

Guide to Table Changes

- Table 4-1: New title; new data
- Table 4-2: No longer relevant
- Table 4-3: No longer relevant
- Table 4-4: New title; new data
- Table 4-5: New data
- Table 4-6: New data
- Table 4-7: New title; new data; part b added for child
- Table 4-8: No longer relevant
- Table 4-9: New data; part b added for child
- Table 4-10: New data; part b added for child
- Table 4-11: New data; information changes
- Table 4-12: New data
- Table 4-13: New data
- Table 4-14: New data
- Table 4-15: New title; new data
- Table 4-16: No longer relevant
- Table 4-17: No longer relevant
- Table 4-18: New title; new data
- Table 4-19: New data
- Table 4-20: New data
- Table 4-21: New title; new data; part b added for child
- Table 4-22: No longer relevant
- Table 4-23: New data; part b added for child
- Table 4-24: New data; part b added for child
- Table 4-25: New data; parts b and c added for child and cancer risks, respectively
- Table 4-26: New data; parts b and c added for child and cancer risks, respectively
- Table 4-27: New data; new format
- Table 4-28: New data; new format
- Table 4-29: New data; part b added for 2005 chemicals
- Table 4-30: New data; part b added for 2005 chemicals
- Table 4-31: New data; part b added for 2005 chemicals
- Table 4-32: New data; part b added for 2005 chemicals
- Table 4-33: No longer used
- Table 4-34: No longer used
- Table 4-35: No longer used
- Table 4-36: New data

Note: The title of this table has changed from “Exposure Estimates for Workers Applying Herbicides with Truck Mounted Spray Equipment.” This table replaces the results in the former tables 4-1 through 4-3 because of a merge of three worker job scenarios into the one described in the new title.

Table 4-1 Exposure Estimates for Workers Engaged in Broadcast Hydraulic Spray Applications.

COMPOUND	Single Day Dose (mg/kg/day)		Lifetime Average Daily Dose (mg/kg/day)	
	Average	Maximum	Average	Maximum
2,4-D	1.9×10^{-2}	1.7×10^{-1}	3.1×10^{-4}	8.6×10^{-3}
Ammonium salt of Fosamine	4.0×10^{-2}	1.1×10^0		
Bromacil/ Diuron				
Bromacil	1.6×10^{-2}	5.4×10^{-1}	2.2×10^{-4}	1.7×10^{-2}
Diuron	1.6×10^{-2}	5.4×10^{-1}	2.2×10^{-4}	1.7×10^{-2}
Chlorsulfuron	7.0×10^{-4}	6.3×10^{-3}		
Clopyralid	1.9×10^{-3}	2.3×10^{-2}		
Clopyralid/ 2,4-D				
Clopyralid	9.5×10^{-4}	8.6×10^{-3}		
2,4-D	5.0×10^{-3}	4.5×10^{-2}	8.2×10^{-5}	1.7×10^{-3}
Dicamba	5.0×10^{-3}	9.0×10^{-2}		
Dicamba/ 2,4-D				
Dicamba	2.8×10^{-3}	9.0×10^{-2}		
2,4-D	8.1×10^{-3}	1.7×10^{-1}	1.3×10^{-4}	8.6×10^{-3}
Dicamba/ MCPA				
Dicamba	3.1×10^{-3}	4.6×10^{-2}		
MCPA	6.3×10^{-3}	9.1×10^{-2}		
Dichlobenil	2.0×10^{-2}	3.6×10^{-1}		
Diuron	2.4×10^{-2}	5.4×10^{-1}	3.3×10^{-4}	1.7×10^{-2}
Glyphosate	1.0×10^{-2}	4.8×10^{-1}		
Metsulfuron Methyl	3.8×10^{-4}	6.8×10^{-3}		
Oryzalin	2.0×10^{-2}	2.7×10^{-1}	2.7×10^{-4}	8.5×10^{-3}
Picloram	5.0×10^{-3}	9.0×10^{-2}		
Sulfometuron Methyl	1.2×10^{-3}	1.7×10^{-2}		
Triclopyr	2.0×10^{-2}	5.4×10^{-1}		
<i>New herbicides for consideration</i>				
Bromoxynil	2.5×10^{-3}	2.3×10^{-2}	1.4×10^{-5}	2.8×10^{-4}
Diflufenopyr				
Diflufenopyr	5.0×10^{-4}	4.5×10^{-3}		
Dicamba	1.3×10^{-3}	1.1×10^{-2}		
Flumioxazin	1.3×10^{-3}	1.7×10^{-2}		
Fluroxypyr	1.3×10^{-3}	2.3×10^{-2}		
Imazapyr	5.0×10^{-3}	6.8×10^{-2}		
Isoxaben	5.0×10^{-3}	4.5×10^{-2}		
Norflurazon	2.0×10^{-2}	1.8×10^{-1}		
Oxadiazon	1.0×10^{-2}	1.8×10^{-1}	1.6×10^{-4}	6.8×10^{-3}
Pendimethalin	1.5×10^{-2}	1.4×10^{-1}		
Pyraflufen	2.0×10^{-5}	1.8×10^{-4}	3.3×10^{-7}	6.8×10^{-6}
Sulfentrazone	1.9×10^{-3}	1.7×10^{-2}		

Tebuthiuron	1.2×10^{-2}	1.8×10^{-1}		
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Note: The title of this table has changed from “Exposure Estimates for Workers Using Backpack or Handheld Spray Equipment.” In addition, only the product types that are used in this manner are presented.

Table 4-4 Exposure Estimates for Workers Engaged in Directed Foliar Applications.

COMPOUND	Single Day Dose (mg/kg/day)		Lifetime Average Daily Dose (mg/kg/day)	
	Average	Maximum	Average	Maximum
Chlorsulfuron	4.2×10^{-4}	1.4×10^{-3}		
Clopyralid	1.1×10^{-3}	5.0×10^{-3}		
Glyphosate	6.0×10^{-3}	1.1×10^{-1}		
Oryzalin	1.2×10^{-2}	6.0×10^{-2}	1.6×10^{-4}	1.9×10^{-3}
Picloram	3.0×10^{-3}	2.0×10^{-2}		
<i>New herbicides for consideration</i>				
Bromoxynil	1.5×10^{-3}	5.0×10^{-3}	8.2×10^{-6}	6.3×10^{-5}
Diflufenzopyr				
Diflufenzopyr	3.0×10^{-4}	1.0×10^{-3}	4.9×10^{-6}	3.8×10^{-5}
Dicamba	7.5×10^{-4}	2.5×10^{-3}	1.2×10^{-5}	9.4×10^{-5}
Fluroxypyr	7.5×10^{-4}	5.0×10^{-3}	1.2×10^{-5}	1.9×10^{-4}
Isoxaben	3.0×10^{-3}	1.0×10^{-2}	4.9×10^{-5}	3.8×10^{-4}
Oxadiazon	6.0×10^{-3}	4.0×10^{-2}	9.9×10^{-5}	1.5×10^{-3}
Pyraflufen	1.2×10^{-5}	4.0×10^{-5}	2.0×10^{-7}	1.5×10^{-6}

Table 4-5 Exposure Estimates for the Public-Ingestion of Drift Contaminated Berries, Adults.

COMPOUND	Single Day Dose (mg/kg/day)		Lifetime Average Daily Dose (mg/kg/day)	
	Average	Maximum	Average	Maximum
2,4-D	1.5×10^{-4}	2.5×10^{-3}	1.6×10^{-6}	1.8×10^{-4}
Ammonium Salt of Fosamine	3.1×10^{-4}	1.6×10^{-2}		
Bromacil/Diuron				
Bromacil	1.2×10^{-4}	8.0×10^{-3}	1.3×10^{-6}	5.7×10^{-4}
Diuron	1.2×10^{-4}	8.0×10^{-3}	1.3×10^{-6}	5.7×10^{-4}
Chlorsulfuron	5.4×10^{-6}	9.4×10^{-5}		
Clopyralid	1.5×10^{-5}	3.3×10^{-4}		
Clopyralid/2,4-D				
Clopyralid	4.6×10^{-6}	1.3×10^{-4}		
2,4-D	4.1×10^{-5}	6.7×10^{-3}	4.4×10^{-7}	4.7×10^{-5}
Dicamba	3.9×10^{-5}	5.4×10^{-3}		
Dicamba/2,4-D				
Dicamba	2.2×10^{-5}	1.3×10^{-3}		
2,4-d	6.2×10^{-5}	2.5×10^{-3}	6.6×10^{-7}	1.8×10^{-4}
Dicamba/MCPA				
Dicamba	3.5×10^{-5}	6.8×10^{-4}		
MCPA	3.5×10^{-5}	1.4×10^{-3}		
Dichlobenil	1.6×10^{-4}	5.4×10^{-3}		
Diuron	1.9×10^{-4}	8.0×10^{-3}	2.0×10^{-6}	5.7×10^{-4}
Glyphosate	7.7×10^{-5}	7.1×10^{-3}		
Metsulfuron Methyl	2.9×10^{-6}	1.0×10^{-4}		
Oryzalin	1.6×10^{-4}	4.0×10^{-3}	1.6×10^{-6}	2.8×10^{-4}
Picloram	3.9×10^{-5}	1.3×10^{-3}		
Sulfometuron Methyl	9.0×10^{-6}	2.5×10^{-4}		
Tricopyr	1.6×10^{-4}	8.0×10^{-3}		
<i>New herbicides for consideration</i>				
Bromoxynil	1.9×10^{-5}	3.3×10^{-4}	2.0×10^{-7}	2.4×10^{-5}
Diflufenzopyr				
Diflufenzopyr	3.9×10^{-6}	6.7×10^{-5}		
Dicamba	9.7×10^{-6}	1.7×10^{-4}		
Flumioxazin	9.7×10^{-6}	2.5×10^{-4}		
Fluroxypyr	9.7×10^{-6}	3.3×10^{-4}		
Imazapyr	3.9×10^{-5}	1.0×10^{-3}		
Isoxaben	3.9×10^{-5}	6.7×10^{-4}		
Norflurazon	1.5×10^{-4}	2.6×10^{-3}		
Oxadiazon	7.7×10^{-5}	2.7×10^{-3}	8.2×10^{-7}	1.9×10^{-4}
Pendimethalin	1.2×10^{-4}	2.0×10^{-3}		
Pyraflufen	1.6×10^{-7}	2.7×10^{-6}	1.6×10^{-9}	1.9×10^{-7}
Sulfentrazone	1.5×10^{-5}	2.5×10^{-4}		
Tebuthiuron	9.3×10^{-5}	2.7×10^{-3}		

Table 4-6 Exposure Estimates for the Public-Ingestion of Drift Contaminated Berries, Children.

COMPOUND	Single Day Dose (mg/kg/day)	
	Average	Maximum
2,4-D	5.9×10^{-4}	1.0×10^{-2}
Ammonium Salt of Fosamine	1.2×10^{-3}	6.4×10^{-2}
Bromacil/Diuron		
Bromacil	4.9×10^{-4}	3.2×10^{-2}
Diuron	4.9×10^{-4}	3.2×10^{-2}
Chlorsulfuron	2.2×10^{-5}	3.7×10^{-4}
Clopyralid	5.8×10^{-5}	1.3×10^{-3}
Clopyralid/2,4-D		
Clopyralid	2.9×10^{-5}	5.1×10^{-4}
2,4-D	1.5×10^{-4}	2.7×10^{-3}
Dicamba	1.5×10^{-4}	5.3×10^{-3}
Dicamba/2,4-D		
Dicamba	8.6×10^{-5}	5.3×10^{-3}
2,4-D	2.5×10^{-4}	1.0×10^{-2}
Dicamba/MCPA		
Dicamba	1.4×10^{-4}	2.7×10^{-3}
MCPA	1.4×10^{-4}	5.4×10^{-3}
Dichlobenil	6.2×10^{-4}	2.1×10^{-2}
Diuron	7.4×10^{-4}	3.2×10^{-2}
Glyphosate	3.1×10^{-4}	2.8×10^{-2}
Metsulfuron Methyl	1.2×10^{-5}	4.0×10^{-4}
Oryzalin	6.2×10^{-4}	1.6×10^{-2}
Picloram	1.5×10^{-4}	5.3×10^{-3}
Sulfometuron Methyl	3.6×10^{-5}	1.0×10^{-3}
Tricopyr	6.2×10^{-4}	3.2×10^{-2}
<i>New herbicides for consideration</i>		
Bromoxynil	7.7×10^{-5}	1.3×10^{-3}
Diflufenzopyr		
Diflufenzopyr	1.5×10^{-5}	2.7×10^{-4}
Dicamba	3.9×10^{-5}	6.7×10^{-4}
Flumioxazin	3.9×10^{-5}	1.0×10^{-3}
Fluroxypyr	3.9×10^{-5}	1.3×10^{-3}
Imazapyr	1.5×10^{-4}	4.0×10^{-3}
Isoxaben	1.5×10^{-4}	2.7×10^{-3}
Norflurazon	6.1×10^{-4}	1.1×10^{-2}
Oxadiazon	3.1×10^{-4}	1.1×10^{-2}
Pendimethalin	4.6×10^{-4}	8.0×10^{-3}
Pyraflufen	6.2×10^{-7}	1.1×10^{-5}
Sulfentrazone	5.8×10^{-5}	1.0×10^{-3}
Tebuthiuron	3.7×10^{-4}	1.1×10^{-2}

Note: The title of this table has changed from “Exposure Estimates for the Public-Ingestion of Drift Contaminated Vegetables, Lettuce.” This table replaces the results in the former tables 4-7 and 4-8 because of the addition of a single category of garden produce to replace the representative vegetables lettuce and beans. Also, this table is numbered 4-7a, to allow for Table 4-7b to address exposure estimates for children.

Table 4-7a Exposure Estimates for the Public-Ingestion of Drift Contaminated Vegetables, adults.

COMPOUND	Single Day Dose (mg/kg/day)		Lifetime Average Daily Dose (mg/kg/day)	
	Average	Maximum	Average	Maximum
2,4-D	2.9x10 ⁻³	1.4x10 ⁻¹	1.4x10 ⁻⁵	4.6x10 ⁻³
Ammonium Salt of Fosamine	6.0x10 ⁻³	8.7x10 ⁻¹		
Bromacil/Diuron				
Bromacil	2.4x10 ⁻³	4.4x10 ⁻¹	1.2x10 ⁻⁵	1.4x10 ⁻²
Diuron	2.4x10 ⁻³	4.4x10 ⁻¹	1.2x10 ⁻⁵	1.4x10 ⁻²
Chlorsulfuron	1.1x10 ⁻⁴	5.1x10 ⁻³		
Clopyralid	2.8x10 ⁻⁴	1.8x10 ⁻²		
Clopyralid/2,4-D				
Clopyralid	1.4x10 ⁻⁴	6.9x10 ⁻³		
2,4-D	7.5x10 ⁻⁴	3.6x10 ⁻²	3.7x10 ⁻⁶	1.2x10 ⁻³
Dicamba	7.5x10 ⁻⁴	7.3x10 ⁻²		
Dicamba/2,4-D				
Dicamba	4.2x10 ⁻⁴	7.3x10 ⁻²		
2,4-d	1.2x10 ⁻³	1.4x10 ⁻¹	5.9x10 ⁻⁶	4.6x10 ⁻³
Dicamba/MCPA				
Dicamba	4.7x10 ⁻⁴	3.7x10 ⁻²		
MCPA	9.4x10 ⁻⁴	7.4x10 ⁻²		
Dichlobenil	3.0x10 ⁻³	2.9x10 ⁻¹		
Diuron	3.6x10 ⁻³	4.4x10 ⁻¹	1.8x10 ⁻⁵	1.4x10 ⁻²
Glyphosate	1.5x10 ⁻³	3.4x10 ⁻¹		
Metsulfuron Methyl	5.7x10 ⁻⁵	5.5x10 ⁻³		
Oryzalin	3.0x10 ⁻³	2.2x10 ⁻¹	1.5x10 ⁻⁵	7.2x10 ⁻³
Picloram	7.5x10 ⁻⁴	7.3x10 ⁻²		
Sulfometuron Methyl	1.8x10 ⁻⁴	1.4x10 ⁻²		
Tricopyr	3.0x10 ⁻³	4.4x10 ⁻¹		
<i>New herbicides for consideration</i>				
Bromoxynil	3.8x10 ⁻⁴	1.8x10 ⁻²	1.8x10 ⁻⁶	6.0x10 ⁻⁴
Diflufenzopyr				
Diflufenzopyr	7.5x10 ⁻⁵	3.6x10 ⁻³		
Dicamba	1.9x10 ⁻⁴	9.1x10 ⁻³		
Flumioxazin	1.9x10 ⁻⁴	1.4x10 ⁻²		
Fluroxypyr	1.9x10 ⁻⁴	1.8x10 ⁻²		
Imazapyr	7.5x10 ⁻⁴	5.5x10 ⁻²		
Isoxaben	7.5x10 ⁻⁴	3.6x10 ⁻²		
Norflurazon	3.0x10 ⁻³	1.4x10 ⁻¹		
Oxadiazon	1.5x10 ⁻³	1.5x10 ⁻¹	7.4x10 ⁻⁶	4.8x10 ⁻³
Pendimethalin	2.3x10 ⁻³	1.1x10 ⁻¹		
Pyraflufen	3.0x10 ⁻⁶	1.5x10 ⁻⁴	1.5x10 ⁻⁸	4.8x10 ⁻⁶
Sulfentrazone	2.8x10 ⁻⁴	1.4x10 ⁻²		
Tebuthiuron	1.8x10 ⁻³	1.5x10 ⁻¹		

Table 4-7b Exposure for the Public-Ingestion of Drift Contaminated Vegetables, children.

COMPOUND	Single Day Dose (mg/kg/day)	
	Average	Maximum
2,4-D	3.5×10^{-3}	1.8×10^{-1}
Ammonium Salt of Fosamine	7.3×10^{-3}	1.1×10^0
Bromacil/Diuron		
Bromacil	2.9×10^{-3}	5.7×10^{-1}
Diuron	2.9×10^{-3}	5.7×10^{-1}
Chlorsulfuron	1.3×10^{-4}	6.6×10^{-3}
Clopyralid	3.4×10^{-4}	2.4×10^{-2}
Clopyralid/2,4-D		
Clopyralid	1.7×10^{-4}	9.0×10^{-3}
2,4-D	9.1×10^{-4}	4.7×10^{-2}
Dicamba	9.1×10^{-4}	9.4×10^{-2}
Dicamba/2,4-D		
Dicamba	5.1×10^{-4}	9.4×10^{-2}
2,4-d	1.5×10^{-3}	1.8×10^{-1}
Dicamba/MCPA		
Dicamba	5.7×10^{-4}	4.8×10^{-2}
MCPA	1.1×10^{-3}	9.6×10^{-2}
Dichlobenil	3.7×10^{-3}	3.8×10^{-1}
Diuron	4.4×10^{-3}	5.7×10^{-1}
Glyphosate	1.8×10^{-3}	5.0×10^{-1}
Metsulfuron Methyl	6.9×10^{-5}	7.1×10^{-3}
Oryzalin	3.7×10^{-3}	2.8×10^{-1}
Picloram	9.1×10^{-4}	9.4×10^{-2}
Sulfometuron Methyl	2.1×10^{-4}	1.8×10^{-2}
Tricopyr	3.7×10^{-3}	5.7×10^{-1}
<i>New herbicides for consideration</i>		
Bromoxynil	4.6×10^{-4}	2.4×10^{-2}
Diflufenzopyr		
Diflufenzopyr	9.1×10^{-5}	4.7×10^{-3}
Dicamba	2.3×10^{-4}	1.2×10^{-2}
Flumioxazin	2.3×10^{-4}	1.8×10^{-2}
Fluroxypyr	2.3×10^{-4}	2.4×10^{-2}
Imazapyr	9.1×10^{-4}	7.1×10^{-2}
Isoxaben	9.1×10^{-4}	4.7×10^{-2}
Norflurazon	3.6×10^{-3}	1.9×10^{-1}
Oxadiazon	1.8×10^{-3}	1.9×10^{-1}
Pendimethalin	2.7×10^{-3}	1.4×10^{-1}
Pyraflufen	3.7×10^{-6}	1.9×10^{-4}
Sulfentrazone	3.4×10^{-4}	1.8×10^{-2}
Tebuthiuron	2.2×10^{-3}	1.9×10^{-1}

Note: This table is numbered 4-9a, to allow for Table 4-9b to address exposure estimates for children.

Table 4-9a Exposure Estimates for the Public-Dermal Exposure from Drift Contaminated Berries, adults.

COMPOUND	Single Day Dose (mg/kg/day)		Lifetime Average Daily Dose (mg/kg/day)	
	Average	Maximum	Average	Maximum
2,4-D	1.3×10^{-3}	1.3×10^{-2}	2.7×10^{-6}	1.3×10^{-4}
Ammonium Salt of Fosamine	2.7×10^{-4}	8.0×10^{-3}		
Bromacil/Diuron				
Bromacil	1.1×10^{-4}	4.0×10^{-3}	2.3×10^{-7}	4.2×10^{-5}
Diuron	5.4×10^{-4}	2.0×10^{-2}	1.1×10^{-6}	2.1×10^{-4}
Chlorsulfuron	4.7×10^{-6}	4.7×10^{-5}		
Clopyralid	1.3×10^{-4}	1.7×10^{-3}		
Clopyralid/2,4-D				
Clopyralid	6.4×10^{-5}	6.4×10^{-4}		
2,4-D	3.3×10^{-4}	3.3×10^{-3}	7.1×10^{-7}	3.5×10^{-5}
Dicamba	1.7×10^{-4}	3.3×10^{-3}		
Dicamba/2,4-D				
Dicamba	9.4×10^{-5}	3.3×10^{-3}		
2,4-d	5.4×10^{-4}	1.3×10^{-2}	1.1×10^{-6}	1.3×10^{-4}
Dicamba/MCPA				
Dicamba	1.0×10^{-4}	1.7×10^{-3}		
MCPA	4.2×10^{-4}	6.8×10^{-3}		
Dichlobenil	6.7×10^{-4}	1.3×10^{-2}		
Diuron	8.0×10^{-4}	2.0×10^{-2}	1.7×10^{-6}	2.1×10^{-4}
Glyphosate	2.3×10^{-4}	1.2×10^{-2}		
Metsulfuron Methyl	2.5×10^{-5}	5.0×10^{-4}		
Oryzalin	6.7×10^{-4}	1.0×10^{-2}	1.4×10^{-6}	1.1×10^{-4}
Picloram	1.6×10^{-5}	3.2×10^{-4}		
Sulfometuron Methyl	7.8×10^{-6}	1.3×10^{-4}		
Tricopyr	2.2×10^{-4}	6.6×10^{-3}		
<i>New herbicides for consideration</i>				
Bromoxynil	1.7×10^{-4}	1.7×10^{-3}	3.5×10^{-7}	1.8×10^{-5}
Diflufenzopyr				
Diflufenzopyr	1.4×10^{-4}	1.4×10^{-3}		
Dicamba	4.2×10^{-5}	4.2×10^{-4}		
Flumioxazin	6.7×10^{-5}	1.0×10^{-3}		
Fluroxypyr	3.5×10^{-4}	7.0×10^{-3}		
Imazapyr	1.4×10^{-3}	2.1×10^{-2}		
Isoxaben	1.4×10^{-3}	1.4×10^{-2}		
Norflurazon	1.3×10^{-5}	1.3×10^{-4}		
Oxadiazon	6.0×10^{-4}	1.2×10^{-2}	1.3×10^{-6}	1.3×10^{-4}
Pendimethalin	1.0×10^{-3}	1.0×10^{-2}		
Pyraflufen	5.6×10^{-6}	5.6×10^{-5}	1.2×10^{-8}	5.9×10^{-7}
Sulfentrazone	1.3×10^{-4}	1.3×10^{-3}		
Tebuthiuron	3.4×10^{-3}	5.6×10^{-2}		

Table 4-9b Exposure Estimates for the Public-Dermal Exposure from Drift Contaminated Berries, children.

COMPOUND	Single Day Dose (mg/kg/day)	
	Average	Maximum
2,4-D	5.1×10^{-3}	5.1×10^{-2}
Ammonium Salt of Fosamine	1.1×10^{-3}	3.2×10^{-2}
Bromacil/Diuron		
Bromacil	4.3×10^{-4}	1.6×10^{-2}
Diuron	2.1×10^{-3}	8.0×10^{-2}
Chlorsulfuron	1.9×10^{-5}	1.9×10^{-4}
Clopyralid	5.0×10^{-4}	6.7×10^{-3}
Clopyralid/2,4-D		
Clopyralid	2.5×10^{-4}	2.5×10^{-3}
2,4-D	1.3×10^{-3}	1.3×10^{-2}
Dicamba	6.7×10^{-4}	1.3×10^{-2}
Dicamba/2,4-D		
Dicamba	3.7×10^{-4}	1.3×10^{-2}
2,4-d	2.2×10^{-3}	5.1×10^{-2}
Dicamba/MCPA		
Dicamba	4.2×10^{-4}	6.8×10^{-3}
MCPA	1.7×10^{-3}	2.7×10^{-2}
Dichlobenil	2.7×10^{-3}	5.3×10^{-2}
Diuron	3.2×10^{-3}	8.0×10^{-2}
Glyphosate	9.3×10^{-4}	5.0×10^{-2}
Metsulfuron Methyl	1.0×10^{-4}	2.0×10^{-3}
Oryzalin	2.7×10^{-3}	4.0×10^{-2}
Picloram	6.4×10^{-5}	1.3×10^{-3}
Sulfometuron Methyl	3.1×10^{-5}	5.0×10^{-4}
Tricopyr	8.8×10^{-4}	2.6×10^{-2}
<i>New herbicides for consideration</i>		
Bromoxynil	6.7×10^{-4}	6.7×10^{-3}
Diflufenzopyr		
Diflufenzopyr	5.6×10^{-4}	5.6×10^{-3}
Dicamba	1.7×10^{-4}	1.7×10^{-3}
Flumioxazin	2.7×10^{-4}	4.1×10^{-3}
Fluroxypyr	1.4×10^{-3}	2.8×10^{-2}
Imazapyr	5.6×10^{-3}	8.4×10^{-2}
Isoxaben	5.6×10^{-3}	5.6×10^{-2}
Norflurazon	5.2×10^{-5}	5.2×10^{-4}
Oxadiazon	2.4×10^{-3}	4.8×10^{-2}
Pendimethalin	4.0×10^{-3}	4.0×10^{-2}
Pyraflufen	2.2×10^{-5}	2.2×10^{-4}
Sulfentrazone	5.0×10^{-4}	5.0×10^{-3}
Tebuthiuron	1.3×10^{-2}	2.2×10^{-1}

Note: This table is numbered 4-10a, to allow for Table 4-10b to address exposure estimates for children.

Table 4-10a Exposure Estimates for the Public-Dermal Exposure from Contaminated Vegetation, adults.

COMPOUND	Single Day Dose (mg/kg/day)		Lifetime Average Daily Dose (mg/kg/day)	
	Average	Maximum	Average	Maximum
2,4-D	2.1×10^{-3}	1.1×10^{-2}	6.3×10^{-5}	1.5×10^{-3}
Ammonium Salt of Fosamine	4.5×10^{-4}	6.7×10^{-3}		
Bromacil/Diuron				
Bromacil	1.8×10^{-4}	3.3×10^{-3}	2.5×10^{-6}	1.6×10^{-4}
Diuron	8.9×10^{-4}	1.7×10^{-2}	1.3×10^{-5}	7.9×10^{-4}
Chlorsulfuron	7.8×10^{-6}	3.9×10^{-5}		
Clopyralid	2.1×10^{-4}	1.4×10^{-3}		
Clopyralid/2,4-D				
Clopyralid	1.1×10^{-4}	5.3×10^{-4}		
2,4-D	5.6×10^{-4}	2.8×10^{-3}	2.4×10^{-5}	3.9×10^{-4}
Dicamba	2.8×10^{-4}	2.8×10^{-3}		
Dicamba/2,4-D				
Dicamba	1.6×10^{-4}	2.8×10^{-3}		
2,4-d	9.0×10^{-4}	1.1×10^{-2}	2.7×10^{-5}	1.5×10^{-3}
Dicamba/MCPA				
Dicamba	1.7×10^{-4}	1.4×10^{-3}		
MCPA	7.0×10^{-4}	5.7×10^{-3}		
Dichlobenil	1.1×10^{-3}	1.1×10^{-2}		
Diuron	1.3×10^{-3}	1.7×10^{-2}	1.9×10^{-5}	7.9×10^{-4}
Glyphosate	3.9×10^{-4}	1.0×10^{-2}		
Metsulfuron Methyl	4.2×10^{-5}	4.2×10^{-4}		
Oryzalin	1.1×10^{-3}	8.4×10^{-3}	6.3×10^{-6}	3.9×10^{-4}
Picloram	2.7×10^{-5}	2.7×10^{-4}		
Sulfometuron Methyl	1.3×10^{-5}	1.0×10^{-4}		
Tricopyr	3.7×10^{-4}	5.5×10^{-3}		
<i>New herbicides for consideration</i>				
Bromoxynil	2.8×10^{-4}	1.4×10^{-3}	3.9×10^{-6}	6.5×10^{-5}
Diflufenzopyr				
Diflufenzopyr	2.3×10^{-4}	1.2×10^{-3}		
Dicamba	7.0×10^{-5}	3.5×10^{-4}		
Flumioxazin	1.1×10^{-4}	8.5×10^{-4}		
Fluroxypyr	5.9×10^{-4}	5.9×10^{-3}		
Imazapyr	2.3×10^{-3}	1.8×10^{-2}		
Isoxaben	2.3×10^{-3}	1.2×10^{-2}		
Norflurazon	2.2×10^{-5}	1.1×10^{-4}		
Oxadiazon	1.0×10^{-3}	1.0×10^{-2}	1.4×10^{-5}	4.7×10^{-4}
Pendimethalin	1.7×10^{-3}	8.4×10^{-3}		
Pyraflufen	9.4×10^{-6}	4.7×10^{-5}	1.3×10^{-7}	2.2×10^{-6}
Sulfentrazone	2.1×10^{-4}	1.0×10^{-3}		
Tebuthiuron	5.6×10^{-3}	4.7×10^{-2}		

Table 4-10b Exposure Estimates for the Public-Dermal Exposure from Contaminated Vegetation, children.

COMPOUND	Single Day Dose (mg/kg/day)	
	Average	Maximum
2,4-D	8.4×10^{-3}	4.2×10^{-2}
Ammonium Salt of Fosamine	1.8×10^{-3}	2.7×10^{-2}
Bromacil/Diuron		
Bromacil	7.1×10^{-4}	1.3×10^{-2}
Diuron	3.6×10^{-3}	6.7×10^{-2}
Chlorsulfuron	3.1×10^{-5}	1.6×10^{-4}
Clopyralid	8.3×10^{-4}	5.6×10^{-3}
Clopyralid/2,4-D		
Clopyralid	4.2×10^{-4}	2.1×10^{-3}
2,4-D	2.2×10^{-3}	1.1×10^{-2}
Dicamba	1.1×10^{-3}	1.1×10^{-2}
Dicamba/2,4-D		
Dicamba	6.2×10^{-4}	1.1×10^{-2}
2,4-d	3.6×10^{-3}	4.2×10^{-2}
Dicamba/MCPA		
Dicamba	6.9×10^{-4}	5.7×10^{-3}
MCPA	2.8×10^{-3}	2.3×10^{-2}
Dichlobenil	4.4×10^{-3}	4.4×10^{-2}
Diuron	5.3×10^{-3}	6.7×10^{-2}
Glyphosate	1.6×10^{-3}	4.1×10^{-2}
Metsulfuron Methyl	1.7×10^{-4}	1.7×10^{-3}
Oryzalin	4.4×10^{-3}	3.3×10^{-2}
Picloram	1.1×10^{-4}	1.1×10^{-3}
Sulfometuron Methyl	5.2×10^{-5}	4.2×10^{-4}
Tricopyr	1.5×10^{-3}	2.2×10^{-2}
<i>New herbicides for consideration</i>		
Bromoxynil	1.1×10^{-3}	5.6×10^{-3}
Diflufenzopyr		
Diflufenzopyr	9.3×10^{-4}	4.7×10^{-3}
Dicamba	2.8×10^{-4}	1.4×10^{-3}
Flumioxazin	4.4×10^{-4}	3.4×10^{-3}
Fluroxypyr	2.3×10^{-3}	2.3×10^{-2}
Imazapyr	9.3×10^{-3}	7.0×10^{-2}
Isoxaben	9.3×10^{-3}	4.7×10^{-2}
Norflurazon	8.7×10^{-5}	4.4×10^{-4}
Oxadiazon	4.0×10^{-3}	4.0×10^{-2}
Pendimethalin	6.7×10^{-3}	3.3×10^{-2}
Pyraflufen	3.7×10^{-5}	1.9×10^{-4}
Sulfentrazone	8.3×10^{-4}	4.2×10^{-3}
Tebuthiuron	2.2×10^{-2}	1.9×10^{-1}

Table 4-11 Critical Exposure Estimate Criteria.

COMPOUND	Application Rate (lbs. a.i./Acre)		Season Applied*	# of months of Appl. per year**	Max # of Appl. per year**	Dermal Bioavailability Factor (DBF)***
	Average	Maximum				
2,4-D	3.8	3.8	All	12	3	0.10
Ammonium salt of Fosamine	8	24	WS	2	1	0.01
Bromacil/Diuron	6.4	24	WS	5	1	0.10
Bromacil	3.2	12				
Diuron	3.2	12				
Chlorsulfuron	0.14	0.14	WS	6	3	0.01
Clopyralid	0.375	0.5	WS	6	3	0.10
Clopyralid/2,4D	1.19	1.19	WS	6	3	0.10
Clopyralid	0.19	0.19				
2,4-D	1	1				
Dicamba	1	2	WS	6	3	0.05
Dicamba/2,4-D	2.175	5.8	All	12	3	0.05
Dicamba	0.56	2				
2,4-D	1.61	3.8				
Dicamba/MCPA	1.875	3.05	WS	6	3	0.05
Dicamba	0.625	1.02				
MCPA	1.25	2.03				
Dichlobenil	4	8	CS	5	1	0.05
Diuron	4.8	12	WS	5	1	0.05
Glyphosate	2	10.6	All	12	1	0.035
Metsulfuron methyl	0.075	0.15	WS	6	1	0.10
Oryzalin	4	6	CS	5	1	0.05
Picloram	1	2	WS	6	3	0.0048
Sulfometuron methyl	0.234	0.375	WS	5	1	0.01
Triclopyr	4	12	WS	6	1	0.0165
<i>New herbicides for consideration</i>						
Bromoxynil	0.5	0.5	WS	2	1	0.10
Diflufenzopyr/Dicamba	0.35	0.35	WS	6	1	0.42
Diflufenzopyr	0.1	0.1				
Dicamba	0.25	0.25				
Flumioxazin	0.25	0.38	WS	3	1	0.08
Fluroxypyr	0.25	0.5	WS	6	1	0.42
Imazapyr	1	1.5	WS	3	1	0.42
Isoxaben	1	1	WS	6	1	0.42
Norflurazon	3.93	3.93	WS	3	1	0.001
Oxadiazon	2	4	WS	6	1	0.09
Pendimethalin	3	3	WS	3	1	0.1
Pyraflufen	0.004	0.004	WS	6	1	0.42
Sulfentrazone	0.375	0.375	WS	3	1	0.1
Tebuthiuron	2.4	4	WS	6	2	0.42

* Seasonal application has been divided into year-round (All), colder season (CS), and warmer season (WS) months. For simplicity sake, the months of November and March are considered “shoulder months,” and can be grouped with either the CS or WS categories.

**For herbicides applied 12 months per year, an average and maximum of 6 and 8 months, respectively, was used to calculate LADD for WSDOT workers. This is based on worker schedule assumptions described in the 1993 EIS.

***See 1993 EIS, Chapter 4, Section 3.1 for sources of DBF estimates. DBFs for herbicides added in the 2005 assessment are described in Chapter 4, Section 3.1.

Table 4-12 List Of Reference Doses.

Compound	RfD ^(a) (mg/kg/d)	UF	NOAEL	Confidence
2,4-D	1×10 ⁻²	100	<ul style="list-style-type: none"> ▪ rat, 90 day ▪ 1 mg/kg/day diet ▪ Hematologic, hepatic & renal toxicity. 	Medium
Bromacil	1×10 ⁻¹	100	<ul style="list-style-type: none"> ▪ rat, 2 year ▪ 9.82 mg/kg/day ▪ Decreased body weight. 	NA
Clopyralid	5×10 ⁻¹	100	<ul style="list-style-type: none"> ▪ rat, 2 year ▪ 50 mg/kg/day ▪ Decreased body weight. 	NA
Chlorsulfuron	5×10 ⁻²	100	<ul style="list-style-type: none"> ▪ rat, 2 year ▪ 5 mg/kg/day ▪ Decreased body weight. 	NA
Dicamba	3×10 ⁻²	100	<ul style="list-style-type: none"> ▪ rabbit,teratology ▪ 3 mg/kg/day ▪ Maternal & fetal toxicity. 	High
Dichlobenil	1.25×10 ^{-2(b)}	100	<ul style="list-style-type: none"> ▪ dog, 2 year ▪ 1.25 mg/kg/day ▪ Inc. organ weights and hepatic toxicity. 	NA
Diuron	2×10 ⁻³	300	<ul style="list-style-type: none"> ▪ dog, 2 year ▪ 0.625 mg/kg/day ▪ Abnormal pigments in blood. 	Low
Fosamine (Ammonium salt of)	1×10 ⁻²	1,000	<ul style="list-style-type: none"> ▪ rat, 90-day ▪ 10 mg/kg/day ▪ Kidney toxicity in males. 	NA
Glyphosate	1×10 ⁻¹	100	<ul style="list-style-type: none"> ▪ rat, reproduction ▪ 10 mg/kg/day ▪ Renal tubular dilation in F3b offspring. 	High
MCPA	5×10 ⁻⁴	300	<ul style="list-style-type: none"> ▪ dog, 1 year ▪ 0.15 mg/kg/day ▪ Kidney and liver toxicity. 	Medium

^a US EPA derived unless stated otherwise.

^b CSI derived reference dose, see compound in dose-response section for more detail.

^c Reported in Jones & Stokes, (1991).

Table 4-12 List Of Reference Doses (cont'd).

Compound	RfD ^(a) (mg/kg/day)	UF	NOAEL	Confidence
Metsulfuron methyl	2.5×10^{-2}	1000	<ul style="list-style-type: none"> ▪ rat, 2 year ▪ 25 mg/kg/day ▪ Decreased body weight. 	High
Oryzalin	5×10^{-2}	100	<ul style="list-style-type: none"> ▪ dog, 1 year ▪ 5 mg/kg/day ▪ Changes in blood parameters, inc. liver & kidney weights & dec. adrenal weights. 	High
Picloram	7×10^{-2}	100	<ul style="list-style-type: none"> ▪ dog, 6 month ▪ 7 mg/kg/day ▪ Increased liver weights. 	Medium
Sulfometuron methyl	2.4×10^{-1}	100	<ul style="list-style-type: none"> ▪ rat, 2 year ▪ 24.4 mg/kg/day ▪ Effects on urinary bladder. 	NA
Triclopyr	5×10^{-2}	100	<ul style="list-style-type: none"> ▪ rat, reproduction ▪ 5 mg/kg/day ▪ Inc. proximal tubular degeneration kidneys in P1 and P2 gen. parental rats. 	NA
<i>New herbicides for consideration</i>				
Bromoxynil	2.0×10^{-2}	100	<ul style="list-style-type: none"> ▪ rat, 2 year ▪ 7.3 mg/kg/day ▪ no effects noted 	Medium
Diflufenzopyr	2.6×10^{-1} (chronic)	100	<ul style="list-style-type: none"> ▪ dog, 1 year ▪ 26 mg/kg/day ▪ erythroid hyperplasia in bone marrow, reticulocytosis, and increased hemosiderin deposits in the liver, kidneys, and spleen 	NA
Flumioxazin	2×10^{-2} (chronic)	100	<ul style="list-style-type: none"> ▪ rat, 2 year ▪ 2 mg/kg/day ▪ nephropathy 	NA
Fluroxypyr	1×10^0 (chronic)	100	<ul style="list-style-type: none"> ▪ rat, 2 year ▪ 100 mg/kg/day ▪ glomerulonephropathy 	NA
Imazapyr	2.5×10^0	100	<ul style="list-style-type: none"> ▪ dog, 1 year ▪ 250 mg/kg/day ▪ no effects noted 	NA
Isoxaben	5.0×10^{-2}	100	<ul style="list-style-type: none"> ▪ rat, 2 year ▪ 5 mg/kg/day ▪ decreased serum AP and AST, decreased food consumption and efficiency, increased BUN and 	High

Compound	RfD ^(a) (mg/kg/day)	UF	NOAEL	Confidence
			heart/body weight	
Norflurazon	4.0x10 ⁻²	100	<ul style="list-style-type: none"> ▪ dog, 6 month ▪ 4 mg/kg/day ▪ liver and thyroid effects 	High
Oxadiazon	5.0x10 ⁻³	100	<ul style="list-style-type: none"> ▪ rat, 2 year ▪ 0.5 mg/kg/day ▪ increased serum proteins and liver weights 	Medium
Pendimethalin	4.0x10 ⁻²	300	<ul style="list-style-type: none"> ▪ dog, 2 year ▪ 12.5 mg/kg/day ▪ increased serum alkaline phosphatase and liver weight, hepatic lesions 	Medium
Pyraflufen	2.0x10 ⁻¹	100	<ul style="list-style-type: none"> ▪ mouse, 78 weeks ▪ 98 mg/kg/day ▪ hepatotoxicity 	NA
Sulfentrazone	1.4x10 ⁻¹ (chronic)	100	<ul style="list-style-type: none"> ▪ rat, reproduction ▪ 14 mg/kg/day ▪ reproductive effects 	NA
Tebuthiuron	7.0x10 ⁻²	100	<ul style="list-style-type: none"> ▪ rat, reproduction ▪ 7 mg/kg/day ▪ decreased body weight 	High

^a US EPA derived unless stated otherwise.

^b CSI derived reference dose, see compound in dose-response section for more detail.

^c Reported in Jones & Stokes, (1991).

Table 4-13 Potential Carcinogens

COMPOUND	CPF (mg/kg/d) ⁻¹	Weight of Evidence Classification	Tumor Type
2,4-D	1.9×10 ^{-2(a)}	D	Increased rate of tumor formation in rats; data on human carcinogenicity are equivocal
Bromacil	3.8×10 ^{-3(a)}	C ^(b)	Hepatocellular adenomas & carcinomas in mice
Diuron	1.91×10 ⁻²	B ^(c)	Urinary bladder carcinomas in rats
MCPA	----	D ^(d)	----
Oryzalin	1.3×10 ^{-1(d)}	C	Tumors at multiple sites in rats
<i>New herbicides for consideration</i>			
Bromoxynil	1.03×10 ⁻¹	C ^(e)	Hepatocellular adenomas, carcinomas, and adenomas/carcinomas in mice
Oxadiazon	7.1×10 ⁻²	likely ^(f)	Hepatocellular adenomas and carcinomas in mice and rats
Pyraflufen	3.32×10 ⁻²	likely ^(g)	Hepatocellular adenomas in mice

(a) US EPA, 1991 (b)

(b) Jones & Stokes, 1991.

(c) US EPA, 1999 (c)

(d) U.S. EPA, 1994b

(e) US EPA, 1998

(f) US EPA, 2003 (a)

(g) US EPA, 2003 (b)

Weight of Evidence Classification:

Group A, human carcinogens - Sufficient evidence from human studies to support a causal association between exposure and cancer.

Group B, probable human carcinogens - Sufficient evidence of carcinogenicity from animal studies but limited evidence in human studies (B1) or inadequate evidence in human studies (B2).

Group C, possible human carcinogens - Limited evidence of carcinogenicity in animal studies and no human data.

Group D, not classifiable as to human carcinogenicity - Inadequate evidence of human or animal carcinogenicity or for which no data are available.

Tumor Type:

Species and tumor(s) produced in the oncogenicity study used to calculate the Cancer Potency Factor.

Table 4-14 Reference Doses and Cancer Potency Factors Used in Risk Assessment

COMPOUND	RfD/EPA (mg/kg/day)	RfD/Other (mg/kg/day)	CPF (mg/kg/day) ⁻¹
2,4-D	1×10 ⁻²	----	1.9×10 ⁻²
Bromacil	1×10 ⁻¹	----	3.8×10 ⁻³
Clopyralid	5×10 ⁻¹	----	----
Chlorsulfuron	5×10 ⁻²	----	----
Dicamba	3×10 ⁻²	----	----
Dichlobenil	----	1.25×10 ⁻²	----
Diuron	2×10 ⁻³	----	1.91×10 ⁻²
Fosamine	----	1.0×10 ⁻²	----
Glyphosate	1×10 ⁻¹	----	----
MCPA	5×10 ⁻⁴	----	----
Metsulfuron methyl	2.5×10 ⁻²	----	----
Oryzalin	5×10 ⁻²	----	1.3×10 ⁻¹
Picloram	7×10 ⁻²	----	----
Sulfometuron methyl	2.4×10 ⁻¹	----	----
Triclopyr	5×10 ⁻²	----	----
<i>New herbicides for consideration</i>			
Bromoxynil	2.0×10 ⁻²	----	1.03×10 ⁻¹
Diflufenzopyr	2.6×10 ⁻¹	----	----
Flumioxazin	2×10 ⁻²	----	----
Fluroxypyr	1×10 ⁰	----	----
Imazapyr	2.5×10 ⁰	----	----
Isoxaben	5.0×10 ⁻²	----	----
Norflurazon	4.0×10 ⁻²	----	----
Oxadiazon	5.0×10 ⁻³	----	7.1×10 ⁻²
Pendimethalin	4.0×10 ⁻²	----	----
Pyraflufen	2.0×10 ⁻¹	----	3.32×10 ⁻²
Sulfentrazone	1.4×10 ⁻¹	----	----

Tebuthiuron	7.0×10^{-2}	----	----
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Note: The title of this table has changed from “Estimates of Non-cancer and Cancer Risks for Workers Applying Herbicides Using Truck Mounted Spray Equipment.” This table replaces the results in the former tables 4-15 through 4-17 because of a merge of three worker job scenarios into the one described in the new title.

Table 4-15 Estimates of Non-cancer and Cancer Risks for Workers Engaged in Broadcast Hydraulic Spray Applications.

COMPOUND	Non-Cancer Hazard Quotient		Cancer Risk	
	Average	Maximum	Average	Maximum
2,4-D	1.9×10^0	$1.7 \times 10^{+1}$	5.9×10^{-6}	1.6×10^{-4}
Ammonium Salt of Fosamine	4.0×10^0	$1.1 \times 10^{+2}$		
Bromacil/Diuron	8.6×10^0	$2.9 \times 10^{+2}$	5.0×10^{-6}	3.9×10^{-4}
Chlorsulfuron	1.4×10^{-2}	1.3×10^{-1}		
Clopyralid	3.8×10^{-3}	4.5×10^{-2}		
Clopyralid/2,4-D	5.0×10^{-1}	4.5×10^0	1.6×10^{-6}	3.2×10^{-5}
Dicamba	1.7×10^{-1}	3.0×10^0		
Dicamba/2,4-D	9.0×10^{-1}	$2.0 \times 10^{+1}$	2.5×10^{-6}	1.6×10^{-4}
Dicamba/MCPA	$1.3 \times 10^{+1}$	$1.8 \times 10^{+2}$		
Dichlobenil	1.6×10^0	$2.9 \times 10^{+1}$		
Diuron	$1.2 \times 10^{+1}$	$2.7 \times 10^{+2}$	6.3×10^{-6}	3.2×10^{-4}
Glyphosate	1.0×10^{-1}	4.8×10^0		
Metsulfuron Methyl	1.5×10^{-2}	2.7×10^{-1}		
Oryzalin	4.0×10^{-1}	5.4×10^0	3.6×10^{-5}	1.1×10^{-3}
Picloram	7.1×10^{-2}	1.3×10^0		
Sulfometuron Methyl	4.9×10^{-3}	7.0×10^{-2}		
Tricopyr	4.0×10^0	$1.1 \times 10^{+2}$		
<i>New herbicides for consideration</i>				
Bromoxynil	1.3×10^{-1}	1.1×10^0	1.4×10^{-6}	2.9×10^{-5}
Diflufenzopyr	4.4×10^{-2}	3.9×10^{-1}		
Flumioxazin	6.3×10^{-2}	8.6×10^{-1}		
Fluroxypyr	1.3×10^{-3}	2.3×10^{-2}		
Imazapyr	2.0×10^{-3}	2.7×10^{-2}		
Isoxaben	1.0×10^{-1}	9.0×10^{-1}		
Norflurazon	4.9×10^{-1}	4.4×10^0		
Oxadiazon	2.0×10^0	$3.6 \times 10^{+1}$	1.2×10^{-5}	4.8×10^{-4}
Pendimethalin	3.8×10^{-1}	3.4×10^0		
Pyraflufen	1.0×10^{-4}	9.0×10^{-4}	1.1×10^{-8}	2.3×10^{-7}
Sulfentrazone	1.3×10^{-2}	1.2×10^{-1}		
Tebuthiuron	1.7×10^{-1}	2.6×10^0		

Note: The title of this table has changed from “Estimates of Non-cancer and Cancer Risk for Workers Applying Herbicides Using Backpack or Hand-held Spray Equipment.” In addition, only the product types that are used in this manner are presented.

Table 4-18 Estimates of Non-cancer and Cancer Risk for Workers Engaged in Directed Foliar Applications.

COMPOUND	Non-Cancer Hazard Quotient		Cancer Risk	
	Average	Maximum	Average	Maximum
Chlorsulfuron	8.4×10^{-3}	2.8×10^{-2}		
Clopyralid	2.3×10^{-3}	1.0×10^{-2}		
Glyphosate	6.0×10^{-2}	1.1×10^0		
Oryzalin	2.4×10^{-1}	1.2×10^0	2.1×10^{-5}	2.4×10^{-4}
Picloram	4.3×10^{-2}	2.9×10^{-1}		
<i>New herbicides for consideration</i>				
Bromoxynil	7.5×10^{-2}	2.5×10^{-1}	8.5×10^{-7}	6.5×10^{-6}
Diflufenzopyr	2.6×10^{-2}	8.7×10^{-2}		
Fluroxypyr	7.5×10^{-4}	5.0×10^{-3}		
Isoxaben	6.0×10^{-2}	2.0×10^{-1}		
Oxadiazon	1.2×10^0	8.0×10^0	7.0×10^{-6}	1.1×10^{-4}
Pyraflufen	6.0×10^{-5}	2.0×10^{-4}	6.6×10^{-9}	5.0×10^{-8}

Table 4-19 Estimates of Non-Cancer and Cancer Risk from Ingestion of Drift Contaminated Berries, Adults.

COMPOUND	Non-Cancer Hazard Quotient		Cancer Risk	
	Average	Maximum	Average	Maximum
2,4-D	1.5×10^{-2}	2.5×10^{-1}	3.0×10^{-8}	3.4×10^{-6}
Ammonium Salt of Fosamine	3.1×10^{-2}	1.6×10^0		
Bromacil/Diuron	6.7×10^{-2}	4.3×10^0	3.0×10^{-8}	1.3×10^{-5}
Chlorsulfuron	1.1×10^{-4}	1.9×10^{-3}		
Clopyralid	2.9×10^{-5}	6.7×10^{-4}		
Clopyralid/2,4-D	4.1×10^{-3}	6.7×10^{-2}	8.3×10^{-9}	9.0×10^{-7}
Dicamba	1.3×10^{-3}	4.5×10^{-2}		
Dicamba/2,4-D	6.9×10^{-3}	3.0×10^{-1}	1.3×10^{-8}	3.4×10^{-6}
Dicamba/MCPA	7.1×10^{-2}	2.7×10^0		
Dichlobenil	1.2×10^{-2}	4.3×10^{-1}		
Diuron	9.3×10^{-2}	4.0×10^0	3.7×10^{-8}	1.1×10^{-5}
Glyphosate	7.7×10^{-4}	7.1×10^{-2}		
Metsulfuron Methyl	1.2×10^{-4}	4.0×10^{-3}		
Oryzalin	3.1×10^{-3}	8.0×10^{-2}	2.1×10^{-7}	3.7×10^{-5}
Picloram	5.5×10^{-4}	1.9×10^{-2}		
Sulfometuron Methyl	3.8×10^{-5}	1.0×10^{-3}		
Tricopyr	3.1×10^{-2}	1.6×10^0		
<i>New herbicides for consideration</i>				
Bromoxynil	9.7×10^{-4}	1.7×10^{-2}	2.1×10^{-8}	2.4×10^{-6}
Diflufenzopyr	3.4×10^{-4}	5.8×10^{-3}		
Flumioxazin	4.8×10^{-4}	1.3×10^{-2}		
Fluroxypyr	9.7×10^{-6}	3.3×10^{-4}		
Imazapyr	1.6×10^{-5}	4.0×10^{-4}		
Isoxaben	7.7×10^{-4}	1.3×10^{-2}		
Norflurazon	3.8×10^{-3}	6.6×10^{-2}		
Oxadiazon	1.6×10^{-2}	5.4×10^{-1}	5.8×10^{-8}	1.3×10^{-5}
Pendimethalin	2.9×10^{-3}	5.0×10^{-2}		
Pyraflufen	7.7×10^{-7}	1.3×10^{-5}	5.4×10^{-11}	6.3×10^{-9}
Sulfentrazone	1.0×10^{-4}	1.8×10^{-3}		
Tebuthiuron	1.3×10^{-3}	3.8×10^{-2}		

Table 4-20 Estimates of Non-Cancer and Cancer Risk from Ingestion of Drift Contaminated Berries, Child.

COMPOUND	Non-Cancer Hazard Quotient	
	Average	Maximum
2,4-D	5.9×10^{-2}	1.0×10^0
Ammonium Salt of Fosamine	1.2×10^{-1}	6.4×10^0
Bromacil/Diuron	2.7×10^{-1}	$1.7 \times 10^{+1}$
Chlorsulfuron	4.3×10^{-4}	7.5×10^{-3}
Clopyralid	1.2×10^{-4}	2.7×10^{-3}
Clopyralid/2,4-D	1.6×10^{-2}	2.7×10^{-1}
Dicamba	5.1×10^{-3}	1.8×10^{-1}
Dicamba/2,4-D	2.8×10^{-2}	1.2×10^0
Dicamba/MCPA	2.8×10^{-1}	$1.1 \times 10^{+1}$
Dichlobenil	4.9×10^{-2}	1.7×10^0
Diuron	3.7×10^{-1}	$1.6 \times 10^{+1}$
Glyphosate	3.1×10^{-3}	2.8×10^{-1}
Metsulfuron Methyl	4.6×10^{-4}	1.6×10^{-2}
Oryzalin	1.2×10^{-2}	3.2×10^{-1}
Picloram	2.2×10^{-3}	7.6×10^{-2}
Sulfometuron Methyl	1.5×10^{-4}	4.2×10^{-3}
Tricopyr	1.2×10^{-1}	6.4×10^0
<i>New herbicides for consideration</i>		
Bromoxynil	3.9×10^{-3}	6.7×10^{-2}
Diflufenzopyr	1.3×10^{-3}	2.3×10^{-2}
Flumioxazin	1.9×10^{-3}	5.1×10^{-2}
Fluroxypyr	3.9×10^{-5}	1.3×10^{-3}
Imazapyr	6.2×10^{-5}	1.6×10^{-3}
Isoxaben	3.1×10^{-3}	5.3×10^{-2}
Norflurazon	1.5×10^{-2}	2.6×10^{-1}
Oxadiazon	6.2×10^{-2}	2.1×10^0
Pendimethalin	1.2×10^{-2}	2.0×10^{-1}
Pyraflufen	3.1×10^{-6}	5.3×10^{-5}
Sulfentrazone	4.1×10^{-4}	7.1×10^{-3}
Tebuthiuron	5.3×10^{-3}	1.5×10^{-1}

Note: The title of this table has changed from “Estimates of Non-cancer and Cancer Risk From Ingestion of Drift Contaminated Vegetables, Lettuce.” This table replaces the results in the former tables 4-21 and 4-22 because of the addition of a single category of garden produce to replace the representative vegetables lettuce and beans. Also, this table is numbered 4-21a, to allow for Table 4-21b to address exposure estimates for children.

Table 4-21a Estimates of Non-Cancer and Cancer Risk from Ingestion of Drift Contaminated Garden Vegetables, adults.

COMPOUND	Non-Cancer Hazard Quotient		Cancer Risk	
	Average	Maximum	Average	Maximum
2,4-D	2.9×10^{-1}	$1.4 \times 10^{+1}$	2.7×10^{-7}	8.7×10^{-5}
Ammonium Salt of Fosamine	6.0×10^{-1}	$8.7 \times 10^{+1}$		
Bromacil/Diuron	1.3×10^0	$2.4 \times 10^{+2}$	2.7×10^{-7}	3.3×10^{-4}
Chlorsulfuron	2.1×10^{-3}	1.0×10^{-1}		
Clopyralid	5.7×10^{-4}	3.6×10^{-2}		
Clopyralid/2,4-D	7.6×10^{-2}	3.7×10^0	7.0×10^{-8}	2.3×10^{-5}
Dicamba	2.5×10^{-2}	2.4×10^0		
Dicamba/2,4-D	1.4×10^{-1}	$1.6 \times 10^{+1}$	1.1×10^{-7}	8.7×10^{-5}
Dicamba/MCPA	1.9×10^0	$1.5 \times 10^{+2}$		
Dichlobenil	2.4×10^{-1}	$2.3 \times 10^{+1}$		
Diuron	1.8×10^0	$2.2 \times 10^{+2}$	3.4×10^{-7}	2.8×10^{-4}
Glyphosate	1.5×10^{-2}	3.9×10^0		
Metsulfuron Methyl	2.3×10^{-3}	2.2×10^{-1}		
Oryzalin	6.0×10^{-2}	4.4×10^0	1.9×10^{-6}	9.4×10^{-4}
Picloram	1.1×10^{-2}	1.0×10^0		
Sulfometuron Methyl	7.3×10^{-4}	5.7×10^{-2}		
Tricopyr	6.0×10^{-1}	$8.7 \times 10^{+1}$		
<i>New herbicides for consideration</i>				
Bromoxynil	1.9×10^{-2}	9.1×10^{-1}	1.9×10^{-7}	6.2×10^{-5}
Diflufenzopyr	6.6×10^{-3}	3.2×10^{-1}		
Flumioxazin	9.4×10^{-3}	6.9×10^{-1}		
Fluroxypyr	1.9×10^{-4}	1.8×10^{-2}		
Imazapyr	3.0×10^{-4}	2.2×10^{-2}		
Isoxaben	1.5×10^{-2}	7.3×10^{-1}		
Norflurazon	7.4×10^{-2}	3.6×10^0		
Oxadiazon	3.0×10^{-1}	$2.9 \times 10^{+1}$	5.2×10^{-7}	3.4×10^{-4}
Pendimethalin	5.7×10^{-2}	2.7×10^0		
Pyraflufen	1.5×10^{-5}	7.3×10^{-4}	4.9×10^{-10}	1.6×10^{-7}
Sulfentrazone	2.0×10^{-3}	9.7×10^{-2}		
Tebuthiuron	2.6×10^{-2}	2.1×10^0		

Table 4-21b Estimates of Non-Cancer and Cancer Risk from Ingestion of Drift Contaminated garden Vegetables, Child.

COMPOUND	Non-Cancer Hazard Quotient	
	Average	Maximum
2,4-D	3.5×10^{-1}	$1.8 \times 10^{+1}$
Ammonium Salt of Fosamine	7.3×10^{-1}	$1.1 \times 10^{+2}$
Bromacil/Diuron	1.6×10^0	$3.1 \times 10^{+2}$
Chlorsulfuron	2.6×10^{-3}	1.3×10^{-1}
Clopyralid	6.9×10^{-4}	4.7×10^{-2}
Clopyralid/2,4-D	9.2×10^{-2}	4.7×10^0
Dicamba	3.0×10^{-2}	3.1×10^0
Dicamba/2,4-D	1.6×10^{-1}	$2.1 \times 10^{+1}$
Dicamba/MCPA	2.3×10^0	$1.9 \times 10^{+2}$
Dichlobenil	2.9×10^{-1}	$3.0 \times 10^{+1}$
Diuron	2.2×10^0	$2.8 \times 10^{+2}$
Glyphosate	1.8×10^{-2}	5.0×10^0
Metsulfuron Methyl	2.7×10^{-3}	2.8×10^{-1}
Oryzalin	7.3×10^{-2}	5.7×10^0
Picloram	1.3×10^{-2}	1.4×10^0
Sulfometuron Methyl	8.9×10^{-4}	7.4×10^{-2}
Tricopyr	7.3×10^{-1}	$1.1 \times 10^{+2}$
<i>New herbicides for consideration</i>		
Bromoxynil	2.3×10^{-2}	1.2×10^0
Diflufenzopyr	8.0×10^{-3}	4.1×10^{-1}
Flumioxazin	1.1×10^{-2}	9.0×10^{-1}
Fluroxypyr	2.3×10^{-4}	2.4×10^{-2}
Imazapyr	3.7×10^{-4}	2.8×10^{-2}
Isoxaben	1.8×10^{-2}	9.4×10^{-1}
Norflurazon	9.0×10^{-2}	4.6×10^0
Oxadiazon	3.7×10^{-1}	$3.8 \times 10^{+1}$
Pendimethalin	6.9×10^{-2}	3.5×10^0
Pyraflufen	1.8×10^{-5}	9.4×10^{-4}
Sulfentrazone	2.5×10^{-3}	1.3×10^{-1}
Tebuthiuron	3.1×10^{-2}	2.7×10^0

Note: This table is numbered 4-23a, to allow for Table 4-23b to address exposure estimates for children.

Table 4-23a Estimates of Non-Cancer and Cancer Risk from Dermal Contact with Drift Contaminated Berries, adult.

COMPOUND	Non-Cancer Hazard Quotient		Cancer Risk	
	Average	Maximum	Average	Maximum
2,4-D	1.3×10^{-1}	1.3×10^0	5.1×10^{-8}	2.6×10^{-6}
Ammonium Salt of Fosamine	2.7×10^{-2}	8.0×10^{-1}		
Bromacil/Diuron	2.7×10^{-1}	$1.0 \times 10^{+1}$	2.2×10^{-8}	4.2×10^{-6}
Chlorsulfuron	9.4×10^{-5}	9.4×10^{-4}		
Clopyralid	2.5×10^{-4}	3.3×10^{-3}		
Clopyralid/2,4-D	3.4×10^{-2}	3.4×10^{-1}	1.3×10^{-8}	6.7×10^{-7}
Dicamba	5.6×10^{-3}	1.1×10^{-1}		
Dicamba/2,4-D	5.7×10^{-2}	1.4×10^0	2.2×10^{-8}	2.6×10^{-6}
Dicamba/MCPA	8.4×10^{-1}	$1.4 \times 10^{+1}$		
Dichlobenil	5.4×10^{-2}	1.1×10^0		
Diuron	4.0×10^{-1}	$1.0 \times 10^{+1}$	3.2×10^{-8}	4.1×10^{-6}
Glyphosate	2.3×10^{-3}	1.2×10^{-1}		
Metsulfuron Methyl	1.0×10^{-3}	2.0×10^{-2}		
Oryzalin	1.3×10^{-2}	2.0×10^{-1}	1.8×10^{-7}	1.4×10^{-5}
Picloram	2.3×10^{-4}	4.6×10^{-3}		
Sulfometuron Methyl	3.3×10^{-5}	5.2×10^{-4}		
Tricopyr	4.4×10^{-2}	1.3×10^0		
<i>New herbicides for consideration</i>				
Bromoxynil	8.4×10^{-3}	8.4×10^{-2}	3.6×10^{-8}	1.8×10^{-6}
Diflufenzopyr	1.9×10^{-3}	1.9×10^{-2}		
Flumioxazin	3.3×10^{-3}	5.1×10^{-2}		
Fluroxypyr	3.5×10^{-4}	7.0×10^{-3}		
Imazapyr	5.6×10^{-4}	8.4×10^{-3}		
Isoxaben	2.8×10^{-2}	2.8×10^{-1}		
Norflurazon	3.3×10^{-4}	3.3×10^{-3}		
Oxadiazon	1.2×10^{-1}	2.4×10^0	9.0×10^{-8}	9.0×10^{-6}
Pendimethalin	2.5×10^{-2}	2.5×10^{-1}		
Pyraflufen	2.8×10^{-5}	2.8×10^{-4}	3.9×10^{-10}	2.0×10^{-8}
Sulfentrazone	9.0×10^{-4}	9.0×10^{-3}		
Tebuthiuron	4.8×10^{-2}	8.0×10^{-1}		

Table 4-23b Estimates of Non-Cancer and Cancer Risk from Dermal Contact with Drift Contaminated Berries, child.

COMPOUND	Non-Cancer Hazard Quotient	
	Average	Maximum
2,4-D	5.1×10^{-1}	5.1×10^0
Ammonium Salt of Fosamine	1.1×10^{-1}	3.2×10^0
Bromacil/Diuron	1.1×10^0	$4.1 \times 10^{+1}$
Chlorsulfuron	3.7×10^{-4}	3.7×10^{-3}
Clopyralid	1.0×10^{-3}	1.3×10^{-2}
Clopyralid/2,4-D	1.3×10^{-1}	1.3×10^0
Dicamba	2.2×10^{-2}	4.4×10^{-1}
Dicamba/2,4-D	2.3×10^{-1}	5.5×10^0
Dicamba/MCPA	3.4×10^0	$5.4 \times 10^{+1}$
Dichlobenil	2.1×10^{-1}	4.3×10^0
Diuron	1.6×10^0	$4.0 \times 10^{+1}$
Glyphosate	9.3×10^{-3}	5.0×10^{-1}
Metsulfuron Methyl	4.0×10^{-3}	8.0×10^{-2}
Oryzalin	5.3×10^{-2}	8.0×10^{-1}
Picloram	9.1×10^{-4}	1.8×10^{-2}
Sulfometuron Methyl	1.3×10^{-4}	2.1×10^{-3}
Tricopyr	1.8×10^{-1}	5.3×10^0
<i>New herbicides for consideration</i>		
Bromoxynil	3.3×10^{-2}	3.3×10^{-1}
Diflufenzopyr	7.7×10^{-3}	7.7×10^{-2}
Flumioxazin	1.3×10^{-2}	2.0×10^{-1}
Fluroxypyr	1.4×10^{-3}	2.8×10^{-2}
Imazapyr	2.2×10^{-3}	3.4×10^{-2}
Isoxaben	1.1×10^{-1}	1.1×10^0
Norflurazon	1.3×10^{-3}	1.3×10^{-2}
Oxadiazon	4.8×10^{-1}	9.6×10^0
Pendimethalin	1.0×10^{-1}	1.0×10^0
Pyraflufen	1.1×10^{-4}	1.1×10^{-3}
Sulfentrazone	3.6×10^{-3}	3.6×10^{-2}
Tebuthiuron	1.9×10^{-1}	3.2×10^0

Note: This table is numbered 4-24a, to allow for Table 4-24b to address exposure estimates for children.

Table 4-24a Estimates of Non-Cancer and Cancer Risk from Dermal Contact with Sprayed Vegetation, adult.

COMPOUND	Non-Cancer Hazard Quotient		Cancer Risk	
	Average	Maximum	Average	Maximum
2,4-D	2.1×10^{-1}	1.1×10^0	1.2×10^{-6}	2.8×10^{-5}
Ammonium Salt of Fosamine	4.5×10^{-2}	6.7×10^{-1}		
Bromacil/Diuron	4.5×10^{-1}	8.5×10^0	2.5×10^{-7}	1.6×10^{-5}
Chlorsulfuron	1.6×10^{-4}	7.8×10^{-4}		
Clopyralid	4.2×10^{-45}	2.8×10^{-3}		
Clopyralid/2,4-D	5.6×10^{-2}	2.8×10^{-1}	4.5×10^{-7}	7.5×10^{-6}
Dicamba	9.3×10^{-3}	9.3×10^{-2}		
Dicamba/2,4-D	9.5×10^{-2}	1.2×10^0	5.0×10^{-7}	2.8×10^{-5}
Dicamba/MCPA	1.4×10^0	$1.1 \times 10^{+1}$		
Dichlobenil	8.9×10^{-2}	8.9×10^{-1}		
Diuron	6.7×10^{-1}	8.4×10^0	3.6×10^{-7}	1.5×10^{-5}
Glyphosate	3.9×10^{-3}	1.0×10^{-1}		
Metsulfuron Methyl	1.7×10^{-3}	1.7×10^{-2}		
Oryzalin	2.2×10^{-2}	1.7×10^{-1}	8.2×10^{-7}	5.1×10^{-5}
Picloram	3.8×10^{-4}	3.8×10^{-3}		
Sulfometuron Methyl	5.4×10^{-5}	4.4×10^{-4}		
Tricopyr	7.4×10^{-2}	1.1×10^0		
<i>New herbicides for consideration</i>				
Bromoxynil	1.4×10^{-2}	7.0×10^{-2}	4.0×10^{-7}	6.7×10^{-6}
Diflufenzopyr	3.2×10^{-3}	1.6×10^{-2}		
Flumioxazin	5.6×10^{-3}	4.2×10^{-2}		
Fluroxypyr	5.9×10^{-4}	5.9×10^{-3}		
Imazapyr	9.4×10^{-4}	7.0×10^{-3}		
Isoxaben	4.7×10^{-2}	2.3×10^{-1}		
Norflurazon	5.5×10^{-4}	2.7×10^{-3}		
Oxadiazon	2.0×10^{-1}	2.0×10^0	1.0×10^{-6}	3.3×10^{-5}
Pendimethalin	4.2×10^{-2}	2.1×10^{-1}		
Pyraflufen	4.7×10^{-5}	2.3×10^{-4}	4.4×10^{-9}	7.3×10^{-8}
Sulfentrazone	1.5×10^{-3}	7.5×10^{-3}		
Tebuthiuron	8.0×10^{-2}	6.7×10^{-1}		

Table 4-24b Estimates of Non-Cancer and Cancer Risk from Dermal Contact with Sprayed Vegetation, child.

COMPOUND	Non-Cancer Hazard Quotient	
	Average	Maximum
2,4-D	8.4×10^{-1}	4.2×10^0
Ammonium Salt of Fosamine	1.8×10^{-1}	2.7×10^0
Bromacil/Diuron	1.8×10^0	$3.4 \times 10^{+1}$
Chlorsulfuron	6.2×10^{-4}	3.1×10^{-3}
Clopyralid	1.7×10^{-3}	1.1×10^{-2}
Clopyralid/2,4-D	2.2×10^{-1}	1.1×10^0
Dicamba	3.7×10^{-2}	3.7×10^{-1}
Dicamba/2,4-D	3.8×10^{-1}	4.6×10^0
Dicamba/MCPA	5.6×10^0	$4.5 \times 10^{+1}$
Dichlobenil	3.6×10^{-1}	3.6×10^0
Diuron	2.7×10^0	$3.3 \times 10^{+1}$
Glyphosate	1.6×10^{-2}	4.1×10^{-1}
Metsulfuron Methyl	6.7×10^{-3}	6.7×10^{-2}
Oryzalin	8.9×10^{-2}	6.7×10^{-1}
Picloram	1.5×10^{-3}	1.5×10^{-2}
Sulfometuron Methyl	2.2×10^{-4}	1.7×10^{-3}
Tricopyr	2.9×10^{-1}	4.4×10^0
<i>New herbicides for consideration</i>		
Bromoxynil	5.6×10^{-2}	2.8×10^{-1}
Diflufenzopyr	1.3×10^{-2}	6.4×10^{-2}
Flumioxazin	2.2×10^{-2}	1.7×10^{-1}
Fluroxypyr	2.3×10^{-3}	2.3×10^{-2}
Imazapyr	3.7×10^{-3}	2.8×10^{-2}
Isoxaben	1.9×10^{-1}	9.3×10^{-1}
Norflurazon	2.2×10^{-3}	1.1×10^{-2}
Oxadiazon	8.0×10^{-1}	8.0×10^0
Pendimethalin	1.7×10^{-1}	8.3×10^{-1}
Pyraflufen	1.9×10^{-4}	9.3×10^{-4}
Sulfentrazone	6.0×10^{-3}	3.0×10^{-2}
Tebuthiuron	3.2×10^{-1}	2.7×10^0

Table 4-25a Multiple Pathway Non-cancer Risks: Hiking Through Sprayed Vegetation to Pick Contaminated Blackberries Which Are Consumed the Same Day, Adult.

COMPOUND	Dermal Vegetation HQ	Dermal Berry HQ	Oral Berry HQ	Hazard Index
2,4-D	2.1×10^{-1}	1.3×10^{-1}	1.5×10^{-2}	3.5×10^{-1}
Ammonium Salt of Fosamine	4.5×10^{-2}	2.7×10^{-2}	3.1×10^{-2}	1.0×10^{-1}
Bromacil/Diuron	4.5×10^{-1}	2.7×10^{-1}	6.7×10^{-2}	7.9×10^{-1}
Chlorsulfuron	1.6×10^{-4}	9.4×10^{-5}	1.1×10^{-4}	3.6×10^{-4}
Clopyralid	4.2×10^{-4}	2.5×10^{-4}	2.9×10^{-5}	7.0×10^{-4}
Clopyralid/2,4-D	5.6×10^{-2}	3.4×10^{-2}	4.1×10^{-3}	9.4×10^{-2}
Dicamba	9.3×10^{-3}	5.6×10^{-3}	1.3×10^{-3}	1.6×10^{-2}
Dicamba/2,4-D	9.5×10^{-2}	5.7×10^{-2}	6.9×10^{-3}	1.6×10^{-1}
Dicamba/MCPA	1.4×10^0	8.4×10^{-1}	7.1×10^{-2}	2.3×10^0
Dichlobenil	8.9×10^{-2}	5.4×10^{-2}	1.2×10^{-2}	1.6×10^{-1}
Diuron	6.7×10^{-1}	4.0×10^{-1}	9.3×10^{-2}	1.2×10^0
Glyphosate	3.9×10^{-3}	2.3×10^{-3}	7.7×10^{-4}	7.0×10^{-3}
Metsulfuron Methyl	1.7×10^{-3}	1.0×10^{-3}	1.2×10^{-4}	2.8×10^{-3}
Oryzalin	2.2×10^{-2}	1.3×10^{-2}	3.1×10^{-3}	3.9×10^{-2}
Picloram	3.8×10^{-4}	2.3×10^{-4}	5.5×10^{-4}	1.2×10^{-3}
Sulfometuron Methyl	5.4×10^{-5}	3.3×10^{-5}	3.8×10^{-5}	1.3×10^{-4}
Tricopyr	7.4×10^{-2}	4.4×10^{-2}	3.1×10^{-2}	1.5×10^{-1}
<i>New herbicides for consideration</i>				
Bromoxynil	1.4×10^{-2}	8.4×10^{-3}	9.7×10^{-4}	2.3×10^{-2}
Diflufenzopyr	3.2×10^{-3}	1.9×10^{-3}	3.4×10^{-4}	5.5×10^{-3}
Flumioxazin	5.6×10^{-3}	3.3×10^{-3}	4.8×10^{-4}	9.4×10^{-3}
Fluroxypyr	5.9×10^{-4}	3.5×10^{-4}	9.7×10^{-6}	9.5×10^{-4}
Imazapyr	9.4×10^{-4}	5.6×10^{-4}	1.6×10^{-5}	1.5×10^{-3}
Isoxaben	4.7×10^{-2}	2.8×10^{-2}	7.7×10^{-4}	7.6×10^{-2}
Norflurazon	5.5×10^{-4}	3.3×10^{-4}	3.8×10^{-3}	4.7×10^{-3}
Oxadiazon	2.0×10^{-1}	1.2×10^{-1}	1.6×10^{-2}	3.4×10^{-1}
Pendimethalin	4.2×10^{-2}	2.5×10^{-2}	2.9×10^{-3}	7.0×10^{-2}
Pyraflufen	4.7×10^{-5}	2.8×10^{-5}	7.7×10^{-7}	7.6×10^{-5}
Sulfentrazone	1.5×10^{-3}	9.0×10^{-4}	1.0×10^{-4}	2.5×10^{-3}
Tebuthiuron	8.0×10^{-2}	4.8×10^{-2}	1.3×10^{-3}	1.3×10^{-1}

Table 4-25b Multiple Pathway Non-cancer Risks: Hiking Through Sprayed Vegetation to Pick Contaminated Blackberries Which Are Consumed the Same Day, Child.

COMPOUND	DermalVegetation HQ	Dermal Berry HQ	Oral Berry HQ	Hazard Index
2,4-D	8.4×10^{-1}	5.1×10^{-1}	5.9×10^{-2}	1.4×10^0
Ammonium Salt of Fosamine	3.2×10^0	1.1×10^{-1}	7.3×10^{-1}	4.0×10^0
Bromacil/Diuron	1.8×10^0	1.1×10^0	2.7×10^{-1}	3.2×10^0
Chlorsulfuron	6.2×10^{-4}	3.7×10^{-4}	4.3×10^{-4}	1.4×10^{-3}
Clopyralid	1.7×10^{-3}	1.0×10^{-3}	1.2×10^{-4}	2.8×10^{-3}
Clopyralid/2,4-D	2.2×10^{-1}	1.3×10^{-1}	1.6×10^{-2}	3.7×10^{-1}
Dicamba	3.7×10^{-2}	2.2×10^{-2}	5.1×10^{-3}	6.4×10^{-2}
Dicamba/2,4-D	3.8×10^{-1}	2.3×10^{-1}	2.8×10^{-2}	6.3×10^{-1}
Dicamba/MCPA	5.6×10^0	3.4×10^0	2.8×10^{-1}	9.2×10^0
Dichlobenil	3.6×10^{-1}	2.1×10^{-1}	4.9×10^{-2}	6.2×10^{-1}
Diuron	2.7×10^0	1.6×10^0	3.7×10^{-1}	4.6×10^0
Glyphosate	1.6×10^{-2}	9.3×10^{-3}	3.1×10^{-3}	2.8×10^{-2}
Metsulfuron Methyl	6.7×10^{-3}	4.0×10^{-3}	4.6×10^{-4}	1.1×10^{-2}
Oryzalin	8.9×10^{-2}	5.3×10^{-2}	1.2×10^{-2}	1.6×10^{-1}
Picloram	1.5×10^{-3}	9.1×10^{-4}	2.2×10^{-3}	4.6×10^{-3}
Sulfometuron Methyl	2.2×10^{-4}	1.3×10^{-4}	1.5×10^{-4}	5.0×10^{-4}
Tricopyr	2.9×10^{-1}	1.8×10^{-1}	1.2×10^{-1}	5.9×10^{-1}
<i>New herbicides for consideration</i>				
Bromoxynil	5.6×10^{-2}	3.3×10^{-2}	3.9×10^{-3}	9.3×10^{-2}
Diflufenzopyr	1.3×10^{-2}	7.7×10^{-3}	1.3×10^{-3}	2.2×10^{-2}
Flumioxazin	2.2×10^{-2}	1.3×10^{-2}	1.9×10^{-3}	3.7×10^{-2}
Fluroxypyr	2.3×10^{-3}	1.4×10^{-3}	3.9×10^{-5}	3.8×10^{-3}
Imazapyr	3.7×10^{-3}	2.2×10^{-3}	6.2×10^{-5}	6.0×10^{-3}
Isoxaben	1.9×10^{-1}	1.1×10^{-1}	3.1×10^{-3}	3.0×10^{-1}
Norflurazon	2.2×10^{-3}	1.3×10^{-3}	1.5×10^{-2}	1.9×10^{-2}
Oxadiazon	8.0×10^{-1}	4.8×10^{-1}	6.2×10^{-2}	1.3×10^0
Pendimethalin	1.7×10^{-1}	1.0×10^{-1}	1.2×10^{-2}	2.8×10^{-1}
Pyraflufen	1.9×10^{-4}	1.1×10^{-4}	3.1×10^{-6}	3.0×10^{-4}
Sulfentrazone	6.0×10^{-3}	3.6×10^{-3}	4.1×10^{-4}	9.9×10^{-3}
Tebuthiuron	3.2×10^{-1}	1.9×10^{-1}	5.3×10^{-3}	5.2×10^{-1}

Table 4-25c Multiple Pathway Cancer Risks: Hiking Through Sprayed Vegetation to Pick Contaminated Blackberries Which Are Consumed the Same Day.

COMPOUND	DermalVegetation Cancer Risk	Dermal Berry Cancer Risk	Oral Berry Cancer Risk	Cancer Risk
2,4-D	1.2×10^{-6}	5.1×10^{-8}	3.0×10^{-8}	1.3×10^{-6}
Bromacil/Diuron	2.5×10^{-7}	2.2×10^{-8}	3.0×10^{-8}	3.0×10^{-7}
Clopyralid/2,4-D	4.5×10^{-7}	1.3×10^{-8}	8.3×10^{-9}	4.7×10^{-7}
Dicamba/2,4-D	5.0×10^{-7}	2.2×10^{-8}	1.3×10^{-8}	5.4×10^{-7}
Diuron	3.6×10^{-7}	3.2×10^{-8}	3.7×10^{-8}	4.3×10^{-7}
Oryzalin	8.2×10^{-7}	1.8×10^{-7}	2.1×10^{-7}	1.2×10^{-6}
<i>New herbicides for consideration</i>				
Bromoxynil	4.0×10^{-7}	3.6×10^{-8}	2.1×10^{-8}	4.6×10^{-7}
Oxadiazon	1.0×10^{-6}	9.0×10^{-8}	5.8×10^{-8}	1.2×10^{-6}
Pyraflufen	4.4×10^{-9}	3.9×10^{-10}	5.4×10^{-11}	4.8×10^{-9}

Table 4-26a Multiple Pathway Non-cancer Risks: Ingestion of Contaminated garden Vegetables and Berries in the Same Day, Adult.

COMPOUND	Oral Vegetable HQ	Oral Berry HQ	Hazard Index
2,4-D	2.9×10^{-1}	1.5×10^{-2}	3.0×10^{-1}
Ammonium Salt of Fosamine	3.0×10^{-1}	3.1×10^{-2}	6.3×10^{-1}
Bromacil/Diuron	1.3×10^0	6.7×10^{-2}	1.4×10^0
Chlorsulfuron	2.1×10^{-3}	1.1×10^{-4}	2.2×10^{-3}
Clopyralid	5.7×10^{-4}	2.9×10^{-5}	5.9×10^{-4}
Clopyralid/2,4-D	7.6×10^{-2}	4.1×10^{-3}	8.0×10^{-2}
Dicamba	2.5×10^{-2}	1.3×10^{-3}	2.6×10^{-2}
Dicamba/2,4-D	1.4×10^{-1}	6.9×10^{-3}	1.4×10^{-1}
Dicamba/MCPA	1.9×10^0	7.1×10^{-2}	2.0×10^0
Dichlobenil	2.4×10^{-1}	1.2×10^{-2}	2.5×10^{-1}
Diuron	1.8×10^0	9.3×10^{-2}	1.9×10^0
Glyphosate	1.5×10^{-2}	7.7×10^{-4}	1.6×10^{-2}
Metsulfuron Methyl	2.3×10^{-3}	1.2×10^{-4}	2.4×10^{-3}
Oryzalin	6.0×10^{-2}	3.1×10^{-3}	6.3×10^{-2}
Picloram	1.1×10^{-2}	5.5×10^{-4}	1.1×10^{-2}
Sulfometuron Methyl	7.3×10^{-4}	3.8×10^{-5}	7.7×10^{-4}
Tricopyr	6.0×10^{-1}	3.1×10^{-2}	6.3×10^{-1}
<i>New herbicides for consideration</i>			
Bromoxynil	1.9×10^{-2}	9.7×10^{-4}	2.0×10^{-2}
Diflufenzopyr	6.6×10^{-3}	3.4×10^{-4}	6.9×10^{-3}
Flumioxazin	9.4×10^{-3}	4.8×10^{-4}	9.9×10^{-3}
Fluroxypyr	1.9×10^{-4}	9.7×10^{-6}	2.0×10^{-4}
Imazapyr	3.0×10^{-4}	1.6×10^{-5}	3.2×10^{-4}
Isoxaben	1.5×10^{-2}	7.7×10^{-4}	1.6×10^{-2}
Norflurazon	7.4×10^{-2}	3.8×10^{-3}	7.8×10^{-2}
Oxadiazon	3.0×10^{-1}	1.6×10^{-2}	3.2×10^{-1}
Pendimethalin	5.7×10^{-2}	2.9×10^{-3}	5.9×10^{-2}
Pyraflufen	1.5×10^{-5}	7.7×10^{-7}	1.6×10^{-5}
Sulfentrazone	2.0×10^{-3}	1.0×10^{-4}	2.1×10^{-3}
Tebuthiuron	2.6×10^{-2}	1.3×10^{-3}	2.7×10^{-2}

Table 4-26b Multiple Pathway Non-cancer Risks: Ingestion of Contaminated garden Vegetables and Berries in the Same Day, Child.

COMPOUND	Oral Vegetable HQ	Oral Berry HQ	Hazard Index
2,4-D	3.5×10^{-1}	5.9×10^{-2}	4.1×10^{-1}
Ammonium Salt of Fosamine	7.3×10^{-1}	1.2×10^{-1}	8.5×10^{-1}
Bromacil/Diuron	1.6×10^0	2.7×10^{-1}	1.8×10^0
Chlorsulfuron	2.6×10^{-3}	4.3×10^{-4}	3.0×10^{-3}
Clopyralid	6.9×10^{-4}	1.2×10^{-4}	8.0×10^{-4}
Clopyralid/2,4-D	9.2×10^{-2}	1.6×10^{-2}	1.1×10^{-1}
Dicamba	3.0×10^{-2}	5.1×10^{-3}	3.6×10^{-2}
Dicamba/2,4-D	1.6×10^{-1}	2.8×10^{-2}	1.9×10^{-1}
Dicamba/MCPA	2.3×10^0	2.8×10^{-1}	2.6×10^0
Dichlobenil	2.9×10^{-1}	4.9×10^{-2}	3.4×10^{-1}
Diuron	2.2×10^0	3.7×10^{-1}	2.6×10^0
Glyphosate	1.8×10^{-2}	3.1×10^{-3}	2.1×10^{-2}
Metsulfuron Methyl	2.7×10^{-3}	4.6×10^{-4}	3.2×10^{-3}
Oryzalin	7.3×10^{-2}	1.2×10^{-2}	8.5×10^{-2}
Picloram	1.3×10^{-2}	2.2×10^{-3}	1.5×10^{-2}
Sulfometuron Methyl	8.9×10^{-4}	1.5×10^{-4}	1.0×10^{-3}
Tricopyr	7.3×10^{-1}	1.2×10^{-1}	8.5×10^{-1}
<i>New herbicides for consideration</i>			
Bromoxynil	2.3×10^{-2}	3.9×10^{-3}	2.7×10^{-2}
Diflufenzopyr	8.0×10^{-3}	1.3×10^{-3}	9.3×10^{-3}
Flumioxazin	1.1×10^{-2}	1.9×10^{-3}	1.3×10^{-2}
Fluroxypyr	2.3×10^{-4}	3.9×10^{-5}	2.7×10^{-4}
Imazapyr	3.7×10^{-4}	6.2×10^{-5}	4.3×10^{-4}
Isoxaben	1.8×10^{-2}	3.1×10^{-3}	2.1×10^{-2}
Norflurazon	9.0×10^{-2}	1.5×10^{-2}	1.0×10^{-1}
Oxadiazon	3.7×10^{-1}	6.2×10^{-2}	4.3×10^{-1}
Pendimethalin	6.9×10^{-2}	1.2×10^{-2}	8.0×10^{-2}
Pyraflufen	1.8×10^{-5}	3.1×10^{-6}	2.1×10^{-5}
Sulfentrazone	2.5×10^{-3}	4.1×10^{-4}	2.9×10^{-3}
Tebuthiuron	3.1×10^{-2}	5.3×10^{-3}	3.7×10^{-2}

Table 4-26c Multiple Pathway Cancer Risks: Ingestion of Contaminated garden Vegetables and Berries in the Same Day.

COMPOUND	Oral Vegetable Cancer Risk	Oral Berry Cancer Risk	Cancer Risk
2,4-D	2.7×10^{-7}	3.0×10^{-8}	3.0×10^{-7}
Bromacil/Diuron	2.7×10^{-7}	3.0×10^{-8}	3.0×10^{-7}
Clopyralid/2,4-D	7.0×10^{-8}	8.3×10^{-9}	7.8×10^{-8}
Dicamba/2,4-D	1.1×10^{-7}	1.3×10^{-8}	1.3×10^{-7}
Diuron	3.4×10^{-7}	3.7×10^{-8}	3.8×10^{-7}
Oryzalin	1.9×10^{-6}	2.1×10^{-7}	2.1×10^{-6}
<i>New herbicides for consideration</i>			
Bromoxynil	1.9×10^{-7}	2.1×10^{-8}	2.1×10^{-7}
Oxadiazon	5.2×10^{-7}	5.8×10^{-8}	5.8×10^{-7}
Pyraflufen	4.9×10^{-10}	5.4×10^{-11}	5.4×10^{-10}

Table 4-27 Hazard Indices For WSDOT Worker Risk From Multiple Chemicals

Compound	Broadcast Application
Glyphosate	HQ: 1.0×10^{-1}
Sulfometuron methyl	HQ: 4.9×10^{-3}
Diuron	HQ: $1.2 \times 10^{+1}$ Cancer Risk: 6.3×10^{-6}
Bromacil/Diuron	HQ: 8.6×10^0 Cancer Risk: 5.0×10^{-6}
Flumioxazin	HQ: 6.3×10^{-2}
Imazapyr	HQ: 2.0×10^{-3}
Norflurazon	HQ: 4.9×10^{-1}
Pendimethalin	HQ: 3.8×10^{-1}
Sulfentrazone	HQ: 1.3×10^{-2}
Tebuthiuron	HQ: 1.7×10^{-1}
Combined: Glyphosate Sulfometuron methyl Diuron	HI: $1.2 \times 10^{+1}$ Cancer Risk: 5.0×10^{-6}
Combined: Glyphosate Sulfometuron methyl Bromacil/Diuron	HI: 8.7×10^0 Cancer Risk: 6.3×10^{-6}
Combined: Glyphosate Sulfometuron methyl Flumioxazin	HI: 1.7×10^{-1}
Combined: Glyphosate Sulfometuron methyl Imazapyr	HI: 1.1×10^{-1}
Combined: Glyphosate Sulfometuron methyl Norflurazon	HI: 6.0×10^{-1}
Combined: Glyphosate Sulfometuron methyl Pendimethalin	HI: 4.8×10^{-1}
Combined: Glyphosate Sulfometuron methyl Sulfentrazone	HI: 1.2×10^{-1}
Combined: Glyphosate	HI: 2.8×10^{-1}

Sulfometuron methyl Tebuthiuron	
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Note: None of the product types that are used in combination are used in directed foliar applications.

Table 4-28 Hazard Indices For Public Risk From Exposure to Multiple Chemicals

Compound	Oral Berry Adult	Oral Berry Child	Oral Vegetable Adult	Oral Vegetable Child	Dermal Berry Adult	Dermal Berry Child	Dermal Vegetation Adult	Dermal Vegetation Child
Glyphosate	HQ: 7.7×10^{-4}	HQ: 3.1×10^{-3}	HQ: 1.5×10^{-2}	HQ: 1.8×10^{-2}	HQ: 2.3×10^{-3}	HQ: 9.3×10^{-3}	HQ: 3.9×10^{-3}	HQ: 1.6×10^{-2}
Sulfometuron methyl	HQ: 3.8×10^{-5}	HQ: 1.5×10^{-4}	HQ: 7.3×10^{-4}	HQ: 8.9×10^{-4}	HQ: 3.3×10^{-5}	HQ: 1.3×10^{-4}	HQ: 5.4×10^{-5}	HQ: 2.2×10^{-4}
Diuron	HQ: 9.3×10^{-2} Cancer Risk: 3.7×10^{-8}	HQ: 3.7×10^{-1}	HQ: 1.8×10^0 Cancer Risk: 3.4×10^{-7}	HQ: 2.2×10^0	HQ: 4.0×10^{-1} Cancer Risk: 3.2×10^{-8}	HQ: 1.6×10^0	HQ: 6.7×10^{-1} Cancer Risk: 3.6×10^{-7}	HQ: 2.7×10^0
Bromacil/ Diuron	HQ: 6.7×10^{-2} Cancer Risk: 3.0×10^{-8}	HQ: 2.7×10^{-1}	HQ: 1.3×10^0 Cancer Risk: 2.7×10^{-7}	HQ: 1.6×10^0	HQ: 2.7×10^{-1} Cancer Risk: 2.2×10^{-8}	HQ: 1.1×10^0	HQ: 4.5×10^{-1} Cancer Risk: 2.5×10^{-7}	HQ: 1.8×10^0
Flumioxazin	HQ: 4.8×10^{-4}	HQ: 1.9×10^{-3}	HQ: 9.4×10^{-3}	HQ: 1.1×10^{-2}	HQ: 3.3×10^{-3}	HQ: 1.3×10^{-2}	HQ: 5.6×10^{-3}	HQ: 2.2×10^{-2}
Imazapyr	HQ: 1.6×10^{-5}	HQ: 6.2×10^{-5}	HQ: 3.0×10^{-4}	HQ: 3.7×10^{-4}	HQ: 5.6×10^{-4}	HQ: 2.2×10^{-3}	HQ: 9.4×10^{-4}	HQ: 3.7×10^{-3}
Norflurazon	HQ: 3.8×10^{-3}	HQ: 1.5×10^{-2}	HQ: 7.4×10^{-2}	HQ: 9.0×10^{-2}	HQ: 3.3×10^{-4}	HQ: 1.3×10^{-3}	HQ: 5.5×10^{-4}	HQ: 2.2×10^{-3}
Pendimethalin	HQ: 2.9×10^{-3}	HQ: 1.2×10^{-2}	HQ: 5.7×10^{-2}	HQ: 6.9×10^{-2}	HQ: 2.5×10^{-2}	HQ: 1.0×10^{-1}	HQ: 4.2×10^{-2}	HQ: 1.7×10^{-1}
Sulfentrazone	HQ: 1.0×10^{-4}	HQ: 4.1×10^{-4}	HQ: 2.0×10^{-3}	HQ: 2.5×10^{-3}	HQ: 9.0×10^{-4}	HQ: 3.6×10^{-3}	HQ: 1.5×10^{-3}	HQ: 6.0×10^{-3}
Tebuthiuron	HQ: 1.3×10^{-3}	HQ: 5.3×10^{-3}	HQ: 2.6×10^{-2}	HQ: 3.1×10^{-2}	HQ: 4.8×10^{-2}	HQ: 1.9×10^{-1}	HQ: 8.0×10^{-2}	HQ: 3.2×10^{-1}
Combined: Glyphosate Sulfometuron methyl Diuron	HI: 9.4×10^{-2} Cancer Risk: 3.7×10^{-8}	HI: 3.7×10^{-1}	HI: 1.8×10^0 Cancer Risk: 3.4×10^{-7}	HI: 2.2×10^0	HI: 4.0×10^{-1} Cancer Risk: 3.2×10^{-8}	HI: 1.6×10^0	HI: 6.7×10^{-1} Cancer Risk: 3.6×10^{-7}	HI: 2.7×10^0
Combined: Glyphosate	HI: 6.8×10^{-2} Cancer Risk:	HI: 2.7×10^{-1}	HI: 1.3×10^0 Cancer Risk:	HI: 1.6×10^0	HI: 2.7×10^{-1} Cancer Risk:	HI: 1.1×10^0	HI: 4.6×10^{-1} Cancer Risk:	HI: 1.8×10^0

Sulfometuron methyl Bromacil/ Diuron	3.0x10 ⁻⁸		2.7x10 ⁻⁷		2.2x10 ⁻⁸		2.5x10 ⁻⁷	
Combined: Glyphosate Sulfometuron methyl Flumioxazin	H.I.: 1.3x10 ⁻³	H.I.: 5.2x10 ⁻³	H.I.: 2.5x10 ⁻²	H.I.: 3.1x10 ⁻²	H.I.: 5.7x10 ⁻³	H.I.: 2.3x10 ⁻²	H.I.: 9.5x10 ⁻³	H.I.: 3.8x10 ⁻²
Combined: Glyphosate Sulfometuron methyl Imazapyr	H.I.: 8.3x10 ⁻⁴	H.I.: 3.3x10 ⁻³	H.I.: 1.6x10 ⁻²	H.I.: 2.0x10 ⁻²	H.I.: 2.9x10 ⁻³	H.I.: 1.2x10 ⁻²	H.I.: 4.9x10 ⁻³	H.I.: 2.0x10 ⁻²
Combined: Glyphosate Sulfometuron methyl Norflurazon	H.I.: 4.6x10 ⁻³	H.I.: 1.8x10 ⁻²	H.I.: 9.0x10 ⁻²	H.I.: 1.1x10 ⁻¹	H.I.: 2.7x10 ⁻³	H.I.: 1.1x10 ⁻²	H.I.: 4.5x10 ⁻³	H.I.: 1.8x10 ⁻²
Combined: Glyphosate Sulfometuron methyl Pendimethalin	H.I.: 3.7x10 ⁻³	H.I.: 1.5x10 ⁻²	H.I.: 7.2x10 ⁻²	H.I.: 8.8x10 ⁻²	H.I.: 2.7x10 ⁻²	H.I.: 1.1x10 ⁻¹	H.I.: 4.6x10 ⁻²	H.I.: 1.8x10 ⁻¹
Combined: Glyphosate Sulfometuron methyl Sulfentrazone	H.I.: 9.1x10 ⁻⁴	H.I.: 3.7x10 ⁻³	H.I.: 1.8x10 ⁻²	H.I.: 2.2x10 ⁻²	H.I.: 3.3x10 ⁻³	H.I.: 1.3x10 ⁻²	H.I.: 5.4x10 ⁻³	H.I.: 2.2x10 ⁻²
Combined: Glyphosate Sulfometuron methyl Tebuthiuron	H.I.: 2.1x10 ⁻³	H.I.: 8.5x10 ⁻³	H.I.: 4.2x10 ⁻²	H.I.: 5.0x10 ⁻²	H.I.: 5.1x10 ⁻²	H.I.: 2.0x10 ⁻¹	H.I.: 8.4x10 ⁻²	H.I.: 3.4x10 ⁻¹

Table 4-29a Compounds of Negligible Risk from 2003 Evaluation

NON-CANCER EFFECTS			CANCER EFFECTS	
	Average	Maximum	Average	Maximum
Broadcast Hydraulic Spray Applications	CS, CP, C/2, DC, D/2, GL, MM, OR, PI, SM	CS, CP, MM, SM	2,4-D, B/D, C/2, D/2, DU	None
Directed Foliar Applications	(ALL) CS, CP, GL, OR, PI	CS, CP, PI	None	None
Ingestion of Contaminated Berries (adult)	(ALL) 2,4-D, FO, B/D, CS, CP, C/2, DC, D/2, D/M, DB, DU, GL, MM, OR, PI, SM, TR	2,4-D, CS, CP, C/2, DC, D/2, DB, GL, MM, OR, PI, SM	(ALL) 2,4-D, B/D, C/2, D/2, DU, OR	2,4-D, C/2, D/2
Ingestion of Contaminated Berries (child)	(ALL) 2,4-D, FO, B/D, CS, CP, C/2, DC, D/2, D/M, DB, DU, GL, MM, OR, PI, SM, TR	CS, CP, C/2, DC, GL, MM, OR, PI, SM	Not Applicable	Not Applicable
Ingestion of Contaminated Garden Vegetables (adult)	2,4-D, FO, CS, CP, C/2, DC, D/2, DB, GL, MM, OR, PI, SM, TR	CS, CP, MM, SM	(ALL) 2,4-D, B/D, C/2, D/2, DU, OR	None
Ingestion of Contaminated Garden Vegetables (child)	2,4-D, FO, CS, CP, C/2, DC, D/2, DB, GL, MM, OR, PI, SM, TR	CS, CP, MM, SM	Not Applicable	Not Applicable
Dermal Contact while Picking Berries (adult)	(ALL) 2,4-D, FO, B/D, CS, CP, C/2, DC, D/2, D/M, DB, DU, GL, MM, OR, PI, SM, TR	FO, CS, CP, C/2, DC, GL, MM, OR, PI, SM	(ALL) 2,4-D, B/D, C/2, D/2, DU, OR	2,4-D, B/D, C/2, D/2, DU
Dermal Contact while Picking Berries (child)	2,4-D, FO, CS, CP, C/2, DC, D/2, DB, GL, MM, OR, PI, SM, TR	CS, CP, DC, GL, MM, OR, PI, SM	Not Applicable	Not Applicable
Dermal Contact with Directly Sprayed Vegetation (adult)	2,4-D, FO, B/D, CS, CP, C/2, DC, D/2, DB, DU, GL, MM, OR, PI, SM, TR	FO, CS, CP, C/2, DC, DB, GL, MM, OR, PI, SM	(ALL) 2,4-D, B/D, C/2, D/2, DU, OR	C/2
Dermal Contact with Directly Sprayed Vegetation (child)	2,4-D, FO, CS, CP, C/2, DC, D/2, DB, GL, MM, OR, PI, SM, TR	CS, CP, DC, GL, MM, OR, PI, SM	Not Applicable	Not Applicable

Legend:

2,4-D=2,4-D

FO=Ammonium salt of Fosamine

B/D=Bromacil/Diuron

DC=Dicamba

D/2=Dicamba/2,4-D

D/M=Dicamba/MCPA

GL=Glyphosate

MM=Metsulfuron methyl

OR=Oryzalin

TR=Triclopyr

CS=Chlorsulfuron
CP=Clopyralid
C/2=Clopyralid/2,4-D

DB=Dichlobenil
DU=Diuron

PI=Picloram
SM=Sulfometuron methyl

Table 4-29b Compounds of Negligible Risk from 2005 Evaluation

	NON-CANCER EFFECTS		CANCER EFFECTS	
	Average	Maximum	Average	Maximum
Broadcast Hydraulic Spray Applications	BR, D/D, FM, FR, IM, IS, NO, PM, PY, ST, TB	D/D, FM, FR, IM, IS, PY, ST	BR, PY	PY
Directed Foliar Applications	BR, D/D, FR, IS, PY	BR, D/D, FR, IS, PY	BR, OX, PY	BR, PY
Ingestion of Contaminated Berries (adult)	(ALL) BR, D/D, FM, FR, IM, IS, NO, OX, PM, PY, ST, TB	(ALL) BR, D/D, FM, FR, IM, IS, NO, OX, PM, PY, ST, TB	(ALL) BR, OX, PY	BR, PY
Ingestion of Contaminated Berries (child)	(ALL) BR, D/D, FM, FR, IM, IS, NO, OX, PM, PY, ST, TB	BR, D/D, FM, FR, IM, IS, NO, PM, PY, ST, TB	Not Applicable	Not Applicable
Ingestion of Contaminated Garden Vegetables (adult)	(ALL) BR, D/D, FM, FR, IM, IS, NO, OX, PM, PY, ST, TB	BR, D/D, FM, FR, IM, IS, PY, ST	(ALL) BR, OX, PY	PY
Ingestion of Contaminated Garden Vegetables (child)	(ALL) BR, D/D, FM, FR, IM, IS, NO, OX, PM, PY, ST, TB	D/D, FM, FR, IM, IS, PY, ST	Not Applicable	Not Applicable
Dermal Contact while Picking Berries (adult)	(ALL) BR, D/D, FM, FR, IM, IS, NO, OX, PM, PY, ST, TB	BR, D/D, FM, FR, IM, IS, NO, PM, PY, ST, TB	(ALL) BR, OX, PY	(ALL) BR, OX, PY
Dermal Contact while Picking Berries (child)	(ALL) BR, D/D, FM, FR, IM, IS, NO, OX, PM, PY, ST, TB	BR, D/D, FM, FR, IM, NO, PY, ST	Not Applicable	Not Applicable
Dermal Contact with Directly Sprayed Vegetation (adult)	(ALL) BR, D/D, FM, FR, IM, IS, NO, OX, PM, PY, ST, TB	BR, D/D, FM, FR, IM, IS, NO, PM, PY, ST, TB	(ALL) BR, OX, PY	BR, PY
Dermal Contact with Directly Sprayed Vegetation (child)	(ALL) BR, D/D, FM, FR, IM, IS, NO, OX, PM, PY, ST, TB	BR, D/D, FM, FR, IM, IS, NO, PM, PY, ST	Not Applicable	Not Applicable

Legend:

BR=Bromoxynil
D/D=Dicamba
FM=Flumioxazin
FR=Fluroxypyr

IM=Imazapyr
IS=Isosablen
NO=Norflurazon
OX=Oxadiazon

PM=Pendimethalin
PY=Pyraflufen
ST=Sulfentrazone
TB=Tebuthiuron

Table 4-30a Compounds of Potentially Low Risk from 2003 Evaluation*

	NON-CANCER EFFECTS		CANCER EFFECTS	
	Average	Maximum	Average	Maximum
Broadcast Hydraulic Spray Applications	2,4-D, FO, B/D, DB, TR	C/2, DC, GL, OR, PI	OR	C/2
Directed Foliar Applications	None	GL, OR	OR	None
Ingestion of Contaminated Berries (adult)	None	FO, B/D, D/M, DU, TR	None	B/D, DU, OR
Ingestion of Contaminated Berries (child)	None	2,4-D, FO, D/2, DB, TR	Not Applicable	Not Applicable
Ingestion of Contaminated Garden Vegetables (adult)	B/D, D/M, DU	C/2, DC, GL, OR, PI	None	2,4-D, C/2, D/2
Ingestion of Contaminated Garden Vegetables (child)	B/D, D/M, DU	C/2, DC, GL, OR, PI	Not Applicable	Not Applicable
Dermal Contact while Picking Berries (adult)	None	2,4-D, D/2, DB, DU, TR	None	OR
Dermal Contact while Picking Berries (child)	B/D, D/M, DU	2,4-D, FO, C/2, D/2, DB, TR	Not Applicable	Not Applicable
Dermal Contact with Directly Sprayed Vegetation (adult)	D/M	2,4-D, B/D, D/2, DU, TR	None	2,4-D, B/D, D/2, DU, OR
Dermal Contact with Directly Sprayed Vegetation (child)	B/D, D/M, DU	2,4-D, FO, C/2, D/2, DB, TR	Not Applicable	Not Applicable

* This risk assessment is designed to provide a preliminary analysis of the plausible risks and to prioritize potential health hazards. The designation “low risk” should not be interpreted as describing the actual or likely health risks in a population. Instead, this designation characterizes a level of priority for risk management decisions.

Legend:

2,4-D=2,4-D	DC=Dicamba	GL=Glyphosate	TR=Triclopyr
FO=Ammonium salt of Fosamine	D/2=Dicamba/2,4-D	MM=Metsulfuron methyl	
B/D=Bromacil/Diuron	D/M=Dicamba/MCPA	OR=Oryzalin	
CS=Chlorsulfuron	DB=Dichlobenil	PI=Picloram	
CP=Clopyralid	DU=Diuron	SM=Sulfometuron methyl	
C/2=Clopyralid/2,4-D			

Table 4-30b Compounds of Potentially Low Risk for 2005 Evaluation*

	NON-CANCER EFFECTS		CANCER EFFECTS	
	Average	Maximum	Average	Maximum
Broadcast Hydraulic Spray Applications	OX	BR, NO, PM, TB	OX	BR
Directed Foliar Applications	OX	OX	None	None
Ingestion of Contaminated Berries (adult)	None	None	None	OX
Ingestion of Contaminated Berries (child)	None	OX	Not Applicable	Not Applicable
Ingestion of Contaminated Garden Vegetables (adult)	None	NO, PM, PY	None	BR
Ingestion of Contaminated Garden Vegetables (child)	None	BR, NO, PM, TB	Not Applicable	Not Applicable
Dermal Contact while Picking Berries (adult)	None	OX	None	None
Dermal Contact while Picking Berries (child)	None	IS, OX, PM, TB	Not Applicable	Not Applicable
Dermal Contact with Directly Sprayed Vegetation (adult)	None	OX	None	OX
Dermal Contact with Directly Sprayed Vegetation (child)	None	OX, TB	Not Applicable	Not Applicable

* This risk assessment is designed to provide a preliminary analysis of the plausible risks and to prioritize potential health hazards. The designation “low risk” should not be interpreted as describing the actual or likely health risks in a population. Instead, this designation characterizes a level of priority for risk management decisions.

Legend:

BR=Bromoxynil	IM=Imazapyr	PM=Pendimethalin
D/D=Diflufenzopyr/Dicamba	IS=Isoxaben	PY=Pyraflufen
FM=Flumioxazin	NO=Norflurazon	ST=Sulfentrazone
FR=Fluroxypyr	OX=Oxadiazon	TB=Tebuthiuron

Table 4-31a Compounds of Potentially Moderate Risk for 2003 Evaluation*

	NON-CANCER EFFECTS		CANCER EFFECTS	
	Average	Maximum	Average	Maximum
Broadcast Hydraulic Spray Applications	DU, D/M	2,4-D, D/2, DB	None	2,4-D, B/D, D/2, DU, OR
Directed Foliar Applications	None	None	None	OR
Ingestion of Contaminated Berries (adult)	None	None	None	None
Ingestion of Contaminated Berries (child)	None	B/D, D/M, DU	Not Applicable	Not Applicable
Ingestion of Contaminated Garden Vegetables (adult)	None	2,4-D, FO, D/2, DB, TR	None	B/D, DU, OR
Ingestion of Contaminated Garden Vegetables (child)	None	2,4-D, D/2, DB	Not Applicable	Not Applicable
Dermal Contact while Picking Berries (adult)	None	B/D, D/M	None	None
Dermal Contact while Picking Berries (child)	None	B/D, D/M, DU	Not Applicable	Not Applicable
Dermal Contact with Directly Sprayed Vegetation (adult)	None	D/M	None	None
Dermal Contact with Directly Sprayed Vegetation (child)	None	B/D, D/M, DU	Not Applicable	Not Applicable

* This risk assessment is designed to provide a preliminary analysis of the plausible risks and to prioritize potential health hazards. The designation “moderate risk” should not be interpreted as describing the actual or likely health risks in a population. Instead, this designation characterizes a level of priority for risk management decisions.

Legend:

2,4-D=2,4-D	DC=Dicamba	GL=Glyphosate	TR=Triclopyr
FO=Ammonium salt of Fosamine	D/2=Dicamba/2,4-D	MM=Metsulfuron methyl	
B/D=Bromacil/Diuron	D/M=Dicamba/MCPA	OR=Oryzalin	
CS=Chlorsulfuron	DB=Dichlobenil	PI=Picloram	
CP=Clopyralid	DU=Diuron	SM=Sulfometuron methyl	
C/2=Clopyralid/2,4-D			

Table 4-31b Compounds of Potentially Moderate Risk for 2005 Evaluation*

	NON-CANCER EFFECTS		CANCER EFFECTS	
	Average	Maximum	Average	Maximum
Broadcast Hydraulic Spray Applications	None	OX	None	OX
Directed Foliar Applications	None	None	None	OX
Ingestion of Contaminated Berries (adult)	None	None	None	None
Ingestion of Contaminated Berries (child)	None	None	Not Applicable	Not Applicable
Ingestion of Contaminated Garden Vegetables (adult)	None	OX	None	OX
Ingestion of Contaminated Garden Vegetables (child)	None	OX	Not Applicable	Not Applicable
Dermal Contact while Picking Berries (adult)	None	None	None	None
Dermal Contact while Picking Berries (child)	None	None	Not Applicable	Not Applicable
Dermal Contact with Directly Sprayed Vegetation (adult)	None	None	None	None
Dermal Contact with Directly Sprayed Vegetation (child)	None	None	Not Applicable	Not Applicable

* This risk assessment is designed to provide a preliminary analysis of the plausible risks and to prioritize potential health hazards. The designation “moderate risk” should not be interpreted as describing the actual or likely health risks in a population. Instead, this designation characterizes a level of priority for risk management decisions.

Legend:

BR=Bromoxynil
D/D=Dicamba
FM=Flumioxazin
FR=Fluroxypyr

IM=Imazapyr
IS=Isosabon
NO=Norflurazon
OX=Oxadiazon

PM=Pendimethalin
PY=Pyraflufen
ST=Sulfentrazone
TB=Tebuthiuron

Table 4-32a Compounds of Potentially High Risk for 2003 Evaluation*

	NON-CANCER EFFECTS		CANCER EFFECTS	
	Average	Maximum	Average	Maximum
Broadcast Hydraulic Spray Applications	None	FO, B/D, D/M, DU, TR	None	None
Directed Foliar Applications	None	None	None	None
Ingestion of Contaminated Berries (adult)	None	None	None	None
Ingestion of Contaminated Berries (child)	None	None	Not Applicable	Not Applicable
Ingestion of Contaminated Garden Vegetables (adult)	None	B/D, D/M, DU	None	None
Ingestion of Contaminated Garden Vegetables (child)	None	FO, B/D, D/M, DU, TR	Not Applicable	Not Applicable
Dermal Contact while Picking Berries (adult)	None	None	None	None
Dermal Contact while Picking Berries (child)	None	None	Not Applicable	Not Applicable
Dermal Contact with Directly Sprayed Vegetation (adult)	None	None	None	None
Dermal Contact with Directly Sprayed Vegetation (child)	None	None	Not Applicable	Not Applicable

* This risk assessment is designed to provide a preliminary analysis of the plausible risks and to prioritize potential health hazards. The designation "high risk" should not be interpreted as describing the actual or likely health risks in a population. Instead, this designation characterizes a level of priority for risk management decisions.

Legend:

2,4-D=2,4-D	DC=Dicamba	GL=Glyphosate	TR=Triclopyr
FO=Ammonium salt of Fosamine	D/2=Dicamba/2,4-D	MM=Metsulfuron methyl	
B/D=Bromacil/Diuron	D/M=Dicamba/MCPA	OR=Oryzalin	
CS=Chlorsulfuron	DB=Dichlobenil	PI=Picloram	
CP=Clopyralid	DU=Diuron	SM=Sulfometuron methyl	
C/2=Clopyralid/2,4-D			

Table 4-32b Compounds of Potentially High Risk for 2005 Evaluation*

	NON-CANCER EFFECTS		CANCER EFFECTS	
	Average	Maximum	Average	Maximum
Broadcast Hydraulic Spray Applications	None	None	None	None
Directed Foliar Applications	None	None	None	None
Ingestion of Contaminated Berries (adult)	None	None	None	None
Ingestion of Contaminated Berries (child)	None	None	Not Applicable	Not Applicable
Ingestion of Contaminated Garden Vegetables (adult)	None	None	None	
Ingestion of Contaminated Garden Vegetables (child)	None	None	Not Applicable	Not Applicable
Dermal Contact while Picking Berries (adult)	None	None	None	None
Dermal Contact while Picking Berries (child)	None	None	Not Applicable	Not Applicable
Dermal Contact with Directly Sprayed Vegetation (adult)	None	None	None	None
Dermal Contact with Directly Sprayed Vegetation (child)	None	None	Not Applicable	Not Applicable

* This risk assessment is designed to provide a preliminary analysis of the plausible risks and to prioritize potential health hazards. The designation “high risk” should not be interpreted as describing the actual or likely health risks in a population. Instead, this designation characterizes a level of priority for risk management decisions.

Legend:

BR=Bromoxynil	IM=Imazapyr	PM=Pendimethalin
D/D=Di flufenzopyr/Dicamba	IS=Isoxaben	PY=Pyraflufen
FM=Flumioxazin	NO=Norflurazon	ST=Sulfentrazone
FR=Fluroxypyr	OX=Oxadiazon	TB=Tebuthiuron

Table 4-36 WSDOT's high end of typical application rates versus maximum relevant label rates for the herbicide product types.

CHEMICAL	Maximum label rate for relevant uses (lbs/acre)	WSDOT's high end of typical application rates (lbs/acre)	% of maximum label rate	Pounds of active ingredient applied in 2002
2,4-D	3.8	3.8	100%	13,885
Ammonium salt of fosamine	24	8	33%	67
Bromacil/Diuron	24	6.4	27%	19,898
Chlorsulfuron	0.14	0.14	100%	536
Clopyralid	0.5	0.375	8%	1
Clopyralid/2,4-D	1.19	1.19	100%	60
Dicamba	2	1	50%	3,749
Dicamba/2,4-D	5.8	2.175	38%	7,830
Dicamba/MCPA	3.05	1.875	61%	379
Dichlobenil	8	4	50%	650
Diuron	12	4.8	40%	40,222
Glysphosate	10.6	2	19%	6,739
Metsulfuron Methyl	0.15	0.075	50%	102
Oryzalin	6	4	67%	44
Picloram	2	1	50%	21
Sulfometuron methyl	0.375	0.234	62%	808
Triclopyr	12	4	33%	4,463
<i>New herbicides for consideration</i>				
CHEMICAL	Maximum label rate for relevant uses (lbs/acre)	WSDOT's high end of typical application rates (lbs/acre)	% of maximum label rate	Pounds of active ingredient applied in 2004
Bromoxynil	0.5	0.5	100%	92
Diflufenzopyr	0.35	0.35	100%	576
Flumioxazin	0.38	0.25	66%	125
Fluroxypyr	0.5	0.25	50%	206
Imazapyr	1.5	1	67%	0
Isoxaben	1	1	100%	257
Norflurazon	3.93	3.93	100%	0
Oxadiazon	4	2	50%	464

Pendimethalin	3	3	100%	365
Pyraflufen	0.004	0.004	100%	0
Sulfentrazone	0.375	0.375	100%	0
Tebuthiuron	4	2.4	60%	996