dinitroaniline	3,403 [2]	7.52 [4]		EPA	8
Nabam	417	Fungicide, Algicide, Bactericide	Dithiocarbamate	1,727 [2]	2.8 [4]		IUPAC	8
Ziram	629	Fungicide	Dithiocarbamate, Inorganic-Zinc	1,080 [2]	9.7 [4]		EPA	8
Pyraclostrobin	5759	Fungicide	Strobin	975 [2]	1.5 [4]		EPA	8
Norflurazon	2019	Herbicide	Pyridazinone	922 [2]	9.7 [4]		EPA	8
Chlorantraniliprole	5964	Insecticide	Anthranilic diamide	887 [2]	4.9 [4]		EPA	8
Cyhalothrin (gamma)	5877	Insecticide	Pyrethroid	107 [1]	0.00024 [8]		EPA	8
Diflubenzuron	1992	Insecticide	Benzoylurea	74 [1]	0.0014 [7]		EPA	7
Cypermethrin (S)	3866	Insecticide	Pyrethroid	<1 [1]	0.0018 [7]		EPA	7
Isoxaben	2289	Herbicide	Amide	16,771 [3]	550 [2]	>	EPA	6
Thiophanate-methyl	1696	Fungicide	Benzimidazole precursor	16,083 [3]	930 [2]		EPA	6
Acephate	1685	Insecticide	Organophosphorus	6,923 [3]	550 [2]		EPA	6
MCPA, dimethylamine salt	786	Herbicide	Phenoxy acid or ester	4,312 [3]	130 [2]		EPA	6



Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used [Score]	Toxicity Benchmark [Score]	Acute Flag	Tox Ref	Final Score
Azoxystrobin	4037	Fungicide	Strobin	2,470 [2]	49 [3]		EPA	6
MCPP-P, dimethylamine salt	5333	Herbicide	Phenoxy acid or ester	1,897 [2]	14 [3]		EPA	6
Hydrogen peroxide	1794	Fungicide, Herbicide, Rodenticide, Biocide	Peroxide, Inorganic	1,517 [2]	11 [3]		IUPAC	6
Fludioxonil	5027	Fungicide	Unclassified	1,048 [2]	70 [3]		EPA	6
Naled	418	Insecticide	Organophosphorus	996 [2]	25 [3]		EPA	6
Dicamba	200	Herbicide	Benzoic acid	862 [2]	61 [3]		EPA	6
Octhilinone	1881	Fungicide, Bactericide	Heteroaramatic	820 [2]	32.5 [3]		IUPAC	6
Thiamethoxam	5598	Insecticide, Fungicide	Neonicotinoid	742 [2]	17.5 [3]		EPA	6
Carfentrazone-ethyl	5130	Herbicide	Triazolone	668 [2]	12 [3]		IUPAC	6
Hydramethylnon	2203	Insecticide	Unclassified	582 [2]	45 [3]		EPA	6
Didecyl dimethyl ammonium chloride	1682	Fungicide, Biocide	Quaternary Ammonium Compound	545 [2]	47 [3]		IUPAC	6
Abamectin	2254	Insecticide	Botanical, Macrocylic Lactone	44 [1]	0.05 [6]		IUPAC	6
Endosulfan	259	Insecticide	Organochlorine	33 [1]	0.05 [6]		EPA	6
Ethion	268	Insecticide, Acaricide, Metabolite	Organophosphate	27 [1]	0.028 [6]		IUPAC	6
EPN	263	Insecticide, Acaricide	Organophosphate	13 [1]	0.03 [6]		IUPAC	6
Fenvalerate	1963	Insecticide	Pyrethroid	4 [1]	0.015 [6]		IUPAC	6

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used [Score]	Toxicity Benchmark [Score]	Acute Flag	Tox Ref	Final Score
Tralomethrin	2329	Insecticide	Pyrethroid	2 [1]	0.0195 [6]		EPA	6
Hexaflumuron	3899	Insecticide	Benzoylurea	0 [1]	0.0555 [6]		EPA	6
Glyphosate, isopropylamine salt	1855	Herbicide	Phosphonoglycine	1,994,761 [5]	16081 [1]	A	EPA	5
Glyphosate, potassium salt	5820	Herbicide	Phosphonoglycine	286,904 [5]	14691 [1]	A	EPA	5
<b>Diazinon</b>	<b>198</b>	<b>Insecticide</b>	<b>Organophosphorus</b>	<b>363 [1]</b>	<b>0.11 [5]</b>		<b>EPA</b>	<b>5</b>
Tetrachlorvinphos	305	Insecticide	Organophosphorus	248 [1]	0.95 [5]		EPA	5
Fenamiphos	1857	Insecticide, Nematicide	Organophosphorus	206 [1]	0.95 [5]		EPA	5
Atrazine	45	Herbicide	Triazine	152 [1]	1 [5]		EPA	5
Resmethrin	2119	Insecticide	Pyrethroid	133 [1]	0.14 [5]		EPA	5
Dodine	245	Fungicide, Biocide	Guanidine	119 [1]	0.95 [5]		EPA	5
Pyraflufen-ethyl	5865	Herbicide	Pyrazolylphenyl	54 [1]	0.23 [5]		IUPAC	5
Fluvalinate (tau)	2195	Insecticide	Pyrethroid	46 [1]	0.175 [5]		EPA	5
Sulfosulfuron	5136	Herbicide	Sulfonylurea	30 [1]	1 [5]		EPA	5
Pyridaben	3959	Insecticide, Acaricide	Pyridazinone	18 [1]	0.265 [5]		EPA	5
Prometryn	502	Herbicide	Triazine	16 [1]	1 [5]		EPA	5
Fenpropathrin	2234	Insecticide	Pyrethroid	12 [1]	0.265 [5]		EPA	5
Methyl parathion	394	Insecticide, Nematicide	Organophosphorus	4 [1]	0.49 [5]		EPA	5
Phosmet	335	Insecticide	Organophosphorus	2 [1]	1 [5]		EPA	5
Fenbutatin oxide	1876	Insecticide	Organotin, Heavy metal	1 [1]	0.85 [5]		EPA	5
Dioxathion	192	Insecticide, Acaricide	Organophosphate	1 [1]	0.175 [5]		IUPAC	5
Endrin	262	Insecticide, Avicide, Rodenticide	Organochlorine	<1 [1]	0.365 [5]		IUPAC	5

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used [Score]	Toxicity Benchmark [Score]	Acute Flag	Tox Ref	Final Score
Lindane	359	Insecticide	Organochlorine	<1 [1]	0.5 [5]		EPA	5
Methoxychlor	384	Insecticide	Organochlorine	<1 [1]	0.7 [5]		EPA	5
Ethofenprox	2292	Insecticide	Pyrethroid Ether	<1 [1]	0.4 [5]		EPA	5
Fenpyroximate	5784	Acaricide	Pyrazole	<1 [1]	0.5 [5]		IUPAC	5
Glyphosate, dimethylamine salt	5972	Herbicide	Phosphonoglycine	49,124 [4]	4400 [1]		IUPAC	4
Glufosinate ammonium	3946	Herbicide	Unclassified	29,770 [4]	1470 [1]		EPA	4
Triclopyr, triethylamine salt	2131	Herbicide	Chloropyridinyl	25,588 [4]	4100 [1]		EPA	4
Piperalin	488	Fungicide	Unclassified	4,132 [2]	385 [2]		EPA	4
Bensulide	70	Herbicide	Organophosphorus	2,289 [2]	290 [2]		EPA	4
Formaldehyde	295	Fungicide, Bactericide, Metabolite, Other product constituent	Unclassified	1,710 [2]	215 [2]		IUPAC	4
Indoxacarb	5331	Insecticide	Unclassified	1,593 [2]	110 [2]		IUPAC	4
Fluazifop-p-butyl	5815	Herbicide	Aryloxyphenoxy propionic acid	1,475 [2]	310 [2]		IUPAC	4
Myclobutanil	2245	Fungicide	Azole	1,157 [2]	830 [2]		EPA	4
Sethoxydim	2177	Herbicide	Cyclohexenone derivative	997 [2]	281 [2]	>	EPA	4
Quinclorac	5104	Herbicide	Unclassified	836 [2]	500 [2]	>	EPA	4
Indaziflam	5999	Herbicide	Alkylazine	710 [2]	500 [2]		IUPAC	4
Fluridone	2279	Herbicide	Unclassified	607 [2]	650 [2]		EPA	4
Tebuconazole	3850	Fungicide	Azole	533 [2]	151.5 [2]		EPA	4
Propoxur	62	Insecticide	Carbamate	422 [1]	5.5 [4]		EPA	4
Metolachlor	1996	Herbicide	Chloroacetanilide	252 [1]	8 [4]		EPA	4
Trifloxystrobin	5321	Fungicide	Strobin	251 [1]	7 [4]		EPA	4
Propetamphos	2122	Insecticide	Organophosphorus	230 [1]	1.65 [4]		EPA	4

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used [Score]	Toxicity Benchmark [Score]	Acute Flag	Tox Ref	Final Score
Trifloxysulfuron sodium	5885	Herbicide	Sulfonylurea	223 [1]	6.5 [4]		IUPAC	4
Metolachlor (S)	5133	Herbicide	Chloroacetanilide	162 [1]	8 [4]		EPA	4
Prallethrin	3985	Insecticide	Pyrethroid	127 [1]	3.1 [4]		EPA	4
Alachlor	678	Herbicide	Chloroacetanilide	112 [1]	1.64 [4]		EPA	4
Phenothrin	2093	Insecticide	Pyrethroid	112 [1]	2.2 [4]		EPA	4
D-trans allethrin	4038	Insecticide	Pyrethroid	49 [1]	3.95 [4]		EPA	4
Metribuzin	1692	Herbicide	Triazinone	46 [1]	8.7 [4]		EPA	4
Aldicarb	575	Insecticide, Nematicide	Carbamate	46 [1]	10 [4]		EPA	4
Methomyl	383	Insecticide, Breakdown product	Carbamate	41 [1]	2.5 [4]		EPA	4
Parathion	459	Insecticide	Organophosphorus	40 [1]	1.25 [4]		IUPAC	4
Trichlorfon	88	Insecticide	Organophosphorus	33 [1]	2.65 [4]		EPA	4
Bromethalin	2288	Rodenticide	Coumarin	23 [1]	2.5 [4]		IUPAC	4
Linuron	361	Herbicide	Urea	16 [1]	2.5 [4]		EPA	4
Disulfoton	230	Insecticide, Nematicide	Organophosphorus	15 [1]	1.95 [4]		EPA	4
TCMTB	971	Microbiocide, Fungicide	Mercaptobenzothiazole	14 [1]	1.05 [4]		IUPAC	4
Methiocarb	375	Insecticide, Molluscicide	Carbamate	10 [1]	3.5 [4]		EPA	4
Difethialone	4014	Rodenticide	Unclassified	9 [1]	2.2 [4]		EPA	4
Spiromesifen	5858	Insecticide	Keto-enol	8 [1]	8 [4]		IUPAC	4
Merphos	293	Plant growth regulator, Herbicide	Organophosphate	4 [1]	8 [4]		IUPAC	4
Etoazole	5849	Acaricide	Diphenyl oxazoline	3 [1]	3.55 [4]		IUPAC	4
Tetramethrin	1695	Insecticide	Pyrethroid	2 [1]	1.85 [4]		EPA	4

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used [Score]	Toxicity Benchmark [Score]	Acute Flag	Tox Ref	Final Score
Clofentezine	2249	Insecticide	Tetrazine	2 [1]	7.3 [4]	>	EPA	4
Pirimicarb	1875	Insecticide	Carbamate	1 [1]	9.5 [4]		EPA	4
Methidathion	1689	Insecticide	Organophosphorus	1 [1]	1.1 [4]		EPA	4
Famoxadone	5878	Fungicide	Unclassified	<1 [1]	5.5 [4]		IUPAC	4
Temephos	1	Insecticide	Organophosphorus	<1 [1]	5 [4]		EPA	4
Allethrin	12	Insecticide	Pyrethroid	<1 [1]	1.05 [4]		EPA	4
Carbofuran	106	Insecticide, Nematicide	Carbamate	<1 [1]	1.12 [4]		EPA	4
Acequinocyl	5801	Insecticide	Unclassified	<1 [1]	1.2 [4]		EPA	4
Esbiothrin	4040	Insecticide	Pyrethroid	<1 [1]	4.45 [4]		EPA	4
Fenthion	63	Insecticide	Fenthion	<1 [1]	2.6 [4]		EPA	4
Chlordecone	347	Insecticide, Fungicide, Metabolite	Insecticide, Fungicide, Metabolite	<1 [1]	10 [4]		IUPAC	4
Glyphosate, monoammonium salt	2301	Herbicide	Phosphonoglycine	17,688 [3]	12660 [1]	A	EPA	3
MSMA	34	Herbicide	Organoarsenic, Heavy metal	12,461 [3]	2800 [1]		EPA	3
Fosetyl-Al	2210	Fungicide	Unclassified	11,824 [3]	5900 [1]		IUPAC	3
Flutolanil	2305	Fungicide	Anilide	8,189 [3]	1250 [1]		EPA	3
Ethofumesate	1900	Herbicide	Unclassified	7,363 [3]	3900 [1]		IUPAC	3
Metaldehyde	379	Molluscicide	Aldehyde	5,999 [3]	34500 [1]		EPA	3
Propionic acid	505	Fungicide, Biocide	Unclassified	4,366 [3]	11350 [1]		EPA	3
Pyriproxyfen	4019	Insecticide	Juvenile hormone mimic	450 [1]	56 [3]		EPA	3
Maneb	369	Fungicide	Dithiocarbamate	427 [1]	13.4 [3]		EPA	3
MCPA, 2-ethyl hexyl ester	5059	Herbicide	Phenoxy acid or ester	376 [1]	20 [3]		EPA	3
Bromoxynil octanoate	834	Herbicide	Hydroxybenzotrile	376 [1]	26.5 [3]		EPA	3

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used [Score]	Toxicity Benchmark [Score]	Acute Flag	Tox Ref	Final Score
Bromoxynil heptanoate	5036	Herbicide	Hydroxybenzotrile	359 [1]	14.5 [3]		EPA	3
<b>Benefin</b>	<b>53</b>	<b>Herbicide</b>	<b>Dinitroaniline</b>	<b>305 [1]</b>	<b>34.85 [3]</b>		<b>EPA</b>	<b>3</b>
Fluroxypyr, 1-methylheptyl ester	5918	Herbicide	Pyridinecarboxylic acid	262 [1]	54.5 [3]	>	EPA	3
Dimethenamid-P	5919	Herbicide	Amide	184 [1]	17 [3]		IUPAC	3
Oxydemeton-methyl	382	Insecticide	Organophosphorus	148 [1]	95 [3]		EPA	3
Spinosad	3983	Insecticide	Macrocyclic Lactone	127 [1]	90 [3]		EPA	3
Captan	104	Fungicide	Thiophthalimide	110 [1]	13.1 [3]		EPA	3
<b>Dimethoate</b>	<b>216</b>	<b>Insecticide</b>	<b>Organophosphorus</b>	<b>105 [1]</b>	<b>21.5 [3]</b>		<b>EPA</b>	<b>3</b>
Fenarimol	1980	Fungicide	Pyrimidine	63 [1]	100 [3]		EPA	3
Rimsulfuron	3835	Herbicide	Sulfonylurea	54 [1]	11.6 [3]		EPA	3
Propanil	503	Herbicide	Anilide	41 [1]	16 [3]		EPA	3
Bromadiolone	2135	Rodenticide	Coumarin	31 [1]	17 [3]		IUPAC	3
Cyprodinil	4000	Fungicide	Anilinopyrimidine	29 [1]	16 [3]		EPA	3
Thiram	589	Fungicide	Dithiocarbamate	26 [1]	21 [3]		EPA	3
Cyazofamid	5930	Fungicide	Azole	20 [1]	25 [3]		IUPAC	3
<b>Ethalfuralin</b>	<b>2166</b>	<b>Herbicide</b>	<b>2,6-Dinitroaniline</b>	<b>19 [1]</b>	<b>16 [3]</b>		<b>EPA</b>	<b>3</b>
Benomyl	1552	Fungicide, Miticide	Benzimidazole	18 [1]	85 [3]		IUPAC	3
Flubendiamide	5948	Insecticide	Anthranilic diamide	17 [1]	27.4 [3]	>	EPA	3
Dinoseb	238	Herbicide	Dinitrophenol	14 [1]	22 [3]		IUPAC	3
Dicofol	346	Insecticide	Organochlorine	12 [1]	26.5 [3]		EPA	3
Anilazine	256	Fungicide	Triazine	11 [1]	47.5 [3]		IUPAC	3
Pentachlorophenol	465	Insecticide, Herbicide, Fungicide, Molluscicide, Plant growth	Organochlorine	11 [1]	25 [3]		EPA	3

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used [Score]	Toxicity Benchmark [Score]	Acute Flag	Tox Ref	Final Score
		regulator						
Oxamyl	1910	Insecticide, Nematicide	Carbamate	9 [1]	90 [3]		EPA	3
Ethoprop	404	Insecticide, Nematicide	Organophosphorus	6 [1]	22 [3]		EPA	3
Imazapyr	2256	Herbicide	Imidazolinone	5 [1]	24 [3]		EPA	3
Carbophenothion	110	Insecticide, Acaricide	Organophosphate	4 [1]	28 [3]		IUPAC	3
Methamidophos	1697	Insecticide, Breakdown product	Organophosphorus	4 [1]	13 [3]		EPA	3
Spirodiclofen	5857	Insecticide	Keto-enol	4 [1]	17.5 [3]		IUPAC	3
Prometon	499	Herbicide	Triazine	4 [1]	98 [3]		EPA	3
Diphenamid	226	Herbicide	Alkanamide	3 [1]	29 [3]		IUPAC	3
Brodifacoum	2049	Rodenticide	Coumarin	3 [1]	25.5 [3]		IUPAC	3
Fenamidone	5791	Fungicide	Imidazole	2 [1]	95 [3]		IUPAC	3
Novaluron	5754	Insecticide	Benzoylurea	2 [1]	29 [3]		IUPAC	3
Bendiocarb	1924	Insecticide, Veterinary treatment	Carbamate	1 [1]	15 [3]		IUPAC	3
Bentazon, sodium salt	1944	Herbicide	Unclassified	1 [1]	60 [3]		EPA	3
Difenoconazole	5024	Fungicide	Triazole	1 [1]	32 [3]		IUPAC	3
Quinoxifen	5787	Fungicide	Quinoline	1 [1]	27 [3]		IUPAC	3
Fluopicolide	5949	Fungicide	Unclassified	<1 [1]	29 [3]		IUPAC	3
Kinoprene	1949	Insecticide	Synthetic	<1 [1]	50 [3]		IUPAC	3
Kresoxim-methyl	5451	Fungicide	Strobin	<1 [1]	29.2 [3]		EPA	3
Difenacoum	5942	Rodenticide	Coumarin	<1 [1]	32 [3]		EPA	3
Bioallethrin (S)	4039	Insecticide	Pyrethroid	<1 [1]	10.5 [3]		IUPAC	3
Imiprothrin	5327	Insecticide	Pyrethroid	<1 [1]	19 [3]		IUPAC	3

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used [Score]	Toxicity Benchmark [Score]	Acute Flag	Tox Ref	Final Score
Trinexapac-ethyl	2345	Plant Growth Regulator, Herbicide	Unclassified	3,860 [2]	9400 [1]		IUPAC	2
Glyphosate	2997	Herbicide	Phosphonoglycine	3,439 [2]	11900 [1]		EPA	2
Glutaraldehyde	139	Fungicide, Microbiocide	Unclassified	3,173 [2]	11250 [1]		IUPAC	2
Mecoprop-P	5111	Herbicide	Phenoxy acid or ester	2,178 [2]	45500 [1]	>	EPA	2
Glyphosate, diammonium salt	5810	Herbicide	Phosphonoglycine	2,117 [2]	14337 [1]	A	EPA	2
Dicamba, dimethylamine salt	849	Herbicide	Benzoic acid	1,974 [2]	488500 [1]		EPA	2
Clethodim	3566	Herbicide	Cyclohexenone derivative	1,486 [2]	1100 [1]		EPA	2
Triadimefon	2133	Fungicide	Azole	1,404 [2]	2010 [1]		IUPAC	2
Mefenoxam	4011	Fungicide	Xylylalanine	960 [2]	20950 [1]		EPA	2
Acetamiprid	5762	Insecticide	Neonicotinoid	731 [2]	24900 [1]		IUPAC	2
Napropamide	1728	Herbicide	Amide	677 [2]	3200 [1]		EPA	2
Propamocarb hydrochloride	4022	Fungicide	Other Carbamate	603 [2]	49500 [1]		IUPAC	2
EPTC	264	Herbicide	Thiocarbamate	536 [2]	1400 [1]		EPA	2
Siduron	603	Herbicide	Urea	514 [1]	212 [2]		EPA	2
Triticonazole	5799	Fungicide	Azole	414 [1]	1000 [2]		IUPAC	2
Vinclozolin	2129	Fungicide	Dicarboximide	313 [1]	900 [2]	>	EPA	2
Chlorpropham	141	Herbicide, Plant growth regulator	Carbamate	277 [1]	1000 [2]		IUPAC	2
Imazalil	2084	Fungicide, Veterinary treatment	Imidazole	239 [1]	740 [2]		IUPAC	2
Thiabendazole	587	Fungicide	Benzimidazole	217 [1]	275 [2]		IUPAC	2
Methoprene	1784	Insect growth	Juvenile hormone	153 [1]	165 [2]		EPA	2



Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used [Score]	Toxicity Benchmark [Score]	Acute Flag	Tox Ref	Final Score
		regulator	mimic					
Chlorflurenol, methyl ester	760	Herbicide, Plant growth regulator	Morphactin	91 [1]	580 [2]		IUPAC	2
<b>MCPA</b>	<b>2326</b>	<b>Herbicide</b>	<b>Phenoxy acid or ester</b>	<b>89 [1]</b>	<b>170 [2]</b>		<b>EPA</b>	<b>2</b>
Methoprene (S)	5026	Insect growth regulator	Juvenile hormone mimic	85 [1]	180 [2]		IUPAC	2
Boscalid	5790	Fungicide	Carboxamide	83 [1]	533 [2]	>	EPA	2
Nitrapyrin	439	Biocide	Unclassified	72 [1]	920 [2]		IUPAC	2
Fluoxastrobin	5915	Fungicide	Strobin	63 [1]	217.5 [2]		IUPAC	2
Bifenazate	5657	Insecticide, Acaricide	Hydrazine carboxylate	48 [1]	250 [2]		IUPAC	2
Terrazole	580	Fungicide	Azole	48 [1]	300 [2]		IUPAC	2
Diphacinone	225	Rodenticide	1,3-Indandione	36 [1]	900 [2]		IUPAC	2
Diphenylamine	228	Fungicide, Insecticide, Plant growth regulator	Amine	23 [1]	300 [2]		IUPAC	2
Fenhexamid	4032	Fungicide	Hydroxyanilide	22 [1]	620 [2]		IUPAC	2
Muscalure	1858	Insecticide, Attractant	Pheromone	14 [1]	133 [2]		IUPAC	2
Fluazifop-butyl	2186	Herbicide	Aryloxyphenoxy propionic acid	13 [1]	265 [2]		IUPAC	2
Fenbuconazole	3905	Fungicide	Triazole	12 [1]	330 [2]		IUPAC	2
Tribenuron-methyl	2338	Herbicide	Sulfonylurea	11 [1]	110 [2]		IUPAC	2
Penoxsulam	5889	Herbicide	Triazolopyrimidine	11 [1]	490 [2]		IUPAC	2
Molinate	449	Herbicide	Thiocarbamate	11 [1]	105 [2]		EPA	2
Oxytetracycline, calcium	3832	Biocide,	Antibiotic	9 [1]	342 [2]		IUPAC	2

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used [Score]	Toxicity Benchmark [Score]	Acute Flag	Tox Ref	Final Score
		Fungicide						
Hexythiazox	2303	Insect growth regulator	Unclassified	8 [1]	265 [2]		EPA	2
Triflumizole	2260	Fungicide	Azole	6 [1]	140 [2]		EPA	2
Chlorophacinone	1625	Rodenticide	1,3-Indandione	3 [1]	175 [2]		IUPAC	2
Dicloran	81	Fungicide	Substituted Benzene	2 [1]	240 [2]		IUPAC	2
Cyhalofop-butyl	5748	Herbicide	Aryloxyphenoxypropionate	2 [1]	395 [2]		IUPAC	2
Spirotetramat	5955	Insecticide	Keto-enol	2 [1]	330 [2]		EPA	2
Sulfluramid	2314	Insecticide	Unclassified	2 [1]	185 [2]		IUPAC	2
Fenoxycarb	2283	Insecticide	Other Carbamate, Juvenile hormone mimic	1 [1]	200 [2]		EPA	2
Noviflumuron	5816	Insecticide	Benzoylurea	1 [1]	900 [2]		IUPAC	2
Thidiazuron	2162	Plant growth regulator, Herbicide, Other product constituent	Phenylurea	1 [1]	150 [2]		IUPAC	2
Buprofezin	3947	Insecticide, Acaricide	Unclassified	1 [1]	165 [2]		IUPAC	2
Cymoxanil	4002	Fungicide	Cyanoacetamide oxime	<1 [1]	254 [2]		IUPAC	2
Fenoxaprop-p-ethyl	5123	Herbicide	Aryloxyphenoxy propionic acid	<1 [1]	155 [2]		EPA	2
Mesosulfuron-methyl	5898	Herbicide	Sulfonylurea	<1 [1]	200 [2]		IUPAC	2
Fenoxaprop-ethyl	2311	Herbicide	Aryloxyphenoxy propionic acid	<1 [1]	240 [2]		IUPAC	2

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used [Score]	Toxicity Benchmark [Score]	Acute Flag	Tox Ref	Final Score
Folpet	294	Fungicide	Phthalimide	<1 [1]	116.5 [2]		IUPAC	2
Metrafenone	5990	Fungicide	Benzophenone	<1 [1]	410 [2]		IUPAC	2
Ronnel	517	Insecticide	Organophosphorus	<1 [1]	370 [2]		IUPAC	2
Propylene glycol	507	Fungicide, Adjuvant, Biocide	Glycol	517 [1]	355000 [1]		IUPAC	1
Metconazole	5983	Fungicide	Azole	505 [1]	1050 [1]		IUPAC	1
Propyzamide	694	Herbicide	Amide	442 [1]	1180 [1]		EPA	1
Clothianidin	5792	Insecticide	Neonicotinoid	317 [1]	20000 [1]		IUPAC	1
Dinotefuran	5822	Insecticide	Guanidine	278 [1]	50000 [1]		IUPAC	1
Benzoic acid	1329	Insecticide, Fungicide	Benzoic acid	257 [1]	10000 [1]		IUPAC	1
Potassium bicarbonate	5037	Fungicide	Mineral salt	198 [1]	600000 [1]		IUPAC	1
4-Aminopyridine	50	Avicide	Unclassified	148 [1]	1600 [1]		IUPAC	1
Glyphosate-trimesium	2327	Herbicide	Phosphonoglycine	126 [1]	6000 [1]		IUPAC	1
MCPP	374	Herbicide	Phenoxy acid or ester	117 [1]	100000 [1]		IUPAC	1
Foramsulfuron	5851	Herbicide	Sulfonylurea	104 [1]	3300 [1]		IUPAC	1
Poly-i-para-menthene	1314	Insect Growth Regulator	Unclassified	93 [1]	3000 [1]		IUPAC	1
Acetic acid	933	Herbicide, Metabolite	Unclassified	85 [1]	15750 [1]		IUPAC	1
Pyrimethanil	5864	Fungicide	Pyrimidine	58 [1]	1500 [1]		EPA	1
Cycloate	516	Herbicide	Thiocarbamate	55 [1]	1300 [1]		EPA	1
Metalaxyl	2132	Fungicide	Xylylalanine	31 [1]	14000 [1]		EPA	1
Bispyribac sodium	5749	Herbicide	Pyrimidinyl(thio)benzoate	30 [1]	3200 [1]		IUPAC	1
Fluroxypyr	5768	Herbicide	Pyridinecarboxylic acid	27 [1]	7150 [1]		EPA	1

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used [Score]	Toxicity Benchmark [Score]	Acute Flag	Tox Ref	Final Score
Cyromazine	2286	Insecticide	Triazine	25 [1]	44850 [1]		EPA	1
Ethyl alcohol	8	Microbiocide, Solvent, Adjuvant, Molluscicide	Alcohol/Ether	23 [1]	50000 [1]		IUPAC	1
Triforine	1905	Fungicide, Insecticide	Unclassified	22 [1]	12500 [1]		IUPAC	1
DEET	189	Insect Repellent	Unclassified	22 [1]	35650 [1]		IUPAC	1
Pyrazon	509	Herbicide	Pyridazinone	14 [1]	3000 [1]		IUPAC	1
Propamocarb	2147	Fungicide	Carbamate	13 [1]	48400 [1]		IUPAC	1
Dimethomorph	4003	Fungicide	Morpholine	12 [1]	1700 [1]		IUPAC	1
Cholecalciferol	2232	Rodenticide	Unclassified	12 [1]	6500 [1]		IUPAC	1
Methoxyfenozide	5698	Insecticide	Diacylhydrazine	9 [1]	1850 [1]		IUPAC	1
Spinetoram	5946	Insecticide	Unclassified	9 [1]	1585 [1]		IUPAC	1
Dichlorprop-p, dimethylamine salt	5336	Herbicide, Plant growth regulator	Phenoxy acid or ester	9 [1]	50000 [1]		IUPAC	1
Chlorthal-dimethyl	179	Herbicide	Benzenedicarboxylic acid	9 [1]	11000 [1]	>	EPA	1
Clopyralid	5135	Herbicide	Pyridinecarboxylic acid	6 [1]	56500 [1]		EPA	1
Pymetrozine	5232	Insecticide	Pyridine	5 [1]	21600 [1]		IUPAC	1
Amitrole	20	Herbicide	triazole	4 [1]	2300 [1]		IUPAC	1
Chloroneb	135	Fungicide	Substituted benzene	3 [1]	1650 [1]		IUPAC	1
Dicamba, sodium salt	5057	Herbicide	Benzoic acid	3 [1]	17300 [1]		EPA	1
Terbutylazine	3004	Herbicide, Algaecide,	Triazine	2 [1]	1700 [1]		EPA	1

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used [Score]	Toxicity Benchmark [Score]	Acute Flag	Tox Ref	Final Score
		Biocide						
Oxytetracycline, hydrochloride salt	1798	Fungicide, Biocide	Antibiotic	2 [1]	47450 [1]	>	EPA	1
4-(2,4-db), dimethylamine salt	838	Herbicide	Chlorophenoxy acid or ester	2 [1]	1567 [1]		EPA	1
Nicosulfuron	3829	Herbicide	Sulfonylurea	1 [1]	7800 [1]		IUPAC	1
Imazamethabenz-methyl	2240	Herbicide	Imidazolinone	1 [1]	50000 [1]		IUPAC	1
Warfarin	621	Rodenticide	Coumarin	1 [1]	8500 [1]		IUPAC	1
Mandipropamid	5961	Fungicide	Mandelamide	1 [1]	2500 [1]	>	EPA	1
Imazethapyr	2340	Herbicide	Imidazolinone	<1 [1]	71000 [1]		IUPAC	1
Tetraconazole	5939	Fungicide	Azole	<1 [1]	1500 [1]		IUPAC	1
Formic acid	3208	Insecticide	Unclassified	<1 [1]	26900 [1]		IUPAC	1
1080	633	Rodenticide, Insecticide	Unclassified	<1 [1]	27000 [1]		EPA	1
Flonicamid	5886	Insecticide	Unclassified	<1 [1]	50000 [1]		IUPAC	1
DSMA	251	Herbicide, Defoliant	Organoarsenic, Heavy metal	<1 [1]	1500 [1]		EPA	1
Picloram	593	Herbicide	Pyridinecarboxylic acid	<1 [1]	4900 [1]		EPA	1
Uniconazole-p	2312	Fungicide	Azole	<1 [1]	5000 [1]		IUPAC	1
2,4-xyleneol	638	Solvent, Fungicide, Microbiocide	Phenol	<1 [1]	2400 [1]		IUPAC	1
Nithiazine	5129	Insecticide, Attractant	Neonicotinoid	<1 [1]	16500 [1]		IUPAC	1

<sup>a</sup> > indicates actual toxicity value could be greater than than reported value, < indicates actual toxicity value could be less than reported value.

<sup>b</sup>EPA=Environmental Protection Agency (EPA, 2012), IUPAC= International Union of Pure and Applied Chemistry (IUPAC, 2012).

<sup>c</sup>Priority score calculated from use score multiplied by toxicity score.

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**Appendix 1.** Screen “A”- Active Ingredients according to use type excluded from prioritization.

<b>Active ingredient</b>	<b>DPR Number</b>	<b>Use Type</b>
2-(3-Hydroxypropyl)-hepta-methyl trisiloxane, ethoxylated, acetate	2610	Adjuvant
4-Nonylphenol, formaldehyde resin, propoxylated	1788	Adjuvant
Acrylamide/sodium acrylate copolymer	3567	Adjuvant
Alkyl (C8,C10) polyglycoside	4015	Adjuvant
Allyloxypolyethylene glycol acetate	2376	Adjuvant
Alpha-(ortho,para-dinonylphenyl)-omega-hydroxypolyoxy(ethylene) phosphate	5895	Adjuvant
Alpha-(para-dodecylphenyl)-omega-hydroxypoly(oxyethylene)	1879	Adjuvant
Alpha-(Para-nonylphenyl)-Omega-Hydroxypoly (Oxyethylene) sulfate, ammonium salt	2046	Adjuvant
Alpha-(Para-Nonylphenyl)-Omega-Hydroxypoly (Oxyethylene), phosphate ester	5016	Adjuvant
Alpha-(para-tert-butylphenyl)-omega-hydroxypoly(oxyethylene) phosphate	1605	Adjuvant
Alpha-[Para-(1,1,3,3-Tetramethylbutyl)Phenyl]-Omega-Hydroxypoly (Oxyethylene)	1932	Adjuvant
Alpha-alkyl (c10-c12)-omega-hydroxypoly(oxyethylene)	2077	Adjuvant
Alpha-alkyl (c10-c14)-omega-hydroxypoly(oxyethylene)	1844	Adjuvant
Alpha-alkyl (c12-c14)-omega-hydroxypoly(oxyethylene)	1766	Adjuvant
Alpha-alkyl (c12-c15)-omega-hydroxypoly(oxyethylene) sulfate, sodium salt	5740	Adjuvant
Alpha-alkyl (c12-c16)-omega-hydroxypoly(oxyethylene)	5863	Adjuvant
Alpha-alkyl (c12-c18)-omega-hydroxypoly(oxyethylene) poly(oxypropylene)	2123	Adjuvant
Alpha-alkyl (c8-c18)-omega-hydroxypoly(oxyethylene) poly(oxypropylene)	2023	Adjuvant
Alpha-Alkyl (C9-C11)-Omega-Hydroxypoly (Oxyethylene)	2700	Adjuvant
Alpha-alkyl (c9-c16)-omega-hydroxypoly(oxyethylene)	1884	Adjuvant
Alpha-alkyl (c9-c18)-omega-hydroxypoly(oxyethylene)	5862	Adjuvant
Alpha-Alkyl (Mixed)-Omega-Hydroxypoly (Oxyethylene) sulfate	1392	Adjuvant
Alpha-alkyl (secondary c12-c14)-omega-hydroxypoly(oxyethylene)	5854	Adjuvant
Alpha-alkylaryl-omega-hydroxypoly(oxyethylene)	748	Adjuvant
Alpha-alkyl-omega-hydroxypoly(oxyethylene)	1874	Adjuvant
Alpha-alkylphenyl-omega-hydroxypoly(oxyethylene)	1173	Adjuvant
Alpha-decyl-omega-hydroxypoly(oxyethylene) phosphate	5872	Adjuvant
Alpha-octylphenyl-omega-hydroxypoly(oxyethylene)	1244	Adjuvant
Alpha-Undecyl-Omega-Hydroxypoly(Oxyethylene)	3929	Adjuvant
Ammonium dodecyl poly oxyethylene sulfate	3046	Adjuvant
Casein	1075	Adjuvant
Derivated natural polymers	5719	Adjuvant
Dextrin	1108	Adjuvant
Dimethyl silicone fluid emulsion	2028	Adjuvant
Dipropylene glycol methyl ether	1776	Adjuvant
EDTA	1702	Adjuvant
EDTA, sodium salt	1757	Adjuvant
EDTA, tetrasodium salt	759	Adjuvant
Emulsifiable polyethylene	1514	Adjuvant
Fatty acids derived from tallow	5204	Adjuvant
Fatty acids, c16-c18 and c18-unsaturated, methyl esters	5881	Adjuvant
Fatty acids, methyl esters	389	Adjuvant
Fatty acids, mixed	2069	Adjuvant



Active ingredient	DPR Number	Use Type
Glycerol	1147	Adjuvant
Heptamethyltrisiloxane ethoxylated	4009	Adjuvant
Heptamethyltrisiloxane-1,3-propanediol ether, ethoxylated propoxylated	5827	Adjuvant
Lauric acid	5324	Adjuvant
Lauryl dimethylamine oxide	2636	Adjuvant
Methyl silicone resins	3689	Adjuvant
Methylated soybean oil	3519	Adjuvant
Methylated soybean oil	3519	Adjuvant
Modified phthalic glycerol alkyd resin	1159	Adjuvant
N,n-bis-(2-omega-hydroxypoly(oxyethylene)ethyl)alkylamine, alkyl derived from tallow fatty acids	2807	Adjuvant
Oleic acid	1156	Adjuvant
Oleic acid, methyl ester	2266	Adjuvant
Oleic acid, potassium salt	865	Adjuvant
Organo/modified polysiloxane	3997	Adjuvant
Organosilicone, poly oxyalkylene ether copolymer	5231	Adjuvant
Petroleum sulfonates	766	Adjuvant
Polyacrylamide polymer	2111	Adjuvant
Polyacrylamide, polyethylene glycol mixture	2822	Adjuvant
Polyacrylic polymer	2196	Adjuvant
Polyalkene oxide modified heptamethyl trisiloxane	3520	Adjuvant
Polyalkylene ether	2271	Adjuvant
Polyalkyleneoxide modified polydimethyl-siloxane	5203	Adjuvant
Polyether modified polysiloxane	5223	Adjuvant
Polyethylene glycol	1600	Adjuvant
Polyethylene glycol mono(3-(tetramethyl-1-(trimethylsiloxy)disiloxanyl)propyl)ether	3841	Adjuvant
Polymerized acrylic acid	3738	Adjuvant
Polyoxyethylene dioleate	3744	Adjuvant
Polyoxyethylene polyoxypropylene block copolymer	1698	Adjuvant
Polyoxyethylene sorbitan mixed fatty acid esters	5873	Adjuvant
Polyoxyethylene sorbitan trioleate	2814	Adjuvant
Polysaccharide polymer	2112	Adjuvant
Polysiloxane	5718	Adjuvant
Propylene glycol, methyl ether	998	Adjuvant
Salicylic and benzoic esters of propylene glycol	1365	Adjuvant
Sawdust	1316	Adjuvant
Silicone	3796	Adjuvant
Silicone defoamer	1917	Adjuvant
Sodium xylene sulfonate	909	Adjuvant
Soybean fatty acids, dimethylamine salt	1882	Adjuvant
Styrene butadiene copolymer	5399	Adjuvant
Tall oil	2912	Adjuvant
Tall oil fatty acids	1389	Adjuvant
Vinyl polymer	1754	Adjuvant
Xanthan gum	2272	Adjuvant
Fish oil	3658	Adjuvant, Deer Repellent, Dog and Cat Repellent
N-(2-Hydroxyethyl) Ethylenediaminetriacetic Acid, Trisodium Salt	911	Adjuvant, Microbiocide
Triethylene glycol	596	Adjuvant, Microbiocide

Active ingredient	DPR Number	Use Type
2-ethylhexyl sulfate, sodium salt	1937	Adjuvant, Soap/Surfactant
Alkyl (AS IN FATTY ACIDS OF COCONUT OIL) mONOETHANOLAMIDE	3573	Adjuvant, Soap/Surfactant
Alpha-[para-(1,1,3,3,-tetramethylbutyl)phenyl]-omega-hydroxypoly(oxyethylene) phosphate ester	2024	Adjuvant, Soap/Surfactant
Alpha-alkyl (c10-c16)-omega-hydroxypoly(oxyethylene) poly(oxypropylene) phosphate	3920	Adjuvant, Soap/Surfactant
Alpha-alkylaryl-omega-hydroxypoly(oxyethylene) phosphate	2368	Adjuvant, Soap/Surfactant
Alpha-isodecyl-omega-hydroxypoly(oxyethylene) phosphate	4008	Adjuvant, Soap/Surfactant
Castor oil ethoxylate	5974	Adjuvant, Soap/Surfactant
N,n-bis-(2-(omega-hydroxypoly(oxyethylene)/poly(oxypropylene))ethyl)alkyl (c8-c18) amine	3976	Adjuvant, Soap/Surfactant
Polyethoxylated castor oil	3740	Adjuvant, Soap/Surfactant
Polyethylene glycol diacetate	2796	Adjuvant, Soap/Surfactant
Polyethylene glycol oleate	2800	Adjuvant, Soap/Surfactant
Sorbitan fatty acid esters	2064	Adjuvant, Soap/Surfactant
Sorbitan monooleate	2870	Adjuvant, Soap/Surfactant
Sorbitan trioleate	2872	Adjuvant, Soap/Surfactant
Diethylene glycol	2334	Adjuvant, Solvent
Polyoxyethylene sorbitan monooleate	1503	Adjuvant, Surfactant
Corn syrup	3628	Bait
Sugar	708	Bait
Methyl anthranilate	3971	Bird Repellent
5,5-Dimethylhydantoin	5833	Breakdown product
Coyote urine	5925	Deer Repellent
Fox urine	5926	Deer Repellent
Methyl nonyl ketone, other related	90877	Dog and Cat Repellent
D & C Red No. 28	3515	Dye
D & C Yello No. 8	3991	Dye
Malachite green	366	Dye
Propylene oxide	508	Fumigant
Sulfuryl fluoride	618	Fumigant
Metam sodium	616	Fumigant, Herbicide, Fungicide, Microbiocide, Algaecide
Aluminum phosphide	484	Fumigant, Fungicide
Dazomet	233	Fumigant, Fungicide, Nematicide
Hydrogen chloride	329	Fumigant, Fungicide, Nematicide, pH Adjustment, Herbicide

Active ingredient	DPR Number	Use Type
Freon 12	1459	Fumigant, Insecticide
Trichlorofluoromethane	1460	Fumigant, Insecticide
Methyl bromide	385	Fumigant, Insecticide, Herbicide, Nematicide
Methyl isothiocyanate	392	Fumigant, Insecticide, Herbicide, Nematicide, Breakdown product
Phosphine	3541	Fumigant, Insecticide, Metabolite
Magnesium phosphide	2085	Fumigant, Insecticide, Rodenticide
1,3-Dichloropropene	573	Fumigant, Nematicide
Chloropicrin	136	Fumigant, Nematicide
Oil of lemon eucalyptus	5782	Insect repellent
Oxythioquinox	410	Insecticide, Fungicide, Fumigant
2-butoxyethanol	89	Other product constituent
Sorbitol	1629	Other product constituent
Xylene	622	Other product constituent
Bentonite	1399	Other product constituent, Adjuvant
Malic acid	1364	Other product constituent, Microbiocide
1,7-dioxaspiro-(5,5)-undecane	5786	Pheromone
E,e-8,10-dodecadien-1-ol	1851	Pheromone
Farnesol	2269	Pheromone
German cockroach pheromone	5132	Pheromone
Nerolidol	2268	Pheromone
Z,e-9,12-tetradecadien-1-yl acetate	5617	Pheromone
Lauryl alcohol	2343	Pheromone, Adjuvant
Myristyl alcohol	2344	Pheromone, Fragrance
Bacillus pumilus, strain qst 2808	5770	Plant Growth Regulator
Daminozide	7	Plant Growth Regulator
Dikegulac sodium	2004	Plant Growth Regulator
Ethephon	1626	Plant Growth Regulator
Flurprimidol	2320	Plant Growth Regulator
Gibberellins	310	Plant growth regulator
IBA	323	Plant Growth Regulator
N6-benzyl adenine	2000	Plant Growth Regulator
NAA	423	Plant Growth Regulator
NAA, ammonium salt	1344	Plant Growth Regulator
NAA, ethyl ester	749	Plant Growth Regulator
Paclobutrazol	2259	Plant Growth Regulator
Oleic acid, ethyl ester	3933	Plant Growth Regulator, Adjuvant
Alpha-(Para-Nonylphenyl)-omega-hydroxypoly (oxyethylene)	1743	Plant Growth Regulator, Adjuvant, Surfactant
Naphthalene	421	Repellent, Other product

Active ingredient	DPR Number	Use Type
		constituent
Methyl nonyl ketone	877	Repellent, Sterilant
Benzyl diethyl [(2,6-xylylcarbamoyl)methyl] ammonium saccharide	3981	Rodent Repellent, Bird Repellent, Deer Repellent
Butyl alcohol	1482	Solvent
Hydrotreated paraffinic solvent	2601	Solvent
Methylene chloride	388	Solvent
Tetrachloroethylene	1174	Solvent
Trichloro ethylene	595	Solvent
Ethylene glycol	276	Solvent, Adjuvant
Ethylene glycol monomethyl ether	1582	Solvent, Adjuvant
Sodium decyl sulfate	5866	Surfactant
Sodium lauroampho acetate	5867	Surfactant
N-Octyl bicycloheptene dicarboximide	396	Synergist
Piperonyl butoxide	486	Synergist
Piperonyl butoxide, other related	90486	Synergist
Sulfaquinoxaline	775	Synergist
1,3,4,6-tetrachloroglycoluril	182	Unclassified
Abietic anhydride	1212	Unclassified
Acrylic acid	2118	Unclassified
Alkanoic and alkenoic (C18) mono- and diesters of alpha-hydro-omega-hydroxypoly(oxyethylene)	5869	Unclassified
Alkyl (C9-C11) oligomeric D-glucopyranoside	4006	Unclassified
Almond, bitter	3576	Unclassified
Alpha-2,6,8-trimethyl-4-nonyloxy-omega-hydroxypoly(oxyethylene)	1196	Unclassified
Alpha-alkyl (C10-C16)-omega-hydroxypoly(oxyethylene)	5821	Unclassified
Amyl acetate	1889	Unclassified
Auramine	702	Unclassified
Cadmium chloride	94	Unclassified
Cadmium sebacate	699	Unclassified
Cottonseed flour	2078	Unclassified
Diethylene glycol abietate	1213	Unclassified
Diethyl phthalate	223	Unclassified
Fatty acids (C12-C18), methyl esters	2893	Unclassified
Fenugreek	3657	Unclassified
Halazone	316	Unclassified
Heptyl butyrate	3668	Unclassified
Isooctyl phthalate	2262	Unclassified
Isoparaffinic hydrocarbons	1641	Unclassified
Lactose	1400	Unclassified
Lignin sulfonic acid	1765	Unclassified
Lignin sulfonic acid, copper salt	1925	Unclassified
Lignin sulfonic acid, manganese salt	1770	Unclassified
Lignin sulfonic acid, zinc salt	1768	Unclassified
Manganese sulfate	658	Unclassified
Methyl cellulose	1205	Unclassified
Methylated silica	5292	Unclassified
Petroleum derivative resin	1411	Unclassified
Phosphorus	513	Unclassified
Piperine	5848	Unclassified
Potassium resinate	1764	Unclassified

<b>Active ingredient</b>	<b>DPR Number</b>	<b>Use Type</b>
Sesame oil	1221	Unclassified
Sodium dihexyl sulfosuccinate	3396	Unclassified
Sodium persulfate	2336	Unclassified
Sodium polyacrylate	2863	Unclassified
Starch	1821	Unclassified
Sulfoxide, other related	90559	Unclassified
Vanillin	5149	Unclassified
Potassium chromate	700	Wood Preservative

**Appendix 2.** Screen “B”- Active ingredients according to chemical group type excluded from prioritization.

<b>Active ingredient</b>	<b>DPR Number</b>	<b>Group</b>
Putrescent whole egg solids	1935	Animal derived
2-Phenethyl propionate	2094	Botanical
Azadirachtin	2328	Botanical
Balsam fir oil	5969	Botanical
Capsicum oleoresin	470	Botanical
Corn product, hydrolyzed	2322	Botanical
Cube extracts	756	Botanical
Garlic	2213	Botanical
Lecithin	3264	Botanical
Margosa oil	6065	Botanical
Methyl eugenol	6009	Botanical
Neem oil	3979	Botanical
Nicotine	75	Botanical
Pine oil	485	Botanical
Pyrethrins	510	Botanical
Quillaja	3779	Botanical
Rotenone	518	Botanical
Rotenone, other related	90518	Botanical
Strychnine	554	Botanical
Thyme	2330	Botanical
Nonanoic acid	2739	Fatty acid
Methylated fatty acids from canola oil	4025	Fatty acid ester
Free fatty acids and/or amine salts	1198	Fatty acid, Soap
Ammonium bicarbonate	3038	Inorganic
Ammonium nitrate	3052	Inorganic
Ammonium sulfamate	21	Inorganic
Ammonium sulfate	1363	Inorganic
Ammonium thiosulfate	892	Inorganic
Borax	79	Inorganic
Boric acid	769	Inorganic
Boron oxide	5951	Inorganic
Bromine chloride	2323	Inorganic
Calcium hypochlorite	326	Inorganic
Carbon	712	Inorganic
Chlorine	131	Inorganic
Chlorine dioxide	2053	Inorganic
Cryolite	173	Inorganic
Cyanamide (hydrogen)	2238	Inorganic
Diatomaceous earth	195	Inorganic
Diatomaceous earth, other related	90195	Inorganic
Disodium octaborate anhydrous	5053	Inorganic
Disodium octaborate tetrahydrate	1800	Inorganic
Ferric sulfate (anhydrous)	1811	Inorganic
Ferrous sulfate	289	Inorganic
Ferrous sulfate (monohydrate)	1812	Inorganic
Iodine	718	Inorganic
Iron phosphate	5014	Inorganic
Lime-sulfur	358	Inorganic
Magnesium chloride	365	Inorganic

Active ingredient	DPR Number	Group
Magnesium sulfate	1339	Inorganic
Nitrogen, liquified	2267	Inorganic
Oxalic acid	899	Inorganic
Phosphoric acid	871	Inorganic
Phosphoric acid, monopotassium salt	2777	Inorganic
Potassium hydroxide	1306	Inorganic
Potassium nitrate	726	Inorganic
Potassium permanganate	498	Inorganic
Silica gel	529	Inorganic
Sodium bromide	1103	Inorganic
Sodium bromosulfamate, sodium chlorosulfamate, potassium bromosulfamate, potassium chlorosulfamate	6031	Inorganic
Sodium chlorite	2148	Inorganic
Sodium fluoride	537	Inorganic
Sodium fluosilicate	538	Inorganic
Sodium hydroxide	362	Inorganic
Sodium hypochlorite	539	Inorganic
Sodium metaborate	689	Inorganic
Sodium metaborate tetrahydrate	4013	Inorganic
Sodium metasilicate	1840	Inorganic
Sodium nitrate	696	Inorganic
Sodium tetraborate (pentahydrate)	1808	Inorganic
Sodium tripolyphosphate	1024	Inorganic
Sulfur	560	Inorganic
Sulfur dioxide	561	Inorganic
Tetrapotassium pyrophosphate	1918	Inorganic
Trisodium phosphate	1579	Inorganic
Urea dihydrogen sulfate	2270	Inorganic
Zinc phosphide	626	Inorganic
Urea	662	Inorganic
Zinc chloride	624	Inorganic
Zinc naphthenate	1111	Inorganic
Zinc sulfate	667	Inorganic
Arsenic acid	40	Inorganic compound
Arsenic trioxide	42	Inorganic compound
Calcium carbonate	1007	Inorganic compound
Calcium chloride	920	Inorganic compound
Calcium hydroxide	99	Inorganic compound
Sodium carbonate	854	Inorganic compound
Sodium chlorate	536	Inorganic compound
Sodium chloride	721	Inorganic compound
Potassium phosphite	5766	Inorganic salt mixture
Sodium arsenate	283	Inorganic, Heavy metal
Silver nitrate	2856	Inorganic, Heavy metal
Silver, ionic	5150	Inorganic, Heavy metal
Bacillus sphaericus, serotype h-5A5B, strain 2362	2409	Microbial
Bacillus subtilis gb03	3945	Microbial
Bacillus thuringiensis	86	Microbial
Bacillus thuringiensis (berliner), subsp. aizawai, serotype h-7	3856	Microbial
Bacillus thuringiensis (berliner), subsp. israelensis, serotype h-14	3857	Microbial
Bacillus thuringiensis (berliner), subsp. kurstaki strain sa-12	3970	Microbial
Bacillus thuringiensis (berliner), subsp. kurstaki, serotype 3a,3b	3858	Microbial

<b>Active ingredient</b>	<b>DPR Number</b>	<b>Group</b>
Bacillus thuringiensis (berliner), subsp. kurstaki, strain eg2371	3860	Microbial
Bacillus thuringiensis (berliner), subsp. kurstaki, strain sa-11	3862	Microbial
Bacillus thuringiensis, subsp. aizawai, strain abts-1857	5879	Microbial
Bacillus thuringiensis, subsp. israelensis, strain am 65-52	5841	Microbial
Bacillus thuringiensis, subsp. kurstaki, strain abts-351, fermentation solids and solubles	5829	Microbial
Bacillus thuringiensis, subsp. kurstaki, strain hd-1	4023	Microbial
Bacillus thuringiensis, var. kurstaki delta endotoxins cry 1a(c) and cry 1c (genetically engineered) encapsulated in pseudomonas fluorescens (killed)	3965	Microbial
Beauveria bassiana strain gha	3993	Microbial
Gliocladium virens gl-21 (spores)	3854	Microbial
Metarhizium anisopliae, var. anisopliae, strain esfl	3935	Microbial
Myrothecium verrucaria, dried fermentation solids & solubles, strain aarc-0255	3966	Microbial
Nonanoic acid, other related	92739	Microbial
Nosema locustae spores	2137	Microbial
Paecilomyces lilacinus strain 251	5861	Microbial
Pantoea agglomerans strain e 325, nRRL b-21856	5945	Microbial
Pseudomonas fluorescens, strain a506	2842	Microbial
Qst 713 strain of dried bacillus subtilis	5447	Microbial
Reynoutria sachalinensis	5823	Microbial
Streptomyces lydicus wYEC 108	5891	Microbial
Trichoderma harzianum rifai strain krl-ag2	3977	Microbial
Trichoderma ICC 012 Asperillum	5981	Microbial
Trichoderma ICC 080 GAMSII	5982	Microbial
Emamectin benzoate	4020	Micro-organism derived
Streptomycin	1217	Micro-organism derived
Essential oils	873	Oil - essential
Limonene	979	Oil - essential
Methyl salicylate	746	Oil - essential
Oil of anise	1051	Oil - essential
Oil of black pepper	5847	Oil - essential
Oil of citronella	143	Oil - essential
Oil of jojoba	3833	Oil - essential
Peppermint oil	2058	Oil - essential
Canola oil	5332	Oil - vegetable
Castor oil	1013	Oil - vegetable
Cottonseed oil	1015	Oil - vegetable
Soybean oil	2335	Oil - vegetable
Vegetable oil	1231	Oil - vegetable
Aromatic 150	2395	Petroleum derivative
Coal tar neutral oils and coal tar acid combinations	144	Petroleum derivative
Kerosene	2071	Petroleum derivative
Mineral oil	401	Petroleum derivative
Orchex 796 oil	5179	Petroleum derivative
Paraffin wax	1214	Petroleum derivative
Petroleum distillates	763	Petroleum derivative
Petroleum distillates, aliphatic	2768	Petroleum derivative
Petroleum distillates, aromatic	1814	Petroleum derivative
Petroleum distillates, refined	2106	Petroleum derivative
Petroleum hydrocarbons	473	Petroleum derivative



<b>Active ingredient</b>	<b>DPR Number</b>	<b>Group</b>
Petroleum naphthenic oils	2107	Petroleum derivative
Petroleum oil, paraffin based	2045	Petroleum derivative
Petroleum oil, unclassified	765	Petroleum derivative
Xylene range aromatic solvent	862	Petroleum derivative
Linalool	2239	Plant derived
Sucrose octanoate	5230	Plant derived
Thymol	991	Plant derived
Ammonium lauryl sulfate	1017	Soap
Ammonium tall oil fatty acid soap	995	Soap
Coconut oil soap	2088	Soap
Dodecylbenzene sulfonic acid	941	Soap
Isopropylamine dodecylbenzene sulfonate	3247	Soap
Potash soap	1596	Soap
Soap	772	Soap
Sodium dodecylbenzene sulfonate	774	Soap
Sodium lauryl sulfate	907	Soap

### Appendix 3. Pesticide groupings

<b>2,4-D Esters</b>		<b>DPR Number</b>	<b>Copper-based Pesticides</b>		<b>DPR Number</b>
2,4-D, butoxyethanol ester		802	Copper carbonate, basic		60
2,4-D, butyl ester		804	Copper hydroxide		151
2,4-D, isooctyl ester		809	Copper naphthenate		153
2,4-D, isopropyl ester		810	Copper salts of fatty and rosin acids		155
2,4-D, 2-ethylhexyl ester		1622	Copper oxychloride		156
			Copper oxychloride sulfate		158
			Copper 8-quinolinoleate		159
<b>2,4-D Acids and Salts</b>		<b>636</b>	Copper sulfate, pentahydrate		161
2,4-D, alkanolamine salts		801	Copper sulfate, basic		162
2,4-D, diethanolamine salt		805	Copper oxide (ous)		175
2,4-D, dimethylamine salt		806	Copper		714
2,4-D, triisopropylamine salt		816	Copper sodium sulfate-phosphate complex		755
2,4-DP, isooctyl ester		1820	Copper triethanolamine complex		1615
2,4-D, triisopropanolamine salt		5538	Copper ammonium carbonate		1762
			Copper (II) oxide		2231
			Copper citrate chelate		3547
			Copper gluconate chelate		3548
			Copper ethylenediamine complex		3549
			Copper ammonium complex		3550
			Copper ethanolamine complexes, mixed		3551
			Copper octanoate		5225

**Appendix 4. Pesticides with reported use and no toxicity reference**

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used
Sodium carbonate peroxyhydrate	5785	Algaecide, Fungicide	Unclassified	92,451 (5)
Trichloro-S-Triazinetrione	407	Biocide	Triazinetrione	29,349 (4)
Isopropyl alcohol	342	Biocide, Solvent	Alcohol/Ether	26,833 (4)
Aminopyralid, triisopropanolamine salt	5928	Herbicide	Pyridinecarboxylic acid	25,183 (4)
Glyphosate, monoammonium salt	2301	Herbicide	Phosphonoglycine	17,688 (3)
Sodium dichloro-S-triazinetrione dihydrate	1818	Biocide	Triazinetrione	16,418 (3)
Imazapyr, isopropylamine salt	2257	Herbicide	Imidazolinone	10,756 (3)
Polyoxyethylene sorbitol, mixed ether ester	1178	Adjuvant, Insecticide	Polyalkyloxy Compound	10,295 (3)
Endothall, dipotassium salt	1356	Herbicide	Unclassified	9,726 (3)
Alkyl(42%c12, 26%c18, 15%c14, 8%c16, 5%c10, 4%c8)1,3-propylenediamine	5068	Microbiocide	Alkyl Amino Propane	5,545 (3)
Endothall, n,N-dimethylalkylamine salt	2056	Herbicide	Unclassified	5,289 (3)
Diglycolamine salt	5007	Herbicide	Benzoic acid	4,081 (3)
Clopyralid, monoethanolamine salt	5050	Herbicide	Pyridinecarboxylic acid	3,532 (2)
Alkyl (50%C14, 40%C12, 10%C16) dimethylbenzyl ammonium chloride	1846	Algaecide	Quaternary Ammonium Compound	3,451 (2)
Dioctyl dimethyl ammonium chloride	1710	Microbiocide, Algaecide, Fungicide	Quaternary Ammonium Compound	3,077 (2)
MCPA, isooctyl ester	787	Herbicide	Phenoxy acid or ester	2,681 (2)
Citric acid	142	Fungicide, Biocide	Unclassified	2,508 (2)
Polymerized pinene	2043	Insecticide	Polymer	2,436 (2)
Poly(oxyethylene) (dimethylimino) ethylene (dimethylimino) ethylene dichloride	1576	Microbiocide	Unclassified	2,361 (2)
Glyphosate, diammonium salt	5810	Herbicide	Phosphonoglycine	2,117 (2)
Sodium dimethyl dithio carbamate	548	Fungicide	Dithiocarbamate	1,994 (2)
MCPP, dimethylamine salt	1016	Herbicide	Phenoxy acid or ester	1,930 (2)
Sodium dichloro-s-triazinetrione	205	Microbiocide	Triazinetrione	1,556 (2)
Ammonium propionate	5015	Preservative, Microbiocide	Unclassified	1,521 (2)
Acid blue 9, diammonium salt	2154	Herbicide	Unclassified	1,477 (2)
Bromacil, lithium salt	1573	Herbicide	Uracil	1,406 (2)
Quinclorac, dimethylamine salt	6102	Herbicide		1,337 (2)
Alkyl (60%C14, 30%C16, 5%C12, 5%C18) dimethylbenzyl ammonium chloride	1847	Algaecide	Quaternary Ammonium Compound	1,266 (2)
Triethanolamine	1006	Insecticide, Biocide, Adjuvant	Amine	1,049 (2)
2,2-dibromo-3-nitrilopropionamide	1749	Microbiocide, Fungicide, Algicide	Unclassified	989 (2)
Alkyl (67%c12, 25%c14, 7%c16, 1%c8,c10,c18) dimethylbenzyl	1853	Algaecide, Microbiocide	Quaternary Ammonium	949 (2)

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used
ammonium chloride			Compound	
Alkyl (68% <sup>c</sup> 12, 32% <sup>c</sup> 14) dimethylethylbenzyl ammonium chloride	1854	Algaecide, Fungicide, Microbiocide	Quaternary Ammonium Compound	927 (2)
MCPP, potassium salt	1303	Herbicide	Phenoxy acid or ester	917 (2)
Mefluidide, diethanolamine salt	1955	Herbicide	Anilide	793 (2)
Ortho-phenylphenol, sodium salt	248	Microbiocide	Phenol	724 (2)
Ortho-benzyl-para-chlorophenol	522	Microbiocide, Fungicide	Chlorinated phenol	717 (2)
Dimethylpolysiloxane	1861	Insecticide, Adjuvant	Silicone	693 (2)
Coconut diethanolamide	1598	Insecticide, Fungicide, Rodenticide, Surfactant	Unclassified	617 (2)
1-bromo-3-chloro-5,5-dimethyl hydantoin	2080	Microbiocide, Fungicide, Herbicide	Hydantoin	569 (2)
Peroxyacetic acid	2291	Microbiocide, Fungicide, Herbicide, Rodenticide	Peroxide	504 (2)
Polyoxyethylene soybean oil fatty acid ester	3338	Insecticide, Adjuvant	Polyalkyloxy Compound	473 (2)
Alkyl (61% <sup>c</sup> 12,23% <sup>c</sup> 14,11% <sup>c</sup> 16,2.5% <sup>c</sup> 8 & c10,2.5% <sup>c</sup> 18) dimethyl benzyl ammonium chloride	2375	Algaecide, Microbiocide	Quaternary Ammonium Compound	464 (2)
Polyoxin-D	5788	Fungicide	Antibiotic	447 (1)
Potassium peroxymonosulfate	1859	Microbiocide, Fungicide, Herbicide, Rodenticide	Peroxide, Inorganic	442 (1)
Alpha-isoocetadecyl-omega-hydroxypoly(oxyethylene)	2216	Insecticide, Adjuvant, Soap/Surfactant	Polyalkyloxy Compound	419 (1)
Para-tert-amylphenol	900	Microbiocide	Phenol	400 (1)
Dodecyl guanidine hydrochloride	1047	Microbiocide	Guanidine	321 (1)
2,4,5-trichlorophenol, sodium salt	1656	Microbiocide, Algaecide	Chlorinated phenol	318 (1)
5-Chloro-2-methyl-4-isothiazolin-3-one	2038	Microbiocide	Isothiazolone	296 (1)
Dimethyl alkyl tertiary amines	3639	Algaecide, Microbiocide	Unclassified	274 (1)
Clopyralid, triethylamine salt	2339	Herbicide	Pyridinecarboxylic acid	257 (1)
Nonyl phenoxy polyoxyethylene ethanol-iodine complex	870	Microbiocide	Iodine Compound, Polyalkyloxy Compound	202 (1)
Polybutenes	1040	Rodenticide	Polymer	171 (1)
Tartrazine	2155	Herbicide	Unclassified	147 (1)
DDVP, other related	90187	Insecticide	Organophosphorus	141 (1)
1,3-dichloro-5,5-dimethylhydantoin	37	Microbiocide, Fungicide, Herbicide	Hydantoin	135 (1)
Octyl decyl dimethyl ammonium chloride	1709	Microbiocide, Fungicide	Quaternary Ammonium Compound	125 (1)
Alpha-pinene beta-pinene copolymer	3996	Insecticide	Polymer	110 (1)
2-methyl-4-isothiazolin-3-one	2039	Microbiocide	Isothiazolone	104 (1)
1-(3-chloroallyl)-3,5,7-triaza-1-azonia adamantane chloride	250	Microbiocide	Unclassified	95 (1)
Cyanuric acid	2138	Microbiocide, Water Treatment	Triazinetrione	83 (1)
Emulsifiable methylated vegetable oil	5224	Insecticide, Adjuvant	Unclassified	77 (1)

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used
2,4-DP-P, isooctyl ester	5337	Herbicide, Plant growth regulator	Phenoxy acid or ester	68 (1)
Thiophanate	1684	Fungicide	Benzimidazole	63 (1)
1,3-dichloro-5-ethyl-5-methylhydantoin	2264	Microbiocide, Fungicide, Herbicide	Hydantoin	55 (1)
Thiabendazole, hypophosphite salt	1952	Fungicide	Benzimidazole	52 (1)
2-(2,4-DP), dimethylamine salt	2247	Herbicide, Plant growth regulator	Phenoxy acid or ester	51 (1)
Tributyltin oxide	569	Antifoulant, Microbiocide, Molluscicide, Fungicide	Organotin, Heavy metal	50 (1)
1-(2-hydroxyethyl)-2-alkyl-2-imidazoline, alkyl derived from tall oil fatty acids	1664	Microbiocide	Imidazoline	37 (1)
Bis butenylene tetrahydro furfural	397	Insect Repellent	Unclassified	35 (1)
Streptomycin sulfate	3834	Fungicide	Antibiotic	35 (1)
Tris (hydroxymethyl) nitromethane	1105	Microbiocide	Unclassified	29 (1)
Saflufenacil	5977	Herbicide	Uracil / amide	28 (1)
Kaolin	2629	Insecticide, Other product constituent, Veterinary treatment	Unclassified	24 (1)
Mefenoxam, other related	94011	Fungicide	Xylylalanine	24 (1)
Alpha-(para-nonylphenyl)-omega-hydroxypoly(oxyethylene), branched	2066	Microbiocide	Polyalkyloxy Compound	23 (1)
Imazethapyr, ammonium salt	2341	Herbicide	Imidazolinone	23 (1)
Flurecol-methyl	1436	Herbicide, Plant growth regulator	Unclassified	22 (1)
Dimethyl dicocoalkyl ammonium salt with naphthalenesulfonic acid, formaldehyde condensate	5181	Microbiocide	Quaternary Ammonium Compound	19 (1)
Methyl-2,7-Dichloro-9-Hydroxyfluorene-9-Carboxylate	1680	Plant Growth Regulator, Herbicide	Unclassified	16 (1)
Dipropyl isocinchomeronate	681	Insect Repellent	Unclassified	16 (1)
Triethanolamine sulfonate	1982	Insecticide, Microbiocide, Adjuvant	Unclassified	16 (1)
Metiram	493	Fungicide	Dithiocarbamate	15 (1)
Methylene bis(thiocyanate)	1185	Microbiocide, Fungicide, Algaecide	Unclassified	14 (1)
Ortho-benzyl-para-chlorophenol, potassium salt	936	Microbiocide	Chlorinated phenol	10 (1)
Para-dichlorobenzene	455	Insecticide, Insect Repellent, Rodenticide, Fungicide	Halogenated organic	8 (1)
Ortho-phenylphenol, potassium salt	935	Microbiocide	Phenol	8 (1)
MCPP-P, potassium salt	5335	Herbicide	Phenoxy acid or ester	7 (1)
Sodium cacodylate	1673	Herbicide, Rodenticide	Organoarsenic, Heavy metal	6 (1)
Chlordane	130	Insecticide	Cyclodiene organochlorine	6 (1)
Para-tert-amylphenol, potassium salt	1056	Microbiocide	Phenol	5 (1)
1,3-Bis(Hydroxymethyl)-5,5-Dimethyl	2298	Fungicide, Herbicide,	Hydantoin	5 (1)

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used
Hydantoin		Microbiocide		
Diphacinone, sodium salt	1636	Rodenticide	1,3-Indandione	5 (1)
Hydroxymethyl-5,5-Dimethyl Hydantoin	2306	Fungicide, Herbicide, Microbiocide	Hydantoin	5 (1)
Butoxy polypropylene glycol	170	Insecticide	Polyalkyloxy Compound	4 (1)
N-dialkyl (60%c14, 30%c16, 5%c12, 5%c18) methyl benzyl ammonium chloride	2070	Microbiocide	Quaternary Ammonium Compound	4 (1)
3-iodo-2-propynyl butylcarbamate	1938	Fungicide, Wood Preservative	Other Carbamate	4 (1)
Polyhexamethylene biguanidine	2258	Microbiocide, Fungicide	Polymer	4 (1)
Captan, other related	90104	Fungicide	Thiophthalimide	4 (1)
MCPP, diethanolamine salt	790	Herbicide	Chlorophenoxy acid or ester	4 (1)
Sulcofuron-sodium	1645	Insecticide	Urea	4 (1)
Atrazine, other related	90045	Herbicide	Triazine	3 (1)
Nicarbazin	5944	Avicide	Unclassified	3 (1)
Sodium diisooctylsulfosuccinate	961	Insecticide	Unclassified	3 (1)
Permethrin, other related	92008	Insecticide	Pyrethroid	3 (1)
Parathion, other related	90459	Insecticide, Nematicide	Organophosphorus	3 (1)
Dimethyl phthalate	232	Insect Repellent	Alkyl Phthalate	3 (1)
Monuron-tca	409	Herbicide	Urea	2 (1)
Butopyronoxyl	90	Insecticide	Unclassified	2 (1)
Morpholine	1936	Microbiocide	Morpholine	2 (1)
Calcium acid methanearsonate	101	Herbicide	Arsenic compound	2 (1)
Dicamba, dimethylamine salt, other related	90849	Herbicide	Benzoic acid	2 (1)
Maleic hydrazide, diethanolamine salt	778	Plant Growth Regulator, Herbicide	Unclassified	2 (1)
DEET, other related	90189	Insect Repellent	Unclassified	2 (1)
Maleic hydrazide, potassium salt	2130	Plant Growth Regulator, Herbicide	Unclassified	2 (1)
PCP, other related	90465	Wood Preservative, Microbiocide, Algaecide, Fungicide, Molluscicide	Chlorinated Phenol	1.5 (1)
Caprylic acid	2316	Microbiocide	Unclassified	1.3 (1)
Polypropylene glycol	3011	Adjuvant, Insecticide	Polyalkyloxy Compound	1.3 (1)
4,5-dichloro-2-n-octyl-3(2h)-isothiazolone	3982	Microbiocide, Antifoulant	Isothiazolone	1.2 (1)
Cacodylic acid	32	Herbicide	Organoarsenic, Heavy metal	1.0 (1)
Alpha-(ortho,para-dinonylphenyl)-omega-hydroxypoly(oxyethylene)	3743	Microbiocide	Polyalkyloxy Compound	1.0 (1)
Dichlorprop, butoxyethanol ester	923	Herbicide, Herbicide	Chlorophenoxy acid or ester, Glycol Ether	0.8 (1)
Alcohols, c4-c12, normal	2067	Solvent, Microbiocide	Alcohol/Ether	0.7 (1)
(S)-Kinoprene	3936	Insect Growth Regulator	Juvenile hormone mimic	0.6 (1)
2,4-DP, isoctyl ester	1820	Herbicide, Plant Growth	Chlorophenoxy acid	0.6 (1)

Active ingredient	DPR Number	Use Type	Group	3-yr Ave Lbs Used
		Regulator	or ester	
Carbo methoxy ether cellulose, sodium salt	2446	Insecticide	Cellulose derivative	0.5 (1)
Coumafuryl	298	Rodenticide	Coumarin anticoagulant	0.4 (1)
Dichloroisocyanuric acid, potassium salt	2	Microbiocide	Triazinetrione	0.4 (1)
Dioxathion, other related	90192	Insecticide	Organophosphorus	0.4 (1)
Ethylan	472	Insecticide	Organochlorine	0.3 (1)
Sodium dioctylsulfosuccinate	2068	Insecticide	Unclassified	0.3 (1)
Beta-pinene polymer	3998	Insecticide	Polymer	0.3 (1)
Alkyl (50% c12, 30% c14, 17% c16, 3% c18) dimethylethylbenzyl ammonium chloride	1849	Algaecide, Microbiocide	Quaternary Ammonium Compound	0.3 (1)
Lanolin	1145	Insecticide	Unclassified	0.2 (1)
Polyethoxy polypropoxy polyethoxy ethanol - iodine complex	1585	Microbiocide	Iodine Compound, Polyalkyloxy Compound	0.1 (1)
Imazapic, ammonium salt	5097	Herbicide	Imidazolinone	0.1 (1)
Dipropylene glycol	1004	Insecticide, Fungicide, Microbiocide, Adjuvant	Glycol	0.1 (1)
Calcium cyanamide	98	Herbicide	Unclassified	0.1 (1)
Merphos, other related	90293	Defoliant, Plant Growth Regulator	Organophosphorus	0.1 (1)
Alkyl (58% c14, 28% c16, 14% c12) dimethylbenzyl ammonium chloride	1912	Algaecide, Microbiocide	Quaternary Ammonium Compound	0.1 (1)
Pindone	489	Rodenticide	1,3-Indandione	0.1 (1)
Coconut imidazoline sodium carboxylate	1659	Microbiocide	Imidazoline	0.1 (1)
Sulfoxide	559	Insecticide, Synergist	Unclassified	0.1 (1)
2-(decylthio)ethanamine, hydrochloride salt	3987	Microbiocide	Unclassified	0.1 (1)
Alpha-alkyl (secondary c11-c15)-omega-hydroxypoly(oxyethylene)	2360	Adjuvant, Fungicide, Avicide, Insecticide	Polyalkyloxy Compound	0.05 (1)
Zineb	627	Fungicide	Dithiocarbamate	0.05 (1)
Deltamethrin, other related	93010	Insecticide	Pyrethroid	0.04 (1)
2-(2-butoxy ethoxy) ethyl thiocyanate	355	Insecticide	Unclassified	0.03 (1)
Methyl parathion, other related	90394	Insecticide, Nematicide	Organophosphorus	0.02 (1)
Resmethrin, other related	92119	Insecticide	Pyrethroid	0.02 (1)
Dihydro-5-heptyl-2(3h)-furanone	2221	Insecticide	Ketone	0.02 (1)
Potassium dimethyl dithio darbamate	1934	Microbiocide	Dithiocarbamate	0.02 (1)
2-isovaleryl 1-1,3-indandione, calcium salt	1736	Rodenticide	1,3-Indandione	0.01 (1)
Oxytetracycline hydrochloride, other related	91798	Fungicide	Unclassified	0.01 (1)
Abamectin, other related	92254	Insecticide	Botanical, Macrocylic Lactone	0.01 (1)
Polyvinyl pyrrolidone	1466	Microbiocide	Polymer	0.01 (1)
Allethrin, other related	90012	Insecticide	Pyrethroid	0.01 (1)
Meta-cresol	378	Microbiocide	Phenol	0.005 (1)
Dichloro-s-triazinetrione	204	Microbiocide	Triazinetrione	0.005 (1)

<b>Active ingredient</b>	<b>DPR Number</b>	<b>Use Type</b>	<b>Group</b>	<b>3-yr Ave Lbs Used</b>
Warfarin, sodium salt	1184	Rodenticide	Coumarin	0.003 (1)
Allethrin (D)	2293	Insecticide	Pyrethroid	0.003 (1)
3,4,5-tribromosalicylanilide	833	Microbiocide	Unclassified	0.003 (1)
Alkyl (61%c12, 23%c14, 11%c16, 5%c8,c10,c18) dimethylbenzyl ammonium chloride	2060	Algaecide, Microbiocide	Quaternary Ammonium Compound	0.003 (1)
N-alkyl (92%c18, 8%c16)-n-ethylmorpholinium ethyl sulfate	986	Fungicide, Microbiocide	Quaternary Ammonium Compound	0.002 (1)
2-(2-(p-(diisobutyl) phenoxy) ethoxy) ethyl dimethylbenzyl ammonium chloride	66	Microbiocide	Quaternary Ammonium Compound	0.001 (1)
Phenothrin, other related	92093	Insecticide	Pyrethroid	0.001 (1)
Alkyl (61%c12, 23%c14, 11%c16, 5%c18) dimethyl benzyl ammonium chloride	1975	Algaecide, Microbiocide	Quaternary Ammonium Compound	0.001 (1)
3,5-dibromosalicylanilide	1256	Microbiocide	Anilide	0.0003 (1)
Dicamba, other related	90200	Herbicide	Benzoic acid	0.0002 (1)
D-allethrin, other related	92293	Insecticide	Pyrethroid	0.0001 (1)
Dihydro-5-pentyl-2(3h)-furanone	2220	Insecticide	Ketone	0.0001 (1)
Methyl dodecyl benzyl trimethyl ammonium chloride	895	Microbiocide	Quaternary Ammonium Compound	0.00001 (1)
Methyl dodecyl xylene bis (trimethyl ammonium chloride)	896	Microbiocide	Quaternary Ammonium Compound	0.000002 (1)