

27-JAN-2009  
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COMMERCIAL  
NET CONTENTS  
113 L  
208 L  
415 L  
Bulk

**VAPAM HL<sup>®</sup>**  
LIQUID SOIL FUMIGANT

**CAUTION**

**POISON      CORROSIVE**

**POTENTIAL SKIN SENSITIZER**

**READ THE LABEL BEFORE USING**

GUARANTEE: Metam Sodium at 42%

REGISTRATION NUMBER: **29128** PEST CONTROL PRODUCTS ACT

**AMVAC CHEMICAL CORPORATION**

4100 E. Washington Blvd.  
Los Angeles, CA 90023  
(323) 264-3910

Notification Change

In all other provinces, contact

For more information, contact:

United Agri Products  
789 Donnybrook Drive  
Dorchester, Ontario N0L 1G5  
(519) 268-8001

in British Columbia, Univar Canada LTD,  
3256 MacCallum Road, Abbotsford, BC  
V2S 4N8 (604) 859-4919

## **PRECAUTIONS**

### **KEEP OUT OF REACH OF CHILDREN**

HARMFUL IF INHALED OR SWALLOWED, IRRITATING TO EYES, NOSE, THROAT AND SKIN. AVOID BREATHING VAPOUR. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING.

Use a respirator approved for protection against pesticide inhalation. Wear rubber gloves, protective clothing and goggles or face shield.

Wash hands, arms and face thoroughly with soap and water after handling and before eating or smoking. Routinely shower or bathe after work and wash all clothing with soap and hot water before reusing. In case of contact, immediately remove contaminated clothing and wash thoroughly with soap and water.

Do not transport or store VAPAM HL with any food or feed intended for human or animal consumption.

Keep container tightly closed when not in use.

Keep children and pets away from treated area.

If this pest control product is to be used on a commodity that may be exported to the U.S. and you require information on acceptable residue levels in the U.S., visit CropLife Canada's website at [www.croplife.ca](http://www.croplife.ca).

### **FIRST AID**

**IF SWALLOWED:** Call a poison control centre or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. DO NOT induce vomiting unless told to do so by a poison control centre or doctor. DO NOT give anything by mouth to an unconscious person.

**IF ON SKIN/CLOTHING:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control centre or doctor for treatment advice.

**IF IN EYES:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treatment advice.

**IF INHALED:** Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.

Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.

### **TOXICOLOGICAL INFORMATION**

Vapours and aerosols can irritate eyes, nose and respiratory passages. Treat symptomatically. No other adverse clinical effects have been associated with exposure to VAPAM HL.

## EMERGENCY TELEPHONE NUMBER

All hours, 1-323-264-3910 only for health and environmental information. For transportation only 1-800-424-9300.

## ENVIRONMENTAL HAZARDS

This product is toxic to fish. Do not apply directly to water or wetlands. Do not apply where runoff is likely to occur. Do not contaminate water by cleaning of equipment or disposal of waste. Apply this product only as specified on the label.

## BULK TRANSPORT/STORAGE

Transport (commercial) in stainless steel. On-farm nurse tank should be high-density polyethylene, fibreglass, mild steel or stainless steel. No fittings should be made of zinc, copper, brass, aluminum or buna-N as corrosion and deterioration will result.

## STORAGE AND DISPOSAL

### PROHIBITIONS:

Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited.

### STORAGE:

Keep container tightly closed when not in use. Do not store near seeds, fertilizers or foodstuffs. Protect from temperatures below - 17 °C. Product crystallizes at lower temperatures. Warm or store at higher temperatures and mix to re-dissolve crystal and assure uniformity before use. (Do not warm above 30 °C).

### DISPOSAL:

#### Bulk

This tank is refillable. Wash inside of tank with water after final use. Do not enter tank. Wear protective equipment (see PRECAUTIONS) during the washing. For information on the disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of spill, and for clean-up of spills.

#### **113L, 208L, 415L**

**"For returnable containers:** Do not reuse this container for any purpose. For disposal, this empty container may be returned to the point of purchase (distributor/dealer).

#### **If not returned:**

- 1 -Triple-or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank.
- 2- Follow provincial instruction for any required additional cleaning of the container prior to its disposal.
- 3- Make the empty container unsuitable for further use.
- 4- Dispose of the container in accordance with provincial requirements.

For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of spill, and for clean-up of spills."

## SPILL CLEANUP

Make sure all personnel involved in the spill cleanup follow good industrial hygiene practices. Any person entering either a significant spill area or an unknown concentration of a vapour or mist should use a positive pressure, self-contained breathing apparatus or a positive pressure, air-supplied respirator with escape pack. Small spills can be handled routinely. Use adequate ventilation and/or wear a NIOSH- approved pesticide respirator to prevent inhalation exposure. Wear protective clothing to prevent skin and eye contact. Use the following procedures: Absorb spillage with an absorbent. Sweep up spilled material being careful not to create dust. Place sweepings in a chemical waste container for disposal. Generously cover contaminated area with a slurry of common, powdered, household laundry detergent and water. Using a stiff brush, work the slurry into cracks and crevices. Allow to stand for 2-3 minutes then flush with water. Repeat if necessary. Dispose of all wastes in accordance with instructions in the DISPOSAL statement above. Large spills should be handled according to a predetermined plan. For assistance, contact Univar in British Columbia and United Agri Products (UAP) in all other provinces.

## PRODUCT INFORMATION

VAPAM HL is a water soluble liquid. When applied to properly prepared soil, the liquid is converted into a gaseous fumigant. After sufficient interval of time, the fumigant dissipates leaving the soil ready for planting.

VAPAM HL is recommended as a pre-planting treatment for the control of many of the soil-borne pests that attack ornamentals, food and fibre crops, and tobacco. VAPAM HL controls germinating weed seeds such as annual grasses, Bermuda grass, chickweed, dandelion, ragweed, henbit, lambsquarters, pigweed, purslane, Johnsongrass, wild morning glory and suppresses perennial weeds such as quack grass. It also controls symphylans (the garden centipede) as well as soil-borne fungus diseases, particularly, damping-off and root rot, including diseases caused by species of *Rhizoctonia*, *Pythium*, *Fusarium*, *Phytophthora*, *Verticillium*, *Sclerotinia*, oak root fungus and clubroot of crucifers. VAPAM HL will also control nematodes, however specific efficacy data on the golden nematode (*Globodera rostochiensis* and *G. pallida*), which is a quarantine pest, was not assessed.

VAPAM HL acts as a fumigant, which can be released, leaving the soil ready for planting.

## NOTICE TO USER

This pest control product is to be used only in accordance with the directions on the label. It is an offence under the *Pest Control Products Act* to use this product in a way that is inconsistent with the directions on the label. The user assumes the risk to persons or property that arises from any such use of this product.

## **DIRECTIONS FOR USE**

### **GENERAL USE PRECAUTIONS**

Prepare soil carefully in advance, according to directions. After mixing with water do not allow solution to stand for more than 1 hour.

Keep off desirable lawns and plants. Do not apply within 1 metre of the drip line of plants, shrubs or trees.

Do not apply in confined spaces without adequate ventilation. If ample ventilation is not available, use an air supplied respirator or gas mask type respirator.

Do not use in greenhouses where growing plants are present or where fumes may enter nearby houses containing growing plants.

Do not tank mix VAPAM HL with other fumigants.

After application observe cultivation and planting directions carefully. Rinse all equipment with water after each day's use. Disassemble valves and clean carefully.

Protect from temperature below  $-17^{\circ}\text{C}$ . Product crystallizes at lower temperatures. Warm or store at higher temperatures and mix to redissolve crystals and assure uniformity before use. Do not warm above  $30^{\circ}\text{C}$ .

### **SOIL PREPARATIONS AND CONDITIONS FOR PROPER USE**

Before applying VAPAM HL always cultivate the area thoroughly, breaking up clods and loosening soil deeply and thoroughly. Do this a week before applying VAPAM HL and keep the soil moist, watering if necessary until time to treat. **THIS IS THE MOST IMPORTANT STEP IN APPLYING VAPAM HL** with all application methods. Success depends upon how carefully the soil is prepared before application. Cultivate lightly immediately before applying VAPAM HL if the soil has crusted.

VAPAM HL must be applied during periods of moderate air temperatures and little wind movement to prevent evaporation and loss.

Do not apply VAPAM HL to the soil surface when air temperature is over  $32^{\circ}\text{C}$ , or when high winds would cause loss of VAPAM HL before it could be sealed into the soil. Soil temperature must be in the range of  $4^{\circ}\text{C}$  to  $32^{\circ}\text{C}$  at a 7.5cm depth.

It is recommended that soil surface be kept moist during application and for 24 hours after application. If fumes become unpleasant during treatment, apply more water to seal the fumes into the soil where they should be confined to achieve maximum fumigant benefit.

The activity of VAPAM HL is increased by the use of a tarp (plastic, paper, or fabric) spread loosely over the treated area and secured to prevent removal by wind. Keep covered for a minimum period of 48 hours. Seven days after treatment cultivate area to depth of 5 cm to aerate the soil. Do not seed earlier than 21 days after application when tarping method is used.

## **APPLICATION METHODS AND RATES**

### **LIMITED AREAS**

For summer and fall treatment of seed beds, plant beds, lawns, greenhouses and other limited areas:

**SPRINKLING CAN METHOD:** Place 0.37L VAPAM HL (0.56L on very heavy soils or for deep-rooted weeds) in a sprinkling can, fill with water, and sprinkle uniformly over 5 square metres of well-prepared soil. Sprinkle immediately with water until soil is sealed, or tarp for 48 hours.

**PRE-MIX:** Add 7.4L of VAPAM HL (11.2L on very heavy or rich soils) to 800L water in a drum or tank and agitate. Sprinkle evenly over 100 square metres of bed. The VAPAM HL solution may be applied from the drum or tank by using a portable pump or a gear pump attachment on a tractor. Use a fan type nozzle that delivers large size droplets. Do not use solid stream or mist spray.

**HOSE PROPORTIONER METHODS:** Add 0.75L VAPAM HL (1.1L on very heavy or rich soils) to 3L water in a bucket or other container and apply using a hose proportioner (1:15 or 2:20 ratio). Apply to an area of 10 square metres. Continue sprinkling with water until soil is wet to a depth of 7.5 to 10cm.

**SOIL INJECTION:** For seed beds, a dosage of 410 to 670L per hectare (should be 0.45 to 0.74L per 10 square metres) is recommended. Space injection shanks 13 - 15 cm apart and inject VAPAM HL 10 - 15 cm into well prepared soil. Follow immediately with a roller to smooth and compact the soil surface. A water seal must be applied immediately (within minutes) after injection. This is done by lightly watering the soil surface, using about 40L per 10 square metres.

**ROTARY TILLER, POWER MULCHER, POWER ROLLER OR ROTVATOR & ROLL METHODS OF APPLICATION:** Spray or sprinkle VAPAM HL immediately in front of equipment. Use 0.75L VAPAM HL in 10L water per each 10 square metres. Follow immediately with a roller to smooth and compact the soil surface. Light watering or a tarp after rolling will help prevent gas escape.

Best results will be obtained if a plastic cover is spread over the treated area. Remove the cover after 48 to 72 hours.

### **FIELD APPLICATION**

(Where entire area is being treated)

**SPRINKLER IRRIGATION SYSTEM:** Use 350 to 670L VAPAM HL per hectare. Meter VAPAM HL at a steady rate into the sprinkler system during the entire irrigation period. Apply in a minimum of 25mm of water per hectare. Avoid making the application if rain is forecast within 24 hours. FOR POTATOES to control nematodes, use 372 to 744 L VAPAM HL per hectare. Apply a minimum of 3 cm of water. Use only sprinkler systems that give large droplets to prevent excessive loss. Apply only through central pivot or solid set sprinkler irrigation systems containing antisiphon and check valves which will prevent water source contamination and overflow of the slurry tank. The systems must also contain interlocking controls between the metering device and the water pump to insure simultaneous shut-off. Soil temperature should be in the range of 4 to 30° C. VAPAM HL will only control nematodes which are in the fumigated zone at the time of treatment.

**SOIL INJECTION:** For field use, a dosage of 279 to 696L per hectare is recommended. Space injection shanks (blades) 13 - 15 cm apart and inject VAPAM HL 10 - 15 cm into well prepared soil. Follow immediately with a roller to smooth and compact the soil surface. Ensure that there is adequate soil moisture (50% - 80% of field capacity) prior to treatment.

**CHECK OR FLOOD IRRIGATION:** Meter VAPAM HL at a steady rate into water during irrigation. Use 372 to 744 L of VAPAM HL per hectare, depending upon the kind of pest and depth desired, in 7 to 45 cm of water per hectare.

**USE PRECAUTIONS FOR IRRIGATION:** Do not operate irrigation systems without safety valves, check valves or other devices to prevent water source contamination or overflow at the nurse tank. Irrigation water treated with VAPAM HL should be maintained on the treated area until the water is absorbed by the soil. Do not contaminate water by cleaning of equipment or disposal of waste. Do not apply where weather conditions favour drift away from target area.

### **FIELD APPLICATION Bed, Rows and other General Broadcast Applications**

**SOIL INJECTION:** For injection into pre-formed plant beds, a dosage of 279 to 696 L per hectare is recommended. Space injection shanks (blades) 13 - 15 cm apart and inject VAPAM HL 10 - 15 cm into well-prepared and moist soil. Follow immediately with a soil compacting roller which may be mounted directly behind the injection system to smooth and seal the soil surface. Best results are obtained if a water seal or plastic tarp is spread over the treated area. Remove cover after 48 to 72 hours. Ensure that there is adequate soil moisture (50% to 80% of field capacity) prior to treatment.

**ROTARY TILLER, POWER MULCHER, POWER ROLLER OR ROTVATOR & ROLL METHODS OF APPLICATION:** Spray or sprinkle VAPAM HL immediately in front of equipment. Use 75 L VAPAM HL per each 1000 square metres. Follow immediately with a roller to smooth and compact the soil surface. Light watering or a tarp after rolling will help prevent gas escape.

Best results will be obtained if a plastic cover is spread over the treated area. Remove the cover after 48 to 72 hours.

**SOIL COVERING METHODS:** (Bed-over methods). VAPAM HL may be sprayed or dripped onto the soil immediately ahead of bed-shaping equipment at a recommended rate of 350 L to 696 L per treated hectare (approximately equivalent to 0.37 to 0.75 L per 30 metres of 30-cm row). Cover the VAPAM HL with soil to a depth of 7 to 15 cm. Follow immediately with a roller to smooth and compact the soil surface.

### **FALL TREATMENT OF TREE REPLANT SITES**

**SITE PREPARATION:** After removing dead or diseased trees and as much of the root system as possible, loosen the soil in the area to a depth of 15 to 20 cm to aid water penetration. Level off the area. Treat during a period of adequate soil moisture (irrigate if necessary). Do not apply to dry soil. When the soil is workable, build a circular basin or ridge 2 metres across on the site.

**APPLICATION:** Add 0.22 L of VAPAM HL to 90 L of water in a drum or tank, agitate and apply to the area.

One week after application lightly cultivate the area, taking care not to mix untreated soil with the treated soil.

The following spring, one week before planting, dig the hole ready to receive the tree, keeping

the soil, removed from the hole, within the treated area.

## **TREATMENT OF POTTING SOIL**

### **SPRINKLE METHOD:**

1. Spread soil in a smooth layer 10 cm high on concrete or on pre-treated soil.
2. Sprinkle VAPAM HL at rate of 0.25 L in 20 L of water per 10 square metres of surface area.
3. Layers can be treated one on top of another.
4. Sprinkle top layer with sufficient additional water to seal the surface, or cover with tarp (plastic, kraft paper, etc.)

### **CEMENT MIXER:**

1. Add VAPAM HL to soil mix at rate of 0.37 L VAPAM HL per cubic metre of soil, in cement or similar mixer. Mix thoroughly.
2. After soil is treated and piled, sprinkle water over entire surface to seal in gas. Or, cover with tarp (plastic, kraft paper, etc.).

### **SHREDDER:**

1. Dilute VAPAM HL in sufficient water to obtain even distribution. As soil is ejected from shredder, spray uniformly on soil stream at a rate of 0.37 L VAPAM HL per cubic metre of soil.
2. After all soil is treated and piled, apply light water seal to entire surface or cover with tarp (plastic, kraft paper, etc.).

## **FALL TREATMENT OF TOBACCO SEED BEDS**

**SEED BED PREPARATION:** Remove muck layer applied the previous planting season. Spade bed area to a depth of 10 to 15 cm and level surface one week prior to treatment. Add any muck that is required for the next season in a uniform layer on the soil. Muck added after VAPAM HL application may contain weeds, insects or diseases which will not be controlled. To ensure acceptable weed control, maintain greenhouse at a temperature of 18 °C (65 °F) for at least 7 days prior to VAPAM HL application, water to a depth of 7.5 to 10 cm, then maintain soil surface moisture by light sprinkling until time to treat. If a crust forms, rake lightly before applying the VAPAM HL.

**APPLICATION:** Add 0.75 L of VAPAM HL to 80 L of water in a drum or tank and agitate. Sprinkle evenly over 10 square metres of bed. The VAPAM HL solution may be applied from the drum or tank by using a portable pump or a gear pump attachment on a tractor. Use a fan type nozzle that delivers large size droplets. Do not use solid stream or mist spray. Immediately after application, seal VAPAM HL into soil by watering entire treated soil surface. Keep moist to a depth of 7.5 to 10 cm for at least 2 days after application. One week after application, lightly rake the seed bed. Cover entire treated area with tarps or plastic until time of greenhouse use to prevent contamination with seeds and debris.

Keep glass in place over the seed bed following treatment. One week before planting, loosen

the soil by piercing with a fork (do not stir the soil), and rake the surface lightly just prior to seeding.

## **BAND INJECTION INTO TOBACCO FIELDS**

**APPLICATION:** Adjust injection chisels to same spacing as the planter. Inject 48.4 to 93.1 L of VAPAM HL per hectare at least 10 to 15 cm below the final transplanting surface. Seal the fumigated strips by bedding or listing. Before transplanting remove the tops of the beds. Be careful none of the soil falls onto the fumigated portion of the bed. Use the low rate of VAPAM HL for nematode control in light sandy soils. Use the middle rate for nematode control in heavier soils and weed control. Use the high rate for soil borne disease control.

**NOTE:** Soil insects may not be effectively controlled with band injection.

## **PREVENTION OF ROOT GRAFT TRANSMISSION OF DUTCH ELM DISEASE**

Immediately after a tree is diagnosed as having Dutch Elm Disease, isolate the diseased tree from healthy trees with the VAPAM HL treatment. If a diseased tree is less than 6 metres from a healthy elm or has advanced wilt symptoms, it may be necessary to treat at two sites: one between the diseased and the first healthy-appearing tree and one between the first and second healthy-appearing tree. This measure is advisable because the causal fungus may have already passed from the diseased to the first healthy-appearing elm before VAPAM HL was applied. Use VAPAM HL diluted one part to three parts water. Drill holes approximately 2 cm in diameter, 38 cm deep and 15 cm apart on the soil surface. Fill each hole with diluted VAPAM HL to within 5cm of the soil surface.

Make the line of treatment sufficiently long to kill all elm roots of the two adjacent trees that are likely to be root-grafted. The line should extend well beyond the drip line of these trees. When necessary, run an additional treatment line parallel to obstructions, such as driveways and streets that roots might grow under. Apply the chemical slowly and carefully to avoid overflowing the drilled holes. This will reduce possibility of grass kill. Tamp each hole closed with the heel. Do not make treatment lines closer than 2 metres to shrubs or 11 metres to other tree species. A small circle of grass is usually killed around each point of injection but after 4 to 6 weeks the dead areas may be reseeded or resodded.

## **SYMPHYLAN CONTROL**

Soil should be in good seed bed condition to a depth of 20 to 25 cm. Maintain adequate moisture during spring season. Treat during July - August when symphylans are in the upper soil surface. Apply 163.8 L of VAPAM HL per hectare using blade or chisel injector. Inject below level of symphylan concentration, usually 15 - 20 cm. Pack soil immediately after application with a roller or other suitable equipment.

## **CULTIVATION AND PLANTING AFTER APPLICATION**

**AFTER FALL APPLICATION:** One week after application, lightly cultivate the area taking care not to mix untreated soil with the treated soil. The following spring repeat the cultivation one week before planting.

**AFTER SUMMER APPLICATION:** One week after application, the soil surface should be lightly cultivated to break up crusting and promote drying of the soil. This cultivation may be repeated as necessary. To avoid reinfesting treated soils, cultural practices should be such that untreated soils are not mixed with treated soils. On well-drained soils of light to medium texture

which are not wet or cold following summer application, planting may take place 21 days following treatment.

**SPECIAL INSTRUCTIONS:** If soils are heavy or especially high in organic matter or remain wet and/or cold (below 16<sup>o</sup> C) following application of VAPAM HL, a minimum interval of 30 days after application should be observed. Where dosages are greater than 0.75 L per 10 square metres, wait at least 60 days after application.

During cold and/or wet weather, frequent shallow cultivations may aid the escape of VAPAM HL from the soil. If in doubt, transplant a seeding plant and examine for injury before planting crop.

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