8. REGULATIONS AND ADVISORIES

The international, national, and state regulations and guidelines regarding methyl parathion in air, water, and other media are summarized in Table 8-1.

Methyl parathion is a restricted-use pesticide (EPA 1985b, 1999a). Methyl parathion formulations must be used under the direct supervision of a certified pesticide applicator (EPA 1980b). The certified pesticide applicator must be physically present during mixing, loading, application, equipment repair, and equipment cleaning (NPIRS 1986). Originally, no worker was allowed to enter a field treated with methyl parathion less than 48 hours after the treatment (EPA 1980b); that interval has been increased to 4–5 days (EPA 1999d). Methyl parathion is not registered for use by homeowners or for use indoors.

EPA (1999d, 1999e) has canceled many food crop uses of methyl parathion, including uses on fruits and vegetables commonly eaten by children (apples, peaches, pears, grapes, nectarines, cherries, plums, carrots, succulent peas and beans, and tomatoes) and some other vegetables, and some nonfood uses such as ornamental plants and nursery stock uses. Pesticide tolerances on these food crops also have been canceled for methyl parathion (EPA 2001). The cancellations occurred because of a concern for risks to children and workers. Existing stocks of methyl parathion products with canceled crop uses were allowed to be applied through December 31, 1999 (EPA 1999d). As listed in Table 8-1, tolerances have been retained for a large number of raw agricultural commodities (EPA 2001).

ATSDR has derived an intermediate-duration oral MRL of .0007 mg/kg/day for methyl parathion based on a minimal LOAEL of 0.22 mg/kg/day for electrophysiological effects in the central and peripheral nervous systems in rats (Desi et al. 1998).

ATSDR has derived a chronic-duration oral MRL of .0003 mg/kg/day for methyl parathion based on a NOAEL of 0.025 mg/kg/day for reduced hematocrit and erythrocyte counts in rats (Suba 1984).

EPA has derived an RfD of .00025 mg/kg/day, based on a NOAEL of 0.025 for reduced hematocrit, erythrocyte counts, and hemoglobin (cholinesterase inhibition was also listed as a critical effect but the reason for this was not explained). This NOAEL appears to be from the same study as for the ATSDR chronic-duration oral MRL, although the study is referenced differently (IRIS 2001).

Table 8-1. Regulations and Guidelines Applicable to Methyl Parathion

Agency	Description	Information	References
INTERNATIONAL			
Guidelines:			
IARC	Carcinogenic classification	Group 3[a]	IARC 2001
WHO	No evidence of carcinogenicity		WHO 2001
NATIONAL			
Regulations and guidelines:			
a. Air			
ACGIH	TLV–TWA[b]	0.2 mg/m^3	ACGIH 2000
NIOSH	REL[b]	0.2 mg/m^3	NIOSH 2001
OSHA	PEL (8-hour TWA)[b]	0.2 mg/m^3	OSHA 2001
b. Water			
EPA	1-Day health advisory (10-kg child) 10-Day health advisory (10-kg child)	0.3 mg/L 0.3 mg/L	EPA 2000a
	Lifetime health advisory	2x10^{-3} mg/L	
	DWEL	9x10^{-3} mg/L	
c. Food			
EPA	Revocation of tolerances for fruits and vegetables commonly eaten by children, and other vegetables		EPA 1999e
	Establishment/retention of tolerances for residues in or on raw agricultural commodities in food crops (ppm)		EPA 2001
	Almonds	0.1	
	Apricots	1.0	
	Avocados	1.0	
	Barley	1.0	
	Beans (dried)	1.0	
	Beets (sugar), including tops	0.1	
	Blackberries	1.0	
	Blueberries	1.0	
	Boysenberries	1.0	
	Cabbage	1.0	
	Clover	1.0	
	Corn	1.0	

Table 8-1. Regulations and Guidelines Applicable to Methyl Parathion *(continued)*

Agency	Description	Information	References
NATIONAL *(cont.)*			
EPA *(cont.)*	Establishment/retention of tolerances for residues in or on raw agricultural commodities in food crops (ppm)		EPA 2001
	Cottonseed	0.75	
	Cranberries	1.0	
	Cucumbers	1.0	
	Currants	1.0	
	Dates	1.0	
	Dewberries	1.0	
	Eggplants	1.0	
	Endive (escarole)	1.0	
	Figs	1.0	
	Filberts	0.1	
	Garlic	1.0	
	Gooseberries	1.0	
	Guavas	1.0	
	Hops	1.0	
	Mangoes	1.0	
	Melons	1.0	
	Mustard seed	0.2	
	Oats	1.0	
	Okra	1.0	
	Olives	1.0	
	Onions	1.0	
	Parsley	1.0	
	Parsnips	1.0	
	Parsnip greens	1.0	
	Peanuts	1.0	
	Peas (dried)	1.0	
	Pecans	0.1	
	Peppers	1.0	
	Pineapple	1.0	
	Potatoes	0.1	
	Pumpkins	1.0	
	Quinces	1.0	
	Radishes (with or without tops)	1.0	
	Rape (canola) seed	0.2	
	Raspberries	1.0	
	Rice	1.0	
	Safflower seed	0.1	
	Sorghum	0.1	
	Soybeans	0.1	
	Squash	1.0	
	Strawberries	1.0	

Table 8-1. Regulations and Guidelines Applicable to Methyl Parathion *(continued)*

Agency	Description	Information	References
NATIONAL *(cont.)*			
EPA *(cont.)*	Establishment/retention of tolerances for residues in or on raw agricultural commodities in food crops (ppm)		EPA 2001
	Summer squash	1.0	
	Sunflower seeds	0.2	
	Sweet potatoes	0.1	
	Swiss chard	1.0	
	Walnuts	0.1	
	Wheat	1.0	
	Youngberries	1.0	
d. Other			
ACGIH	Carcinogenic classification	A4[c]	ACGIH 2000
EPA	RfD	2.5×10^{-4} mg/kg/day	IRIS 2001
	Carcinogenic classification	Group D[d]	EPA 2000a
	Designated hazardous substance in accordance with Section 311(b)(2)(a)		EPA 2000b 40CFR116.4
	Pesticide chemicals manufacturing discharges		EPA 2000c 40CFR455.20
	RCRA—identification and listing as a hazardous waste	P071	EPA 2000d 40CFR261.33
	CERCLA—reportable quantity	100 pounds	EPA 1999f 40CFR302.4
	Toxic chemical release reporting; Community Right-to-Know —effective date	01/01/95	EPA 1999g 40CFR372.65
STATE			
Regulations and guidelines:			
a. Air:			
Arkansas	Hazardous Air Pollutant		ADEQ 2001
	RAC	0.3 µg/m^3	BNA 2001
California	RAC	0.3 µg/m^3	BNA 2001

Table 8-1. Regulations and Guidelines Applicable to Methyl Parathion *(continued)*

Agency	Description	Information	References
STATE *(cont.)*			
California	Toxic Air Contaminant		California EPA 2001
Colorado	Hazardous air pollutant		BNA 2001
	8 hour	4 µg/m^3	
	30 minutes	20 µg/m^3	
Delaware	RAC	0.3 µg/m^3	BNA 2001
Idaho	Toxic air pollutants		BNA 2001
	OEL	0.2 mg/m^3	
	EL	0.013 pounds/hour	
	AAC	0.01 mg/m^3	
Illinois	RAC	0.3 µg/m^3	BNA 2001
Kentucky	RAC	0.3 µg/m^3	BNA 2001
New Hampshire	Regulated toxic air contaminant		BNA 2001
	OEL	0.2 mg/m^3	
South Carolina	RAC	0.3 µg/m^3	BNA 2001
Tennessee	RAC	0.3 µg/m^3	BNA 2001
Wisconsin	Proposed threshold		Wisconsin DNR 2001
	24 hour<25 feet (pounds/hour)	0.0107	
	24 hour$25 feet<75 feet (pounds/hour)	0.0417	
	24 hour$75 feet (pounds/hour)	0.324	
	AAC	4.8 µg/L	
Wyoming	RAC	0.3 µg/m^3	BNA 2001
b. Water:			
Arizona	Drinking water guideline	1.8 µg/L	HSDB 2001
California	Drinking water guideline	30 µg/L	HSDB 2001
Florida	Drinking water guideline	10 µg/L	HSDB 2001
Kentucky	Hazardous constituent for groundwater monitoring		BNA 2001
Maine	Drinking water guideline	2 µg/L	HSDB 2001

Table 8-1. Regulations and Guidelines Applicable to Methyl Parathion *(continued)*

Agency	Description	Information	References
STATE *(cont.)*			
Vermont	Enforcement standard Preventive action level	2.0 µg/L 1.0 µg/L	BNA 2001
c. Food:		No data	
d. Other:			
Arizona	Soil remediation level Residential Non-residential	 16.0 mg/kg 170 mg/kg	BNA 2001
Massachusetts	RfD	$2.5x10^{-4}$ mg/kg/day	BNA 2001
Missouri	Hazardous constituent		BNA 2001
New Jersey	Requires field posting		CDC 2001
Ohio	Extremely hazardous substance		Ohio EPA 2001

[a]Group 3: not classifiable as to its carcinogenicity to humans
[b]Skin notation: danger of cutaneous absorption
[c]A4: not classifiable as a human carcinogen
[d]Group D: inadequate or no human or animal evidence of carcinogenicity

AAC = acceptable ambient concentration; ACGIH = American Conference of Governmental Industrial Hygienists; ADEQ = Arizona Department of Environmental Quality; BNA = Bureau of National Affairs; CDC = Center for Disease Control; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; DNR = Department of Natural Resources; DWEL = drinking water equivalent level; EL = emissions level; EPA = Environmental Protection Agency; HSDB = Hazardous Substances Data Bank; IARC = International Agency for Research on Cancer; IRIS = Integrated Risk Information System; NIOSH = National Institute of Occupational Safety and Health; OEL = occupational exposure limit; OSHA = Occupational Safety and Health Administration; PEL = permissible exposure limit; RAC = reference air concentration; REL = recommended exposure limit; RCRA = Resource Conservation and Recovery Act; RfD = reference dose; TLV = threshold limit value; TWA = time-weighted average; WHO = World Health Organization