



**Department of Pesticide Regulation
Environmental Monitoring Branch
1001 I Street
Sacramento, CA 95812**

**Surveys of Pesticide Products Sold in Retail Stores in
Northern and Southern California, 2010**

Kimberly Osienski, Emily Lisker, and Robert Budd

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Abstract

A store survey of four large home improvement stores in northern and southern California was conducted to identify active ingredients in pesticide products for outdoor use. A total of 190 outdoor use products and 79 active ingredients were identified. Glyphosate, 2,4-D dimethylamine salt, imidacloprid, dicamba dimethylamine salt, bifenthrin, permethrin, and lambda-cyhalothrin were the most prevalent chemicals in retail products. Insecticides represented more than half of the products available, with pyrethroids representing 46% of the insecticidal products. Natural products and biopesticides represented 17% of active ingredients. Northern California stores sold more ready-to-use formulations of products than the Southern California stores and had more than twice as many products containing lambda-cyhalothrin. Also, the pyrethroid cypermethrin was absent from all products sold in Southern California. Comparisons to a 2003 survey conducted by the University of California revealed that diazinon, which has been phased out in California, is no longer found in any products. Gamma-cyhalothrin, a chemical registered for use in 2005 and not found in the 2003 survey, is now an active ingredient in multiple products.

Introduction

Pesticide usage by certified pesticide applicators is reported to the Department of Pesticide Regulation (DPR) and recorded in the pesticide use reporting (PUR) system. However, usage by residential homeowners is not tracked, resulting in a lack of information for this user type. Pesticides available for residential use are in constant flux due to the introduction of new products and phasing out of others because of ecological or human health concerns. Also for reported uses, it is difficult to quickly discern products available for indoor versus outdoor usage in the PUR system. Therefore, a store survey was needed to provide a snapshot accounting of pesticides currently being marketed to the general public for outdoor pest control. Through this survey any regional

(northern and southern California) differences in pesticide use due to local pest management needs could be discerned. Active ingredients identified in this store survey will be included in an evaluation to prioritize candidate pesticides for surface water monitoring in urban areas.

Objectives

The primary objectives of this exercise were to:

1. Identify pesticidal products and associated active ingredients (AIs) that are currently available to residential users for outdoor use
2. Evaluate primary class and groups of identified AIs
3. Identify potential regional differences between southern and northern California product availability
4. Compare findings with those from a previous retail store survey

Methods

Pesticides available to the public were evaluated by conducting store surveys at four large retail home improvement stores. It is estimated that home supply stores account for 55.1 % of pesticide sales to residential users (Wilen, 2001). Two large home supply stores in Orange County (Southern California) were surveyed in February, 2010, and two in Yolo County (Northern California) in August, 2010. The following information was recorded for each individual product:

- Product Manufacturer
- Product Name
- Active Ingredients (AI)
- Percent AI
- Formulation
- Store location where product is sold

Any product with a unique active ingredient, name, manufacturer, or formulation was entered as an individual product. For example, different concentrations of active ingredients indicate different efficacies and different instructions for users; therefore, two products having the same name but a different percentage of an active ingredient were recorded as two individual products. There are 54 products in this survey that have identical names and active ingredients but unique formulations or concentrations. Using this definition, the three products listed below are regarded as individual products in this survey.

Manufacturer	Product Name	Active Ingredient	% AI	Formulation
Monsanto	Roundup Extended Control	Glyphosate isopropylamine salt	18.0	Liquid Concentrate
Monsanto	Roundup Extended Control Ready-to-Use	Glyphosate isopropylamine salt	1.0	Liquid Spray
Monsanto	Roundup Weed and Grass Killer	Glyphosate isopropylamine salt	2.0	Liquid Spray

Types of formulations identified include:

- Ready-to-use sprays
- Liquid concentrates
- Granules, powders, dust
- Foggers
- Baits, bait traps, stakes

Since the focus of the DPR's EMON mission is to monitor environmental media for pesticide residues, only products registered for outdoor pest control were surveyed, including natural products and biopesticides. Biopesticides are defined as those "derived from such natural materials as animals, plants, bacteria and certain minerals", which would include products such as canola oil and baking soda (US EPA, 2010). Product and formulation definitions are provided in Appendix A.

Results and Discussion

A total of 190 individual outdoor use products and 79 distinct active ingredients (AIs) were identified at the four home improvement retail stores surveyed (Appendix B). There were 36 different product manufacturers; three of which - Ortho, Bayer, Spectracide - produced over half of all products surveyed. There were 161 products in the Northern California stores and 125 products in the Southern California stores. Each product was available in one to four of the stores surveyed, with 40% observed in only one store and 13% identified in all four stores (Table 1). The product formulations did not vary widely between the two regions. The largest difference existed among the ready-to-use sprays, in that there were 17 more products with this formulation in Northern than in Southern California. Additionally, lambda-cyhalothrin was identified in more than twice as many products in Northern California stores (13 products) than in Southern California (6 products).

Table 1. Pesticide products sold in all (four) retail stores surveyed in Northern and Southern California, 2010.

Product Name	Manufacturer	Formulation
Advanced complete insect killer 2-way formula	Bayer	Liquid Concentrate
Advanced complete insect killer 2-way formula	Bayer	Liquid Spray
Ant block	Amdro	Liquid Spray
Bug getta: snail and slug	Ortho	Granular
Complete insect killer	Bayer	Granular
Daconil fungicide	GardenTech	Liquid Spray
Dual action rose and flower insect killer	Bayer	Liquid Spray

Product Name	Manufacturer	Formulation
Ground clear	Ortho	Liquid Concentrate
Ground clear	Ortho	Liquid Spray
Immunox lawn disease control	Spectracide	Concentrate Spray
Poison ivy tough	Monsanto	Liquid Concentrate
Poison ivy tough	Monsanto	Liquid Spray
Roundup Extended control ready to use	Monsanto	Liquid Spray
Roundup Weed and Grass Killer Concentrate Plus	Monsanto	Liquid Concentrate
Roundup Weed and Grass Killer Super Concentrate	Monsanto	Liquid Concentrate
Slug and snail death	Corry's	Granular
Termite and carpenter ant killer	Spectracide	Liquid Concentrate
Triazicide insect killer	Spectracide	Granular
Triazicide insect killer	Spectracide	Liquid Concentrate
Triazicide insect killer	Spectracide	Liquid Spray
Volck oil spray insect killer	Ortho	Liquid Concentrate
Weed and grass killer Spectracide	Spectracide	Liquid Spray
Weed B Gon max plus crabgrass killer	Ortho	Liquid Concentrate
Weed B Gon max plus crabgrass killer	Ortho	Liquid Spray

Active ingredients were evaluated independently, as several products had more than one AI. More than half of all active ingredients surveyed were insecticides, and approximately one third were herbicides. Five percent were fungicides, and the remaining 11% consisted of molluscicides, rodenticides, attractants, surfactants, and synergists (Figure 1).

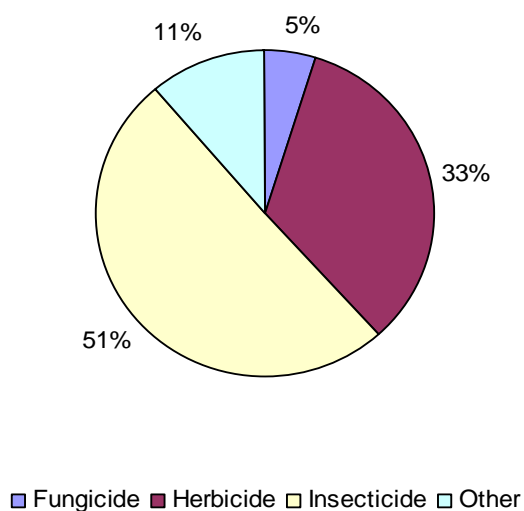
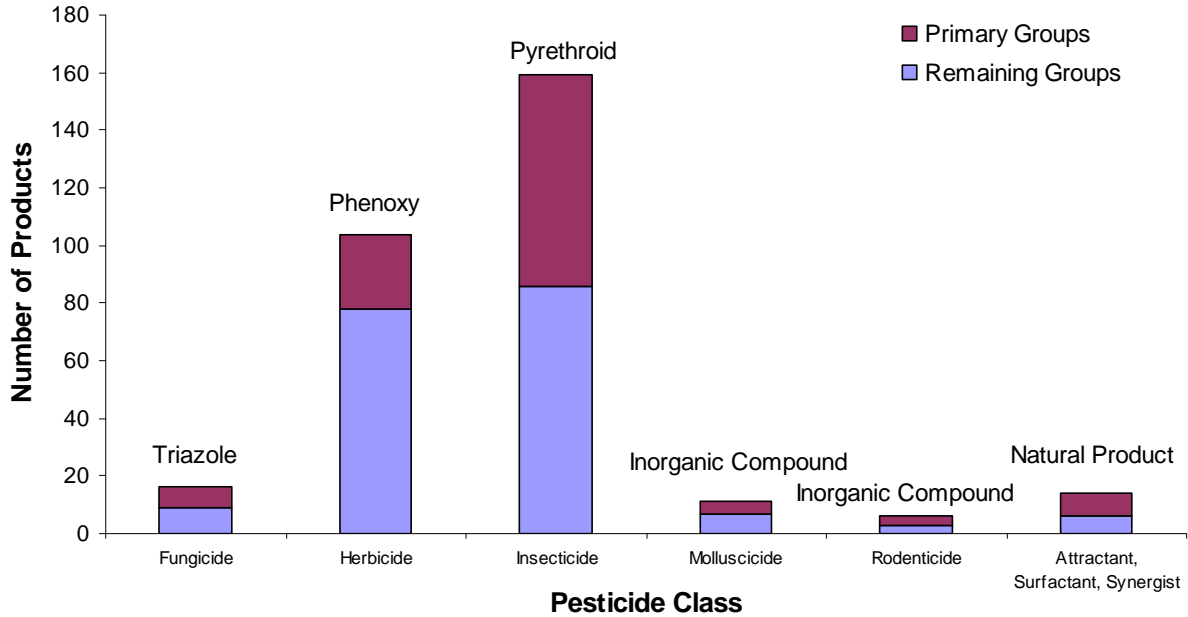


Figure 1. Percentage of major pesticide classes

Pyrethroid insecticides, phenoxy herbicides, and triazole fungicides were the most represented (primary) groups within the three major pesticide classes with 73 (46% of insecticides), 26 (25% of herbicides), and 7 products (44% of fungicides), respectively

(Figure 2). Inorganic compounds and natural products were the primary groups within the less commonly found pesticide classes. Piperonyl butoxide was the only AI surveyed that is classified as a synergist.

Figure 2. Primary pesticide groups within each pesticide class



The store surveys identified a large diversity of products, with the 79 active ingredients represented by 55 pesticide chemistry group classifications (Figure 3). There were 72 different AIs identified in Northern California stores and 64 AIs in Southern California. There were several AIs identified in only one region, the majority of which being natural product and biopesticide AIs (Table 2). One AI of note found only in northern California retail stores was cypermethrin, a pyrethroid which is currently monitored by the DPR surface water monitoring program.

Table 2. Active ingredients identified in only one region.

Northern California	# Products	Southern California	# Products
3-phenoxybenzyl	1	Isoxaben	1
Ammoniated soap of fatty acids	2	Magnesium chloride	1
Avermectin	1	Monosodium acid methanearsonate	1
Bacillus subtilis	1	Natural gum resins	1
Bioallethrin (S)	1	Oryzalin	1
Bromethalin	2	Prometon	1
Citric acid	1	Spinosad	1
Cypermethrin	1		
Dinotefuran	1		
Diphacinone	1		
Methoprene (S)	1		
Propoxur	1		
Sesame oil	2		
Zinc phosphide	3		

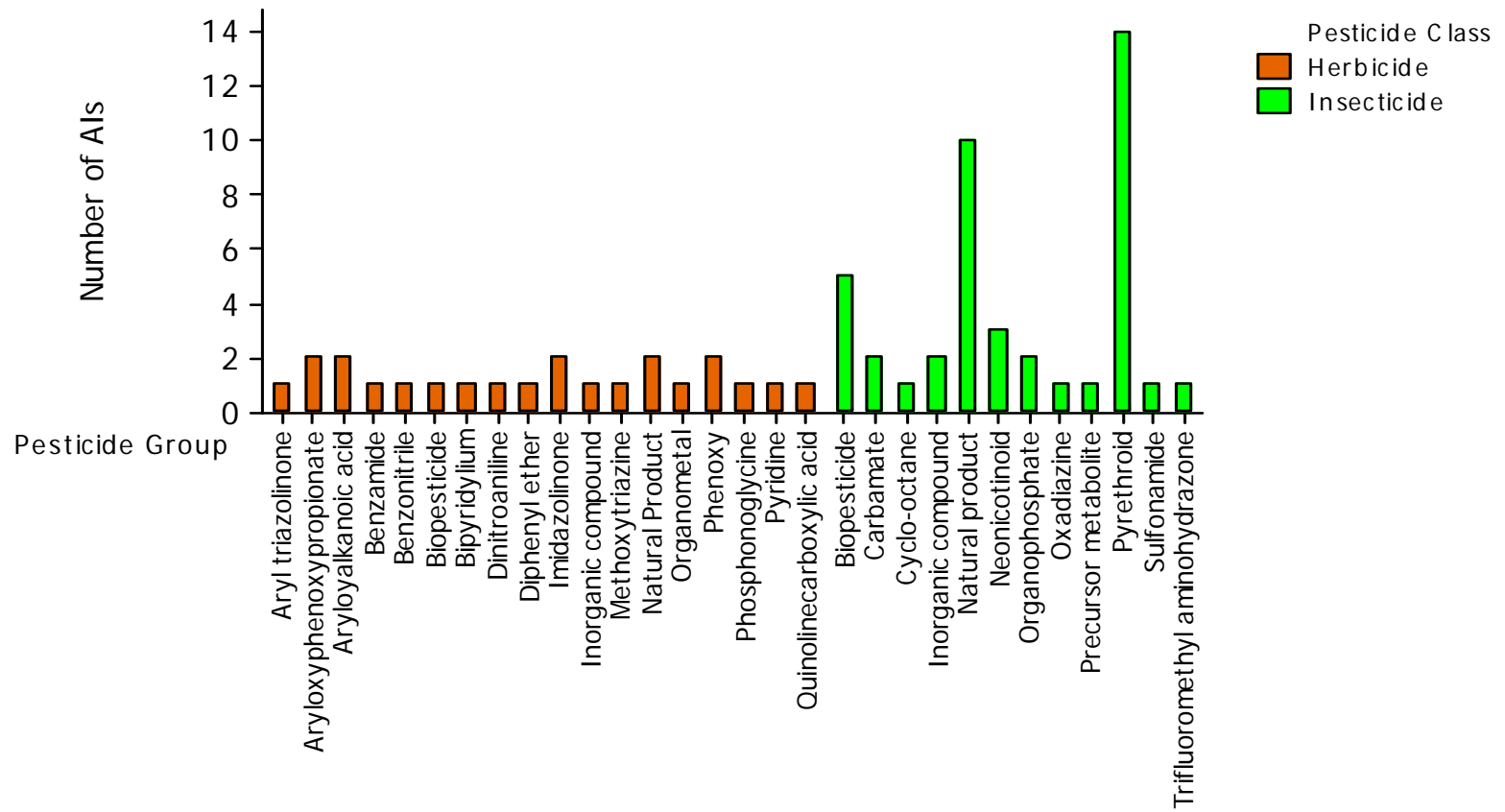


Figure 3. Number of AIs, by pesticide chemistry group, surveyed within herbicide and insecticide classes.

The identified AIs were found in 1 to 15 different product labels. The most prevalent AIs found in retail products included glyphosate (15), 2, 4-D dimethylamine salt (14), imidacloprid (13), lambda-cyhalothrin (13), dicamba dimethylamine salt (12), bifenthrin (11), and permethrin (11). The University of California Statewide IPM Program conducted a survey in 2003 of 14 stores in the Sacramento and Bay area that included large home supply stores, grocery/drug stores, discount department stores, hardware stores, and retail nurseries. Unlike the current survey, products registered for indoor use only were also included. The previous study identified 542 individual products containing 112 active ingredients (Flint, 2003). Of the 542 products, 78 contained the pyrethroid permethrin, the most common active ingredient found in residential-use pesticides. The second most common AI was the pyrethroid tralomethrin, followed by metaldehyde, and dicamba (Table 3).

Table 3. Most common active ingredients identified in products from store surveys conducted in 2003 and 2010.

Active Ingredient	# Products, 2003 Survey (total=542) ¹	% of total Products	Active Ingredient	# Products, 2010 Survey (total=189)	% of total Products
Permethrin	78	14	Glyphosate	15	8
			2,4-D	14	7
Tralomethrin	32	6	dimethylamine salt		
Metaldehyde	30	6	lambda-Cyhalothrin	13	7
Dicamba	28	5	Imidacloprid	13	7
Pyrethrins	26	5	Dicamba	12	6
Glyphosate	25	5	Permethrin	11	6
Diazinon	13	2	Bifenthrin	11	6
			Metaldehyde	7	4
			Pyrethrins	7	4

¹Flint, 2003

Glyphosate, dicamba, and permethrin were amongst the most common ingredients in both the 2003 and 2010 surveys. However, differences between the two surveys were also noted. Diazinon, which has been phased out in California for residential use, was not found in any products in the 2010 survey, nor was tralomethrin which is more commonly used as an indoor insecticide. Gamma-cyhalothrin was not a registered chemical in California until 2005. Seventeen products are currently registered in California containing gamma-cyhalothrin, three of which were identified during this survey. Natural products and biopesticides accounted for 17% of pesticides in the 2010 survey, demonstrating their popularity in the residential-use market, although there is no data for natural products in the 2003 survey. However, customers who were queried about pesticide use “express a preference for more natural products” feeling that “botanical-based products are safer” (Wilén 2001).

Conclusion

The large home supply store survey revealed a wide range of pesticide products are available to homeowners for outdoor control of pests. Insecticides are the most prevalent class of pesticides sold for urban use, accounting for 51% of total pesticides sold. Pyrethroids accounted for 46% of insecticides, and 23% of all pesticides surveyed. The second most common group of pesticides was natural products and biopesticides, comprising 17% of total pesticides, an increasingly popular group of products since the 2003 survey conducted by Wilén and Flint. Differences between northern and southern California home supply stores were few. A major difference is the absence of cypermethrin in southern California stores. Diazinon was a common active ingredient in 2003, but has since been phased out in California and was not found in any shelf products in the 2010 survey. Glyphosate, dicamba, and permethrin remain three of the most commonly available pesticides to residential users. We have identified 79 active ingredients that will be included in the screening list of AIs to prioritize candidates for surface water monitoring.

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APPENDIX A: Definitions

Product Ingredients:

Active Ingredient	Compound that provides the pesticidal action in a formulation
Attractants	Substance, other than food, intended to attract pests or lure into a trap
Biopesticide	Pesticides derived from such natural materials as animals, plants, bacteria and certain minerals; naturally-occurring substances that control pests via non-toxic mechanisms
Formulation	Mixture of one or more active ingredients and inerts (see types of formulations below)
Surfactant	Substance that enables immiscible ingredients to combine
Synergist	A chemical compound that reacts with an active ingredient to enhance its pesticidal activity; often used with pyrethroids

Formulations:

Ready-to-use liquid sprays	Active ingredient(s) dissolved in water or other solvent; ready-made for application
Liquid concentrates	Solutions that contain a higher percentage of active ingredient(s); usually combined with a surfactant; must be diluted before use
Granules	Pesticides adsorbed onto uniformly-sized granules, such as sand, clay, or diatomaceous earth; intended for direct aerial or ground application
Powders/Dust	Active ingredient(s) mixed with an inert carrier, such as flour, lime, or sand
Foggers	Mixture of active ingredient(s), solvent, and propellant that, when applied, results in the suspension of fine solids or liquid particles
Baits/Bait Traps/Stakes	Mixture of active ingredient(s) and an attractant or food to lure pests with the aim of exterminating them

APPENDIX B: Retail store survey of pesticide products by active ingredient.

Active Ingredient	Product Manufacturer	Product Name	Product Type	Southern California	Northern California
2,4-D, dimethylamine salt	Bayer	Advanced Lawn Weed and Crabgrass Killer	Liquid Concentrate	X	X
	Bayer	Lawn Weed and Crabgrass Killer	Liquid Concentrate		X
	Ortho	Total Kill	Liquid Concentrate	X	X
	Ortho	Weed-B-Gon Max Plus Crabgrass Killer	Liquid Concentrate	X	X
	Spectracide	Weed Stop	Liquid Concentrate	X	
	Spectracide	Weed Stop Plus Crabgrass Killer	Liquid Concentrate	X	X
	Bayer	Advanced Lawn Weed and Crabgrass Killer	Liquid Spray	X	X
	Bayer	Advanced Season Long	Liquid Spray	X	
	Scott's	Liquid Turf Builder	Liquid Spray	X	X
	Ortho	Total Kill	Liquid Spray	X	X
	Vigoro	Ultra Turf	Liquid Spray	X	
	Sta-Green	Weed and Feed	Liquid Spray		X
	Ortho	Weed-B-Gon Max Plus Crabgrass Killer	Liquid Spray	X	X
	Spectracide	Weed Stop Plus Crabgrass Killer	Liquid Spray	X	X
2-phenethyl propionate	EcoSmart	Organic Yard Protection Mosquito and Tick Control	Liquid Concentrate		X
	EcoSmart	Organic Insect Killer	Liquid Spray	X	X
	EcoSmart	Organic Insecticide Indoor and Outdoor	Liquid Spray	X	X
	EcoSmart	Organic Weed and Grass Killer	Liquid Spray	X	X
3-phenoxybenzyl	Black Flag	Fogging Insecticide	Fogger		X
Acetamiprid	Ortho	Flower, Fruit, and Vegetable Insect Killer	Liquid Spray	X	X
	Ortho	Max Flower Fruit and Vegetable Insect Killer	Liquid Spray	X	X
	Ortho	Rose Pride Insect Killer	Liquid Spray	X	X
Allethrin (d-cis/trans)	ThermaCell	Patio Lantern Mosquito Repellent	Butane Cartridge		X
	Raid	Flying Insect Indoor and Outdoor	Fogger	X	X
	Raid	Yard Guard	Fogger		X
Ammoniated soap of fatty acids	Bayer	Natria Grass and Weed Killer	Liquid Spray		X
	GardenSafe	Weed and Grass Killer Gardensafe	Liquid Spray		X
Avermectin	Raid	Raid Ant Baits	Bait Traps		X
Bacillus subtilis	Bayer	Natria Disease Control	Liquid Spray		X
Bacillus thuringiensis	Southern Ag	Thuricide BT Caterpillar Control	Liquid Spray	X	
	Summit	Mosquito Dunks	Tablets		X

Active Ingredient	Product Manufacturer	Product Name	Product Type	Southern California	Northern California
Bifenthrin	Ortho	Bug-B-Gone Max	Granular		X
	Ortho	Home Defense Max: Outdoor Perimeter Insect Killer	Granular	X	X
	Ortho	Insect Killer for Lawns	Granular		X
	Ortho	Max Insect Killer for Lawns	Granular	X	X
	Ortho	Total Kill Lawn and Garden Insect Killer	Granular	X	X
	Ortho	Home Defense Max: Termite and Destructive Bug Killer	Liquid Concentrate	X	X
	Ortho	Max Lawn And Garden Insect Killer	Liquid Concentrate	X	X
	Ortho	Home Defense Max: Outdoor Perimeter Insect Killer	Liquid Spray	X	
	Ortho	Home Defense Max: Perimeter and Indoor Insect Killer	Liquid Spray	X	X
	Ortho	Home Defense Max: Termite and Destructive Bug Killer	Liquid Spray	X	
	Ortho	Max Lawn and Garden Insect Killer	Liquid Spray	X	X
Bioallethrin (S)	Spectracide	Commercial Wasp and Hornet Killer	Liquid Spray		X
Bromethalin	Tomcat	Mole Killer	Granular		X
	RealKill	Rat and Mouse Bait	Tablets		X
Carbaryl	GardenTech	Sevin	Dust		X
	Ortho	Bug Getta Plus: Snail, Slug and Insect Killer	Granular	X	X
	Corry's	Insect Killer	Granular	X	X
	Cutter	Bug Killler	Liquid Concentrate	X	
	GardenTech	Sevin Concentrated Bug Killer	Liquid Concentrate	X	X
	Bayer	Advanced Complete Insect Killer for Gardens	Liquid Spray	X	X
	GardenTech	Sevin Ready-to-Use	Liquid Spray	X	X
	GardenTech	Sevin-5	Powder	X	X
Chlorothalonil	Ortho	Garden Disease Control	Liquid Concentrate		X
	Ortho	Max Garden Disease Control	Liquid Concentrate	X	
	GardenTech	Daconil Fungicide	Liquid Spray	X	X
Citric acid	Worryfree	Moss and Algae Control	Liquid Spray		X
Clove oil	EcoSmart	Organic Insect Killer	Liquid Spray	X	
	EcoSmart	Organic Insecticide	Liquid Spray	X	
	EcoSmart	Organic Insecticide Indoor and Outdoor	Liquid Spray	X	

Active Ingredient	Product Manufacturer	Product Name	Product Type	Southern California	Northern California
Copper octanoate	Worryfree	Copper Soap Fungicide	Liquid Spray		X
	Ortho	Ecosense Garden Disease Control	Liquid Spray		X
	Ortho	Garden Disease Control	Liquid Spray	X	
Cyfluthrin (beta)	Bayer	Complete Insect Killer	Granular	X	X
	Bayer	Advanced Carpenter and Termite Killer	Liquid Concentrate	X	X
	Bayer	Advanced Complete Insect Killer 2-Way Formula	Liquid Concentrate	X	X
	Bayer	Advanced Complete Insect Killer 2-Way Formula	Liquid Spray	X	X
	Bayer	Advanced Home Pest Control Indoor and Outdoor Insect Killer	Liquid Spray	X	X
	Bayer	Dual Action Rose and Flower Insect Killer	Liquid Spray	X	X
	Bayer	Home Pest Control	Liquid Spray		X
Cyhalothrin (gamma)	Spectracide	Termite Killing Foam	Fogger	X	X
	Terro	Ant Killer	Granular	X	X
	Spectracide	Ant Shield Home Barrier	Granular	X	X
	Spectracide	Triazicide Insect Killer	Granular	X	X
	Spectracide	Termite and Carpenter Ant Killer	Liquid Concentrate	X	X
	Spectracide	Triazicide Insect Killer	Liquid Concentrate	X	X
	Spectracide	Bug Stop Indoor and Outdoor	Liquid Spray	X	X
	Spectracide	Terminate	Liquid Spray	X	X
	Spectracide	Termite and Carpenter Ant Killer	Liquid Spray		X
Cyhalothrin (lambda)	Cutter	Bug Free Backyard	Liquid Concentrate		X
	Cutter	Backyard Bug Control	Liquid Spray		X
	Hotshot	Home Insect Control	Liquid Spray		X
	Hotshot	Hotshot Spider Killer	Liquid Spray		X
	Hotshot	Roach and Ant Killer	Liquid Spray		X
	Spectracide	Spectracide Wasp And Hornet Killer	Liquid Spray		X
	Cypermethrin	Hotshot	Pest Control Concentrate	Liquid Concentrate	
Deltamethrin	Black Flag	Extreme Home Insect Control	Liquid Concentrate		X
	Spectracide	Commercial Wasp and Hornet Killer	Liquid Spray		X
	Green Light	Roach, Ant, and Spider Control	Liquid Spray		X
	Green Light	Many Purpose Dust	Powder	X	
	Bayer	Advanced Lawn Weed and Crabgrass Killer	Liquid Concentrate	X	X

Active Ingredient	Product Manufacturer	Product Name	Product Type	Southern California	Northern California
Dicamba, dimethylamine salt	Bayer	Lawn Weed and Crabgrass Killer	Liquid Concentrate		X
	Spectracide	Triple Strike	Liquid Concentrate	X	
	Spectracide	Weed and Grass Killer	Liquid Concentrate	X	X
	Ortho	Weed-B-Gon Max Plus Crabgrass Killer	Liquid Concentrate	X	X
	Spectracide	Weed Stop	Liquid Concentrate	X	
	Spectracide	Weed Stop Plus Crabgrass Killer	Liquid Concentrate	X	X
	Bayer	Advanced Lawn Weed and Crabgrass Killer	Liquid Spray	X	X
	Bayer	Advanced Season Long	Liquid Spray	X	
	Spectracide	Weed and Grass Killer	Liquid Spray	X	X
	Ortho	Weed B Gon Max Plus Crabgrass Killer	Liquid Spray	X	X
Spectracide	Weed Stop Plus Crabgrass Killer	Liquid Spray	X	X	
Dichlobenil	Image	Vegetation Killer	Granular	X	X
Dichlorprop-p, dimethylamine salt	Bayer	Advanced Lawn Weed and Crabgrass Killer	Liquid Concentrate	X	X
	Ortho	Total Kill	Liquid Concentrate	X	X
	Scott's	Liquid Turf Builder	Liquid Spray	X	X
	Ortho	Total Kill	Liquid Spray	X	X
	Vigoro	Ultra Turf	Liquid Spray	X	
Sta-Green	Weed and Feed	Liquid Spray		X	
Dinotefuran	Hotshot	Ultra Ant Bait	Bait Traps		X
Diphacinone	SureStop	Ground Squirrel Bait	Granular		
Diquat dibromide	Monsanto	Roundup Weed and Grass Killer Concentrate Plus	Liquid Concentrate	X	X
	Monsanto	Roundup Weed and Grass Killer Extended Control	Liquid Concentrate	X	X
	Spectracide	Triple Strike	Liquid Concentrate	X	
	Image	Vegetation Killer	Liquid Concentrate	X	
	Spectracide	Weed and Grass Killer	Liquid Concentrate	X	X
Spectracide	Weed and Grass Killer	Liquid Spray	X	X	
Disulfoton	Bayer	Advanced 2-in-1 Systemic Rose and Flower Care	Granular	X	X
	Bayer	Advanced Rose and Flower Care	Granular	X	X
	Bayer	Rose and Flower Care	Granular		X
Eugenol	EcoSmart	Organic Insect Killer	Granular	X	
	EcoSmart	Organic Yard Protection Mosquito and Tick Control	Liquid Concentrate		X
	EcoSmart	Organic Weed and Grass Killer	Liquid Spray	X	

Active Ingredient	Product Manufacturer	Product Name	Product Type	Southern California	Northern California
Fenoxaprop-p-ethyl	Bayer	Advanced Bermuda Grass Control	Liquid Spray	X	X
	Bayer	Bermuda Grass Control For Lawns	Liquid Spray		X
Fluazifop-p-butyl	Spectracide	Triple Strike	Liquid Concentrate	X	
	Spectracide	Weed and Grass Killer	Liquid Concentrate	X	X
	Ortho	Grass-B-Gon: Garden Grass Killer	Liquid Spray	X	X
	Spectracide	Weed and Grass Killer	Liquid Spray	X	X
Fluvalinate (tau)	Bayer	Insect Disease and Mite Control	Liquid Spray	X	X
Glyphosate, isopropylamine salt	Ortho	Ground Clear	Liquid Concentrate	X	X
	Monsanto	Poison Ivy Tough	Liquid Concentrate	X	X
	Monsanto	Roundup Weed and Grass Killer Concentrate Plus	Liquid Concentrate	X	X
	Monsanto	Roundup Weed and Grass Killer Extended Control	Liquid Concentrate	X	X
	Monsanto	Roundup Weed and Grass Killer Super Concentrate	Liquid Concentrate	X	X
	Ultrakill	Weed And Grass Killer Ultrakill	Liquid Concentrate		X
	Ortho	Ground Clear	Liquid Spray	X	X
	Monsanto	Poison Ivy Tough	Liquid Spray	X	X
	Monsanto	Ready-To-Use Pro	Liquid Spray	X	
	Monsanto	Roundup Extended Control Ready-To-Use	Liquid Spray	X	X
	Monsanto	Roundup Weed and Grass Killer	Liquid Spray		X
	Ortho	Season Long Max	Liquid Spray	X	X
	Ortho	Total Kill Weed and Grass Killer	Liquid Spray	X	X
	Ultrakill	Weed and Grass Killer Ultrakill	Liquid Spray		X
	Ortho	Total Kill Weed and Grass Killer	Super concentrate	X	X
Hydramethylnon	Grant's	Kills Ants	Bait Traps	X	X
	Amdro	Ant Block	Liquid Spray	X	X
Imazapic, ammonium salt	Monsanto	Roundup Weed and Grass Killer Extended Control	Liquid Concentrate	X	X
	Monsanto	Roundup Extended Control Ready-To-Use	Liquid Spray	X	X
Imazapyr	Ortho	Ground Clear	Liquid Concentrate	X	X
	Ortho	Season Long Grass and Weed Killer	Liquid Concentrate	X	
	Ortho	Ground Clear	Liquid Spray	X	X
Imidacloprid	Bayer	Advanced Termite Killer	Granular	X	X
	Bayer	Advanced Tree and Shrub Protectant and Feed	Granular	X	
	Bayer	Complete Insect Killer	Granular	X	X
	Bayer	Tree And Shrub Protect and Feed	Granular		X

Active Ingredient	Product Manufacturer	Product Name	Product Type	Southern California	Northern California
Imidacloprid	Bayer	Advanced Complete Insect Killer 2-Way Formula	Liquid Concentrate	X	X
	Bayer	Advanced Tree and Shrub Protectant and Feed	Liquid Concentrate	X	
	Bayer	Tree and Shrub Protect and Feed	Liquid Concentrate		X
	Bayer	Advanced Complete Insect Killer 2-Way Formula	Liquid Spray	X	X
	Bayer	Dual Action Rose and Flower Insect Killer	Liquid Spray	X	X
	Bayer	Fruit, Citrus, and Vegetable Insect Control	Liquid Spray	X	X
	Bayer	Insect Disease and Mite Control	Liquid Spray	X	X
	Bayer	Rose and Flower Care	Liquid Spray	X	X
	Ortho	Tree and Shrub Insect Control	Liquid Spray	X	X
Indoxacarb	Hotshot	Maxattract Ant Bait	Bait Traps		X
	RealKill	Realkill Ant Bait	Bait Traps		X
	Sta-Green	Weed and Feed	Bait Traps		X
	Spectracide	Ant Shield Outdoor Killing Stakes	Stakes	X	X
Iron phosphate	Bayer	Advanced Snail and Slug Killer Bait	Granular	X	X
	Ortho	Ecosense Slug and Snail Killer	Granular	X	X
	Worryfree	Ferramol Slug and Snail Bait	Granular	X	X
	Monterey	Sluggo	Granular	X	X
Isoxaben	Bayer	Advanced Season Long	Liquid Spray	X	
Magnesium chloride	Killer	Killer Ice Plant Weeds	Liquid Concentrate	X	
Malathion	Spectracide	Malathion	Liquid Concentrate	X	X
Mecoprop-p, dimethylamine salt	Bayer	Advanced Lawn Weed and Crabgrass Killer	Liquid Concentrate	X	X
	Ortho	Total Kill	Liquid Concentrate	X	X
	Bayer	Advanced Season Long	Liquid Spray	X	
	Scott's	Liquid Turf Builder	Liquid Spray	X	X
	Ortho	Total Kill	Liquid Spray	X	X
	Vigoro	Ultra Turf	Liquid Spray	X	
	Sta-Green	Weed And Feed	Liquid Spray		X
	Ortho	Weed-B-Gon Max Plus Crabgrass Killer	Liquid Spray	X	X
Metaldehyde	Ortho	Bug Getta Plus: Snail, Slug and Insect Killer	Granular	X	X
	Ortho	Bug Getta: Snail and Slug	Granular	X	X
	Matson	Deadline Force II Slug and Snail Killer	Granular	X	X
	Corry's	Insect Killer	Granular	X	X
	Corry's	Slug and Snail Death	Granular	X	X

Active Ingredient	Product Manufacturer	Product Name	Product Type	Southern California	Northern California
Metaldehyde	Corry's	Slug and Snail Pellets	Granular	X	X
	Matson	Deadline Force II Slug and Snail Killer	Liquid Concentrate	X	X
Methoprene (S)	Wellmark International	Pre-Strike Mosquito Torpedo	Tablets		X
Monosodium acid methanearsonate	GardenTech	Crabgrass Killer	Liquid Concentrate	X	
Myclobutanil	Spectracide	Immunox Lawn Disease Control	Concentrate Spray	X	X
	Spectracide	Immunox Plus Insect and Disease Control	Fogger	X	X
	Spectracide	Immunox Multi-Purpose Fungicide	Liquid Concentrate		X
	Spectracide	Immunox Plus Insect and Disease Control	Liquid Concentrate		X
	Spectracide	Insect and Disease Control	Liquid Concentrate	X	X
Natural gum resins	Tree Tanglefoot	Insect Barrier	Resin	X	
Neem oil	GardenSafe	Fungicide	Liquid Spray		X
	Bonide	Rose Rx	Liquid Spray	X	
Oryzalin	Monterey	Weed Impede	Liquid Concentrate	X	
Oxyfluorfen	Ortho	Season Long Grass and Weed Killer	Liquid Concentrate	X	
	Ortho	Season Long Max	Liquid Spray	X	X
Pelargonic acid	Monsanto	Ready-To-Use Pro	Liquid Spray	X	
	Monsanto	Roundup Extended Control Ready-To-Use	Liquid Spray	X	X
	Monsanto	Roundup Weed and Grass Killer	Liquid Spray		X
Peppermint oil	EcoSmart	Organic Yard Protection Mosquito and Tick Control	Liquid Concentrate		X
	EcoSmart	Organic Insect Killer	Liquid Spray	X	
	EcoSmart	Organic Insecticide	Liquid Spray	X	
	EcoSmart	Organic Insecticide Indoor and Outdoor	Liquid Spray	X	
Permethrin	Raid	Flying Insect Indoor and Outdoor	Fogger	X	X
	Spectracide	Immunox Plus Insect and Disease Control	Fogger	X	X
	Raid	Yard Guard	Fogger		X
	Spectracide	Immunox Plus Insect and Disease Control	Liquid Concentrate		X
	Spectracide	Insect and Disease Control	Liquid Concentrate	X	X
	Ortho	Total Kill Lawn and Garden Insect Killer	Liquid Concentrate	X	X
	Terro	Terro Spider Killer	Liquid Spray		X
	Ortho	Total Kill Lawn and Garden Insect Killer	Liquid Spray	X	X

Active Ingredient	Product Manufacturer	Product Name	Product Type	Southern California	Northern California
Permethrin	Spectracide	Wasp and Hornet Killer	Liquid Spray		X
	Ortho	Ant-B-Gone Dust	Powder		X
	Bayer	Complete Insect Dust	Powder		X
Petroleum oil	Ortho	Volck Oil Spray Insect Killer	Liquid Concentrate	X	X
	Bonide	All Seasons Spray Oil	Liquid Spray	X	
Phenothrin	Corry's	Backyard Bug Control	Fogger	X	X
	Black Flag	Flying Insect Killer	Liquid Spray		X
	Ortho	Total Kill Wasp And Hornet Killer	Liquid Spray		X
Piperonyl butoxide	Black Flag	Fogging Insecticide	Fogger		X
	Green Light	Fruit Tree Spray	Liquid Concentrate	X	X
	Green Light	Neem	Liquid Concentrate	X	X
	GardenSafe	Insect Killer	Liquid Spray		X
	Terro	Terro Spider Killer	Liquid Spray		X
	Spectracide	Wasp and Hornet Killer	Liquid Spray		X
Potassium salts of fatty acids	Bayer	Advanced Moss and Algae Killer	Liquid Spray	X	X
	Ortho	Ecosense Insecticidal Soap	Liquid Spray	X	X
	Bayer	Natria Multi-Insect Control	Liquid Spray		X
Prallethrin	Spectracide	Termite Killing Foam	Fogger	X	X
	Hotshot	Hotshot Spider Killer	Liquid Spray		
	Hotshot	Roach and Ant Killer	Liquid Spray		X
	Spectracide	Spectracide Wasp and Hornet Killer	Liquid Spray		X
Prometon	Image	Vegetation Killer	Liquid Concentrate	X	
Propoxur	Ortho	Ant-B-Gone Bait	Bait Traps		X
Pyrethrins	Green Light	Fruit Tree Spray	Liquid Concentrate	X	X
	Bonide	Citrus Fruit and Nut Spray	Liquid Spray	X	X
	Ortho	Ecosense 3-in-1 Rose and Flower Care	Liquid Spray	X	X
	Ortho	Ecosense Outdoor Insect Killer	Liquid Spray	X	X
	GardenSafe	Insect Killer	Liquid Spray		X
	Bayer	Natria Insect, Disease, And Mite Control	Liquid Spray		X
	Terro	Terro Spider Killer	Liquid Spray		X
Quinclorac	Bayer	Advanced Lawn Weed and Crabgrass Killer	Liquid Concentrate	X	X
	Bayer	Lawn Weed and Crabgrass Killer	Liquid Concentrate		X
	Ortho	Weed-B-Gon Max Plus Crabgrass Killer	Liquid Concentrate	X	X

Active Ingredient	Product Manufacturer	Product Name	Product Type	Southern California	Northern California
Quinclorac	Spectracide	Weed Stop	Liquid Concentrate	X	
	Spectracide	Weed Stop Plus Crabgrass Killer	Liquid Concentrate	X	X
	Bayer	Advanced Lawn Weed and Crabgrass Killer	Liquid Spray	X	X
	Ortho	Weed-B-Gon Max Plus Crabgrass Killer	Liquid Spray	X	X
	Spectracide	Weed Stop Plus Crabgrass Killer	Liquid Spray	X	X
Rosemary oil	EcoSmart	Organic Yard Protection Mosquito and Tick Control	Liquid Concentrate		X
	EcoSmart	Organic Garden Fungicide	Liquid Spray	X	X
	EcoSmart	Organic Insect Killer	Liquid Spray	X	
	EcoSmart	Organic Insecticide	Liquid Spray	X	
	EcoSmart	Organic Insecticide Indoor and Outdoor	Liquid Spray	X	
Sesame oil	EcoSmart	Organic Yard Protection Mosquito and Tick Control	Liquid Concentrate		X
	Organic Laboratories	Organocide	Liquid Spray		X
Sodium lauryl sulfate	EcoSmart	Organic Yard Protection Mosquito and Tick Control	Liquid Concentrate		X
	Worryfree	Moss And Algae Control	Liquid Spray		X
	EcoSmart	Organic Garden Fungicide	Liquid Spray	X	X
	EcoSmart	Organic Insect Killer	Liquid Spray	X	
	EcoSmart	Organic Weed and Grass Killer	Liquid Spray	X	
Sodium tetraborate decahydrate	Terro	Terro Liquid Ant Baits	Bait Traps	X	X
Spinosad	Monterey	Garden Insect Spray	Liquid Spray	X	
Sulfentrazone	Spectracide	Weed Stop	Liquid Concentrate	X	
	Spectracide	Weed Stop Plus Crabgrass Killer	Liquid Concentrate	X	X
	Spectracide	Weed Stop Plus Crabgrass Killer	Liquid Spray	X	X
Sulfluramid	Spectracide	Termite Detection and Killing Stakes	Stakes	X	X
Sulfur	Bonide	Citrus Fruit and Nut Spray	Liquid Spray	X	X
	Ortho	Ecosense 3-in-1 Rose and Flower Care	Liquid Spray	X	X
	Bayer	Natria Insect, Disease, and Mite Control	Liquid Spray		X
Tebuconazole	Bayer	Insect Disease and Mite Control	Liquid Spray	X	X
	Bayer	Rose and Flower Care	Liquid Spray	X	X
Tetramethrin	Corry's	Backyard Bug Control	Fogger	X	X

Active Ingredient	Product Manufacturer	Product Name	Product Type	Southern California	Northern California
Tetramethrin	Raid	Flying Insect Indoor and Outdoor	Fogger	X	X
	Black Flag	Flying Insect Killer	Liquid Spray		X
	Ortho	Home Defense Max Wasp and Hornet Killer	Liquid Spray		X
Thiophanate-methyl	Scott's	Lawn Fungus Control	Granular	X	X
Thyme oil	EcoSmart	Organic Insect Killer	Granular	X	
	EcoSmart	Organic Yard Protection Mosquito and Tick Control	Liquid Concentrate		X
	EcoSmart	Organic Insect Killer	Liquid Spray	X	
	EcoSmart	Organic Insecticide	Liquid Spray	X	
	EcoSmart	Organic Insecticide Indoor and Outdoor	Liquid Spray	X	
Triclopyr, triethylamine salt	Ortho	Max Brush-B-Gon	Liquid Concentrate	X	
	Monsanto	Poison Ivy Tough	Liquid Concentrate	X	X
	Ortho	Max Brush-B-Gon	Liquid Spray	X	
	Monsanto	Poison Ivy Tough	Liquid Spray	X	X
Triforine	Ortho	Rose Pride Disease Control	Liquid Concentrate	X	X
Zinc phosphide	SureStop	Gopher Killer	Granular		X
	Tomcat	Mole and Gopher Bait	Granular		X
	Sweeney's	Moles and Gophers	Granular		X