

## Commonly Used Pesticides – Human Health & Environmental Impacts

Pesticide	Use	Impacts	Alternatives
<p><b>2,4-D</b></p> <p>2,4-Dichlorophenoxyacetic acid</p> <p>(e.g., Trimec, Ortho Weed-B-Gon Max, Scotts Lawn Pro Step 2 Weed Control &amp; Fertilizer, Scotts Lawn Pro Super Winterizer with Plus 2 Weed Control, Triplex, Killex, Escalade, Bayer Advanced Lawn Fertilizer Plus Weed Control II, Bayer Advanced All-in-One Weed Killer for Lawns, Vigoro Ultra Turf Weed &amp; Feed, Scotts Liquid Turf Builder Plus 2 Weed Control, Ortho Basic Solutions Lawn Weed Killer)</p>	<p>broad leaf weeds</p>	<ul style="list-style-type: none"> <li>• Component of Agent Orange<sup>1</sup></li> <li>• Potential for dioxin contamination<sup>2</sup></li> <li>• Contaminates surface and groundwater<sup>3,4</sup></li> <li>• Linked to non-Hodgkin's lymphoma in several studies<sup>5, 6, 7, 8, 9</sup></li> <li>• Linked to prostate cancer in farmers<sup>10</sup></li> <li>• Found in residential carpet dust up to one year after application outdoors on lawns<sup>11</sup></li> <li>• Endocrine (hormone) disruption<sup>12</sup></li> <li>• Acute effects of pesticide exposure range from irritation of the nose, eyes and throat, burning, itches and rashes to nausea, vomiting, headaches and general malaise<sup>13, 14</sup></li> <li>• Reduced sperm counts and/or increased abnormalities in sperm<sup>15, 16</sup></li> <li>• Linked to fetal skeletal abnormalities and increased fetal mortality<sup>17</sup></li> <li>• Chlorophenoxy herbicides, including 2,4-D, are classified as possible carcinogens by the International Agency for Research on Cancer<sup>18</sup></li> </ul>	<p>Preventative turf management program, including:</p> <ul style="list-style-type: none"> <li>• mowing high with sharp blades</li> <li>• proper fertilization</li> <li>• overseeding</li> <li>• aeration</li> <li>• infrequent, deep watering</li> </ul> <p>Corn gluten meal (organic pre-emergent weed control)</p>
<p><b>Dicamba</b></p> <p>2-Methoxy-3,6-dichlorobenzoic acid</p> <p>(e.g., Trimec, Tripower, Ortho Weed-B-Gon Max, Scotts Lawn Pro Step 2 Weed Control &amp; Fertilizer, Tracker, Trooper, Triplex, Escalade, Bayer Advanced Lawn Fertilizer Plus Weed Control II, Bayer Advanced All-in-One Weed Killer for Lawns, Vigoro Ultra Turf Weed &amp; Feed)</p>	<p>broad leaf weeds</p>	<ul style="list-style-type: none"> <li>• Listed by the U.S. EPA as a developmental toxin<sup>19</sup></li> <li>• Negative reproductive effects<sup>20</sup></li> <li>• Cholinesterase inhibitor (neurotoxin)<sup>20</sup></li> <li>• Linked to non-Hodgkin's lymphoma<sup>20</sup></li> <li>• Surface and groundwater contaminant<sup>3</sup></li> </ul>	<p>Same as above</p>
<p><b>Mecoprop (aka MCPP)</b></p> <p>2-(4-chloro-2-methyl phenoxy) propionic acid</p> <p>(e.g., Ortho Weed-B-Gon Max, Scotts Lawn Pro Step 2 Weed Control &amp; Fertilizer, Scotts Lawn Pro Super Winterizer with Plus 2 Weed Control, Scotts Lawn Pro Super Turf Builder with Plus 2 Weed Control, Triplex, Tripower, Triamine II, Bayer Advanced Lawn Fertilizer Plus Weed Control II, Bayer Advanced All-in-One Weed Killer for Lawns, Vigoro Ultra Turf Weed &amp; Feed, Scotts Liquid Turf Builder Plus 2 Weed Control, Ortho Basic Solutions Lawn Weed Killer)</p>	<p>broad leaf weeds</p>	<ul style="list-style-type: none"> <li>• Linked to cancer of soft tissues and non-Hodgkin's lymphoma<sup>14</sup></li> <li>• Medium toxicity to birds<sup>14</sup></li> <li>• Surface and groundwater contaminant<sup>3</sup></li> <li>• Listed as a possible carcinogen by the International Agency for Research on Cancer<sup>18</sup></li> </ul>	<p>Same as above</p>
<p><b>MCPA</b></p> <p>2-Methyl-4-chlorophenoxyacetic acid</p> <p>(e.g., Tripower, Triamine II)</p>	<p>broad leaf weeds</p>	<ul style="list-style-type: none"> <li>• Linked to reproductive effects; mutagenic (alters genes)<sup>14</sup></li> <li>• Potential groundwater contaminant<sup>2, 14</sup></li> <li>• Can cause severe eye irritation, slurred speech, muscle spasms<sup>14</sup></li> <li>• Listed as a possible carcinogen by the International Agency for Research on Cancer<sup>18</sup></li> </ul>	<p>Same as above</p>

## Commonly Used Pesticides – Human, Health & Environmental Impacts (page 2)

Pesticide	Use	Impacts	Alternatives
<p><b>Glyphosate</b></p> <p>N-(phosphonomethyl) glycine</p> <p>(e.g., <i>Roundup, Touchdown, Rodeo, Accord, Vision</i>)</p>	<p>broad spectrum herbicide (total vegetation killer)</p>	<ul style="list-style-type: none"> <li>• Linked to spontaneous abortion<sup>21</sup></li> <li>• Kills turf and other desirable plants if applied incorrectly<sup>22</sup></li> <li>• Some formulations contain toxic surfactants<sup>22</sup></li> <li>• Used in conjunction with genetically ("Roundup Ready") modified crops</li> <li>• Implicated in disappearance of Houston Toad<sup>22</sup></li> </ul>	<p>Same as above; for spot killing weeds, use vinegar spray, herbicidal soap, or weed torch (flamer); for killing large areas of vegetation, smother with newspaper &amp; mulch</p>
<p><b>Pendimethalin</b></p> <p>(e.g., <i>Scotts Crabgrass Preventer, Scotts Lawn Pro Super Turf Builder with Halts, Prowl, Sovereign, Squadron, Stomp</i>)</p>	<p>broadleaf weed control</p>	<ul style="list-style-type: none"> <li>• Possible human carcinogen<sup>23,24</sup></li> <li>• Suspected endocrine (hormone) disruptor<sup>25</sup></li> <li>• Highly toxic to fish and aquatic invertebrates<sup>24</sup></li> <li>• Half-life (amount of time required for half of the pesticide present after an application to breakdown) in soil of 42-101 days<sup>24</sup></li> <li>• Has been detected in lower Great Lakes tributaries<sup>24</sup></li> </ul>	<p>Same as above</p>
<p><b>Triclopyr</b></p> <p>3,5,6-trichloro-2-pyridinyloxyacetic acid</p> <p>(e.g., <i>Garlon, Access, selected Ortho Weed-B-Gon products</i>)</p>	<p>control of woody and broadleaf plants</p>	<ul style="list-style-type: none"> <li>• Some forms and degrade (breakdown product) toxic to fish &amp; aquatic organisms<sup>26</sup></li> <li>• Half life in soil ranges from 30 to 90 days; one of the breakdown products can persist for up to 279 days<sup>27</sup></li> <li>• Potential to groundwater contaminant<sup>26</sup></li> </ul>	<p>Same as above and mechanical removal for woody plants</p>
<p><b>Bifenthrin</b></p> <p>(e.g., <i>Scotts Lawn Pro Insect Control Plus Fertilizer, Scotts Turf Builder with Summer Guard, Scotts Turf Builder with Fire Ant Killer, selected Ortho Weed-B-Gon products, Talstar</i>)</p>	<p>insect control</p>	<ul style="list-style-type: none"> <li>• Restricted use pesticide due to its toxicity to fish and aquatic organisms<sup>28</sup></li> <li>• Moderately toxic to many birds, bees<sup>29</sup></li> <li>• Half-life in soil is 7 days to 8 months<sup>29</sup></li> <li>• Possible human carcinogen<sup>23</sup></li> </ul>	<p>Boric acid, diatomaceous earth, nematode products, insecticidal soaps</p> <p>For fire ants: spinosad baits (use with caution, as this organic control is toxic to fish)</p>
<p><b>Carbaryl</b></p> <p>1-Naphthyl-N-methylcarbamate</p> <p>(e.g., <i>Sevin, Sevinol, Latox, Ortho Bug-Geta</i>)</p>	<p>insect control</p>	<ul style="list-style-type: none"> <li>• Potential endocrine (hormone) disruptor<sup>30</sup></li> <li>• Linked to spontaneous abortion<sup>21</sup></li> <li>• Linked to non-Hodgkin's lymphoma<sup>31,32</sup></li> <li>• Toxic to fish, bees and earthworms<sup>14</sup></li> <li>• Possible human carcinogen<sup>23</sup></li> </ul>	<p>Boric acid, diatomaceous earth, nematode products, insecticidal soaps</p>
<p><b>Permethrin</b></p> <p>aka synthetic pyrethroid</p> <p>(e.g., <i>Ortho Bug-B-Gon products, Spectracide Bug Stop Granules, Ambush, Torpedo, Dragnet</i>)</p>	<p>insect control</p>	<ul style="list-style-type: none"> <li>• Restricted use due to aquatic toxicity and association with tumors<sup>28</sup></li> <li>• Neurotoxin<sup>33</sup></li> <li>• Toxic to wildlife and extremely toxic to bees<sup>33</sup></li> </ul>	<p>Same as above</p>

Pesticide	Use	Impacts	Alternatives
<b>Malathion</b>  <i>(e.g., Cekumal, Cythion, Fosfothion, Fyfaton, Malixol, Maltox, Sadothos, and Zithiol)</i>	insect control (esp. mosquito-toes)	<ul style="list-style-type: none"> <li>• Linked to inducement of breast cancer cells<sup>34</sup></li> <li>• May affect immune system, central nervous system, adrenal glands, liver and blood<sup>35</sup></li> <li>• Produced detectable mutations in human white blood cells and lymph cells<sup>35</sup></li> <li>• Toxic to birds, fish, aquatic invertebrates and honeybees<sup>35</sup></li> <li>• Commercial products often contain impurities and hydrocarbon solvents, such as xylene or toluene, which themselves are toxic<sup>35</sup></li> </ul>	Same as above; also eliminate standing water where mosquitoes breed; larvicides containing the soil bacterium <i>Bacillus thuringiensis</i> (B.t.) are safer

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