STATE OF WASHINGTON

DEPARTMENT OF AGRICULTURE

P.O. Box 42560 • Olympia, Washington 98504-2560 • (360) 902-1800

WASHINGTON STATE
METHYL PARATHION USE SUMMARY

- Methyl parathion is an organophosphate insecticide and acaricide used to control many biting or sucking insect pests of agricultural crops.
- Methyl parathion kills insects by contact, stomach and respiratory action.
- All formulations of methyl parathion registered for use in Washington State are classified as federal Restricted Use Pesticides (RUPs). RUPs may be purchased and used only by certified applicators.
- Methyl parathion is available in dust, emulsifiable concentrate, ultra-low volume (ULV) liquid, and wettable powder formulations.
- Methyl parathion is classified toxicity category I. Products containing methyl parathion must bear the signal word, "Danger." It is very toxic to humans, wildlife and aquatic organisms. Methyl parathion belongs to the organophosphate chemical class.
- Major crop uses in Washington State, listed alphabetically, are as follows:

CROP	WASS* 2002 EST. ACRES PLANTED	EST. % ACRES TREATED	EST. LBS. A.I./ACRE	# OF APPS	EST. ACRES TREATED	EST. LBS. A.I. APPLIED
Alfalfa, hay**	485,000	5	0.5	1	24,250	12,125
Alfalfa, seed	12,000	75	0.5	1	9,000	4,500
Barley	350,000	Varies by pest, see narrative				
Beans, dry	41,000					
Corn, grain & silage	130,000					
Corn, seed	Unknown					
Corn, sweet	97,900					
Lentils	75,000					
Pasture	70,000	15	0.8	1	`10,500	8,400
Peas, dry edible	70,000					
Peas, seed	Unknown					
Potatoes	170,000	Not used on potatoes in WA State. See narrative below.				
Rape, seed	< 75	Limited acreage. See narrative below.				
Sugar beets	4,000	See narrative below.				
Wheat	2,420,000	5	0.4	1	121,000	48,400

* Washington Agricultural Statistics Service

** Commodities noted in **BLUE** have not had peer review input.

MAJOR USES (listed alphabetically):

The major use listing supplies the most commonly used formulations of the active ingredient. No discrimination or endorsement is intended.

The pesticide labels take precedence over any information contained herein. It is the responsibility of the user to comply with the label directions provided.

The following pesticide use summary reflects the general pesticide practices for the listed commodities. The use information is not intended to reflect the pesticide application practices of any individual.

NOTE: Microencapsulated methyl parathion should never be sprayed on pollen-shedding corn or adjacent fields, or on blooming weeds in field edges and adjacent fields. If misused, this formulation is especially hazardous to honey bees and other pollinating insects because of its strong tendency to contaminate pollen.

ALFALFA, HAY:

- In 2003, approximately 485,000 acres of alfalfa hay were harvested. There are approximately 526,000 acres in alfalfa hay production in Washington State. Grant County produces nearly one-quarter of the state's alfalfa hay crop (119,000 acres).
- Methyl parathion at 0.25 to 0.5 pounds active ingredient per acre to control the following insect pest. .
  - ✓ Alfalfa caterpillar
  - ✓ Aphids – spotted alfalfa aphid can seriously damage seedling alfalfa. Seedlings are very susceptible to injury and one aphid per plant may kill them.
  - ✓ Armyworms
  - ✓ Grasshoppers

ALFALFA, SEED:

- Washington State has approximately 12,000 acres in alfalfa seed production with Walla Walla (6,400 acres) and Grant (3,400 acres) counties in eastern Washington the top producers.
- Alfalfa is planted from mid-March to early May for a current year crop or planted in late summer for harvest in the following year. The crop is harvested at the end of August or in early September.
- Lygus bugs, alfalfa aphids and pea aphid are the most critical insect pest in alfalfa seed production.
- Growers are advised strongly to rotate insecticide families (i.e. organophosphates, carbamates, and synthetic pyrethroids) in their Lygus control program to help prevent the development of insecticide resistance. Bifenthrin is the insecticide of choice.
- Methyl parathion may be applied prebloom at a rate of 0.5 pounds active ingredient per acre to control the following insect pests:

- ✓ alfalfa weevil – for larval control, prebloom only. Use of Penncap-M is not recommended.
- ✓ aphids
- ✓ armyworms
- ✓ Lygus bugs – applied prebloom on warm days in late May. If treating for Lygus bugs, growers prefer bifenthrin (Capture 2EC) because it is least destructive of predators.

BARLEY:

- Washington State had 350,000 acres in barley production in 2002. Barley, as a cash grain, is grown eastern Washington.
- Methyl parathion (Penncap-M and Declare) is used by barley producers to control aphids. Occasionally aphids have been sufficiently abundant to cause localized damage to grain prior to grain fill, but usually they are held in check by predators and/or parasitoids. There is no advantage to chemical control past the milk stage of grain ripening.
- To control aphids, methyl parathion is aerially applied in the late spring (May – June) and fall (September – October) at a rate of 0.125 to 0.375 pounds active ingredient per acre. No more than 3 pounds active ingredient may be applied per acre per year.
- If treating for control of Russian wheat aphids, the application rate of methyl parathion (Penncap-M) is increased to 0.25 – 0.75 pounds active ingredient per acre. No more than 3 pounds active ingredient may be applied per acre per year.
- Methyl parathion is also labeled for control of the following small grain insect pests. No more than 3 pounds active ingredient may be applied per acre per year.
  - ✓ barley thrips – applied at a rate of 0.25 – 0.75 pounds active ingredient per acre
  - ✓ brown wheat mite – applied at a rate of 0.5 pounds active ingredient per acre
  - ✓ armyworms – for true armyworm, applied at a rate of 1.0 to 1.5 pounds active ingredient per acre.
  - ✓ grasshoppers – applied at a rate of 0.375 - 0.5 pounds active ingredient per acre
  - ✓ plant bugs – not a common problem in grain growing areas
  - ✓ stink bugs – applied at a rate of 0.25 – 0.75 pounds active ingredient per acre.

BEANS, DRY:

- Over 41,000 acres of dry beans were produced in Washington State in 2002. The majority of beans are grown in eastern Washington in Adams (8,800 acres), Franklin (3,300 acres) and Grant (14,400) counties.
- Dry beans (*Phaseolus vulgaris*) include white, pinto, pink, black, red and kidney beans. Production of dry beans, both as crop and seed, is similar to the production of snap beans.
- Methyl parathion may be applied at a rate of 0.5 to 1.5 pounds active ingredient per acre to control aphids, cutworms and armyworms.

CORN, GRAIN & SILAGE:

- In 2002, 130,000 acres of field corn were planted. Of that acreage, 70,000 acres were harvested for grain and 60,000 acres were cut for silage. Most corn is grown in the following eastern Washington counties: Grant (30,000 acres), Yakima (25,000 acres) and Franklin (11,700 acres). However, western Washington produces 28,700 acres of corn in

the following counties: Whatcom (16,000 acres), Skagit (7,200 acres) and Snohomish (5,500 acres).

- Methyl parathion should not be applied to corn during pollen shed.
- Methyl parathion (Declare) may be applied on grain and silage corn at a rate of 0.25 pounds active ingredient per acre to control the following insect pests:
  - ✓ Aphids – may become very abundant in eastern Washington
  - ✓ Armyworms
  - ✓ Grasshoppers – use at a rate of 0.5 pounds active ingredient per acre
  - ✓ Western corn rootworm (adults)

CORN, SEED:

- Seed corn production in Washington State is confined to the eastern Washington counties of Adams, Franklin, Grant and Lincoln. There is some seed corn production in western Washington in Jefferson County.
- Production of corn for seed is similar to the production of corn for food and feed.
- Methyl parathion (Declare) may be applied at a rate of 0.25 pounds active ingredient per acre to control aphids and adult corn rootworms. Adult corn rootworms feed on silks reducing seed yield.
- Growers typically use pyrethroid insecticides to control insects that infest the corn ear.

CORN, SWEET:

- In 2002, Washington State harvested 97,900 acres of sweet corn were harvested (2,600 acres for the fresh market and 95,300 picked for processing). Grant (33,000 acres), Benton (15,000 acres) and Franklin (18,000 acres) counties are Washington State's leading producers of sweet corn for processing.
- While many counties decreased sweet corn acreage in 2002, Yakima County increased sweet corn production 3-fold, going from 2,700 acres in production to 8,900 acres.
- The most serious pest is the corn earworm, which is especially severe in eastern Washington.
- Methyl parathion is not typically used for insect control in sweet corn. Methyl parathion may be applied at a rate of 0.5 pounds active ingredient per acre to control grasshoppers.

LENTILS:

- Over 90 percent of the lentils grown in the United States are produced within a 90-mile radius of Pullman, Washington (Whitman and Spokane counties). In 2002, Washington State had 75,000 acres in lentil production.
- Lentils are planted in mid-April and have a 3-month growing season.
- Critical insect pests are pea aphids and Lygus bugs. Lygus bugs not only cause primary damage but also cause areas of the seed to have a chalky white, mealy texture (chalky spot).
- Methyl parathion (Penncap-M - Washington 24(c) Special Local Needs registration #WA-000012) may be aerially applied at a rate of 0.5 pounds active ingredient per acre to control aphids and Lygus bugs.

PASTURE:

- Methyl parathion (Declare) may be applied to pastureland at a rate of 0.5 to 1.0 pounds active ingredient per acre to control the following insect pests:
  - ✓ aphids
  - ✓ armyworms
  - ✓ blackgrass bug
  - ✓ crested wheat bug
  - ✓ European crane fly – applied when larvae are small. Requires irrigation or rain to wash the insecticide into crown.
  - ✓ grasshoppers
  - ✓ winter grain mite – applied at a rate of 0.25 to 0.375 pounds active ingredient per acre.

PEAS, DRY:

- In 2002, Washington State had over 70,000 acres in dry pea production. Whitman County has the largest amount of acres in dry peas followed by Spokane County.
- Over 97 percent of the dry peas produced in the United States are within a 90-mile radius of Pullman, Washington.
- Dry peas are planted in mid-April and harvested in mid-July. The peas dry on the plant in the field and are harvest mechanically.
- Methyl parathion (Declare - Washington 24(c) Special Local Needs registration #WA-000019) may be applied at a rate of 0.5 to 1.0 pounds active ingredient per acre to control cutworms, armyworms, loopers and pea aphids in dry edible and seed peas. These insects are primarily pests of alfalfa and clovers but will attack other legumes. Cutworms do not often seriously damage field peas.
- Methyl parathion (Cheminova Methyl 4EC - Washington 24(c) Special Local Needs registration #WA-000004) may also be applied as noted above.

PEAS, SEED:

- Pea seed is a short-season crop planted in mid-April and harvested in mid-July. Seed peas are harvested by cutting without drying the plants the field to prevent weed contamination.
- The most critical seed pea pests are weeds. A number of insects affect seed peas. However, aphids are the most seer problem since they transmit viruses.
- If aphids are present, dimethoate is the preferred insecticide.
- Methyl parathion (Declare - Washington 24(c) Special Local Needs registration #WA-000019) may be applied at a rate of 0.5 to 1.0 pounds active ingredient per acre to control cutworms, armyworms, loopers and pea aphids in dry edible and seed peas. These insects are primarily pests of alfalfa and clovers but will attack other legumes. Cutworms do not often seriously damage field peas.
- Methyl parathion (Cheminova Methyl 4EC - Washington 24(c) Special Local Needs registration #WA-000004) may also be applied as noted above.

POTATOES (IRISH):

- The majority of potato acreage is located in eastern Washington in the following counties: Franklin (37,000 acres), Grant (36,500 acres), Benton (30,000 acres), Adams (27,000 acres), Walla Walla (12,000 acres), Lincoln (4,500 acres), Yakima (2,300 acres), Klickitat (1,700 acres) and Kittitas (500 acres). Most of the eastern Washington potato production contracted for processing (chipping, fries, etc.)
- The principal potato producing counties in western Washington are Skagit (9,000 acres) and Whatcom (2,600 acres). Potatoes production in western Washington (approximately 12,000 acres) is for the fresh market.
- Potatoes are usually grown in a four-year rotation (one in four) with wheat, alfalfa, and corn.
- Insecticides used to control pests in potatoes are rotated for resistance management. Some fields may not have any insecticides applied, for example, potatoes grown for the fresh pack market. Other fields may receive only at-plant applications while fields producing long-season storage potatoes will get 6 - 8 foliar applications during a 4 - 5 month growing season.
- Washington State potato producers stated they do not use methyl parathion.
- However, methyl parathion (Penncap-M, generics) is labeled to control the following potato insect pests. Rate of application is 0.5 to 1.0 pounds active ingredient per acre as foliar treatment.
    - ✓ Colorado potato beetle (CPB) – can cause complete defoliation and nearly complete crop loss if allowed to reproduce unchecked. Both larvae and adults feed on potato foliage throughout the season. In cool climates, the beetle undergoes only one generation per season; but in warmer areas, such as the southern Columbia Basin, three generations may occur. The CPB has developed very high levels of resistance to insecticides in many parts of the country. Fortunately, most populations in the Pacific Northwest are still susceptible to almost all labeled products.
    - ✓ Cutworms – cutworms are active mostly at night, and therefore are difficult to sample and monitor. Damage to mature potato plants is usually minor, and these caterpillars rarely require control.
    - ✓ Potato flea beetle.
    - ✓ Grasshoppers
    - ✓ Leafhoppers – one species (*Empoasca)* rarely reaches damaging levels in potatoes in the Pacific Northwest. Other leafhopper species may be involved in transmitting various phytoplasmas (bacteria-like pathogens) to potatoes in the Pacific Northwest.
    - ✓ Lygus bugs - cause minor damage of unknown economic significance. Chemical treatment for lygus bugs in potatoes is rarely needed.

RAPE, SEED:

- Production of rapeseed is limited to Skagit County in western Washington. The seed is used to produce "leafy vegetable rape." The young leaves of the plant are used similarly to spinach.
- Rapeseed is an annual crop that is planted in early April and harvested in September.

- Although labeled for the control of aphids and cabbage flea beetles, methyl parathion is seldom used in WA and is not recommended by WSU Extension faculty due to bee safety and health considerations.

SUGAR BEETS:

- Methyl parathion (Declare, Methyl 4EC) is labeled for control of the following insect pests:
  - ✓ aphids
  - ✓ beet leafhoppers
  - ✓ cutworms and armyworms
  - ✓ flea beetles (adults)
  - ✓ grasshoppers
  - ✓ Lygus bugs: primarily seed feeders, so usually they are inconsequential pests except in sugar beet seed fields. Lygus bugs are known to move from adjoining field crops into sugar beets, where they feed on the newest leaves and petioles
  - ✓ spider mites
  - ✓ stinkbugs: primarily seed feeders, so they are usually inconsequential pests except in sugar beet seed fields.
  - ✓ webworms
- However, with the closing of the eastern Washington (Moses Lake) processing plant in 2000, sugar beets are being phased out of production in eastern Washington State. Sugar beet production in 2002 (4,000 acres) was less than 15 percent of the acres (28,400 acres) in production in 2001. It is not likely the plant will re-open.

WHEAT:

- Washington State produced 2.42 million acres of wheat (spring & winter) in 2002. Spring wheat acreage was 620,000 acres and winter wheat acreage was 1.8 million acres. Common white winter wheat makes up 61 percent of all wheat grown in Washington State.
- Whitman County is the largest wheat producer in Washington State with 493,500 acres planted in 2002.
- The southeast area of Washington State (Asotin, Columbia, Garfield, Walla Walla and Whitman counties) produces the majority of wheat with 919,600 acres planted in 2002.
- The east central area of Washington State (Adams, Douglas, Franklin and Grant counties) has dropped to second in wheat production with 744,900 acres planted in 2002.
- Methyl parathion (Penncap-M and Declare) is used by eastern Washington wheat producers to control aphids. Occasionally aphids have been sufficiently abundant to cause localized damage to grain prior to grain fill, but usually they are held in check by predators and/or parasitoids. There is no advantage to chemical control past the milk stage of grain ripening.
- Methyl parathion is aerially applied in the late spring (May – June) and fall (September – October) at a rate of 0.125 to 0.375 pounds active ingredient per acre. No more than 3 pounds active ingredient may be applied per acre per year.
- If treating for control of Russian wheat aphids, the application rate of methyl parathion (Penncap-M) is increased to 0.25 – 0.75 pounds active ingredient per acre. No more than 3 pounds active ingredient may be applied per acre per year.

- Methyl parathion is also labeled for control of the following small grain insect pests:
  - ✓ barley thrips
  - ✓ brown wheat mite
  - ✓ armyworms
  - ✓ grasshoppers
  - ✓ plant bugs
  - ✓ stink bugs

PRODUCT NAMES AND LABELED CROPS:

A complete list of all products currently registered for use in Washington State and their respective labeled crops is attached.

PRODUCT NAME	CROP
CHEMINOVA METHYL 4 EC	ALFALFA
CHEMINOVA METHYL 4 EC	BARLEY
CHEMINOVA METHYL 4 EC	BEAN (DRY)
CHEMINOVA METHYL 4 EC	CABBAGE
CHEMINOVA METHYL 4 EC	CANOLA
CHEMINOVA METHYL 4 EC	CORN (FIELD)
CHEMINOVA METHYL 4 EC	CORN (SWEET)
CHEMINOVA METHYL 4 EC	GRASS
CHEMINOVA METHYL 4 EC	OAT
CHEMINOVA METHYL 4 EC	ONION (DRY BULB)
CHEMINOVA METHYL 4 EC	ONION (GREEN)
CHEMINOVA METHYL 4 EC	PEA (DRY)
CHEMINOVA METHYL 4 EC	POPCORN
CHEMINOVA METHYL 4 EC	POTATO
CHEMINOVA METHYL 4 EC	RAPE GREENS
CHEMINOVA METHYL 4 EC	RYE
CHEMINOVA METHYL 4 EC	SOYBEAN
CHEMINOVA METHYL 4 EC	SUGARBEET
CHEMINOVA METHYL 4 EC	SUNFLOWER
CHEMINOVA METHYL 4 EC	WHEAT
CHEMINOVA METHYL 4EC (SLN: DRY PEAS)	PEA (DRY)
DECLARE INSECTICIDE (SLN: DRY PEAS)	PEA (DRY)
DECLARE INSECTICIDE	ALFALFA
DECLARE INSECTICIDE	ALFALFA SEED CROP
DECLARE INSECTICIDE	BARLEY
DECLARE INSECTICIDE	BEAN (DRY)
DECLARE INSECTICIDE	CABBAGE
DECLARE INSECTICIDE	CANOLA
DECLARE INSECTICIDE	CORN (FIELD)
DECLARE INSECTICIDE	CORN (SWEET)
DECLARE INSECTICIDE	CORN SEED CROP

DECLARE INSECTICIDE	GRASS
DECLARE INSECTICIDE	OAT
DECLARE INSECTICIDE	ONION (DRY BULB)
DECLARE INSECTICIDE	ONION (GREEN)
DECLARE INSECTICIDE	PASTURE
DECLARE INSECTICIDE	PEA (DRY)
DECLARE INSECTICIDE	POPCORN
DECLARE INSECTICIDE	POTATO
DECLARE INSECTICIDE	RANGELAND
DECLARE INSECTICIDE	RYE
DECLARE INSECTICIDE	SOYBEAN
DECLARE INSECTICIDE	SOYBEAN SEED CROP
DECLARE INSECTICIDE	SUGARBEET
DECLARE INSECTICIDE	SUNFLOWER
DECLARE INSECTICIDE	WHEAT
PENNCAP-M	BARLEY
PENNCAP-M	BEAN (DRY)
PENNCAP-M	CORN (FIELD)
PENNCAP-M	CORN (SWEET)
PENNCAP-M	OAT
PENNCAP-M	ONION (DRY BULB)
PENNCAP-M	ONION (GREEN)
PENNCAP-M	PEA (AUSTRIAN WINTER)
PENNCAP-M	POPCORN
PENNCAP-M	POTATO
PENNCAP-M	SOYBEAN
PENNCAP-M	WHEAT
PENNCAP-M (SLN: LENTILS)	LENTIL

References:

2003 Farm Chemicals Handbook, Meister Pro Information Resources
2003 Pacific Northwest Plant Disease Management Handbook, Extension Services of OSU, WSU, and UI

Schreiber, Alan and Laurie Ritchie. "Washington Minor Crops." 1994. Food and Environmental Quality Lab, Washington State University.

2003 Washington State registered pesticide labels

CDMS Label Database: http://www.cdms.net/manuf/manuf.aspwebsite
ExToxNet Pesticide Information Profiles: http://ace.orst.edu/info/extoxnet/pips/pips.html
Greenbook, Chemical & Pharmaceutical Press Inc.: http://www.greenbook.net/
National Agricultural Statistics Service – Agricultural Chemical Use Database: http://www.pestmanagement.info/nass/
National Center for Food & Agricultural Policy: http://www.ncfap.org/database/ingredient/default.asp
National Pesticide Use Database: http://www.ncfap.org/database/ingredient/default.asp
Pesticide Action Network Pesticide Database: http://www.pesticideinfo.org/index.html
U.S. Department of Agriculture National Agricultural Statistics Service: http://www.usda.gov/nass/
U.S. Department of Agriculture Pest Management Centers Crop Profiles: http://www.pmcenters.org/cropprofiles/
U.S. Department of Agriculture Crop Profiles: http://pestdata.ncsu.edu/cropprofiles/

Washington 2003 Annual Bulletin, Washington Agricultural Statistics Service , http://www.nass.usda.gov/wa/annual03/content3.htm
Washington State Pesticide Management Practices: http://www.tricity.wsu.edu/~cdaniels/wapiap.html
WSU PICOL Label/Crop Profile Database: http://picol.cahe.wsu.edu/LabelTolerance.html
WSU Pesticide Notification Network, http://ext.wsu.edu/pnn/user/blank.php

E-mail correspondence – John Kugler, March 4, 2004, WSU Grant-Adams Area Cooperative Extension (alfalfa)
E-mail correspondence – Alan Schreiber, May 6, 2003, Agriculture Development Group, Inc.

Personal communication – Gretchen Borck, WA Association of Wheat Growers, Ritzville (wheat)
Personal communication – Brian Davis, February 6, 2003, Quincy Farm Chemicals, wheat chemigation specialist (wheat)
Personal communication – Ron Jirava, WA Association of Wheat Growers, Ritzville (wheat)
Personal communication – Tom Kucklick, The McGregor Company, St. John (wheat)
Personal communication – John Kugler, various dates, WSU Grant-Adams Area Cooperative Extension , (alfalfa seed)
Personal communication – Ted Martin, February 6, 2004, J.R. Simplot, Moses Lake (sugar beets)
Personal communication – Roger Wesselman, WA Association of Wheat Growers, Ritzville (wheat)
Personal communication – Joe Yenish, WSU Cooperative Extension (wheat)