

# Health Effects of 30 Commonly Used Lawn Pesticides

	Health Effects						
	Cancer	Endocrine Disruption	Reproductive Effects	Neurotoxicity	Kidney/Liver Damage	Sensitizer/Irritant	Birth Defects
<b>Herbicides</b>							
2,4-D*	X <sup>4</sup>	X <sup>10</sup>	X <sup>7</sup>	X <sup>8</sup>	X <sup>8</sup>	X <sup>1</sup>	X <sup>11</sup>
Benfluralin					X <sup>1</sup>	X <sup>1</sup>	
Bensulide				X <sup>2</sup>	X <sup>1</sup>	X <sup>2</sup>	
Clopyralid			X <sup>7</sup>			X <sup>2</sup>	X <sup>7</sup>
Dicamba*			X <sup>1</sup>	X <sup>2</sup>	X <sup>2</sup>	X <sup>1</sup>	X <sup>1</sup>
Diquat Dibromide			X <sup>12</sup>		X <sup>11</sup>	X <sup>1</sup>	
Dithiopyr					X <sup>1</sup>	X <sup>1</sup>	
Fluazipop-p-butyl			X <sup>1</sup>		X <sup>1</sup>		X <sup>1</sup>
Glyphosate*	X <sup>12</sup>	X <sup>8</sup>	X <sup>1</sup>		X <sup>8</sup>	X <sup>1</sup>	
Imazapyr					X <sup>7</sup>	X <sup>2</sup>	
Isoxaben	X <sup>3</sup>				X <sup>2</sup>		
MCPA		X <sup>6</sup>	X <sup>2</sup>	X <sup>2</sup>	X <sup>11</sup>	X <sup>1</sup>	
Mecroporp (MCP)P*	Possible <sup>3</sup>	X <sup>6</sup>	X <sup>2</sup>	X <sup>1</sup>	X <sup>9</sup>	X <sup>1</sup>	X <sup>1</sup>
Pelargonic Acid*						X <sup>1</sup>	
Pendimethalin*	Possible <sup>3</sup>	X <sup>6</sup>	X <sup>1</sup>			X <sup>2</sup>	
Triclopyr			X <sup>7</sup>		X <sup>9</sup>	X <sup>1</sup>	X <sup>7</sup>
Trifluralin*	Possible <sup>3</sup>	X <sup>6</sup>	X <sup>1</sup>		X <sup>2</sup>	X <sup>1</sup>	
<b>Insecticides</b>							
Acephate	Possible <sup>3</sup>	X <sup>6</sup>	X <sup>11</sup>	X <sup>9</sup>		X <sup>2</sup>	
Bifenthrin*†	Possible <sup>3</sup>	Suspected <sup>6,10</sup>		X <sup>8</sup>		X <sup>1</sup>	X <sup>9</sup>
Carbaryl	X <sup>3</sup>	X <sup>10</sup>	X <sup>8</sup>	X <sup>1</sup>	X <sup>11</sup>	X <sup>11</sup>	X <sup>7</sup>
Fipronil	Possible <sup>3</sup>	X <sup>6</sup>	X <sup>8</sup>	X <sup>8</sup>	X <sup>8</sup>	X <sup>8</sup>	
Imidacloprid ‡			X <sup>7</sup>		X <sup>2</sup>		X <sup>7</sup>
Malathion*	Possible <sup>3</sup>	X <sup>10</sup>	X <sup>11</sup>	X <sup>9</sup>	X <sup>2</sup>	X <sup>2</sup>	X <sup>2</sup>
Permethrin*†	X <sup>3</sup>	Suspected <sup>6,10</sup>	X <sup>1,7</sup>	X <sup>9,7</sup>	X <sup>9</sup>	X <sup>1</sup>	
Trichlorfon	X <sup>3</sup>	X <sup>6</sup>	X <sup>11</sup>	X <sup>2</sup>	X <sup>2</sup>		X <sup>2</sup>
<b>Fungicides</b>							
Azoxystrobin					X <sup>2</sup>	X <sup>2</sup>	
Myclobutanil		Probable <sup>6</sup>	X <sup>2</sup>		X <sup>2</sup>		
Propiconazole	Possible <sup>3</sup>	X <sup>6</sup>	X <sup>2</sup>		X <sup>1</sup>	X <sup>1</sup>	
Sulfur						X <sup>1</sup>	
Thiophanate methyl	X <sup>3</sup>	X <sup>1</sup>	X <sup>1</sup>	Suspected <sup>1</sup>	X <sup>1</sup>	X <sup>2</sup>	X <sup>1</sup>
Ziram	Suggestive <sup>3</sup>	Suspected <sup>6</sup>		X <sup>2</sup>	X <sup>2</sup>	X <sup>2</sup>	
<b>Totals:</b>	<b>16</b>	<b>17</b>	<b>21</b>	<b>14</b>	<b>25</b>	<b>26</b>	<b>12</b>

Pesticides

\*These pesticides are among the top 10 most heavily used pesticides in the home and garden sector from 2006-2007, according to the latest sales and usage data available from EPA (2011), available at [http://www.epa.gov/opp00001/pestsales/07pestsales/market\\_estimates2007.pdf](http://www.epa.gov/opp00001/pestsales/07pestsales/market_estimates2007.pdf).

† EPA lists all synthetic pyrethroids under the same category. While all synthetic pyrethroids have similar toxicological profiles, some may be more or less toxic in certain categories than others. See Beyond Pesticides' synthetic pyrethroid fact sheet at [bit.ly/TLBuP8](http://bit.ly/TLBuP8) for additional information.

‡ Imidacloprid is a systemic insecticide in the neonicotinoid chemical class, which is linked to bee decline.

## Description

Most toxicity determinations based on interpretations and conclusions of studies by university, government, or organization databases. Empty cells may refer to either insufficient data or if the chemical is considered relatively non-toxic based on currently available data.

The list of 30 commonly used lawn chemicals is based on information provided by the General Accounting Office 1990 Report, "Lawn Care Pesticides: Risks Remain Uncertain While Prohibited Safety Claims Continue," U.S. Environmental Protection Agency (EPA) National Pesticide Survey (1990), Farm Chemicals Handbook (1989), The National Home and Garden Pesticide Use Survey by Research Triangle Institute, NC (1992), multiple state reports, current EPA Environmental Impact Statements, and Risk Assessments, EPA national sales and usage data, best-selling products at Lowe's and Home Depot, and Beyond Pesticides' information requests.

For more information on hazards associated with pesticides, please see Beyond Pesticides' *Gateway on Pesticide Hazards and Safe Pest Management* at [www.beyondpesticides.org/gateway](http://www.beyondpesticides.org/gateway). For questions and other inquiries, please contact our office at 202-543-5450, email [info@beyondpesticides.org](mailto:info@beyondpesticides.org) or visit us on the web at [www.beyondpesticides.org](http://www.beyondpesticides.org).

## Citations

1. U.S. EPA. Office of Pesticide Program *Reregistration Eligibility Decisions (REDs), Interim REDs (iREDs), and RED factsheets*. <http://www.epa.gov/pesticides/reregistration/>.
2. National Library of Medicine, TOXNET, *Hazardous Substances Database*, <http://toxnet.nlm.nih.gov/>.
3. U.S. EPA. 2012. Office of Pesticide Programs, *Chemicals Evaluated for Carcinogenic Potential*. [http://npic.orst.edu/chemicals\\_evaluated.pdf](http://npic.orst.edu/chemicals_evaluated.pdf).
4. California Environmental Protection Agency. *Proposition 65: Chemicals Known to the State to Cause Cancer or Reproductive Toxicity*. Office of Environmental Health Hazard Assessment. [http://www.oehha.org/prop65/prop65\\_list/files/P65single052413.pdf](http://www.oehha.org/prop65/prop65_list/files/P65single052413.pdf).
5. The Pesticide Management Education Program at Cornell University. *Pesticide Active Ingredient Information*. <http://pmep.cce.cornell.edu/profiles/index.html>.
6. The Endocrine Disruption Exchange. 2011. *List of Potential Endocrine Disruptors*. <http://www.endocrinedisruption.com/endocrine.TEDXList.overview.php>.
7. Northwest Coalition for Alternatives to Pesticides (NCAP), *Pesticide Factsheets*. <http://www.pesticide.org/get-the-facts/pesticide-factsheets>.
8. Beyond Pesticides *ChemWatch Factsheets*, <http://www.beyondpesticides.org/pesticides/factsheets/index.htm>.
9. U.S. EPA. *Chronic (Non-Cancer) Toxicity Data for Chemicals Listed Under EPCRA Section 313*. Toxic Release Inventory Program. [http://www.epa.gov/tri/trichemicals/hazardinfo/hazard\\_chronic\\_non-cancer95.pdf](http://www.epa.gov/tri/trichemicals/hazardinfo/hazard_chronic_non-cancer95.pdf).
10. European Union Commission on the Environment. *List of 146 substances with endocrine disruption classifications, Annex 13*. [http://ec.europa.eu/environment/endocrine/strategy/substances\\_en.htm#report2](http://ec.europa.eu/environment/endocrine/strategy/substances_en.htm#report2).
11. Extension Toxicology Network (EXTOXNET) *Pesticide Information Profiles*. <http://extoxnet.orst.edu/ghindex.html>.
12. International Agency for Research on Cancer, World Health Organization (IARC) category 2A, the agent (mixture) is probably carcinogenic to humans based on sufficient evidence of carcinogenicity in laboratory animal studies. <http://monographs.iarc.fr/ENG/Classification/index.php>.