

## Cancer Risks of Pesticide Exposure

Increased incidence of certain cancers among farmers and workers employed in agricultural settings has been reported in a variety of studies, raising concerns about exposure to agricultural pesticides.<sup>1</sup> A study of cancer rates in 25 states, including Wisconsin, found that in counties with cropland of 20 percent or more, children are at a statistically elevated risk for many types of cancer, including specific cancers of the immune system, kidney, liver, connective tissue, thyroid, skin, eye and intestines. No association was seen when looking at total cancer rates.<sup>1</sup>

Figure 1 lists the top five agricultural pesticides used in Wisconsin by pounds applied.<sup>2</sup> The crops to which these pesticides are commonly applied and the potential of each pesticide to cause cancer<sup>3</sup> are also listed. Figure 2 lists common crops in Wisconsin, the top five pesticides applied to each crop by acres treated,<sup>4</sup> and the potential of each pesticide to cause cancer.<sup>3</sup> For the common Wisconsin crops of field corn, soybeans, sweet corn, snap beans and potatoes, at least one of the top five pesticides applied to each crop is a possible human carcinogen.<sup>3</sup> For snap beans, four of the top five pesticides applied are possible or likely human carcinogens.<sup>3</sup>

Figure 2 Top 5 Pesticides Used in Wisconsin<sup>2, 3</sup>

Pesticide	Crops Applied	Carcinogenic Potential
<b>Glyphosate</b> 2,482,500 lbs	Apples, corn, snap beans, sweet corn, soybeans, tart cherries	Evidence of non-carcinogenicity for humans
<b>S-metolachlor</b> 1,766,000 lbs	Corn, potatoes, snap beans and sweet corn	Possible human carcinogen
<b>Atrazine</b> 1,626,400 lbs	Corn and sweet corn	Not likely to be carcinogenic to humans
<b>Acetochlor</b> 1,009,000 lbs	Corn	Suggestive evidence of carcinogenic potential
<b>Pendimethalin</b> 391,700 lbs	Corn, potatoes, green peas, snap beans, soybeans, sweet corn	Possible human carcinogen

Figure 1 Cancer Potential for Top 5 Pesticides in Common Crops<sup>2, 3, 4</sup>

Chemical	Acres Treated	Carcinogenic Potential
<b>Corn:</b> 3.98 million acres		
Atrazine	54%	Not likely to be carcinogenic to humans
S-Metolachlor	30%	Possible human carcinogen
Glyphosate iso. salt	28%	Evidence of non-carcinogenicity for humans
Mesotrione	25%	Not likely to be carcinogenic to humans
Flumetsulam	21%	Evidence of non-carcinogenicity for humans
<b>Soybeans:</b> 1.36 million acres		
Glyphosate iso. salt	85%	Evidence of non-carcinogenicity for humans
Imazethapyr	11%	Not likely to be carcinogenic to humans
Pendimethalin	6%	Possible human carcinogen
Chlorpyrifos	3%	Evidence of non-carcinogenicity for humans
No other pesticides reported		
<b>Oats:</b> 167,000 acres		
2,4-D	4%	Not likely to be carcinogenic to humans
No other pesticides reported		
<b>Sweet corn for processing:</b> 91,000 acres		
Atrazine	71%	Not likely to be carcinogenic to humans
S-Metolachlor	47%	Possible human carcinogen
Lambda-cyhalothrin	36%	Not classifiable as to human carcinogenicity
Alachlor	29%	Likely to be carcinogenic to humans in high doses; Not likely to be carcinogenic to humans in low doses
Propiconazole	17%	Possible human carcinogen
<b>Snap beans for processing:</b> 71,000 acres		
EPTC	49%	Not likely to be carcinogenic to humans
Trifluralin	43%	Possible human carcinogen
Bifenthrin	42%	Possible human carcinogen
Thiophanate-methyl	39%	Likely to be carcinogenic to humans
Zeta-cypermethrin	37%	Possible human carcinogen
<b>Potatoes:</b> 64,000 acres		
Chlorothalonil	93%	Likely to be carcinogenic to humans
Metribuzin	79%	Not classifiable as to human carcinogenicity
Diquat dibromide	76%	Evidence of non-carcinogenicity for humans
Mancozeb	73%	Probable human carcinogen
Imidacloprid	56%	Evidence of non-carcinogenicity for humans

Compiled by Lynn Markham, Center for Land Use Education, 2010. <sup>1</sup> Carozza SE, et. al. 2008. Risk of Childhood Cancers Associated with Residence in Agriculturally Intense Areas in the United States. Environmental Health Perspectives, 116: 559-565. <sup>2</sup> Wisconsin Agricultural Statistics Service. 2006. Wisconsin Pesticide Use. www.nass.usda.gov/Statistics\_by\_State/Wisconsin/Publications/Miscellaneous/pest\_use\_06.pdf <sup>3</sup> U.S. EPA, Office of Pesticide Programs. List of Chemicals Evaluated for Carcinogenic Potential. September 3, 2009. <sup>4</sup> U.S. Department of Agriculture. 2007 Census of Agriculture.