

Herbicides Sold at Home Depot and Lowe's: A Toxicity Analysis

Introduction

Many herbicides that are widely available at home and garden stores are associated with a range of toxic impacts on human health and the environment, including harm to bees and other pollinators. To meet growing consumer demand for safer and more environmentally friendly products, home and garden stores must commit to phase out the most toxic products from their shelves and to increase the number of organic and safer alternatives that they offer.

This analysis of herbicide products offered by the two largest U.S. home and garden retailers, Home Depot and Lowe's, is meant to educate consumers and to encourage the companies to take action to protect people and pollinators by rejecting toxic products and expanding safer options.

Summary of findings	We urge Home Depot and Lowe's to:
The main ingredient in Roundup — glyphosate — is associated with increased risk of cancer, reproductive harm, neurotoxicity, and endocrine disruption. It is also toxic to birds, bees, aquatic organisms, and contaminates water resources.	End sales of all glyphosate-based herbicides.
Half of all herbicide products offered by Home Depot (24 of 51) and Lowe's (23 of 40) contain ingredients classified as Highly Hazardous Pesticides.*	Phase out herbicides containing highly hazardous ingredients.
29% of all herbicide products offered by Home Depot (15 of 51) and 17% offered by Lowe's (7 of 40) qualify as organic or least-toxic.	Expand organic and least-toxic options.

* See Pesticide Action Network [List of Highly Hazardous Pesticides](#)

Understanding organic and least-toxic products

Organic systems nurture soil biology to support the natural cycling of nutrients, resulting in resilient turf systems and plants. Because the use of toxic materials undermines the organic system by harming soil life, identifying compatible products is an essential component of the system.

The term "organic" is backed by a robust set of criteria governed by federal law under the National Organic Program at the United States Department of Agriculture (USDA). The list of herbicides and other pesticide products allowed in organic production is highly restricted to include only least-toxic ingredients derived primarily from natural (non-synthetic) sources.

A least-toxic pesticide is one that has low human and environmental health hazards. Many least-toxic pesticides are botanicals, essential oils, or are derived from plant or natural mineral sources.

OMRI Approved



Consumers seeking safer alternatives at home and garden stores can look for the Organic Materials Review Institute (OMRI) label. OMRI is an independent agency that reviews products against the federal organic standards, so consumers can trust that “OMRI-approved” means that a product is compatible with the National Organic Standards and is a safer alternative. However, not all products approved for organic production are listed with OMRI since the institute is not affiliated with the USDA.

Consumers won’t find the USDA Organic seal that’s familiar from grocery shopping at home and garden stores. “Certified Organic” applies only to products grown organically, it does not apply to products used in organic production. In other words, a carrot, a bag of potato chips, or cotton may be certified organic, but the potting soil or biological pesticide used in growing these products is not certified organic.

25(b) Exempt Products

This resource identifies least-toxic products that are 25(b) Exempt. This classification was created by the U.S. Environmental Protection Agency (EPA) to identify products that the EPA considers to be ‘minimal risk’ to human health. To achieve this classification, both the active and inert ingredients of a product need to be clearly identified on the label and must all meet the criteria for minimal risk. Consumers can trust that 25(b) Exempt products are safer options.

The challenge of inert ingredients

Under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), pesticide manufacturers are only required to list the active ingredients in an herbicide or other pesticide product. Therefore, neither conventional nor organic pesticides are required to reveal their inert ingredients on the product label. This creates a major challenge for assessing the toxicity of any product since inert ingredients can be more toxic than the active ingredients. And in some cases, inert ingredients can amplify the toxicity of the active ingredients. For example, research has shown that the inert ingredients in Roundup amplify the toxic effects of glyphosate on human cells. Unless the EPA publicly identifies an inert ingredient as posing a public health threat, consumers and applicators remain unaware of the possible toxicities present in the inert ingredients of herbicides and other pesticide products. There is a need for more transparency and research on inert ingredients in order to protect consumer health.

Conventional Herbicides

By Product

Retailer		Product Name	Active Ingredients	Human Health Effects									Animal & Environmental Effects			
Lowe's	Home Depot	Ingredient(s) classified as Highly Hazardous Pesticide(s)*		Birth/Developmental effects	Cancer	Endocrine Disruption	Kidney/Liver Effects	Neurotoxicity	Reproductive/Sexual Dysfunction	Skin, Eye, Mucosal Sensitizer/Irritant	Other	Toxic to Birds	Toxic to Bees and Other Beneficial Organisms	Toxic to Fish/Aquatic Organisms	Contamination (groundwater, drift, leaching)	
X	X		30 Seconds Spray and Walk Away Concentrate	Alkyl dimethyl benzyl ammonium chloride (ADBAC)	Possible ⁵⁷	Not Likely	Suggestive ^{58c}	Not Likely ⁶²	Possible ⁵⁹	Likely ⁵⁸	Yes ²⁹	Possible Immunotoxicity ⁵⁶	Yes ²⁹	Not Likely	Yes ²⁹	Not Likely
X	X		Bayer Advanced Brush Killer Plus	Triclopyr Triethylamine Salt	Yes ¹	Not Likely	Suggestive ⁶⁰	Yes ³	Not Likely	Yes ¹	Yes ²	Low ^{2,61}	Low ²	Yes ²	Yes ^{1,2}	
X	X	X	Bayer Advanced Lawn Weed Killer	2,4-D, dimethylamine salt	Yes ⁴	Yes ⁴	Probable ⁵	Yes ⁷	Yes ⁷	Yes ⁶	Yes ⁴	Yes ⁴	Yes ⁴	Yes ⁸	Yes ^{4,7,63}	
				Dicamba, dimethylamine salt	Yes ³	Suggestive ⁹	Potential ⁶⁵	Yes ¹⁰	Yes ¹¹	Yes ¹¹	Possible ¹⁰	Yes ¹²	Low to Moderate ^{10,66}	Low to Moderate ¹⁰	Yes ^{11,63,64}	
				Quinclorac	Low ^{13b}	Insufficiently Studied	Insufficiently Studied	Possible ⁷⁹	Possible ⁷⁹	Low ^{13b}	Yes ¹³	Low ⁷⁹	Low ⁷⁹	Yes ^{13a}	Yes ^{13a}	
X	X	X	Bayer Advanced Season Long Weed Control for Lawns	2,4-D, dimethylamine salt	Yes ⁴	Yes ⁴	Probable ⁵	Yes ⁷	Yes ⁷	Yes ⁶	Yes ⁴	Yes ⁴	Yes ⁴	Yes ⁸	Yes ^{4,7,63}	
				Dicamba, potassium salt	Yes ³	Suggestive ⁹	Potential ⁶⁵	Yes ¹⁰	Yes ¹¹	Yes ¹¹	Yes ¹⁰	Yes ¹²	Low to Moderate ^{10,66}	Yes ¹⁰	Yes ^{11,63,64}	
				Isoxaben	Possible ⁷⁰	Suggestive ¹⁴	Insufficiently Studied	Yes ¹⁵	Not Likely	Insufficiently Studied	Not Likely ⁷⁰	Yes ^{15 (cardiovascular)}	Yes ^{12a}	Low ⁷⁰	Moderate ⁷⁰	Yes ⁶⁸
				Mecoprop-p, potassium salt	Yes ¹⁶	Yes ¹⁴	Insufficiently Studied	Yes ¹⁶	Yes ¹⁶	Yes ¹⁷	Yes ¹⁶	Acute Toxicity ⁷¹	Yes ^{12b}	Insufficiently Studied	Yes ¹⁸	Yes ⁷¹
	X		Bonide Crabgrass and Weed Preventer	Dithiopyr	Not Likely	Not Likely	Yes ³⁰	Probable ⁷³	Insufficiently Studied	Not Likely	Possible Mild Irritant ⁷³	Suggestive Mammalian Toxicity ⁷³	Not Likely ⁷³	Yes ³¹	Yes ³⁰	Yes ⁷²
	X	X	Compare-N-Save 2, 4-D Broadleaf Weed Control	2,4-D, dimethylamine salt	Yes ⁴	Yes ⁴	Probable ⁵	Yes ⁷	Yes ⁷	Yes ⁶	Yes ⁴	Yes ⁴	Yes ⁴	Yes ⁸	Yes ^{4,7,63}	
	X	X	Compare-N-Save Weed Killer for Lawns	2,4-D, dimethylamine salt	Yes ⁴	Yes ⁴	Probable ⁵	Yes ⁷	Yes ⁷	Yes ⁶	Yes ⁴	Yes ⁴	Yes ⁴	Yes ⁸	Yes ^{4,7,23}	
				Dicamba, potassium salt	Yes ³	Suggestive ⁹	Potential ⁶⁵	Yes ¹⁰	Yes ¹¹	Yes ¹¹	Yes ¹⁰	Yes ¹²	Low to Moderate ^{10,66}	Yes ¹⁰	Yes ^{11,63,64}	
				Mecoprop-p, potassium salt	Yes ¹⁶	Yes ¹⁴	Insufficiently Studied	Yes ¹⁶	Yes ¹⁶	Yes ¹⁷	Yes ¹⁶	Acute Toxicity ⁷¹	Yes ^{12b}	Insufficiently Studied	Yes ¹⁸	Yes ⁷¹
	X	X	GreenView Broadleaf Weed Control	Dicamba, potassium salt	Yes ³	Suggestive ⁹	Potential ⁶⁵	Yes ¹⁰	Yes ¹¹	Yes ¹¹	Yes ¹⁰	Yes ¹²	Low to Moderate ^{10,66}	Yes ¹⁰	Yes ^{11,63,64}	
				Mecoprop-p, potassium salt	Yes ¹⁶	Yes ¹⁴	Insufficiently Studied	Yes ¹⁶	Yes ¹⁶	Yes ¹⁷	Yes ¹⁶	Acute Toxicity ⁷¹	Yes ^{12b}	Insufficiently Studied	Yes ¹⁸	Yes ⁷¹
				2,4-D, dimethylamine salt	Yes ⁴	Yes ⁴	Probable ⁵	Yes ⁷	Yes ⁷	Yes ⁶	Yes ⁴	Yes ⁴	Yes ⁴	Yes ⁴	Yes ⁸	Yes ^{4,7,63}
X	X		GreenView Fairway Formula with Crabgrass Preventer	Dithiopyr	Not Likely	Not Likely	Yes ³⁰	Probable ⁷³	Insufficiently Studied	Not Likely	Possible Mild Irritant ⁷³	Suggestive Mammalian Toxicity ⁷³	Not Likely ⁷³	Yes ³¹	Yes ³⁰	Yes ⁷²

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X	X	Ike's Lawn Weed Killer	Dicamba, potassium salt	Yes ³	Suggestive ⁹	Potential ⁶⁵	Yes ¹⁰	Yes ¹¹	Yes ¹¹	Yes ¹⁰		Yes ¹²	Low to Moderate ^{10,66}	Yes ¹⁰	Yes ^{11,63,64}	
			Mecoprop-p, potassium salt	Yes ¹⁶	Yes ¹⁴	Insufficiently Studied	Yes ¹⁶	Yes ¹⁶	Yes ¹⁷	Yes ¹⁶	Acute Toxicity ⁷¹	Yes ^{12b}	Insufficiently Studied	Yes ¹⁸	Yes ⁷¹	
			2,4-D, dimethylamine salt	Yes ⁴	Yes ⁴	Probable ⁵	Yes ⁷	Yes ⁷	Yes ⁶	Yes ⁴		Yes ⁴	Yes ⁴	Yes ⁸		
X	X	Ike's Sandbur and Crabgrass Preventer	Pendimethalin	Yes ⁹⁷	Possible ¹⁴	Yes ⁵¹	Yes ³	Insufficiently Studied	Yes ⁵²	Yes ⁵³	Bioaccumulation in Tissue ⁹⁷	Moderate ⁹⁷	Moderate ⁹⁷	Yes ^{52,54}	Yes ⁵²	
X	X	IMAGE All-in-One Lawn Weed Killer	Sulfentrazone	Yes ¹⁹	Not Likely ⁷⁶	Insufficiently Studied	Possible ⁷⁸	Possible ⁷⁶	Yes ¹⁹	Yes ¹⁹	Possible Hematotoxicity ⁷⁶	Not Likely ⁷⁸	Moderate ⁷⁸	Yes ¹⁹	Yes ⁷⁸	
			Quinclorac	Low ^{13b}	Insufficiently Studied	Insufficiently Studied	Possible ⁷⁹	Possible ⁷⁹	Low ^{13b}	Yes ¹³		Low ⁷⁹	Low ⁷⁹	Yes ^{13a}	Yes ^{13a}	
X	X	IMAGE Nutsedge Killer	Ammonium salt of Imazaquin	Possible ⁸⁰	Suggestive ⁸¹	Suggestive Thyroid Stimulating ²⁰	Not Likely	Possible ⁸²	Possible ⁸⁰	Possible Skin Sensitizer ⁸⁰		Low to Moderate ⁸⁰	Low to Moderate ⁸⁰	Low ⁸⁰	Not Likely	
	X	LESCO Dimension Crabgrass Preventer	Dithiopyr	Not Likely	Not Likely	Yes ³⁰	Probable ⁷³	Insufficiently Studied	Not Likely	Possible Mild Irritant ⁷³	Suggestive Mammalian Toxicity ⁷³	Not Likely ⁷³	Yes ³¹	Yes ³⁰	Yes ⁷²	
X	X	LESCO Weed and Feed Professional	2,4-D, dimethylamine salt	Yes ⁴	Yes ⁴	Probable ⁵	Yes ⁷	Yes ⁷	Yes ⁶	Yes ⁴		Yes ⁴	Yes ⁴	Yes ⁸		
			Mecoprop-p, potassium salt	Yes ¹⁶	Yes ¹⁴	Insufficiently Studied	Yes ¹⁶	Yes ¹⁶	Yes ¹⁷	Yes ¹⁶	Acute Toxicity ⁷¹	Yes ^{12b}	Insufficiently Studied	Yes ¹⁸	Yes ⁷¹	
			Dichlorprop-p	Yes ³	Suggestive ⁸⁴	Insufficiently Studied	Possible ⁸³	Not Likely	Yes ⁸³	Yes ⁴⁰	Suggestive Moderate Mammalian Toxicity ⁸³ Possible Hematotoxicity ⁸³	Moderate ⁴⁰	Low ⁸³	Low ⁸³	Moderate ⁸³	
X	X	Lilly Miller Moss Out! Lawn Granules	Ferrous Sulfate Monohydrate	Possible ^{85,86}	Suggestive ⁸⁵ Insufficiently Studied ⁸⁶	Insufficiently Studied	Possible ⁸⁶	Insufficiently Studied	Possible ⁸⁵	Eye Irritant ^{85,86}	Possible Mammalian Toxicity ¹¹² Environmental Persistent ¹¹²	Low ⁸⁷	Insufficiently Studied	Low to Moderate ⁸⁷	Not Likely	
X	X	X	Miracle Gro Garden Weed Preventer	Trifluralin	Possible ^{89,90}	Likely ⁵³	Probable ^{5,46}	Insufficiently Studied	Yes ⁴⁷	Yes ⁴⁸	Yes ⁴⁸	Possible Hematotoxicity ⁸⁹	Low to Moderate ⁸⁹	Low (Bees)/ Moderate (Earthworms) ⁸⁹	Yes ⁴⁸	Yes ⁸⁸
	X	X	Monterey Remuda Concentrated Herbicide	Glyphosate, isopropylamine salt	Yes ²¹	Yes ²²	Yes ²³	Yes ²³	Yes ²⁴	Yes ²⁵	Yes ^{25a}		Yes ²⁷	Yes ²⁸	Yes ²⁶	Yes ⁷¹
X	X	Natria Natural Weed and Grass Killer	Ammoniated soap of fatty acids	Insufficiently Studied	Not Likely	Not Likely	Insufficiently Studied	Not Likely	Possible (at high doses) ⁵⁵	Mild ⁵⁵	Possible Mutagenicity (at high doses) ⁵⁵	Low ⁹³	Moderate ⁹³	Yes ⁵⁵	Not Likely	
			Maleic Hydrazide	Not Likely	Insufficiently Studied	Insufficiently Studied	Potential ⁹²	Yes ⁹²	Not Likely	Not a Sensitizer ⁴¹ Skin, Eye, Respiratory Irritant ⁹²	Possible Mutagenicity (genetic mutation) ⁹²	Low ⁹²	Low ⁹²	Yes ⁴²	Not Likely	

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X	X	X	Ortho Weed B-Gon	2,4-D Dimethylamine Salt	Yes ⁴	Yes ⁴	Probable ⁵	Yes ⁷	Yes ⁷	Yes ⁶	Yes ⁴		Yes ⁴	Yes ⁴	Yes ⁸	Yes ^{4,7,63}
				Dicamba Dimethylamine Salt	Yes ³	Suggestive ⁹	Potential ⁶⁵	Yes ¹⁰	Yes ¹¹	Yes ¹¹	Yes ¹⁰		Yes ¹²	Low to Moderate ^{10,66}	Yes ¹⁰	Yes ^{11,63,64}
				Quinclorac	Low ^{13b}	Insufficiently Studied	Insufficiently Studied	Possible ⁷⁹	Possible ⁷⁹	Low ^{13b}	Yes ¹³		Low ⁷⁹	Low ⁷⁹	Yes ^{13a}	Yes ^{13a}
X	X	X	Pennington UltraGreen Crabgrass Preventer	2,4-D, dimethylamine salt	Yes ⁴	Yes ⁴	Probable ⁵	Yes ⁷	Yes ⁷	Yes ⁶	Yes ⁴		Yes ⁴	Yes ⁴	Yes ⁸	Yes ^{4,7,63}
				Dicamba, potassium salt	Yes ³	Suggestive ⁹	Potential ⁶⁵	Yes ¹⁰	Yes ¹¹	Yes ¹¹	Possible ¹⁰		Yes ¹²	Low to Moderate ^{10,66}	Low to Moderate ¹⁰	Yes ^{11,63,64}
				Mecoprop-p, potassium salt	Yes ¹⁶	Yes ¹⁴	Insufficiently Studied	Yes ¹⁶	Yes ¹⁶	Yes ¹⁷	Yes ¹⁶	Acute Toxicity ⁷¹	Yes ^{12b}	Insufficiently Studied	Yes ¹⁸	Yes ⁷¹
X	X		Pennington Weed and Feed Fertilizer	Prodiamine	Yes ⁴⁹	Probable ⁴³	Suggestive ^{43,50}	Possible ⁴⁹	Yes ⁴³	Possible ⁴⁹	Skin/Eye Irritant, Possible Respiratory Irritant ⁹⁴	Possible Thyroid Toxicity ⁹⁴	Low ⁹⁴	Low ⁹⁴	Moderate ⁹⁴	Not Likely
X	X	X	Preen Extended Control	Trifluralin	Possible ^{89,90}	Likely ⁵³	Probable ^{5,46}	Insufficiently Studied	Yes ⁴⁷	Yes ⁴⁸	Yes ⁴⁸	Possible Hematotoxicity ⁸⁹	Low to Moderate ⁸⁹	Low (Bees)/ Moderate (Earthworms) ⁸⁹	Yes ⁴⁸	Yes ⁸⁸
				Isoxaben	Possible ⁷⁰	Suggestive ¹⁴	Insufficiently Studied	Yes ¹⁵	Not Likely	Insufficiently Studied	Not Likely ⁷⁰	Yes ¹⁵ (cardiovascular)	Yes ^{12a}	Low ⁷⁰	Moderate ⁷⁰	Yes ⁴⁸
X	X	X	Preen Lawn Weed Control	2,4-D, dimethylamine salt	Yes ⁴	Yes ⁴	Probable ⁵	Yes ⁷	Yes ⁷	Yes ⁶	Yes ⁴		Yes ⁴	Yes ⁴	Yes ⁸	Yes ^{4,7,63}
				Dicamba, potassium salt	Yes ³	Suggestive ⁹	Potential ⁶⁵	Yes ¹⁰	Yes ¹¹	Yes ¹¹	Possible ¹⁰		Yes ¹²	Low to Moderate ^{10,66}	Low to Moderate ¹⁰	Yes ^{11,63,64}
X	X	X	Preen Weed Preventer	Trifluralin	Possible ^{89,90}	Likely ⁵³	Probable ^{5,46}	Insufficiently Studied	Yes ⁴⁷	Yes ⁴⁸	Yes ⁴⁸	Possible Hematotoxicity ⁸⁹	Low to Moderate ⁸⁹	Low (Bees)/ Moderate (Earthworms) ⁸⁹	Yes ⁴⁸	Yes ⁸⁸
	X		Pulverize Weed, Brush, and Vine Killer	Ammoniated soap of fatty acids	Insufficiently Studied	Not Likely	Not Likely	Insufficiently Studied	Not Likely	Possible (at high doses) ⁵⁵	Mild ⁵⁵	Possible Mutagenicity (at high doses) ⁵⁵	Low ⁹³	Moderate ⁹³	Yes ⁵⁵	Not Likely
				Maleic Hydrazide	Not Likely	Insufficiently Studied	Insufficiently Studied	Potential ⁹²	Yes ⁹²	Not Likely	Not a Sensitizer ⁴¹ Skin, Eye, Respiratory Irritant ⁹²	Possible Mutagenicity (genetic mutation) ⁹²	Low ⁹²	Low ⁹²	Yes ⁴²	Not Likely for Parent (Very High Drift Potential for Breakdown Product) ⁴²
	X	X	RM43 Total Vegetation Control, Weed Killer and Preventer	Glyphosate, isopropylamine salt	Yes ²¹	Yes ²²	Yes ²³	Yes ²³	Yes ²⁴	Yes ²⁵	Yes ^{25a}		Yes ²⁷	Yes ²⁸	Yes ²⁶	Yes ⁹¹
				Imazapyr, isopropylamine salt	Not Likely	Suggestive ⁹⁶	Insufficiently Studied	Suggestive ⁹⁶	Not Likely	Insufficiently Studied	Yes ³²	Highly Toxic ⁹⁵	Low ⁹⁵	Yes ³³	Yes ³³	Possible ⁹⁵
X	X	X	Roundup Weed and Grass Killer	Glyphosate, isopropylamine salt	Yes ²¹	Yes ²²	Yes ²³	Yes ²³	Yes ²⁴	Yes ²⁵	Yes ^{25a}		Yes ²⁷	Yes ²⁸	Yes ²⁶	Yes ⁹¹
				Pelargonic acid	Possible ¹¹³	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Skin and Eye Irritant ¹⁰⁶		Insufficiently Studied	Moderate ¹⁰⁶	Moderate to High ¹⁰³	Insufficiently Studied

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X	X	X	Roundup Extended Control Weed and Grass Killer	Glyphosate, isopropylamine salt	Yes ²¹	Yes ²²	Yes ²³	Yes ²³	Yes ²⁴	Yes ²⁵	Yes ^{25a}		Yes ²⁷	Yes ²⁸	Yes ²⁶	Yes ²¹
				Pelargonic acid	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Skin and Eye Irritant ¹⁰⁶		Insufficiently Studied	Moderate ¹⁰⁶	Moderate to High ¹⁰³	Insufficiently Studied
				Imazapic, ammonium salt	Possible ¹¹⁵	Not Likely	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Possible ¹¹⁵	Yes (Irritant) ¹¹⁴	Possible Chronic Toxicity to Muscles ¹¹⁵	Low ¹¹⁴	Low ¹¹⁴	Moderate ¹¹⁴	Yes ¹¹⁴
X	X		Roundup for Lawns	MCPA, dimethylamine salt	Possible ¹¹⁹	Possible ¹¹⁶	Insufficiently Studied	Yes ¹¹⁷	Yes ¹¹⁸	Yes ¹¹⁷	Yes ¹¹⁸	Highly Toxic ¹²¹ Possible Hypotension ¹²¹	Moderate to High ¹¹⁸	Moderate ^{12a}	Moderate ¹²¹	Yes ^{117,120}
				Quinclorac	Low ^{13b}	Insufficiently Studied	Insufficiently Studied	Possible ⁷⁹	Possible ⁷⁹	Low ^{13b}	Yes ^{13a}		Low ⁷⁹	Low ⁷⁹	Yes ^{13a}	Yes ^{13a}
				Dicamba, dimethylamine salt	Yes ³	Suggestive ⁹	Potential ⁶⁵	Yes ¹⁰	Yes ¹¹	Yes ¹¹	Yes ¹⁰		Yes ¹²	Low to Moderate ^{10,66}	Yes ¹⁰	Yes ^{11,63,64}
				Sulfentrazone	Yes ¹⁹	Not Likely ⁷⁶	Insufficiently Studied	Possible ⁷⁸	Possible ⁷⁶	Yes ¹⁹	Yes ¹⁹	Possible Hematotoxicity ⁷⁶	Not Likely ⁷⁸	Moderate ⁷⁸	Yes ¹⁹	Yes ⁷⁸
X	X	X	Roundup 365 Max Control	Glyphosate, isopropylamine salt	Yes ²¹	Yes ²²	Yes ²³	Yes ²³	Yes ²⁴	Yes ²⁵	Yes ^{25a}		Yes ²⁷	Yes ²⁸	Yes ²⁶	Yes ²¹
				Imazapic, ammonium salt	Possible ¹¹⁵	Not Likely	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Possible ¹¹⁵	Yes (Irritant) ¹¹⁴	Possible Chronic Toxicity to Muscles ¹¹⁵	Low ¹¹⁴	Low ¹¹⁴	Moderate ¹¹⁴	Yes ¹¹⁴
				Diquat Dibromide	Possible ⁹⁹	Not Likely	Insufficiently Studied	Yes ³⁴	Not Likely	Yes ³⁵	Yes ³⁶	Stomach/Intestine Toxicity ⁹⁸ Fatal if Inhaled ⁹⁸	Yes ³⁴	Moderate ⁹⁸	Yes ³⁶	Insufficiently Studied
X	X	X	Roundup Weed Preventer	Pendimethalin	Yes ⁹⁷	Possible ¹⁴	Yes ⁵¹	Yes ³	Insufficiently Studied	Yes ⁵²	Yes ⁵³	Bioaccumulation in Tissue ⁹⁷	Moderate ⁹⁷	Moderate ⁹⁷	Yes ^{52,54}	Yes ⁵²
X	X	X	Scotts Halts Crabgrass and Grassy Weed Preventer	Pendimethalin	Yes ⁹⁷	Possible ¹⁴	Yes ⁵¹	Yes ³	Insufficiently Studied	Yes ⁵²	Yes ⁵³	Bioaccumulation in Tissue ⁹⁷	Moderate ⁹⁷	Moderate ⁹⁷	Yes ^{52,54}	Yes ⁵²
X	X	X	Scotts Turf Builder Weed and Feed Lawn Fertilizer	2,4-D, dimethylamine salt	Yes ⁴	Yes ⁴	Probable ⁵	Yes ⁷	Yes ⁷	Yes ⁶	Yes ⁴		Yes ⁴	Yes ⁴	Yes ⁸	Yes ^{4,7,63}
				Mecoprop-p, potassium salt	Yes ¹⁶	Yes ¹⁴	Insufficiently Studied	Yes ¹⁶	Yes ¹⁶	Yes ¹⁷	Yes ¹⁶	Acute Toxicity ⁷¹	Yes ^{12b}	Insufficiently Studied	Yes ¹⁸	Yes ¹
X		X	Scotts WeedEx	Pendimethalin	Yes ⁹⁷	Possible ¹⁴	Yes ⁵¹	Yes ³	Insufficiently Studied	Yes ⁵²	Yes ⁵³	Bioaccumulation in Tissue ⁹⁷	Moderate ⁹⁷	Moderate ⁹⁷	Yes ^{52,54}	Yes ⁵²
X	X	X	Spectracide Weed Stop for Lawns	2,4-D, dimethylamine salt	Yes ⁴	Yes ⁴	Probable ⁵	Yes ⁷	Yes ⁷	Yes ⁶	Yes ⁴		Yes ⁴	Yes ⁴	Yes ⁸	Yes ^{4,7,63}
				Dicamba, dimethylamine salt	Yes ³	Suggestive ⁹	Potential ⁶⁵	Yes ¹⁰	Yes ¹¹	Yes ¹¹	Yes ¹⁰		Yes ¹²	Low to Moderate ^{10,66}	Yes ¹⁰	Yes ^{11,63,64}
				Sulfentrazone	Yes ¹⁹	Not Likely	Insufficiently Studied	Possible ⁷⁸	Possible ⁷⁶	Yes ¹⁹	Yes ¹⁹	Possible Hematotoxicity ⁷⁶	Not Likely ⁷⁸	Moderate ⁷⁸	Yes ¹⁹	Yes ⁷⁸
				Quinclorac	Low ^{13b}	Insufficiently Studied	Insufficiently Studied	Possible ⁷⁹	Possible ⁷⁹	Low ^{13b}	Yes ¹³		Low ⁷⁹	Low ⁷⁹	Yes ^{13a}	Yes ^{13a}

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X	X	X	Spectracide Weed and Grass Killer	Dicamba, dimethylamine salt	Yes ³	Suggestive ⁹	Potential ⁶⁵	Yes ¹⁰	Yes ¹¹	Yes ¹¹	Possible ¹⁰		Yes ¹²	Low to Moderate ^{10,66}	Low to Moderate ¹⁰	Yes ^{11,63,64}
				Diquat Dibromide	Possible ⁹⁹	Not Likely	Insufficiently Studied	Yes ³⁴	Not Likely	Yes ³⁵	Yes ³⁶	Stomach/Intestine Toxicity ⁹⁸ Fatal if Inhaled ⁹⁸	Yes ³⁴	Moderate ⁹⁸	Yes ³⁶	Insufficiently Studied
				Fluazifop-p-butyl	Possible ³⁷	Insufficiently Studied	Insufficiently Studied	Yes ³⁷	Insufficiently Studied	Possible ³⁷	No ³⁷	Probable Spleen Toxicity ¹⁰⁰ May Cause Possible Cataracts ¹⁰⁰	Moderate ¹⁰⁰	Low ¹⁰⁰	Yes ³⁷	Low ¹⁰⁰
X	X	X	Spectracide Weed and Grass Killer - Extended Control	Dicamba, dimethylamine salt	Yes ³	Suggestive ⁹	Potential ⁶⁵	Yes ¹⁰	Yes ¹¹	Yes ¹¹	Yes ¹⁰		Yes ¹²	Low to Moderate ^{10,66}	Yes ¹⁰	Yes ^{11,63,64}
				Diquat Dibromide	Possible ⁹⁹	Not Likely	Insufficiently Studied	Yes ³⁴	Not Likely	Yes ³⁵	Yes ³⁶	Stomach/Intestine Toxicity ⁹⁸ Fatal if Inhaled ⁹⁸	Yes ³⁴	Moderate ⁹⁸	Yes ³⁶	Insufficiently Studied
				Fluazifop-p-butyl	Possible ³⁷	Insufficiently Studied	Insufficiently Studied	Possible ³⁷	Insufficiently Studied	Yes ³⁷	No ³⁷	Probable Spleen Toxicity ¹⁰⁰ May Cause Cataracts ¹⁰⁰	Moderate ¹⁰⁰	Low ¹⁰⁰	Yes ³⁷	Low ¹⁰⁰
				Oxyfluorfen	Yes ³⁸	Possible ³⁹	Insufficiently Studied	Yes ³⁸	Not Likely	Yes ³⁸	Yes ³⁸	Possible Spleen Toxicity ¹⁰¹	Moderate ¹⁰¹	Low ¹⁰¹	Yes ³⁸	Insufficiently Studied
X		X	Sta-Green Crab-Ex	Trifluralin	Possible ^{89,90}	Likely ⁵³	Probable ^{5,46}	Insufficiently Studied	Yes ⁴⁷	Yes ⁴⁸	Yes ⁴⁸	Possible Hematotoxicity ⁸⁹	Low to Moderate ⁸⁹	Low (Bees)/Moderate (Earthworms) ⁸⁹	Yes ⁴⁸	Yes ⁸⁸
X		X	Sta-Green Weed and Feed	2,4-D, dimethylamine salt	Yes ⁴	Yes ⁴	Probable ⁵	Yes ⁷	Yes ⁷	Yes ⁶	Yes ⁴		Yes ⁴	Yes ⁴	Yes ⁸	Yes ^{4,7,63}
				Mecoprop-p, potassium salt	Yes ¹⁶	Yes ¹⁴	Insufficiently Studied	Yes ¹⁶	Yes ¹⁶	Yes ¹⁷	Yes ¹⁶	Acute Toxicity ⁷¹	Yes ^{12b}	Insufficiently Studied	Yes ¹⁸	Yes ⁷¹
				Dicamba	Yes ³	Suggestive ⁹	Potential ⁶⁵	Yes ¹⁰	Yes ¹¹	Yes ¹¹	Possible ¹⁰		Yes ¹²	Low to Moderate ^{10,66}	Low to Moderate ¹⁰	Yes ^{11,63,64}
X			TurfGro Preemergent Crabgrass Control	Dithiopyr	Not Likely	Not Likely	Yes ³⁰	Probable ⁷³	Insufficiently Studied	Not Likely	Possible Mild Irritant ⁷³	Suggestive Mammalian Toxicity ⁷³	Not Likely ⁷³	Yes ³¹	Yes ³⁰	Yes ⁷²
	X	X	Vigoro All Season Weed and Feed Lawn Fertilizer	2,4-D, dimethylamine salt	Yes ⁴	Yes ⁴	Probable ⁵	Yes ⁷	Yes ⁷	Yes ⁶	Yes ⁴		Yes ⁴	Yes ⁴	Yes ⁸	Yes ^{4,7,63}
				Mecoprop-p, potassium salt	Yes ¹⁶	Yes ¹⁴	Insufficiently Studied	Yes ¹⁶	Yes ¹⁶	Yes ¹⁷	Yes ¹⁶	Acute Toxicity ⁷¹	Yes ^{12b}	Insufficiently Studied	Yes ¹⁸	Yes ⁷¹

* See Pesticide Action Network [List of Highly Hazardous Pesticides](#)

Analysis by Akayla Bracey and Beyond Pesticides Gateway on Pesticide Hazards



Conventional Herbicides

By Active Ingredient

Active Ingredients		Human Health Effects								Animal & Environmental Effects			
	Classified as a Highly Hazardous Pesticide*	Birth/ Developmental Abnormalities	Cancer	Endocrine Disruption	Kidney/Liver Damage	Neurotoxicity	Reproductive/ Sexual Dysfunction	Skin, Eye, Mucosal Sensitizer/Irritant	Other	Toxic to Birds	Toxic to Bees and Other Beneficials	Toxic to Fish/ Aquatic Organisms	Contamination (groundwater, drift, leaching)
2,4-D, dimethylamine salt	X	Yes ⁴	Yes ⁴	Probable ⁵	Yes ⁷	Yes ⁷	Yes ⁶	Yes ⁴		Yes ⁴	Yes ⁴	Yes ⁸	Yes ^{4,7,63}
Alkyl dimethyl benzyl ammonium chloride (ADBAC)		Possible ⁵⁷	Not Likely	Suggestive ^{58c}	Not Likely ⁶²	Possible ⁵⁹	Likely ⁵⁸	Yes ²⁹	Possible Immunotoxicity ⁵⁶	Yes ²⁹	Not Likely	Yes ²⁹	Not Likely
Ammonium salt of imazaquin		Possible ⁸⁰	Suggestive ⁸¹	Suggestive (Thyroid Stimulating) ²⁰	Not Likely	Possible ⁸²	Possible ⁸⁰	Possible Skin Sensitizer ⁸⁰		Low to Moderate ⁸⁰	Low to Moderate ⁸⁰	Low ⁸⁰	Not Likely
Dicamba, dimethylamine salt		Yes ³	Suggestive ⁹	Potential ⁶⁵	Yes ¹⁰	Yes ¹¹	Yes ¹¹	Yes ¹⁰		Yes ¹²	Low to Moderate ^{10,66}	Yes ¹⁰	Yes ^{11,63,64}
Dichlorprop-p	X	Yes ³	Suggestive ⁸⁴	Insufficiently Studied	Possible ⁸³	Not Likely	Yes ⁸³	Yes ⁴⁰	Suggestive Moderate Mammalian Toxicity ⁸³ Possible Hemotoxicity ⁸³	Moderate ⁴⁰	Low ⁸³	Low ⁸³	Moderate ⁸³
Diquat Dibromide	X	Possible ⁹⁹	Not Likely	Insufficiently Studied	Yes ³⁴	Not Likely	Yes ³⁵	Yes ³⁶	Stomach/Intestine Toxicity ⁹⁸ Fatal if Inhaled ⁹⁸	Yes ³⁴	Moderate ⁹⁸	Yes ³⁶	Insufficiently Studied
Dithiopyr		Not Likely	Not Likely	Yes ³⁰	Probable ⁷³	Insufficiently Studied	Not Likely	Possible Mild Irritant ⁷³	Suggestive Mammalian Toxicity ⁷³	Not Likely ⁷³	Yes ³¹	Yes ³⁰	Yes ⁷²
Ferric (Iron) HEDTA		Low ⁷⁴	Insufficiently Studied	Not Likely ⁷⁴	Insufficiently Studied	Not Likely ⁷⁴	Possible ⁷⁴	Not a Sensitizer/ Severe Eye Irritant ⁷⁴	Low Mutagenic Potential ⁷⁴	Not Likely ⁷⁴	Moderate (worms) ⁷⁴	Yes (aquatic organisms) ⁴⁴	Insufficiently Studied
Ferrous Sulfate Monohydrate		Possible ^{85,86}	Suggestive ⁸⁵ Insufficiently Studied ⁸⁶	Insufficiently Studied	Possible ⁸⁶	Insufficiently Studied	Possible ⁸⁵	Eye Irritant ^{85,86}		Low ⁸⁷	Insufficiently Studied	Low to Moderate ⁸⁷	Not Likely
Fluazifop-p-butyl	X	Possible ³⁷	Insufficiently Studied	Insufficiently Studied	Yes ³⁷	Insufficiently Studied	Possible ³⁷	No ³⁷	Probable Spleen Toxicity ¹⁰⁰ Possible Cataracts ¹⁰⁰	Moderate ¹⁰⁰	Low ¹⁰⁰	Yes ³⁷	Low ¹⁰⁰
Glyphosate in the form of its isopropylamine salt	X	Yes ²¹	Yes ²²	Yes ²³	Yes ²³	Yes ²⁴	Yes ²⁵	Yes ^{25a}		Yes ²⁷	Yes ²⁸	Yes ²⁶	Yes ⁹¹
Imazapic, ammonium salt		Possible ¹¹⁵	Not Likely	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Yes (Irritant) ¹¹⁴	Possible Chronic Toxicity to Muscles ¹¹⁵		Low ¹¹⁴	Low ¹¹⁴	Moderate ¹¹⁴	Yes ¹¹⁴
Imazapyr, isopropylamine salt		Not Likely	Suggestive ⁹⁶	Insufficiently Studied	Suggestive ⁹⁶	Not Likely	Insufficiently Studied	Yes ³²	High Acute Toxicity ⁹⁵	Low ⁹⁵	Yes ³³	Yes ³³	Possible ⁹⁵
Isoxaben		Possible ⁷⁰	Suggestive ¹⁴	Insufficiently Studied	Yes ¹⁵	Not Likely	Insufficiently Studied	Not Likely ⁷⁰	Yes ¹⁵ (cardiovascular)	Yes ^{12a}	Low ⁷⁰	Moderate ⁷⁰	Yes ⁶⁸
Maleic Hydrazide		Not Likely	Insufficiently Studied	Insufficiently Studied	Potential ⁹²	Yes ⁹²	Not Likely	Not a Sensitizer ⁴¹ Skin, Eye, Respiratory Irritant ⁹²	Possible Mutagenicity (genetic mutation) ⁹²	Low ⁹²	Low ⁹²	Yes ⁴²	Breakdown Product Drift Prone ⁴²
MCPA, dimethylamine salt		Possible ¹¹⁹	Possible ¹¹⁶	Insufficiently Studied	Yes ¹¹⁷	Yes ¹¹⁸	Yes ¹¹⁷	Yes ¹¹⁸	Highly Toxic ¹²¹ Possible Hypotension ¹²¹	Moderate to High ¹¹⁸	Moderate ^{12a}	Moderate ¹²¹	Yes ^{117,120}

Analysis by Akayla Bracey and Beyond Pesticides Gateway on Pesticide Hazards



Mecoprop-p, potassium salt	X	Yes ¹⁶	Yes ¹⁴	Insufficiently Studied	Yes ¹⁶	Yes ¹⁶	Yes ¹⁷	Yes ¹⁶	Acute Toxicity ⁷¹	Yes ^{12b}	Insufficiently Studied	Yes ¹⁸	Yes ⁷¹
Oxyfluorfen	X	Yes ³⁸	Possible ³⁹	Insufficiently Studied	Yes ³⁸	Not Likely	Yes ³⁸	Yes ³⁸	Possible Spleen Toxicity ¹⁰¹	Moderate ¹⁰¹	Low ¹⁰¹	Yes ³⁸	Insufficiently Studied
Pendimethalin	X	Yes ⁹⁷	Possible ¹⁴	Yes ⁵¹	Yes ³	Insufficiently Studied	Yes ⁵²	Yes ⁵³	Bioaccumulation in Tissue ⁹⁷	Moderate ⁹⁷	Moderate ⁹⁷	Yes ^{52,54}	Yes ⁵²
Prodiamine		Yes ⁴⁹	Probable ⁴³	Suggestive ^{43,50}	Possible ⁹⁴	Yes ⁴³	Possible ⁴⁹	Skin/Eye Irritant ⁹⁴ Possible Respiratory Irritant ⁹⁴	Possible Thyroid Toxicity ⁹⁴	Low ⁹⁴	Low ⁹⁴	Moderate ⁹⁴	Not Likely
Quinclorac		Low ^{13b}	Insufficiently Studied	Insufficiently Studied	Possible ⁷⁹	Possible ⁷⁹	Low ^{13b}	Yes ^{13a}		Low ⁷⁹	Low ⁷⁹	Yes ^{13a}	Yes ^{13a}
Sulfentrazone		Yes ¹⁹	Not Likely ⁷⁶	Insufficiently Studied	Possible ⁷⁸	Possible ⁷⁶	Yes ¹⁹	Yes ¹⁹	Possible Hematotoxicity ⁷⁶	Not Likely ⁷⁸	Moderate ⁷⁸	Yes ¹⁹	Yes ⁷⁸
Triclopyr Triethylamine Salt		Yes ¹	Not Likely	Suggestive ⁶⁰	Yes ³	Not Likely	Yes ¹	Yes ²		Low ^{2,61}	Low ²	Yes ²	Yes ^{1,2}
Trifluralin	X	Possible ^{89,90}	Likely ⁵³	Probable ^{5,46}	Insufficiently Studied	Yes ⁴⁷	Yes ⁴⁸	Yes ⁴⁸	Possible Hematotoxicity ⁸⁹	Low to Moderate ⁸⁹	Low (Bees)/ Moderate (Earthworms) ⁸⁹	Yes ⁴⁸	Yes ⁸⁸

* See Pesticide Action Network [List of Highly Hazardous Pesticides](#)

Analysis by Akayla Bracey and Beyond Pesticides Gateway on Pesticide Hazards

Organic and Least-Toxic Herbicides

By Product

Retailer		OMRI Approved or EPA 25(b) Exempt**	Product Name	Active Ingredients	Human Health Effects								Animal & Environmental Effects			
Lowes	Home Depot				Birth/Developmental Abnormalities	Cancer	Endocrine Disruption	Kidney/Liver Damage	Neurotoxicity	Reproductive/Sexual Dysfunction	Skin, Eye, Mucosal Sensitizer/Irritant	Other	Toxic to Birds	Toxic to Bees and Other Beneficials	Toxic to Fish/Aquatic Organisms	Contamination (groundwater, drift, leaching)
X	X	OMRI	Avengers Weed Killer	d-Limonene	Possible ¹⁰⁴	Not Likely	Not Likely	Insufficiently Studied	Insufficiently Studied	Possible ¹⁰⁴	Yes ¹⁰⁴		Insufficiently Studied	Low (Bees) ¹⁰⁴ Moderate (Earthworms) ¹⁰⁴	Moderate ¹⁰⁴	Not Likely
X	X	OMRI	Bonide BurnOut Weed and Grass Killer	Caprylic Acid	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied		Non-Toxic	Non-Toxic	Non-Toxic	Insufficiently Studied
				Capric Acid	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied		Insufficiently Studied	Insufficiently Studied
	X	OMRI	Bonide Deadweed Brew	Caprylic Acid	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied		Non-Toxic	Non-Toxic	Non-Toxic	Insufficiently Studied
				Capric Acid	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied		Insufficiently Studied	Insufficiently Studied
	X		Bonide LawnWeed Brew	Ferric (Iron) HEDTA	Low ⁷⁴	Insufficiently Studied	Not Likely ⁷⁴	Insufficiently Studied	Not Likely ⁷⁴	Possible ⁷⁴	Severe Eye Irritant/Not a Sensitizer ⁷⁴	Low Mutagenic Potential ⁷⁴	Not Likely ⁷⁴	Moderate (worms) ⁷⁴	Yes (aquatic organisms) ⁴⁴	Insufficiently Studied
	X		Bonide Weed Beater FE	Ferric (Iron) HEDTA	Low ⁷⁴	Insufficiently Studied	Not Likely ⁷⁴	Insufficiently Studied	Not Likely ⁷⁴	Possible ⁷⁴	Severe Eye Irritant/Not a Sensitizer ⁷⁴	Low Mutagenic Potential ⁷⁴	Not Likely ⁷⁴	Moderate (worms) ⁷⁴	Yes (aquatic organisms) ⁴⁴	Insufficiently Studied
	X	EPA 25(b)	Concern All Natural Weed Prevention Plus	Corn Gluten Meal	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely		Non-Toxic	Non-Toxic	Non-Toxic	Insufficiently Studied
	X	EPA 25(b)	Dr. Earth's Final Stop Weed and Grass Killer	Rosemary Oil	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Possible Irritant ¹⁰⁷	May cause headaches and nausea ¹⁰⁷	Low ¹⁰⁷	Low ¹⁰⁷	Low ¹⁰⁷	Insufficiently Studied
				Cinnamon Oil	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Yes ¹⁰⁹	Mutagenic Potential (Genotoxic) ¹⁰⁹ Toxic in Large Doses ¹⁰⁹ Possible Gastrointestinal Inflammation ¹⁰⁹	Low ¹⁰⁹	Low ¹⁰⁹	Low ¹⁰⁹	Low ¹⁰⁹
				Clove Oil	Insufficiently Studied	Not Likely	Insufficiently Studied	Insufficiently Studied	Potential ¹²³	Yes ¹²³	Yes ¹²³	At high doses: Cytotoxic, Acute Respiratory Distress, Central Nervous System Depression ¹²³	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Yes(drift) ¹²⁴
				Sesame Oil	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied		Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied
				Thyme Oil	Possible ¹²²	Not Likely	Not Likely	Possible ¹²²	Insufficiently Studied	Suggestive ¹²²	Yes ¹²²	Moderate Mammal Acute Toxicity ¹²² Possible Gastrointestinal Toxicity ¹²² Possible Genotoxicity ¹²²	Low ¹²²	Low to Moderate ¹²²	Moderate ¹²²	Low ¹²²

Analysis by Akayla Bracey and Beyond Pesticides Gateway on Pesticide Hazards



X	X	EPA 25(b)	Earth's Ally Weed and Grass Killer	Acetic Acid	Possible ¹⁰⁵	Not Likely	Insufficiently Studied	Not Likely	Insufficiently Studied	Possible ¹⁰⁵	Yes ¹⁰²	Ingestion may cause severe corrosion of the mouth and gastrointestinal tract ¹⁰⁵	Insufficiently Studied	Insufficiently Studied	Moderate ¹⁰⁵	Possible ¹⁰⁵
X		EPA 25(b)	Ecologic Weed and Grass Killer	Rosemary Oil	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Possible Irritant ¹⁰⁷	May cause headaches and nausea ¹⁰⁷	Low ¹⁰⁷	Low ¹⁰⁷	Low ¹⁰⁷	Insufficiently Studied
				Cinnamon Oil	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Yes ¹⁰⁹	Mutagenic Potential (Genotoxic) ¹⁰⁹ Toxic in Large Doses ¹⁰⁹ Possible Gastrointestinal Inflammation ¹⁰⁹	Low ¹⁰⁹	Low ¹⁰⁹
X		EPA 25(b)	Ecosmart Weed and Grass Killer	Rosemary Oil	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Possible Irritant ¹⁰⁷	May cause headaches and nausea ¹⁰⁷	Low ¹⁰⁷	Low ¹⁰⁷	Low ¹⁰⁷	Insufficiently Studied
				Sodium Lauryl Sulfate	Insufficiently Studied	Not Likely	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Likely ¹⁰⁸		Insufficiently Studied	Insufficiently Studied	Insufficiently Studied
	X	OMRI	Green Gobbler 20% Vinegar Ready-to-Use Weed and Grass Killer	Acetic Acid (Vinegar)	Possible ¹⁰⁵	Not Likely	Insufficiently Studied	Not Likely	Insufficiently Studied	Possible ¹⁰⁵	Yes ¹⁰²	Ingestion may cause severe corrosion of the mouth and gastrointestinal tract ¹⁰⁵	Insufficiently Studied	Insufficiently Studied	Moderate ¹⁰⁵	Possible ¹⁰⁵
X	X	OMRI	Green It Corn Gluten Weed Preventer	Corn Gluten Meal	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely		Non-Toxic	Non-Toxic	Non-Toxic	Insufficiently Studied
	X	OMRI	Harris 20% Vinegar Weed Killer	Acetic Acid (Vinegar)	Possible ¹⁰⁵	Not Likely	Insufficiently Studied	Not Likely	Insufficiently Studied	Possible ¹⁰⁵	Yes ¹⁰²	Ingestion may cause severe corrosion of the mouth and gastrointestinal tract ¹⁰⁵	Insufficiently Studied	Insufficiently Studied	Moderate ¹⁰⁵	Possible ¹⁰⁵
	X	EPA 25(b)	Natural Armour Weed and Grass Killer	Clove Oil	Insufficiently Studied	Not Likely	Insufficiently Studied	Insufficiently Studied	Potential ¹²³	Yes ¹²³	Yes ¹²³	At high doses: Cytotoxic, Acute Respiratory Distress, Central Nervous System Depression ¹²³	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Yes (drift) ¹²⁴
X	X	OMRI	Ortho GroundClear Weed & Grass Killer	Ammonium Nonanoate	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely	Yes (Eye/ Skin Irritant), Not a Sensitizer ¹¹⁰	Possible Genotoxicity (at high doses) ¹¹⁰	Low ¹¹¹	Low ¹¹¹	Yes ¹¹¹	Not Likely
	X		Pulverize Non-Selective Weed and Grass Killer	Ammoniated Soap of Fatty Acids	Insufficiently Studied	Not Likely	Not Likely	Insufficiently Studied	Not Likely	Possible (at high doses) ⁵⁵	Mild ⁵⁵	Possible Mutagenicity (at high doses) ⁵⁵	Low ⁹³	Moderate ⁹³	Yes ⁵⁵	Not Likely
	X	EPA 25(b)	Safer Brand Weed Prevention Plus Pre-Emergent Herbicide Control	Corn Gluten Meal	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely		Non-Toxic	Insufficiently Studied	Non-Toxic	Insufficiently Studied

**Approved by the [Organic Materials Review Institute](#) for use in organic farming and gardening or classified by the EPA as 25(b) Exempt, i.e. minimal risk to human health

Analysis by Akayla Bracey and Beyond Pesticides Gateway on Pesticide Hazards



Organic and Least-Toxic Herbicides

By Active Ingredient

Active Ingredients	Human Health Effects								Animal & Environmental Effects			
	Birth/ Developmental Abnormalities	Cancer	Endocrine Disruption	Kidney/Liver Damage	Neurotoxicity	Reproductive/ Sexual Dysfunction	Skin, Eye, Mucosal Sensitizer/ Irritant	Other	Toxic to Birds	Toxic to Bees and Other Beneficials	Toxic to Fish/ Aquatic Organisms	Contamination (groundwater, drift, leaching)
Acetic Acid (Vinegar)	Possible ¹⁰⁵	Not Likely	Insufficiently Studied	Not Likely	Insufficiently Studied	Possible ¹⁰⁵	Yes ¹⁰²	Ingestion may cause severe corrosion of the mouth and gastrointestinal tract ¹⁰⁵	Insufficiently Studied	Insufficiently Studied	Moderate ¹⁰⁵	Possible ¹⁰⁵
Ammoniated soap of fatty acids	Insufficiently Studied	Not Likely	Not Likely	Insufficiently Studied	Not Likely	Possible (at high doses) ⁵⁵	Mild ⁵⁵	Possible Mutagenicity (at high doses) ⁵⁵	Low ⁹³	Moderate ⁹³	Yes ⁵⁵	Not Likely
Ammonium Nonanoate	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely	Yes (Eye/ Skin Irritant, Not a Sensitizer) ¹¹⁰	Possible Genotoxicity (at high doses) ¹¹⁰	Low ¹¹¹	Low ¹¹¹	Yes ¹¹¹	Not Likely
Capric Acid	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied		Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied
Caprylic acid	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied		Non-Toxic	Non-Toxic	Non-Toxic	Insufficiently Studied
Cinnamon Oil	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Yes ¹⁰⁹	Mutagenic Potential (Genotoxic) ¹⁰⁹ Toxic in Large Doses ¹⁰⁹ Possible Gastrointestinal Inflammation ¹⁰⁹	Low ¹⁰⁹	Low ¹⁰⁹	Low ¹⁰⁹	Low ¹⁰⁹
Clove Oil	Insufficiently Studied	Not Likely	Insufficiently Studied	Insufficiently Studied	Potential ¹²³	Yes ¹²³	Yes ¹²³	At high doses: Cytotoxic, Acute Respiratory Distress, Central Nervous System Depression ¹²³	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Yes (drift) ¹²⁴
Corn gluten Meal	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely	Not Likely		Non-Toxic	Insufficiently Studied	Non-Toxic	Insufficiently Studied
d-Limonene	Possible ¹⁰⁴	Not Likely	Not Likely	Insufficiently Studied	Insufficiently Studied	Possible ¹⁰⁴	Yes ¹⁰⁴			Low (Bees) ¹⁰⁴ Moderate (Earthworms) ¹⁰⁴	Moderate ¹⁰⁴	Not Likely
Pelargonic Acid	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Skin and Eye Irritant ¹⁰⁶		Insufficiently Studied	Moderate ¹⁰⁶	Moderate to High ¹⁰³	Insufficiently Studied
Rosemary Oil	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Possible Irritant ¹⁰⁷	May cause headaches and nausea ¹⁰⁷	Low ¹⁰⁷	Low ¹⁰⁷	Low ¹⁰⁷	Insufficiently Studied
Sesame Oil	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied		Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied
Sodium Lauryl Sulfate	Insufficiently Studied	Not Likely	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Likely ¹⁰⁸		Insufficiently Studied	Insufficiently Studied	Insufficiently Studied	Insufficiently Studied
Thyme Oil	Possible ¹²²	Not Likely	Not Likely	Possible ¹²²	Insufficiently Studied	Suggestive ¹²²	Yes ¹²²	Moderate Mammal Acute Toxicity ¹²² Possible Gastrointestinal Toxicity ¹²² Possible Genotoxicity ¹²²	Low ¹²²	Low to Moderate ¹²²	Moderate ¹²²	Low ¹²²

Analysis by Akayla Bracey and Beyond Pesticides Gateway on Pesticide Hazards



Acknowledgements

This research was compiled and analysis written by Akayla Bracey, Science and Regulatory Manager, Beyond Pesticides and is based upon Beyond Pesticides' Pesticide Gateway, a comprehensive database of pesticide hazards; with input from Valeria Paredes, Friends of the Earth; and Kendra Klein, PhD, Friends of the Earth.

Methods

Friends of the Earth identified products sold by each store by searching their online catalogues, searching for products online, and by visiting local stores in San Francisco and Los Angeles. We also gave each company a chance to review the lists and make corrections. Beyond Pesticides provided the toxicity analysis for each product and active ingredient based on the available science.



About Beyond Pesticides

Beyond Pesticides is a national, grassroots, membership organization, which works with allies in protecting public health and the environment to lead the transition to a world free of toxic pesticides. The founders, who established Beyond Pesticides as a nonprofit membership organization in 1981, felt that without the existence of such an organized, national network, local, state, and national pesticide policy would become, under chemical industry pressure, increasingly unresponsive to public health and environmental concerns. Beyond Pesticides believes that people must have a voice in decisions that affect them directly, and decisions should not be made for us by chemical companies or by decisionmakers who either do not have all of the facts or refuse to consider them.



About Friends of the Earth

Friends of the Earth United States, founded by David Brower in 1969, is the U.S. voice of the world's largest federation of grassroots environmental groups, with a presence in 75 countries. Friends of the Earth works to defend the environment and champion a more healthy and just world. We have provided crucial leadership in campaigns resulting in landmark environmental laws, precedent-setting legal victories and groundbreaking reforms of domestic and international regulatory, corporate and financial institution policies. Visit www.foe.org to learn more.

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Citations

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