STATE OF WASHINGTON

DEPARTMENT OF AGRICULTURE

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WASHINGTON STATE
NALED USE SUMMARY

- Naled is a fast acting, non-systemic contact and stomach organophosphate insecticide. It is used to control aphids, mites, mosquitoes, and flies on crops and in greenhouses, mushroom houses, animal and poultry houses, kennels, food processing plants, and aquaria and in outdoor mosquito control. Liquid formulations can be applied to greenhouse heating pipes to kill insects by vapor action. Veterinarians have used naled to kill parasitic worms (other than tapeworms) in dogs.
- Naled is a general use pesticide (GUP).
- Naled is available in dust, emulsion concentrate, liquid, and ultra-low volume (ULV) formulations.
- Naled is classified toxicity category I. Products containing naled bear the signal words, "Danger-Poison" because it is corrosive to the eyes. Naled belongs to the organophosphate chemical class.
- Major crop uses in Washington State, listed alphabetically, are as follows:

CROP	WASS* 2002 EST. ACRES	EST. % ACRES TREATED	EST. LBS. A.I./ACRE	# OF APPS	EST. ACRES TREATED	EST. LBS. A.I. APPLIED
Alfalfa, seed	12,000	50	0.75	1	6,000	4,500
Beans, dry	41,000					
Beans, lima	2,200					
Beans, snap	Unknown					
Broccoli & other cole crops	1,500					
Celery	100					
Collards & kale	Unknown	Limited acreage, see narrative below.				
Eggplant	Unknown	Limited acreage, see narrative below.				
Hops	20,333	Not used in Washington State. See narrative below.				
Melons, net	< 200	Limited acreage, see narrative below.				
Peas, dry	70,000					
Peas, green	36,800					
Peppers, bell & chili	< 500	Limited acreage, see narrative below.				
Spinach	< 800					
Spinach, seed	< 500	Limited acreage, see narrative below.				
Squash	< 1,000	Limited acreage, see narrative below.				
Sugar beets	4,000	See narrative below.				

* 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.

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.
- Naled (Dibrom - Washington 24(c) Special Local Needs registration #WA-99028) may be applied during bloom (July – early August) at a rate of 0.75 pounds of active ingredient per acre to control Lygus bugs.
- Approximately 50 percent of the alfalfa seed growers in Washington State use naled as opposed to the near total use of bifenthrin.
- 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.
- Naled (Dibrom) is not recommended during early season, because night applications can cause severe killing of either leafcutting or alkali bees the following day. Leafcutting bees are typically used for pollination. However, alkali bees are used exclusively for pollination in the Touchet Valley in Walla Walla County.
- Naled (Dibrom) also kills the beneficial bigeyed bug and damsel bug predators. Among materials available for this program, bifenthrin (Capture 2EC) is least destructive of predators.

BEANS, DRY:

- Over 41,000 acres of dry beans are produced in Washington State. 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.
- Naled (Dibrom 8E) may be applied at a rate of 1 pound active ingredient per acre to control the following insect pests:
  - ✓ aphids - Destroy infested crops immediately after harvest to prevent dispersal. Aphid populations tend to be higher in crops that are fertilized liberally with nitrogen.
  - ✓ Lygus bugs
  - ✓ spider mites - Several species of spider mites are common in the Pacific Northwest. Frequently, infestations include a mixture of spider mite species.

BEANS, LIMA:

- There are approximately 2,200 acres of lima beans are produced in eastern Washington with Franklin and Grant the top producing counties.
- Most commercially grown lima beans are bush type and harvested like peas (when the crop is still green).
- Naled (Dibrom 8E) may be applied at a rate of 1 pound active ingredient per acre to control the following insect pests:
  - ✓ aphids - Destroy infested crops immediately after harvest to prevent dispersal. Aphid populations tend to be higher in crops that are fertilized liberally with nitrogen.
  - ✓ leafhoppers - There are three to four generations each year. Each generation requires 27 to 34 days.
  - ✓ Lygus bugs
  - ✓ spider mites - Several species of spider mites are common in the Pacific Northwest. Frequently, infestations include a mixture of spider mite species

BEANS, SNAP:

- In western Washington, there are several small farms, most of them organic, growing beans for the fresh market. Most of these farms are located in King, Snohomish, Clallum, Kitsap, Pierce, Mason, Skagit and Thurston counties.
- Snap beans are produced in the northwest and northeast corners of Washington State as well as along the Columbia River basin.
- Snap beans are the same genus and species as kidney beans. Bush/dwarf type varieties (green or yellow wax varieties) are the most common types produced since they can be mechanically harvested. (Climbing/pole varieties are harvested by hand.)

- Snap beans prefer warm, frost-free areas and excessive heat can limit growth. Pest problems are similar to those for dry beans but are less extensive because the harvest is earlier.
- Naled (Dibrom 8E) may be applied at a rate of 1 pound active ingredient per acre to control the following insect pests:
  - ✓ aphids - Destroy infested crops immediately after harvest to prevent dispersal. Aphid populations tend to be higher in crops that are fertilized liberally with nitrogen.
  - ✓ leafhoppers - There are three to four generations each year. Each generation requires 27 to 34 days.
  - ✓ Lygus bugs
  - ✓ spider mites - Several species of spider mites are common in the Pacific Northwest. Frequently, infestations include a mixture of spider mite species

BROCCOLI & OTHER COLE CROPS (CAULIFLOWER & CABBAGE)

- The majority of cole crops produced in Washington State, approximately 1, 500 acres, are grown for the fresh market with the balance sent for processing.
- If used, naled (Dibrom) may be used to control the following cole crop insect pests:
  - ✓ aphids & imported cabbage worm – applied at a rate of 1 pound active ingredient per acre.
  - ✓ loopers – applied at a rate of 2 pounds active ingredient per acre.

CELERY:

- There are less than 100 acres and less than 10 growers producing celery in Washington State. The majority of producers reside in the following western Washington counties: King, Pierce, Thurston and Whatcom.
- Celery is high-density (22-inch rows, 9 inches part) planted into the field from transplants in late-May and continuing through mid-July. The planting schedule assures a long harvest (late August to mid-October).
- The most serious pest issue in celery is weeds. Currently available herbicides such as trifluralin and sethoxydim are not effective against weeds. Weeds are controlled through mechanical cultivation between rows and hand weeding. However, hand weeding is very cost prohibitive.
- Naled (Dibrom 8E) may be applied at a rate of 1 – 1.5 pounds active ingredient per acre to control Lepidoptera larvae. Application may be made with ground equipment only.

COLLARDS AND KALE:

- Collards and kale are produced for local consumption and farmers' markets in Washington State. Due to this limited acreage, information on pests and pesticides is not readily available.
- Since collards and kale are grown on minimal acreage, growers can control many pests by hand. Growers frequently market these crops as organic.

- Aphids are typically controlled using insecticidal soaps. Naled may be applied to control aphids. If used, naled (Dibrom 8E) is applied at a rate of 1 – 2 pounds active ingredient per acre. Naled has a one-day post-harvest interval (PHI).
- Naled may also be applied to control diamondback moth. If used, naled (Dibrom 8E) is applied at a rate of 1 – 1.5 pounds active ingredient per acre. In the Pacific Northwest, the damage from diamondback moth is not so much from feeding as from contamination by pupae. Late stage instars crawl into stems infesting harvested crops.

EGGPLANT:

- In Washington State, eggplant is produced for local consumption and farmers'markets. Due to this limited acreage, information on pests and pesticides is not readily available.
- Cultural practices for eggplant production are similar to that of tomatoes.
- Naled (Dibrom 8E) may be applied at a rate of 0.94 – 1.87 pounds active ingredient (1 – 2 pints product) per acre to control the following insect pests:
  - ✓ aphids
  - ✓ flea beetles
  - ✓ spider mites
- Do not exceed 5.64 pounds active ingredient (6 pints of product) per acre per season.

HOPS:

- In 2002, hop production was down 15 percent from 2001 production. Harvested acres totaled 20,333, a 6,006-acre decrease from 2001. The majority of hops (approximately 80 per cent) are grown in Yakima County.
- Naled (Dibrom) may be applied at a rate of 1 pound active ingredient per acre to control the fois labeled for the control of the following hop insect pests. Up to 5 applications may be made at 14-day intervals.
  - ✓ hop aphid
  - ✓ hop looper
  - ✓ spider mites
  - ✓ corn earworm
- Naled is not typically used by Washington State hop producers per discussions with growers and representatives of Washington Hop Growers. Rather, bifenthrin (Capture 2EC, Brigade) is applied by air blast sprayer in May for control of lepidoptera, weevils, and aphids.

CANTALOUPES & MUSKMELONS:

- The number of acres producing cantaloupes and muskmelons in Washington State is relatively small (less than 200 acres for all melons which includes watermelons). Yakima County is the largest producer.
- Melons are planted over a three-month period from mid-April to mid-June.
- Naled (Dibrom 8) may be applied to control aphids and loopers. Application rate is 0.94 pounds active ingredient (1 pint product) per acre and should not exceed 1.87 pounds active ingredient (2 pints product) per acre per season.

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.
- Naled (Dibrom 8E) may be applied at a rate of 0.94 pounds active ingredient (1 pint product) to control the following insect pests:
  - ✓ aphids - populations tend to build in spring, decline in summer, and build again in the fall.
  - ✓ leafminers

PEAS, GREEN:

- In 2002, Washington State harvested 36,800 acres of green peas. Grant County was the largest producer with 14,600 acres harvested.
- Peas are planted from early March to mid-June and harvested from the first week of June to the end of August.
- In western Washington, aphids and loopers are the most severe insect pests. In eastern Washington, aphids and weevils are severe.
- Naled (Dibrom 8E) may be applied at a rate of 0.94 pounds active ingredient (1 pint product) to control the following insect pests:
  - ✓ aphids - populations tend to build in spring, decline in summer, and build again in the fall.
  - ✓ leafminers
  - ✓ loopers - processing (green) peas only.

PEPPERS, BELL & CHILI:

- There are less than 500 acres of peppers grown in Washington State with Yakima County the leading producer.
- While peppers are a warm season crop that yields best with a long growing season, production occurs both in western and eastern Washington.
- Green peach aphid and corn borer are the primary insect pests in peppers.
- Naled (Dibrom 8E) may be applied at a rate of 1 pound active ingredient per acre to control aphids in peppers.

SPINACH:

- There are less than 800 acres in spinach production in Washington State. King County in western Washington and Walla Walla County in eastern Washington are the two largest spinach growing counties.
- Spinach in Washington State is produced for fresh market or processing. It is direct seeded and generally matures in 40 – 50 days.
- Insect pest are generally insignificant in spinach.
- Naled (Dibrom 8E) may be applied at a rate of 1 – 1.5 pounds active ingredient per acre to control leafminers.

SPINACH, SEED:

- Spinach seed is produced in western Washington. In 2003, there were approximately 500 acres in production. Production has increased 300 acres since 2002. Most of the acreage is located in Skagit County.
- Spinach seed is the most economically important small-seeded vegetable see crop grown in western Washington.
- Spinach seed is an annual crop. It is direct-seeded between late March and mid-May. The seed is harvested in July and August.
- Pesticides registered for pest control on the related vegetable crop may be used for the vegetable seed crop.
- Insect pest are generally insignificant in spinach.
- Naled (Dibrom 8E) may be applied at a rate of 1 – 1.5 pounds active ingredient per acre to control leafminers.

SQUASH:

- There are less than 1,000 acres of winter and summer squash grown in Washington State. Because squash is an annual that thrives in hot weather, eastern Washington, especially Yakima and Walla Walla counties, is the major production area.
- Viruses are the primary pest of squash in the Columbia Basin and are transmitted by aphids.
- Naled (Dibrom 8) may be applied to summer squash only at a rate of 0.94 – 1.87 pounds active ingredient (1 – 2 pints product) per acre. Applications should not exceed 5.64 pounds active ingredient (6 pints of product) per acre per season.

SUGAR BEETS:

- Naled (Dibrom 8E) is labeled for use on sugar beets to control sucking and chewing insects. 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.

PRODUCT NAMES AND LABELED CROP:

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

PRODUCT NAME	CROP
DIBROM 8 EMULSIVE (ALFALFA-SEED ONLY)	ALFALFA SEED CROP
DIBROM 8 EMULSIVE NALED INSECTICIDE	AQUATIC SITE/ADJACENT AREA
DIBROM 8 EMULSIVE NALED INSECTICIDE	BEAN (DRY)
DIBROM 8 EMULSIVE NALED INSECTICIDE	BEAN (GREEN)
DIBROM 8 EMULSIVE NALED INSECTICIDE	BEAN (LIMA)
DIBROM 8 EMULSIVE NALED INSECTICIDE	BROCCOLI

DIBROM 8 EMULSIVE NALED INSECTICIDE	BRUSSELS SPROUT
DIBROM 8 EMULSIVE NALED INSECTICIDE	BUILDING (ADJACENT AREA)
DIBROM 8 EMULSIVE NALED INSECTICIDE	BUILDING (AGR. PRODUCTION)
DIBROM 8 EMULSIVE NALED INSECTICIDE	CABBAGE
DIBROM 8 EMULSIVE NALED INSECTICIDE	CANTALOUPE
DIBROM 8 EMULSIVE NALED INSECTICIDE	CAULIFLOWER
DIBROM 8 EMULSIVE NALED INSECTICIDE	CHINESE CABBAGE
DIBROM 8 EMULSIVE NALED INSECTICIDE	COLLARD
DIBROM 8 EMULSIVE NALED INSECTICIDE	CONIFER
DIBROM 8 EMULSIVE NALED INSECTICIDE	DECIDUOUS/SHADE TREE
DIBROM 8 EMULSIVE NALED INSECTICIDE	EGGPLANT
DIBROM 8 EMULSIVE NALED INSECTICIDE	FARM BUILDING
DIBROM 8 EMULSIVE NALED INSECTICIDE	FARM BUILDING AREA AROUND
DIBROM 8 EMULSIVE NALED INSECTICIDE	FLOWER
DIBROM 8 EMULSIVE NALED INSECTICIDE	FOOD PROCESSING AREA
DIBROM 8 EMULSIVE NALED INSECTICIDE	FOREST
DIBROM 8 EMULSIVE NALED INSECTICIDE	GRAPE
DIBROM 8 EMULSIVE NALED INSECTICIDE	HOP
DIBROM 8 EMULSIVE NALED INSECTICIDE	KALE
DIBROM 8 EMULSIVE NALED INSECTICIDE	LIVESTOCK BUILDING NON-DAIRY
DIBROM 8 EMULSIVE NALED INSECTICIDE	MELON SEED CROP
DIBROM 8 EMULSIVE NALED INSECTICIDE	MOSQUITO BREEDING SITE
DIBROM 8 EMULSIVE NALED INSECTICIDE	MUSKMELON
DIBROM 8 EMULSIVE NALED INSECTICIDE	NONCROP AGRICULTURAL AREA
DIBROM 8 EMULSIVE NALED INSECTICIDE	ORNAMENTAL (GREENHOUSE)
DIBROM 8 EMULSIVE NALED INSECTICIDE	ORNAMENTAL TREE
DIBROM 8 EMULSIVE NALED INSECTICIDE	OUTDOOR RESIDENTIAL AREA
DIBROM 8 EMULSIVE NALED INSECTICIDE	PASTURE
DIBROM 8 EMULSIVE NALED INSECTICIDE	PEA (DRY)
DIBROM 8 EMULSIVE NALED INSECTICIDE	PEA (GREEN)
DIBROM 8 EMULSIVE NALED INSECTICIDE	PEACH
DIBROM 8 EMULSIVE NALED INSECTICIDE	PEPPER
DIBROM 8 EMULSIVE NALED INSECTICIDE	RANGELAND
DIBROM 8 EMULSIVE NALED INSECTICIDE	ROSE
DIBROM 8 EMULSIVE NALED INSECTICIDE	ROSE (GREENHOUSE)
DIBROM 8 EMULSIVE NALED INSECTICIDE	SHRUB
DIBROM 8 EMULSIVE NALED INSECTICIDE	SQUASH (SUMMER TYPES)
DIBROM 8 EMULSIVE NALED INSECTICIDE	STRAWBERRY
DIBROM 8 EMULSIVE NALED INSECTICIDE	SUGARBEET
DIBROM 8 EMULSIVE NALED INSECTICIDE	TIDAL MARSH
DIBROM 8 EMULSIVE NALED INSECTICIDE	WALNUT
DIBROM 8 EMULSIVE NALED INSECTICIDE	WASTELAND
DIBROM CONCENTRATE INSECTICIDE	AQUATIC SITE
DIBROM CONCENTRATE INSECTICIDE	FOREST RECREATION
DIBROM CONCENTRATE INSECTICIDE	MOSQUITO BREEDING SITE

DIBROM CONCENTRATE INSECTICIDE	NONCROP AGRICULTURAL AREA
DIBROM CONCENTRATE INSECTICIDE	OUTDOOR RESIDENTIAL AREA
DIBROM CONCENTRATE INSECTICIDE	PASTURE
DIBROM CONCENTRATE INSECTICIDE	RANGELAND
DIBROM CONCENTRATE INSECTICIDE	WASTELAND
PROZAP FLY KILLER D	DAIRY BUILDING
PROZAP FLY KILLER D	FARM BUILDING
PROZAP FLY KILLER D	FARM BUILDING AREA AROUND
PROZAP FLY KILLER D	FOOD PROCESSING AREA
PROZAP FLY KILLER D	FOREST
PROZAP FLY KILLER D	LIVESTOCK BUILDING NON-DAIRY
PROZAP FLY KILLER D	MOSQUITO BREEDING SITE
PROZAP FLY KILLER D	OUTDOOR RESIDENTIAL AREA
PROZAP FLY KILLER D	PASTURE
PROZAP FLY KILLER D	POULTRY BUILDING/YARD
PROZAP FLY KILLER D	TIDAL MARSH
PROZAP FLY KILLER D	WASTELAND
TRUMPET EC INSECTICIDE	AQUATIC SITE
TRUMPET EC INSECTICIDE	FOREST RECREATION
TRUMPET EC INSECTICIDE	MOSQUITO BREEDING SITE
TRUMPET EC INSECTICIDE	NONCROP AGRICULTURAL AREA
TRUMPET EC INSECTICIDE	OUTDOOR RESIDENTIAL AREA
TRUMPET EC INSECTICIDE	PASTURE
TRUMPET EC INSECTICIDE	WASTELAND

References:

2003 Farm Chemicals Handbook, Meister Pro Information Resources

2003 Pacific Northwest Insect Management Handbook, Extension Services of OSU, WSU, and UI

*2002 Pest Management Guide for Commercial Small Fruits***,** Cooperative Extension, College of Agriculture & Home Economics, Washington State University, EB1491.

1999 Estimated Cost of Producing Hops Under Drip Irrigation in the Yakima Valley, Washington State University EB1134,

Crop Profile for Alfalfa in Oregon, Oregon State University, Nov 2000

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
NW Berry and Grape Information Network: http://berrygrape.orst.edu/
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

Personal communication – Ann & Steve George, October 10, 2002, Washington State Hops Commission (hops)
Personal communication – John Kugler, various dates, Extension Forage Agronomist, Washington State University (alfalfa seed)
Personal communication – Ted Martin, February 6, 2004, J.R. Simplot, Moses Lake (sugar beets)
Personal communication – Harry Wolden, July 8, 2003, Vegetable Seed Fieldman, Mt. Vernon (spinach seed)