RESTRICTED USE PESTICIDE

Due to acute inhalation toxicity to humans.
For retail sale to and use by certified applicators or persons under their direct supervision and only for those uses covered by the certified applicator’s certification.

K-PAM® HL

A SOIL FUMIGANT SOLUTION FOR SPECIFIC CROPS AS LISTED IN THIS LABEL:

MAY BE APPLIED BY WATER-RUN APPLICATIONS (e.g., CHEMIGATION), SOIL INJECTION OR SOIL BEDDING EQUIPMENT TO SUPPRESS AND/OR CONTROL SOIL-BORNE PESTS IN LISTED ORNAMENTALS, FOOD AND FIBER CROPS.

For the control or suppression of Weeds, Diseases and Nematodes. Controls or suppresses weeds such as Bermudagrass, Chickweed, Dandelion, Ragweed, Henbit, Lambquarters, Pigweed, Watercress, Amaranths species: Watergrass, Johnsongrass, Nightshade, Nutsedge, Wild Morning-Glory and Purslane, Nematodes and Symphylids. Soil-borne diseases such as Rhizoctonia, Pythium, Phytophthora, Verticillium, Sclerotinia, Oak Root Fungus and Club Root of Crucifers. Refer to specific cropping and application methods to determine control or suppression of the target.

ACTIVE INGREDIENT:

Potassium N-methyldithiocarbamate*.............................................................................. 54.0%

INERT INGREDIENTS: .................................................................................................... 46.0%

TOTAL: ......................................................................................................................................... 100.0%

*Contains 5.8 lbs. active ingredient per gallon

U.S. Patent No. 4,994,487 and 5,075,332

TOTAL:

......................................................................................................................................... 100.0%

For more options, follow the instructions for category H on an EPA chemical-resistance category selection chart.

Handlers applying via weed sprayer while irrigation sprinklers are running or handlers who may be exposed to liquid spray while repairing a malfunctioning chemigation system or shutting off equipment must wear:

- Chemical-resistant covers all over long-sleeve shirt and long pants,
- Chemical-resistant gloves,
- Chemical-resistant footwear plus socks,
- Chemical-resistant apron if transferring or loading the fumigant or cleaning up spills or equipment,
- Protective eyewear, and
- Respirator of the type specified in the respiratory protection section in the PPE requirements on this label.

Handlers wearing chemical-resistant attire are limited to 30 minutes of exposure in any 60-minute period to prevent heat illness, and, as required by the Worker Protection Standard for Agricultural Pesticides, employers of these handlers must take any necessary steps to avoid heat illness. Except as required above, handlers transferring or loading liquid formulations, handlers operating motorized ground equipment with open cabs, handlers repairing or inactivating irrigation or chemigation equipment during application, and handlers cleaning up spills or equipment must wear:

- Covers all over long-sleeve shirt and long pants,
- Chemical-resistant gloves,
- Chemical-resistant footwear plus socks,
- Chemical-resistant apron if transferring or loading the fumigant or cleaning up spills or equipment,
- Protective eyewear, and
- Respirator of the type specified in the PPE requirements for respiratory protection in the PPE requirements on this label if triggered.

All other handlers including handlers operating motorized ground equipment with closed cabs (except for handlers who set up and calibrate chemigation and irrigation equipment and start the application from inside the application block) as stated in this labeling must wear:

- Long-sleeve shirt and long pants,
- Shoes plus socks, and
- Respirator of the type specified in the eye and respiratory protection section in the PPE requirements on this label if triggered.

All handlers who set-up and calibrate chemigation and irrigation equipment and start the application from inside the application block must wear:

- Long-sleeve shirt and long pants,
- Shoes plus socks,
- Protective eyewear, and
- Respirator of the type specified in the respiratory protection section in the PPE requirements on this label if triggered.

PERSONAL PROTECTIVE EQUIPMENT (PPE) FOR RESPIRATORY PROTECTION

When respiratory protection is required, in lieu of protective eyewear, handlers must wear:

- At least a NIOSH-approved full-face, or helmet/hood style respirator with either:
  - A respirator with a canister approved for pesticides (NIOSH approval number prefix TC-23C), or
  - A respirator with a canister approved for pesticides (NIOSH approval number prefix TC-14G) or canister with any N, R, P or HE prefilter.

EPA Reg. No. 5481-483
EPA Est. No. 5481-CA-1 1448-MO-1 61842-WA-1 Other_______

Net Contents:
As Marked on Container
USER SAFETY REQUIREMENTS

Follow manufacturer’s instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product’s concentrate. Do not reuse them. DO NOT transport contaminated clothing inside a closed vehicle unless stored in a sealed container. Wash or dispose as specified.

User Safety Recommendations

Users should:
- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to mammals, birds, aquatic invertebrates and fish. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash waters or rinsate. Metam sodium has certain properties and characteristics in common with chemicals that have been detected in groundwater (highly soluble in water and has low adsorption to soil). For unpumped applications, teaching and runoff may occur if there is heavy rainfall after soil fumigation.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation. Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. Refer to supplemental labeling under “Agricultural Use Requirements” in this section for information about this standard. Do not apply when wind speed favors drift beyond the area intended for treatment. Do not use in a greenhouse or any other enclosed structure or confined area. Use in greenhouses is prohibited. Application with handheld equipment is prohibited. Application with cement grinder and shredder equipment is prohibited. Open-pour applications are prohibited.

The following activities are prohibited from being performed in the fumigant application block until the entry-restricted period ends (NOTE: persons installing, perforating, removing, repairing, or monitoring tarps:

- Installing, perforating (cutting, punching, slicing, poking), removing, repairing, or monitoring tarps;
- Handling or disposing of fumigant containers;
- Cleaning, handling, adjusting, or repairing the parts of fumigation equipment that may contain fumigant residues;
- Insulating, repairing, operating, or removing irrigation equipment in the application block;
- Entering the application site to perform scouting, crop advising, or monitoring tasks;
- Installing, perforating (cutting, punching, slicing, poking), removing, repairing, or monitoring tarps:
  - until 14 days after application is complete if tarps are not perforated and removed during those 14 days after application;
  - under tarp removal is complete if tarps are both perforated and removed less than 14 days after application;
  - until 48 hours after tarps perforation is complete if they will not be removed within 14 days after application.

NOTE: See Tarp Perforation and/or Removal section on this labeling for requirements about when tarps are allowed to be perforated.

Performing any handling tasks as defined by the Worker Protection Standard.

In addition to the above, persons outside the perimeter of the application block who visually monitor application equipment to ensure proper functioning and monitor fumigant air concentrations in accordance with the fumigant site monitoring requirement must also be trained and equipped as handlers in accordance with the requirements in the Worker Protection Standard (40 CFR Part 170).

PROTECTION FOR HANDLERS

For all applications except water run: from the start of the application until the fumigant has stopped being delivered/dispensed into the soil, i.e., after the soil is sealed, the certified applicator must be at the fumigation site in the line of sight of the application and must directly supervise all persons performing handling activities.

For all water-run applications (e.g., sprinkler/chemigation, wheel line, center pivot, lateral move, drip, flood, etc.), the certified applicator must be at the fumigation site in the line of sight of the application to start the application including set-up, calibration, and initiation of the application. The certified applicator must leave the site but must return at least every two hours to visually inspect the equipment to ensure proper functioning and must directly supervise all Worker Protection Standard-trained handlers on-site until the fumigation has stopped being delivered/dispersed into the soil. Worker Protection Standard-trained handlers may perform the monitoring functions in place of the certified applicator but must be under the supervision of the certified applicator and able to communicate with the certified applicator at all times during monitoring activities via cell phone or other means. The results of monitoring activities must be captured in the Fumigation Management Plan (FMP).

For handling activities that take place after the fumigant has been delivered/dispensed into the soil until the entry restricted period expires, the certified applicator does not have to be on-site, but must be immediately available for each handler participating in the application and responsible for carrying out those activities, the information necessary to comply with the label and procedures described in the FMP (e.g., emergency response plans and procedures). The results of communication activities must be captured in the FMP.

IMPORTANT: This requirement does not override the requirements in the Worker Protection Standard for Agricultural Pesticides for information exchange between owners/operators of agricultural establishments and commercial pesticide applicators. The certified applicator must provide Fumigant Safe Handling information to each handler involved in the application or confirm that each handler participating in the application has received Fumigant Safe Handling information in a manner they can understand within the past 12 months. Fumigant Safe Handling information will be provided where this product is purchased at www.epa.gov/fumiganttraining.

The certified applicator supervising the application and the owner/operator of the establishment where the fumigation is taking place must make sure that all persons who are not trained and de-equipped and who are not performing any of the handling tasks defined in this labeling are excluded from the application block during the entry restricted period.

The employer of any handler (as stated in this label) must make sure that all handlers are provided and correctly wear the required PPE. The PPE must be cleaned and maintained as required by the Worker Protection Standard for Agricultural Pesticides. At least one handler must have the appropriate respirator and cartridges available, and they must be fit-tested, trained, and medically examined.

The fumigation handler employer must confirm and document in the FMP that an air-purifying respirator and appropriate cartridges of the type specified in the PPE section of this labeling are immediately available for each handler who will wear one. This must be documented in the FMP.

Cartridges or canisters must be replaced when odor or irritation from this product becomes apparent, if the measured concentration of MITC is greater than 6000 ppb, or after 8 hours of use, whichever occurs first.

RESPIRATOR FIT TESTING, MEDICAL QUALIFICATION, AND TRAINING

Employers must verify that any handler that uses a respirator is:
- Fit-tested and fit-checked using a program that conforms to OSHA’s requirements (see 29 CFR Part 1910.134);
- Trained using a program that conforms to OSHA’s requirements (see 29 CFR Part 1910.134);
- Examined by a qualified medical practitioner to verify physical ability to safely wear the style of respirator to be worn. A qualified medical practitioner is a physician or other licensed health care professional who will evaluate the ability of a worker to wear a respirator. The initial evaluation consists of a questionnaire that asks about medical conditions (such as a heart condition) that would be problematic for respirator use. If concerns are identified, then additional evaluations, such as a physical exam, might be necessary. The initial evaluation must be done before respirator use begins. Handlers must be reexamined by a qualified medical practitioner if their health status or respirator style or use-conditions change. Upon request by local/state/federal/tribal enforcement personnel, employers must provide documentation how they have complied with these requirements.

RESPIRATORY PROTECTION AND STOP WORK TRIGGERS

The following procedures must be followed to determine whether an air-purifying respirator is required or if operations must cease for any person performing a handling task as defined in this labeling.

If at any time any handler experiences sensory irritation (tearing, burning of the eyes or nose) then:
- An air-purifying respirator must be worn by all handlers who remain in the application block, or
- Operations must cease and handlers not wearing an air-purifying respirator must leave the application block.

Handlers can remove respirators or resume operations if two consecutive breathing-zone samples taken at the handling site at least 15 minutes apart show that levels of MITC have decreased to less than 600 ppb, provided that handlers do not experience sensory irritation. Samples must be taken where the irritation is first experienced.

During the collection of air samples, an air-purifying respirator must be worn by the handler taking the air samples.

When using monitoring devices to monitor air concentration levels, a direct reading detection device, such as a Draeger or Sensidyne device must be used. The devices must have a sensitivity of at least 600 ppb for MITC.

When breathing-zone samples are required, they must be taken outside respiratory protection equipment and within a ten inch radius of handler’s nose and mouth.
• When respirators are worn, then air monitoring samples must be collected at least every 2 hours in the breathing zone of a handler performing a representative handling task.
• If at any time: (1) a handler experiences any sensory irritation when wearing an air-purifying respirator, or (2) an air sample is greater than or equal to 6,000 ppb, then all handler activities must cease and handlers must be removed from the application block. If operations cease, the emergency plan detailed in the labeling must be implemented.
• Handlers can resume work activities without respiratory protection, if two consecutive breathing zone samples taken at the handling site at least 15 minutes apart show levels of MITC decreased to less than 600 ppb, provided that handlers do not experience sensory irritation. During the collection of air samples an air-purifying respirator must be worn by the handler taking the air samples. Samples must be taken where the irritation is experienced.
• Work activities can resume if all the following conditions exist provided that the appropriate air-purifying respirator is worn:
  - Two consecutive breathing zone samples for MITC taken at the handling site at least 15 minutes apart must be less than 6,000 ppb.
  - Handlers do not experience sensory irritation while wearing the air-purifying respirator, and
  - Cartridges have been changed.
• During the collection of air samples an air-purifying respirator must be worn by the handler taking the air samples. Samples must be taken where the irritation is first experienced.

**TARP PERFORATION AND/OR REMOVAL**

**IMPORTANT:** Persons perforating, repairing, removing, and/or monitoring tarps are defined, within certain time limitations, as handlers (see definition of fumigant handlers in this labeling) and must be provided the PPE and other protections for handlers as required on this labeling within certain time limitations, as handlers (see definition of fumigant handlers in this labeling).

- Tarps must not be perforated until a minimum of 5 days (120 hours) have elapsed after the fumigant injection into the soil is complete (e.g., after injection of the fumigant product and tarps have been laid or after drip lines have been purged and tarps have been laid), unless a weather condition exists which necessitates the need for early perforation or removal. See Early Tarp Removal for Broadcast Applications Only and Early Tarp Perforation for Flood Prevention Activities sections.
- If tarps will be removed before planting, tarp removal must not begin until at least 2 hours after tarp perforation is complete.
- If tarps will not be removed before planting, planting or transplanting must not begin until at least 48 hours after the tarp perforation is complete.
- If tarps are left intact for a minimum of 14 days after fumigant injection into the soil is complete, planting or transplanting may take place while the tarps are being perforated.
- Each tarp panel used for broadcast fumigation must be perforated.
- Tarps used for fumigations may be perforated manually ONLY for the following situations:
  - At the beginning of each row where a coulter blade (or other device which performs similarly) is used on a motorized vehicle such as an ATV;
  - In fields that are 1 acre or less; or
  - During flood prevention activities.
- In all other instances tarps must be perforated (cut, punched, poked or sliced) only by mechanical methods.
- For broadcast fumigations, tarps must not be perforated if rainfall is expected within 12 hours.
- Early Tarp Removal for Broadcast Applications Only:
  - Tarps may be removed before the required 5 days (120 hours) if adverse weather conditions have compromised the integrity of the tarp, provided that the compromised tarp poses a safety hazard. Adverse weather includes high wind, hail, or storms that blow tarps off the field and create a safety hazard, e.g., tarps blowing into power lines and onto roads. A compromised tarp is a tarp that due to an adverse weather condition is no longer performing its intended function and is creating a hazard.
  - If tarps are removed before the required 5 days have elapsed due to adverse weather, the events must be documented in the post-fumigation summary section of the FMP.
- Early Tarp Perforation for Flood Prevention Activities:
  - Tarp perforation is allowed before the 5 days (120 hours) have elapsed if rain necessitates field drainage.
  - Tarps must be immediately retucked and packed after soil removal.

**AGRICULTURAL USE REQUIREMENTS**

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard (WPS).

For entry-restricted period and notification requirements, see the Entry Restricted Period section of this labeling.

**ENTRY-RESTRICTED PERIOD**

Entry (including early entry that would otherwise be permitted under the Worker Protection Standard) by any person - other than a correctly trained and PPE-equipped handler who is performing a handling task listed on this labeling - is PROHIBITED from the start of the application until:

- 5 days (120 hours) after the application is complete for untaged applications, or
- 48 hours after a broadcast tarp perforation is complete if they will not be removed for at least 14 days after following application, or
- Tarp removal is complete if tars are both perforated and removed less than 14 days after application.

**NOTE:** See Tarp Perforation and/or Removal section on this labeling for requirements about when tarps are allowed to be perforated.

**NOTIFICATION REQUIREMENT**

Notify workers of the application by warning them orally and by posting Fumigant Treated Area signs. The signs must bear the skull and crossbones symbol and state:
- **DANGER/PELIGRO.**
- **“Area under fumigation, DO NOT ENTER NO ENTRE,**
- **“Metam Sodium Fumigant in Use,”**
- The date and time of fumigation,
- The date and time the entry restricted period is lifted,
- **“K-PAM HL,” and**
- Name, address, and telephone number of the certified applicator in charge of the fumigation.

Post the Fumigant Treated Area sign instead of the Worker Protection Standard sign for this application but follow all Worker Protection Standard requirements pertaining to location, legibility, size, and timing of posting and removal.

Post the Fumigant Treated Area signs at all entrances to the application block (i.e., the field or portion of a field treated with a fumigant in any 24-hour period or, for center pivot applications which occur over many days, the total acres of a field treated).

**MANDATORY GOOD AGRICULTURAL PRACTICES (GAPs)**

The following GAPs must be followed during all fumigant applications. All measurements and other documentation planned to ensure that the mandatory GAPs are achieved must be recorded in the FMP and/or the post-application summary report.

**Shank Applications**

**Wind Speed**
- Wind speed at the application site must be a minimum of 2 mph at the start of the application or forecasted to reach at least 5 mph during the application.

**Weather Conditions**

- Prior to fumigation, the weather forecast for the day of the application and the 48-hour period following the fumigation must be checked to determine if unfavorable weather conditions exist or are predicted (see Identifying Unfavorable Weather Conditions section) and whether fumigation should proceed.
- Do not apply if a shallow, compressed (low-level) temperature inversion is forecast to persist for more than 16 consecutive hours for the 48-hour period after the start of application, or if there is an air-stagnation advisory issued by the National Weather Service in effect for the area which the fumigation is planned.
- Detailed local forecasts for weather conditions, wind speed, and air stagnation advisories may be obtained online at http://www.nws.noaa.gov or by contacting your local National Weather Service Forecasting Office.

**Identifying Unfavorable Weather Conditions**

- Unfavorable weather conditions block upward movement of air, which results in trapping fumigant vapors near the ground. The resulting air mass can move off-site in unpredictable directions. These conditions typically exist prior to sunset and continue past sunrise and persist as late as noontime. Unfavorable conditions are common on nights with limited cloud cover and light to no wind, and their presence can be indicated by ground fog or smog and can also be identified by smoke from a ground source that flattens out below a ceiling layer and moves laterally in a concentrated cloud.

**Soil Conditions, Injection Depth and Soil Sealing**

- Soil must be in good tilth and free of large clods. Large clods can prevent effective soil sealing and reduce effectiveness of the application. If subsurface soil compaction layers (hardpans) are present within the intended fumigation treatment zone, a deep tillage to fracture these layers must occur prior to or as part of the soil fumigant application. The soil must be tilted, at minimum to the depth of the treatment zone.
- Plant residue that is present must not interfere with the application or the soil seal. Non-decomposed plant material may harbor pests that will not be controlled by fumigation. Crop residue that is present must lie flat to permit the soil to be sealed effectively and limit the natural “chimneys” that may occur in the soil when plant residue is present. These “chimneys” allow the soil fumigants to move through the soil quickly and escape into the atmosphere. This may create potentially harmful conditions for workers and bystanders and limits the efficacy of the fumigant. Plant residue on the field serves to prevent soil erosion from both wind and water.
- The injection point for bedded and broadcast applications shall be a minimum of 3 inches from the final soil/surface interface. Chisel traces must be eliminated following an application and the soil surface must be sealed immediately after application using one or more of the following methods:
  - Compaction with a bed-shaper, roller, press wheel or by similar device, OR
  - Covering the treated soil with 3-6 inches of untreated soil, OR
  - Applying a minimum of a 1/2-inch of water beginning immediately after application of a set and completing the water treatment within four hours, OR
  - Covering treated area with a tarp.
Application and Equipment Considerations

- At the beginning of the application, the maximum soil temperature at the injection depth is 90°F.
- Dry connect fittings (closed transfer system) must be installed on all tanks and transfer hoses.
- All tanks, hoses, fittings, valves and connections must be serviceable, tightened, sealed and not leaking.
- Nozzles and metering devices must be the correct size and sealed and unobstructed.
- Sight gauges and pressure gauges must be working.
- All rigs must have a constant pressure system with orifice plates to insure the proper amount of fumigant is applied.

Soil Temperature

- The soil moisture in the top six inches of soil must be between 60% to 80% of soil capacity (field capacity) immediately prior to the application, subject to the exception below.
- If soil temperature must be measured and recorded in the FMP.

Moisture

- Exception: In areas where soil moisture must exceed field capacity to form a bed (e.g. certain regions in Florida), soil capacity (field capacity) may exceed the 80% allocated above.
- If appropriate measuring equipment is not used to determine whether the soil moisture in the top six inches of soil is between 60% to 80% of soil capacity (field capacity) immediately prior to the application, the USDA Feel Method test may be used to help estimate whether the 60% to 80% soil capacity (field capacity) requirement is met:
  - Coarse textured soils (fine sand and loamy fine sand): there must be enough moisture (50-75% available soil water moisture) to form a weak ball with loose and clustered sand grains on fingers, darkened color, moderate water staining on fingers, will not ribbon.
  - Moderately coarse textured soils (sandy loam and fine sandy loam): there must be enough moisture (50-75% available soil water moisture) to form a ball with defined finger marks, very light soil/water staining on fingers, darkened color, will not stick.
  - Medium textured soils (sandy clay loam, loam, and silt loam): there must be enough moisture (50-75% available soil water moisture) to form a ball, very light staining on fingers, darkened color, pliable and forms a weak ribbon between the thumb and forefinger.
  - Fine textured soils (clay, clay loam, and silty clay loam): there must be enough moisture (50-75% available soil water moisture) to form a smooth ball with defined finger marks, light soil/water staining on fingers, ribbons between thumb and forefinger.
  - For fields with more than one soil texture, soil moisture content in the lightest textured (most sandy) area must comply with this soil moisture requirement. The field may be divided into areas of similar soil texture and the soil moisture of each area should be adjusted as needed. Coarser textured soils can be fumigated under conditions of higher soil moisture than finer textured soils; however, if the soil moisture is too high, fumigant movement will be retarded and effectiveness of the treatment will be reduced. Previous and/or local experience with the soil to be treated or the crop to be planted can often serve as a guide to conditions that will be acceptable. If there is uncertainty in determining the soil moisture content of the area to be treated, a local extension service or soil conservation service specialist or pest control advisor (agriculture consultant) should be consulted for assistance.
- If there is insufficient moisture throughout the top six inches of soil immediately prior to the application, the soil moisture must be adjusted. If there is adequate soil moisture below six inches, soil moisture can be brought to the surface by tillage before or during injection. To conserve soil moisture, tillage should be done as close to the time of application as possible.

Application and Equipment Considerations

- Do not apply or allow fumigant to drain or drip onto the soil surface. Injectors must be placed below the soil surface before product flow begins. For each injection line either have a check valve, located as close as possible to the final injection point, or drain/purge the line of any remaining fumigant prior to lifting injection shanks from the ground. Do not lift injection shanks from the soil until the shut-off valve has been closed and the fumigant has been depressurized (passively drained) or purged (actively forced out via air compressor) from the system.
- Application equipment must be in good working order.
- All tanks, hoses, fittings, valves and connections must be serviceable, tightened, sealed and not leaking.
- Dry connect fittings (closed transfer system) must be installed on all tanks and transfer hoses.
- Sight gauges and pressure gauges must be working.
- Nozzles and metering devices must be the correct size and sealed and unobstructed.
- Use only tanks, hoses and fittings designed to withstand the pressure of the system and resistant to metal.
- Each nozzle must be equipped with a flow monitor, e.g. mechanical, electronic, or Red-ball type monitor.
- For undiluted product, aluminum, brass, copper, galvanized iron, and zinc materials cannot be used.
- All rigs must include a filter to remove any particulates from the fumigant, and a check valve that is visible to the tractor pilot during application to prevent backflow of the fumigant into the pressurizing cylinder.
- All rigs must include a flow meter or a flow monitoring device.
- All rigs must have a constant pressure system with orifice plates to insure the proper amount of fumigant is applied.
- Valves, vacuum relief valves, and low pressure drains must be in place, operational, and leak free.
- Interlocking controls must be installed and functioning.
- Use only positive displacement pumps. Do NOT use impellers made of brass, aluminum, or galvanized material.
- Before using a fumigation rig for the first time, or when preparing it for use after storage, the operator must check the following items carefully:
  - Check the filter, and clean or replace the filter element as required.
  - Check all tubes and chisels to make sure they are free of debris and obstructions.
  - Check and clean the orifice plates.

Spray Blade Applications (includes bed-top blade and soil cap applications)

Wind Speed

- Wind speed at the application site must be a minimum of 2 mph at the start of the application or forecasted to reach at least 5 mph during the application.

Weather Conditions

- Prior to fumigation, the weather forecast for the day of the application and the 48-hour period following the fumigation must be checked to determine if unfavorable weather conditions exist or are predicted (see Identifying Unfavorable Weather Conditions section) and whether fumigation should proceed.
- Do not apply if a shallow, compressed (low-level) temperature inversion is forecast to persist for more than 18 consecutive hours for the 48-hour period after the start of application, or if there is an air-stagnation advisory issued by the National Weather Service in effect for the area which the fumigation is planned.
- Detailed local forecasts for weather conditions, wind speed, and air stagnation advisories may be obtained online at http://www.nws.noaa.gov or by contacting your local National Weather Service Forecast Office.

Identifying Unfavorable Weather Conditions

- Unfavorable weather conditions block upward movement of air, which results in trapping fumigant vapors near the ground. The resulting air mass can move off-site in unpredictable directions. These conditions typically exist prior to sunset and continue past sunrise and persist as late as noontime. Unfavorable conditions are common on nights with limited cloud cover and light to no wind, and their presence can be indicated by ground fog or smog and can also be identified by smoke from a ground source that flattens out below a ceiling layer and moves laterally in a concentrated cloud.

Soil Conditions, Injection Depth and Soil Sealing

- Soil must be in good tilth and free of large clods. Large clods can prevent effective soil sealing and reduce effectiveness of the application. If subsurface soil compaction layers (hardpans) are present within the intended fumigation treatment zone, a deep tillage to fracture these layers must occur prior to or as part of the soil fumigant application. The soil must be tilled, at minimum, to the depth of the treatment zone.
- Plant residue that is present must not interfere with the application or the soil seal. Non-decomposed plant material may harbor pests that will not be controlled by fumigation. Crop residue that is present must lie flat to permit the soil to be sealed effectively and limit the natural “chimneys” that may occur in the soil when plant residue is present. These “chimneys” allow the soil fumigant to move through the soil quickly and escape into the atmosphere. This may create potentially harmful conditions for workers and bystanders and limits the efficacy of the fumigant. Plant residue on the field serves to prevent soil erosion from both wind and water.
- Apply the product on the soil immediately ahead of the bed-shaping equipment. The soil surface must be compacted immediately after application using one or more of the following methods:
  - Compaction with a bed-shaper, roller, press wheel or similar device, OR
  - Covering the treated soil with 3-6 inches of untreated soil, OR
  - Applying a minimum of a 1/2-inch of water beginning immediately after application of a set and completing the water treatment within four hours, OR
  - Covering treated area with a tarp.

Tarps

- When tarps are used for emission control, tarps must be installed immediately after application.
- When tarps are used, a written tarp plan must be developed and included in the FMP that includes:
  - Schedule and procedures for checking tarps for damage, tears, and other problems,
  - Plans for determining when and how repairs to tarp will be made, and by whom,
  - Minimum time following injection that tarp will be repaired,
  - Minimum size of damage that will be repaired,
  - Other factors used to determine when tarp repair will be conducted,
  - Schedule, equipment and methods used to cut tarp,
  - Aeration plans and procedures following cutting and/or slitting prior to tarp removal or planting, and
  - Schedule, equipment, and procedures for tarp removal.

Soil Temperature

- At the beginning of the application, the maximum soil temperature at the injection depth is 90°F.
- If air temperatures have been above 100°F in any of the three days prior to application, then soil temperature must be measured and recorded in the FMP.
Soil Moisture

• The soil moisture in the top six inches of soil must be between 60% to 80% of soil capacity (field capacity) immediately prior to the application, subject to the exception below.

• EXCEPTION: In areas where soil moisture must exceed field capacity to form a bed (e.g., certain regions in Florida), soil capacity (field capacity) may exceed the 80% allocated above.

If appropriate measuring equipment is not used to determine whether the soil moisture in the top six inches of soil is between 60% to 80% of soil capacity (field capacity) immediately prior to the application, the USDA Feel Method test may be used to help estimate whether the 60% to 80% soil capacity (field capacity) requirement is met:

• coarse textured soils (fine sand and loamy fine sand): there must be enough moisture (50-75% available soil water moisture) to form a weak ball with loose and clustered sand grains on fingers, darkened color, moderate water staining on fingers, will not ribbon.

• moderately coarse textured soils (sandy loam and fine sandy loam): there must be enough moisture (50-75% available soil water moisture) to form a ball with defined finger marks, very light soil/water staining on fingers, darkened color, will not stick.

• medium textured soils (sandy clay loam, loam, and silt loam): there must be enough moisture (50-75% available soil water moisture) to form a ball, very light staining on fingers, darkened color, pliable and forms a weak ribbon between the thumb and forefinger.

• fine textured soils (clay, clay loam, and silty clay loam): there must be enough moisture (50-75% available soil water moisture) to form a smooth ball with defined finger marks, light soil/water staining on fingers, ribbons between thumb and forefinger.

For fields with more than one soil texture, soil moisture content in the lightest textured (most sandy) areas must comply with this soil moisture requirement. The field may be divided into areas of similar soil texture and the soil moisture of each area should be adjusted as needed. Coarser textured soils can be fumigated under conditions of higher soil moisture than finer textured soils; however, if the soil moisture is too high, fumigant movement will be retarded and effectiveness of the treatment will be reduced. Previous and/or local experience in the area should be adjusted to the conditions that will be acceptable. If there is uncertainty in determining the soil moisture content of the area to be treated, a local extension service or soil conservation service specialist or plant control advisor (agriculture consultant) should be consulted for assistance.

If there is insufficient moisture throughout the top six inches of soil immediately prior to the application, the soil moisture must be adjusted. If there is adequate soil moisture below six inches, soil moisture can be brought to the surface by tillage before or during injection. To conserve soil moisture, tillage should be done as close to the time of application as possible.

Application and Equipment Considerations

• Do not apply or allow fumigant to drain or drip onto the soil surface.

• Application equipment must be in good working order.

• All tanks, hoses, fittings, valves and connections must be serviceable, tightened, sealed and not leaking.

• Dry connect fittings (closed transfer system) must be installed on all tanks and transfer hoses.

• All tanks, hoses, fittings, valves and connections must be serviceable, tightened, sealed and not leaking.

• Do not apply or allow fumigant to drain or drip onto the soil surface.

• Nozzles and metering devices must be the correct size and sealed and unobstructed.

• Use only tanks, hoses and fittings designed to withstand the pressure of the system and resistant to sediment.

• Each nozzle must be equipped with a flow monitor, e.g., mechanical, electronic, or Red-ball type monitor.

• For undiluted product, aluminum, brass, copper, galvanized iron, and zinc materials cannot be used.

• All rigs must include a filter to remove any particulates from the fumigant, and a check valve that is visible to the tractor pilot during application to prevent backflow of the fumigant into the pressurizing cylinder.

• Before using a fumigation rig for the first time, or when preparing it for use after storage, the operator must check the following items carefully:

  • Check the filter, and clean or replace the filter element as required.

  • Check all tubes and chisels to make sure they are free of debris and obstructions.

  • Check and clean the orifice plates.

Rotary Tiller Applications

Wind Speed

• Wind speed at the application site must be a minimum of 2 mph at the start of the application or forecasted to reach at least 5 mph during the application.

Weather Conditions

• Prior to fumigation, the weather forecast for the day of the application and the 48-hour period following the fumigation must be checked to determine if unfavorable weather conditions exist or are predicted (see identifying Unfavorable Weather Conditions section) and whether fumigation should proceed.

• Do not apply if a shallow, compressed (low-level) temperature inversion is forecast to persist for more than 18 consecutive hours for the 48-hour period after the start of application, or if there is an air-stagnation advisory issued by the National Weather Service in effect for the area that the fumigant will be applied to.

• Detailed local forecasts for weather conditions, wind speed, and air stagnation advisories may be obtained online at http://www.nws.noaa.gov or by contacting your local National Weather Service Forecasting Office.

Identifying Unfavorable Weather Conditions

• Unfavorable weather conditions block upward movement of air, which results in trapping fumigant vapors near the ground. The resulting air mass can move off-site in unpredictable directions. These conditions typically exist prior to sunset and continue past sunrise and persist as late as noontime. Unfavorable conditions are common on nights with limited cloud cover and light to no wind, and their presence can be indicated by ground fog or smog and can also be identified by smoke from a ground source that flattens out below a ceiling layer and moves laterally in a concentrated cloud.

Soil Conditions, Injection Depth and Soil Sealing

• Soil must be good tilth and free of large clods. Large clods can prevent effective soil sealing and reduce effectiveness of the application. If subsurface soil compaction layers (hardpans) are present within the intended fumigation treatment zone, a deep tillage to fracture these layers must occur prior to or as part of the soil fumigant application. The soil must be tilled, at minimum to the depth of the treatment zone.

• Plant residue that is present must not interfere with the application or the soil seal. Non-decomposed plant material may harbor pests that will not be controlled by fumigation. Crop residue that is present must lie flat to permit the soil to be sealed effectively and limit the natural “chimneys” that may occur in the soil when plant residue is present. These “chimneys” allow the soil fumigants to move through the soil quickly and escape into the atmosphere. This may create potentially harmful conditions for workers and bystanders and limits the efficacy of the fumigant. Plant residue on the field serves to prevent soil erosion from both wind and water.

• Splay or drip the product mixture on the soil immediately ahead of the bed-shaping equipment or tiller. The soil surface must be compacted immediately after application using one or more of the following methods:

  • Compaction with a bed-shaper, roller, press wheel or similar device, OR

  • Covering the treated soil with 3-6 inches of untreated soil, OR

  • Applying a minimum of a 1/2-inch of water beginning immediately after application of a set and completing the water treatment within four hours, OR

  • Covering treated area with a tarp.

Tarp

• When tarping is used for emission control, tarp must be installed immediately after application.

• When tarp is used, a written tarp plan must be developed and included in the FMP that includes:

  • Schedule and procedures for checking tarp for damage, tears, and other problems,

  • Plans for determining when and how repairs to tarp will be made, and by whom,

  • Minimum time following injection that tarp will be repaired,

  • Minimum size of damage that will be repaired,

  • Other factors used to determine when tarp repair will be conducted,

  • Schedule, equipment and methods used to cut tarp,

  • Aeration plans and procedures following cutting and/or slitting prior to tarp removal or planting, and

  • Schedule, equipment, and procedures for tarp removal.

Soil Temperature

• At the beginning of the application, the maximum soil temperature at the injection depth is 90°F.

• If air temperatures have been above 100°F in any of the three days prior to application, then soil temperature must be measured and recorded in the FMP.

Soil Moisture

• The soil moisture in the top six inches of soil must be between 60% to 80% of soil capacity (field capacity) immediately prior to the application, subject to the exception below.

• EXCEPTION: In areas where soil moisture must exceed field capacity to form a bed (e.g., certain regions in Florida), soil capacity (field capacity) may exceed the 80% allocated above.

• If appropriate measuring equipment is not used to determine whether the soil moisture in the top six inches of soil is between 60% to 80% of soil capacity (field capacity) immediately prior to the application, the USDA Feel Method test may be used to help estimate whether the 60% to 80% soil capacity (field capacity) requirement is met:

  • coarse textured soils (fine sand and loamy fine sand): there must be enough moisture (50-75% available soil water moisture) to form a weak ball with loose and clustered sand grains on fingers, darkened color, moderate water staining on fingers, will not ribbon.

  • moderately coarse textured soils (sandy loam and fine sandy loam): there must be enough moisture (50-75% available soil water moisture) to form a ball, very light staining on fingers, darkened color, pliable and forms a weak ribbon between the thumb and forefinger.

  • medium textured soils (sandy clay loam, loam, and silt loam): there must be enough moisture (50-75% available soil water moisture) to form a ball, very light staining on fingers, darkened color, will not stick.

  • fine textured soils (clay, clay loam, and silty clay loam): there must be enough moisture (50-75% available soil water moisture) to form a ball, very light soil/water staining on fingers, darkened color, will not stick.

  • For fields with more than one soil texture, soil moisture content in the lightest textured (most sandy) areas must comply with this soil moisture requirement. The field may be divided into areas of similar soil texture and the soil moisture of each area should be adjusted as needed. Coarser textured soils can be fumigated under conditions of higher soil moisture than finer textured soils; however, if the soil moisture is too high, fumigant movement will be retarded and effectiveness of the treatment will be reduced. Previous and/or local experience with the soil to be treated or the crop to be planted can often serve as a guide to conditions that will be acceptable. If there is uncertainty in determining the soil moisture content of the area to be treated, a local extension service or soil conservation service specialist or plant control advisor (agriculture consultant) should be consulted for assistance.
Soil Conditions

- Identify unfavorable weather conditions block upward movement of air, which results in trapping fumigant vapors near the ground. The resulting air mass can move off-site in unpredictable directions. These conditions typically exist prior to sunset and continue past sunrise and persist as late as noon. Unfavorable conditions are common on nights with limited cloud cover and light to no wind, and their presence can be indicated by ground fog or smog and can also be identified by smoke from a ground source that flattens out below a ceiling layer and moves laterally in a concentrated cloud.

- Soil conditions: soil must be good till and free of large clods. Large clods can prevent effective soil sealing and reduce effectiveness of the application. If subsurface soil compaction layers (hardpans) are present within the intended fumigation treatment zone, tillage to fracture these layers must occur. The soil must be tilled before or during the application, at minimum, to the depth of the intended treatment zone.

- Plant residue is present must not interfere with the application or the soil seal. Non-decomposed plant material may harbor pests that will not be controlled by fumigation. Except when applying over cover crops as set forth in the General Instructions for Sprinkler System. crop residue that is present must be flat to permit the soil to be sealed effectively and limit the natural “chimneys” that may occur in the soil when plant residue is present. These “chimneys” allow the soil fumigants to move through the soil quickly and escape into the atmosphere. This may create potentially harmful conditions for workers and bystanders and limits the efficacy of the fumigant. Plant residue on the field serves to prevent soil erosion from both wind and water.

- Soil temperature: at the beginning of the application, the maximum soil temperature is 90°F, measured at 3 inches in depth. If air temperatures have been above 100°F in any of the three days prior to application, then soil temperature must be measured and recorded in the FMP.

- Do not apply or allow fumigant to drain or drip onto the soil surface.

- EDEN, a type monitor.

- Use only tanks constructed with materials approved for handling metam. Tanks must be in good condition and capable of being filled with the system interlock to prevent withdrawal of the supply tank when the irrigation system is either automatically or manually shut down.

- The system must contain a functional check valve, vacuum relief valve, inspection port, and low-pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.

- The pesticide injection pipeline must be a minimum of 2 mph at the start of the application and the maximum wind speed is 10 mph.

- Wind speed at the application site must be a minimum of 2 mph at the start of the application and the maximum wind speed is 10 mph.

- For sprinkler or center pivot applications: 1) not using a solid stream type nozzle, OR 2) having a release height or spray height greater than 4 feet, OR 3) having 30 lbs or greater PSI at the sprinkler head, wind speed at the application site must be a minimum of 2 mph at the start of the application and forecasted to reach 5 mph during the application and the maximum wind speed is 25 mph.

- Prior to fumigation, the weather forecast for the day of the application and the 48-hour period following the fumigation must be checked to determine if unfavorable weather conditions exist or are predicted (see identifying unfavorable weather conditions section) and whether fumigation should proceed.

- Do not apply if a shallow, compressed (low-level) temperature inversion is forecast to persist to eight hours after the start of the application, or if there is an air-stagnation advisory issued. A forecast of a shallow, compressed (low-level) temperature inversion is forecast to persist to eight hours after the start of the application, then the USDA Fm System test may be used to help estimate whether the six inches of soil to be treated or the crop to be planted can often serve as a guide to conditions that will be acceptable. If there is uncertainty in determining the soil moisture content of the area to be treated, a local extension service or soil conservation service specialist or pest control advisor should be consulted for assistance.

- The irrigation line or water pump must include a functional pressure switch that will stop the system when the irrigation system is either automatically or manually shut down.

- The system must contain a functional check valve, vacuum relief valve, inspection port, and low-pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.

- The pesticide injection pipeline must be a minimum of 2 mph at the start of the application and the maximum wind speed is 10 mph.

- Wind speed at the application site must be a minimum of 2 mph at the start of the application or forecasted to reach at least 5 mph during the application and the maximum wind speed is 10 mph.
Soil Conditions

- Do not apply if a shallow, compressed (low-level) temperature inversion is forecast to persist for more than 18 consecutive hours for the 48-hour period after the start of application, or if there is an air-stagnation advisory issued by the National Weather Service in effect for the area which the fumigation is planned.
- Detailed local forecasts for weather conditions, wind speed, and air stagnation advisories may be obtained online at http://www.nws.noaa.gov or by contacting your local National Weather Service Forecasting Office.

Weather Conditions

- Prior to fumigation, the weather forecast for the day of the application and the 48-hour period following the fumigation must be checked to determine if unfavorable weather conditions exist or are predicted (see Identifying Unfavorable Weather Conditions section) and whether fumigation should proceed.
- Do not apply if a shallow, compressed (low-level) temperature inversion is forecast to persist for more than 18 consecutive hours for the 48-hour period after the start of application, or if there is an air-stagnation advisory issued by the National Weather Service in effect for the area which the fumigation is planned.
- Detailed local forecasts for weather conditions, wind speed, and air stagnation advisories may be obtained online at http://www.nws.noaa.gov or by contacting your local National Weather Service Forecasting Office.

Soil Conditions

- Soil must be in good tilth and free of large clods. Large clods can prevent effective soil sealing and reduce effectiveness of the application. If subsurface soil compaction layers (hardpans) are present within the intended fumigation treatment zone, the soil must be tilled, at minimum, to the depth of the treatment zone.
- Plant residue that is present must not interfere with the application or the soil seal. Non-decomposed plant material may harbor pests that will not be controlled by fumigation. Except when applying over cover crops as set forth in the General Instructions for Sprinkler System, crop residue that is present must lie flat to permit the soil to be sealed effectively and limit the natural “chimneys” that may occur in the soil when plant residue is present. These “chimneys” allow the soil fumigants to move through the soil quickly and escape into the atmosphere. This may create potentially harmful conditions for workers and bystanders and limits the efficacy of the fumigant. Plant residue on the field serves to prevent soil erosion from both wind and water.

Soil Temperature

- At the beginning of the application, the maximum soil temperature is 90°F, measured at 3 inches in depth.
- If air temperatures have been above 100°F in any of the three days prior to application, then soil temperature must be measured and recorded in the FMP.

Soil Moisture

- The soil moisture in the top six inches of soil must be between 60% to 80% of soil capacity (field capacity) immediately prior to the application, the USDA Feel Method test may be used to help estimate whether the 60% to 80% soil capacity (field capacity) requirement is met:
  - coarse textured soils (fine sand and loamy fine sand): there must be enough moisture (50-75% available soil water moisture) to form a weak ball with loose and crusted sand grains on fingers, darkened color, moderate water staining on fingers, will not stick.
  - moderately coarse textured soils (sandy loam and fine sandy loam): there must be enough moisture (50-75% available soil water moisture) to form a ball with defined finger marks, very light soil/water staining on fingers, darkened color, will not stick.
  - medium textured soils (sandy clay loam, loam, and silt loam): there must be enough moisture (50-75% available soil water moisture) to form a ball, very light staining on fingers, darkened color, pliable and forms a weak ribbon between the thumb and forearm.
  - fine textured soils (clay, clay loam, and silty clay loam): there must be enough moisture (50-75% available soil water moisture) to form a smooth ball with defined finger marks, light soil/water staining on fingers, ribs between thumb and forearm.
- For fields with more than one soil texture, soil moisture content in the lightest textured (most sandy) areas must comply with this soil moisture requirement. The field may be divided into areas of similar soil texture and the soil moisture of each area should be adjusted as needed. Coarse textured soils can be fumigated under conditions of higher soil moisture than finer textured soils; however, if the soil moisture is too high, fumigation movement will be retarded and effectiveness of the treatment will be reduced. Previous and/or local experience with the soil to be treated or the crop to be planted can often serve as a guide to conditions that will be acceptable. If there is uncertainty in determining the soil moisture content of the area to be treated, a local extension service or soil conservation service specialist or pest control advisor (agriculture consultant) should be consulted for assistance.

If there is insufficient moisture throughout the top six inches below the surface of soil immediately prior to the application, the soil moisture must be adjusted. If there is adequate soil moisture below six inches, soil moisture can be brought to the surface by tillage prior to the application. To conserve soil moisture, tillage should be done close to the time of application as possible.

Flushing Irrigation Lines

- Do not allow fumigant in the irrigation system after the application is complete. After application of the fumigant, flush the injection and irrigation system with untreated water. The flush time must be adequate to purge the fumigant from the injection and irrigation system, but should be less than the amount that could over-saturate the beds. If common lines are used for both the fumigant application and the water treatment/seal (if applied), these lines must be adequately flushed before starting the water treatment/seal.

Application and Equipment Considerations

- If air temperatures have been above 100°F in any of the three days prior to application, then soil temperature must be measured and recorded in the FMP.
- The soil moisture in the top six inches of soil must be between 60% to 80% of soil capacity (field capacity) immediately prior to the application.
Wind Speed
• The pesticide injection pipeline must also contain a functional, normally-closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
• The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
• The irrigation line or water pump must include a functional pressure switch that will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
• Systems must use a metering pump such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.

Drip Applications
Wind Speed
• Wind speed at the application site must be a minimum of 2 mph at the start of the application and not exceed 5 mph at the finish.
Weather Conditions

- Plans for determining when and how repairs to tarp will be made, and by whom,
- Minimum time following injection that tarp will be repaired,
- Minimum size of damage that will be repaired,
- Other factors used to determine when tarp repair will be conducted,
- Schedule, equipment, and methods used to cut tarp,
- Aeration plans and procedures following cutting and/or sitting prior to tarp removal or plant-
ing, and
- Schedule, equipment, and procedures for tarp removal.

Flushing Drip Irrigation Lines

- After application of the fumigant, continue to irrigate the area with water to flush the injection
  and irrigation system with untreated water. Do not allow fumigant to remain in the irrigation
  system after the application is complete. The total volume of water must be adequate to com-
  pletely remove the fumigant from the irrigation system, but should be less than the amount
  that could over-saturate the beds. If common lines are used for both the fumigant application
  and the water treatment/seal (if applied), these lines must be adequately flushed before start-
  ing the water treatment/seal and/or normal irrigation practices.

Application and Equipment Considerations

- Anti-siphon and back-flow prevention devices must be installed and in working order.
- Use only tanks constructed with materials approved for handling metal. Tanks must be in
  good condition to ensure product does not spill or leak.
- Tanks must have proper pesticide labels on them.
- All tanks, hoses, fittings, valves and connections must be serviceable, tightened, sealed
  and not leaking.
- Use only tanks, hoses and fittings designed to withstand the pressure of the system and re-
  sistant to metal.
- Use undiluted product, aluminum, brass, copper, galvanized iron, and zinc materials cannot
  be used.
- The drip irrigation system (main lines, headers, drip tape) must be thoroughly checked for
  leaks before the start of the application. An adequate run-time and pressure are needed to
detect leaks. Look for puddling along major pipes (holes on pipes or leaky joints) at the top
  and ends of rows (leaky connections, open drip tape), in the furrows and on the bed surface
  (damaged drip tape, malfunctioning emitters).
- To inject fumigant, use a metering system, effectively designed and constructed of materials
  that are compatible with the fumigant and capable of being fitted with system interlocking
  controls.
- The system must contain a functional check valve, vacuum relief valve, inspection port, and
  low-pressure drain appropriately located on the irrigation pipeline to prevent water source con-
tamination from backflow.
- The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve
  to prevent the flow of fluid toward the injection pump.
- The pesticide injection pipeline must also contain a functional, normally-closed, solenoid-op-
  erated valve located on the intake side of the injection pump and connected to the system in-
  terlock to prevent fluid from being withdrawn from the supply tank when the irrigation system
  is either automatically or manually shut down.
- The system must contain functional interlocking controls to automatically shut off the pesticide
  injection pump when the water pump motor stops.
- The irrigation line or water pump must include a functional pressure switch that will stop the
  water pump motor when the water pressure decreases to the point where pesticide distribution
  is adversely affected.
- Systems must use a metering pump such as a positive displacement injection pump (e.g., di-
  aphragm pump) effectively designed and constructed of materials that are compatible with
  pesticides and capable of being fitted with a system interlock.
- Nozzles and metering devices are of correct size and are sealed and unobstructed.

Flood Basin, Furrow and Border Application

Wind Speed

- Wind speed at the application site must be a minimum of 2 mph at the start of the application
  or forecasted to reach at least 5 mph during the application.

Weather Conditions

- Prior to fumigation, the weather forecast for the day of the application and the 48-hour period
  following the fumigation must be checked to determine if unfavorable weather conditions exist
  or are predicted (see Identifying Unfavorable Weather Conditions section) and whether fumiga-
tion should proceed.
- Do not apply if a shallow, compressed (low-level) temperature inversion is forecast to persist
  for more than 18 consecutive hours for the 48-hour period after the start of application, or if
  there is an air-stagnation advisory issued by the National Weather Service in effect for the
  area which the fumigation is planned.
- Detailed local forecasts for weather conditions, wind speed, and air stagnation advisories may
  be obtained online at http://www.nws.noaa.gov or by contacting your local National Weather
  Service Forecasting Office.

Identifying Unfavorable Weather Conditions

- Unfavorable weather conditions block upward movement of air, which results in trapping fumi-
gant vapors near the ground. The resulting air mass can move off-site in unpredictable direc-
tions. These conditions typically exist prior to sunset and continue past sunrise and persist as
  late as noon-time. Unfavorable conditions are common on nights with limited cloud cover and
  light to no wind, and their presence can be indicated by ground fog or smog and can also be
  identified by smoke from a ground source that flattens out below a ceiling layer and moves
  laterally in a concentrated cloud.

Soil Conditions

- Soil must be in good tilth and free of large clods. Large clods can prevent effective soil sealing
  and reduce effectiveness of the application. If subsurface soil compaction layers (hardpans)
  are present within the intended fumigation treatment zone, tillage to fracture these layers must
  occur. The soil must be tilled prior to the soil fumigant application, at minimum, to the depth
  of the treatment zone.
- Plant residue that is present must not interfere with the application or the soil seal. Non-de-
  composed plant material may harbor pests that will not be controlled by fumigation. Crop
  residue that is present must lie flat to permit the soil to be sealed effectively and limit the natural
  “chimneys” that may occur in the soil where plant residue is present. These “chimneys” allow
  the soil fumigants to move through the soil quickly and escape into the atmosphere. This may
  create potentially harmful conditions for workers and bystanders and limits the efficacy of the
  fumigant. Plant residue on the field serves to prevent soil erosion from both wind and water.

Tarp

- When tarp is used for emission control, the tarp must be installed immediately after applica-
  tion.
- When tarp is used, a written tarp plan must be developed and included in the FMP that includes:
  - Schedule and procedures for checking tars for damage, tears, and other problems,
  - Plans for determining when and how repairs to tarp will be made, and by whom,
  - Minimum time following injection that tarp will be repaired,
  - Minimum size of damage that will be repaired,
  - Other factors used to determine when tarp repair will be conducted,
  - Schedule, equipment and methods used to cut tarp,
  - Aeration plans and procedures following cutting and/or sitting prior to tarp removal or plant-
ing, and
  - Schedule, equipment, and procedures for tarp removal.

Soil Temperature

- At the beginning of the application, the maximum soil temperature is 90°F, measured at 3
  inches in depth.
- If air temperatures have been above 100°F in any of the three days prior to application, then
  soil temperature must be measured and recorded in the FMP.

Soil Moisture

- Soil moisture in the top six inches of soil must be between 60% to 80% of soil capacity (field
  capacity) immediately prior to the application.
- EXCEPTION: In areas where soil moisture must exceed field capacity to form a bed (e.g., cer-
  tain regions in Florida), soil capacity (field capacity) may exceed the 80% allocated above.
- If appropriate measuring equipment is not used to determine whether soil moisture in the top
  six inches of soil is between 60% to 80% of soil capacity (field capacity) immediately prior to
  the application, the USDA Feel Method test may be used to help estimate whether the 60% to
  80% soil capacity (field capacity) requirement is met:
  - coarse textured soils (fine sand and loamy fine sand): there must be enough moisture (50-
    75% available soil water moisture) to form a weak ball with loose and clustered sand grains
    on fingers, darkened color, moderate water staining on fingers, will not ribbon.
  - moderately coarse textured soils (sandy loam and fine sandy loam): there must be enough
    moisture (50-75% available soil water moisture) to form a ball with defined finger marks,
    very light soil/water staining on fingers, darkened color, will not stick.
  - medium textured soils (sandy clay loam, loam, and silt loam): there must be enough mois-
    ture (50-75% available soil water moisture) to form a ball, very light staining on fingers,
    darkened color, will form a weak ribbon between the thumb and forefinger.
  - fine textured soils (clay, clay loam, and silty clay loam): there must be enough moisture
    (50-75% available soil water moisture) to form a smooth ball with defined finger marks,
    light soil/water staining on fingers, ribbons between thumb and forefinger.
  - For fields with more than one soil texture, soil moisture content in the lightest textured
    (most sandy) areas must comply with this soil moisture requirement. The field may be di-
    vided into areas of similar soil texture and the soil moisture of each area should be adjusted
    as needed. Coarser textured soils can be fumigated under conditions of higher soil moisture
    than finer textured soils; however, if the soil moisture is too high, fumigant movement will
    be retarded and effectiveness of the treatment will be reduced. Previous and/or local experi-
    ence with the soil to be treated or the crop to be planted can often serve as a guide to con-
    ditions that will be acceptable. If there is uncertainty in determining the soil moisture content
    of the area to be treated, a local extension service or soil conservation service specialist or
    pest control advisor (agriculture consultant) should be consulted for assistance.
  - If there is insufficient moisture throughout the top six inches below the surface of soil imme-
    diately prior to the application, the soil moisture must be adjusted. If there is adequate soil
    moisture below six inches, soil moisture can be brought to the surface by tillage prior to the
    application. To conserve soil moisture, tillage should be done as close to the time of applica-
    tion as possible.

Application and Equipment Considerations

- Systems using a gravity flow pesticide dispersing system must meter the pesticide into the
  water at the head of the field and downstream of a hydraulic discontinuity such as a drop struc-
  ture or weir box to decrease potential for water source contamination from backflow if water
  flow stops.
- Meter at a steady rate into 3 to 18 inches of water per treated acre during irrigation. IMPOR-
  TANT: Prior to starting the application, always inspect ditches and border areas to ensure con-
  tainment of the irrigation waters. Apply only into field head ditch. DO NOT APPLY INTO ANY
  LATERAL DITCHES.
SITE-SPECIFIC FUMIGATION MANAGEMENT PLAN (FMP):

Prior to the start of fumigation, the certified applicator supervising the application must verify that a site-specific FMP exists for each application block (i.e., the field or portion of a field treated with a fumigant in any 24-hour period). In addition, agricultural operations fumigating multiple application blocks as part of a larger fumigation may format their FMP in a manner whereby all of the information that is common to all the application blocks is captured once, and any information unique to a particular application block or blocks is captured in subsequent, separate sections. The FMP must be prepared by the certified applicator, the site owner/operator, registrant or other party. The certified applicator must verify in writing (sign and date) that the site-specific FMP(s) reflects current site conditions before the start of fumigation.

Each site-specific FMP must contain the following elements:

- **Applicator information (name, phone number, pesticide applicator license and/or certificate number, employer name, employer address).**
- **General site information:***
  - Application block location (e.g., county, township, range, quadranl), address, or global positioning system (GPS) coordinates.
  - Name, address, and phone number of owner/operator of the application block.
- **General application information (target application date/window, brand name of fumigant, EPA registration number).**
- **Tarp information and procedures for repair, perforation and removal (if tarp is used).**
  - Brand name, lot number, thickness.
  - Name and phone number of person responsible for repairing tarp.
  - Schedule for checking tarp for damage, tears, and other problems.
  - Maximum time following notification of damage that the person(s) responsible for tarp repair will respond.
  - Minimum time following application that tarp will be repaired.
  - Minimum size of damage that will be repaired.
  - Other factors used to determine when tarp repair will be conducted.
  - Name and phone number of person responsible for cutting and/or removing tarp(s) (if other than certified applicator).
- **Equipment/methods used to cut tarp.**
- **Schedule and target dates for cutting tarp.**
- **Schedule and target dates for removing tarp.**
- **Soil conditions (description of soil texture in application block, method used to determine soil moisture).**
- **Weather conditions (summary of forecasted conditions for the day of the application and the 48-hour period following the fumigant application).**
  - Wind speed.
  - Inversion conditions (e.g., shallow, compressed (low-level) temperature inversion).
  - Air stagnation advisory.
- **Respirators and other PPE for handlers (handler task, protective clothing, respirator type, respirator cartridge type, respirator cartridge replacement schedule, eye protection, gloves, other PPE).**
- **Emergency procedures (evacuation routes, locations of telephones, contact information for first responders, local/state/federal/tribal contacts, key personnel and emergency procedures/responsibilities in case of an incident, equipment/tarp seal failure, odor complaints, or other emergencies).**
- **Fumigant Treated Area posting procedures (name, address, and phone number of person(s) who will post Fumigant Treated Area signs, location of posting Fumigant Treated Area signs, procedures for Fumigant Treated Area sign removal).**
- **Plan describing how communication will take place between applicator, land owner/operator, and other on-site handlers (e.g., tarp cutters/removers, irrigators) for complying with label requirements (e.g., treated area location, timing of tarp cutting and removal, PPE).**
- **Name and phone number of persons contacted.**
- **Date contacted.**
- **Authorized on-site personnel.***
  - Names, addresses and phone numbers of handlers.
  - Name, address, and phone number for employers of handlers.

- **Tasks that each handler is authorized and trained to perform.**
- **For handlers designated to wear air-purifying respirators (an air-purifying respirator is required for a minimum of one handler):***
  - Date of medical qualification to wear an air-purifying respirator.
  - Date of air-purifying respirator training, and
  - Date of fit testing for the air-purifying respirator.
- **Air monitoring Plan.***
  - If sensory irritation is experienced, indicate whether operations will be ceased or operations will continue with an air-purifying respirator.
  - If the intention is to cease operations when sensory irritation is experienced, provide the name, address, and phone number of the handler that will perform monitoring activities prior to operations resuming.
  - When air-purifying respirators are worn:
    - Representative handler tasks to be monitored.
    - Monitoring equipment to be used and timing of monitoring.
- **Good Agricultural Practices (GAPs).***
  - Description of applicable mandatory GAPs.
  - Measurements and documentation to ensure GAPs are achieved (e.g., measurement of soil and other site conditions).
  - Description of hazard communication. (e.g., The treated area has been posted in accordance with the label. Pesticide product labels and material safety data sheets are on-site and readily available for employees to review.)
  - Record-keeping procedures (the owner/operator of the application block as well as the certified applicator, must keep a signed copy of the site-specific FMP for 2 years from the date of application).
  - For situations where an initial FMP is developed and certain elements do not change for multiple fumigation sites (e.g., applicator information, authorized on-site personnel, record-keeping procedures, emergency procedures, etc.,) only elements that have changed need to be updated in the site-specific FMP provided following:
  - The certified applicator supervising the application has verified that those elements are current and applicable to the application block before it is fumigated and has documented the verification in the site-specific FMP; and
  - Record-keeping requirements are followed for the entire FMP (including elements that do not change).

Once the application begins, the certified applicator must make a copy of the FMP available for viewing by handlers involved in the fumigation. The certified applicator or the owner/operator of the application block must provide a copy of the FMP to any federal, state, tribal, or local enforcement personnel who request the FMP. In case of an emergency, the FMP must be made available when requested by federal/state/tribal/local emergency response and enforcement personnel.

Within 30 days of completing the application portion of the fumigation process, the certified applicator supervising the application must complete a post-fumigation application summary that describes any deviations from FMP that have occurred, measurements taken to comply with GAPs as well as any complaints and/or incidents that have been reported to him/her.

The Post-Application Summary must contain the following elements:

- **Actual date of the application, application rate, and size of application block fumigated.**
- **Summary of weather conditions on the day of the application and during the 48-hour period following the fumigant application.**
- **Tarp damage and repair information (if applicable).**
  - Location and size of tarp damage.
  - Description of tarp/protective equipment failure.
  - Date and time of tarp repair.
- **Tarp perforation/removal details (if applicable).**
  - Description of tarp removal (if different than in the FMP).
  - Date tarp was perforated.
  - Date tarp was removed.
- **Complaint details (if applicable).**
  - Person filing complaint (e.g., on-site handler, person off-site).
  - If off-site person: name, address, and phone number of person filing claim.
- **Description of control measure or emergency procedures followed after complaint.**
- **Description of incidents, equipment failure, or other emergency and emergency procedures followed (if applicable).**
- **Details of elevated air concentrations monitored on-site (if applicable).**
  - Location of elevated air concentration levels.
  - Description of control measure or emergency procedures followed.
- **When sensory irritation experienced:***
  - Date and time of sensory irritation.
  - Handler task/activity.
  - Handler location where irritation was observed.
  - Resulting action (e.g., cease operations, continue operation with air-purifying respirators).
- **When using a direct read instrument:***
  - Sample date and time.
  - Handler task/activity.
  - Handler location.
  - Air concentration.
**Sampling method.**
- Date of fumigant treatment
- Area sign removal
- Any deviations from the FMP.

Record-keeping procedures (the operator of the application block as well as the certified applicator must keep a signed copy of the post-application summary for 2 years from the date of application).

### MAXIMUM APPLICATION RATES FOR PRE-PLANT SOIL FUMIGATION

**Maximum application rate** is 360 lbs a.i./acre (62 gallons treated acre).

For use on the following: Alfalfa; Almond (P. amygdaliformis); Apricot; Artichoke; Asparagus (asperus); Barley; Basil; Bayberry; Beech Nut (Fagus spp.); Beet; Garden Beets; Beet, Sugar; Bilberry; Blackberry; Blackberry (Rubus eutatus); Black Satin Berry; Blueberry, highbush and lowbush (Vaccinium spp.); Broccoli; Broccoli, white (Brassica oleracea var. botrytis); Buckwheat; Cabbage; Cabbage, (J. ugians cinerea); Cabbage; Cabbage, Chinese must (Gai Choy); Cabbage, Napa; Calamondin (Citrus milis X Citrofornlenta milis); Celery (Apium graveolens); Celery (C. mixta); Celery (C. pepo var. tuberosum); Parsnip; Pasture Cheese (Lactuca sativa); Pumpkin (Cucurbita spp.); Purslane, winter (Portulaca oleracea); Pursat (Eruca sativa); Quince; Summer Squash, straightneck; Summer Squash, straightneck; Pumpkin (Cucurbita maxima); C. moschata) includes: acorn squash, spaghetti squash; Stone Fruit (orchard replant only); Strawberries; Sudan; Sweet bay (bay leaf); Sweet Potato; Swiss Chard; Tansy; Tarragon; Tayberry; Thyme; Tobacco; Tomatoes; Tree Nuts (orchard replant only) Turnip; Turf (including golf courses); Walnut; Black and English (Prunus armeniaca); Watermelon; and/or varieties of Cirsium lanatus hybrids; Wheat; Wintergreen; Woodruff; Wormwood; Yams; Youngberry and varieties and/or hybrids of these; and Zarramora.

### GENERAL INSTRUCTIONS

**Mycorrhizae:** There are occasions when K-PAM HL is known to temporarily reduce mycorrhizae in agricultural soils. For those crops that are mycorrhizae dependent and planted into K-PAM HL treated soils, it is necessary to practice a good fertilizer program until the mycorrhizae reestablish the treated area.

**PRODUCT INFORMATION**

K-PAM HL is a water soluble liquid. When applied to soil, the liquid is converted into a volatile fungin (Methylisothiouvanate, MIT). After a sufficient interval of time, the fumigant degrades/disinfest the soil.

### WHEN TO USE MAXIMUM AND MINIMUM RATES

The application rate of K-PAM HL is dependent on the soil type to be treated and the position in the soil of the pest to be suppressed or controlled. For maximum control or suppression, an understanding of the pest, its location and its respiring state will ensure maximum performance of K-PAM HL. Generally, a light sandy soil requires a lower application rate than a heavier mineral soil. In addition, if the pest is in the upper portion of the soil profile (annual weeds), a lower application rate is generally required than if the pest is deeper in the soil profile and deeper penetration is desired (perennial weed seeds and nematodes). When a range of application rates is provided, consult with your local agricultural extension service for more specific application rates.

**Nematodes and Nutsedge:** Nematode suppression is achieved when K-PAM HL converts to MIT and makes contact with active forms of the nematodes, preferably juveniles. Endo-parasites in plant residue may not be suppressed. Plant residues from previously infected crops should be completely decomposed prior to K-PAM HL application to ensure maximum exposure. Eggs are more difficult to suppress than juveniles, but are susceptible. Pre-irrigation has been demonstrated to stimulate egg hatch of some species and may enhance overall K-PAM HL performance. Nutsedge may be suppressed with K-PAM HL if actively growing and a high use rate is used (62 gal/acre). More often, rhizomes, roots and shoots will be controlled but the tuber will remain viable and at a later time regrow. Treatments made immediately prior to a necessary waiting period will give a weed-free period for crop establishment.

### USE PRECAUTIONS

Keep children and pets out of treated areas. K-PAM HL uses described on this label are intended for pre-plant soil preparation only. All plant foliage and any established plants growing on the treatment sites will be either severely damaged or destroyed. Keep the product off of any desirable turf or plants. Do not apply within 3 feet of the drip line of desirable plants, shrubs, or trees. Do not use in confined areas without adequate ventilation or when fumes may enter nearby dwellings. Do not use in greenhouses. Keep tightly closed when not in use. Do not store near food or feed. NOTE: K-PAM HL will suppress and/or control only those pests in the fungistatic zone at the time of treatment. Reinfestation may occur subsequent to the fumigant degradation/disinfestation from the soil.

### TREATMENT GUIDELINES

For optimum results, certain procedures should be observed at designated times in the treatment procedure. Guidelines below are important for each of the four stages of the treatment process. Consult your Sales Representative for the appropriate treatment program for your particular needs.

- **Pre-Application**
- **Field Preparation Prior to Application**
- **Application**
- **Pre-Planting After Application of K-PAM HL**

### PRE-APPLICATION

K-PAM HL is applied post-harvest and 14 to 21 days before a new crop is planted (see “Testing of Treated Soil Before Planting” section). In some areas, fall application is preferred as the product will degrade/disinfest over the winter that allows planting to begin as soon as favorable springtime conditions arrive.

**Application Rate**

30 to 50 lbs a.i. of product per treated acre depending on crop, target pest and soil properties (or crop-specific considerations in the Additional Information section of this label). Some of the soil properties to consider when determining the application rate include soil texture, percent organic matter and depth of soil to be treated.

### Target Pest and Depth of Treatment

When application rates for this product are given in ranges, the higher rate if pests (insects, nematodes, etc.) are present in high numbers or if the area to be treated has a history of pest problems. Consult with your State nematologist, entomologist and plant pathologist to determine if crop rotation is more feasible or desirable than fumigation. NOTE: This product will only suppress pests in the fumigated zone at time of treatment. For control of pests in the furrow zone or furrow zone and surface application, contact your local agricultural extension service for more specific information on application rates.

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### Target Pest and Depth of Treatment

When application rates for this product are given in ranges, the higher rate if pests (insects, nematodes, etc.) are present in high numbers or if the area to be treated has a history of pest problems. Consult with your State nematologist, entomologist and plant pathologist to determine if crop rotation is more feasible or desirable than fumigation. NOTE: This product will only suppress pests in the fumigated zone at time of treatment. For control of pests in the furrow zone or surface application, contact your local agricultural extension service for more specific information on application rates.
**Soil Characteristics**

Soil properties to consider when determining the application rate of this product include the depth of soil to be treated, soil texture, and percent organic matter. Due to the absorbing effect of humus, soils with high levels of organic matter under the surface require higher rates. For example, muck soil may require twice the rate that would be used in mineral soils. Application rates will also vary with soil texture. For example, heavy clay soils require a higher rate than light sandy soils.

**Phytotoxicity**

K-PAM HL is phytotoxic. Protect valuable, non-target plants by stopping soil applications of this product at least three feet short of the drip line of trees, shrubs and other desirable plants. For sprinkler application, crop injury and lack of effectiveness can result from non-uniform distribution of the treated water.

**Application of K-PAM HL**

Apply according to the methods and rates outlined below under the section “Uses, Rates and Application Methods.”

**Use of Diluted K-PAM HL**

Do not store the diluted product. Do not allow the diluted solution to stand overnight. Use the diluted solution promptly after mixing with water. Flush all equipment with water after each day’s use; disassemble valves and clean carefully.

**Application in Tank Mix with Liquid Fertilizer**

K-PAM HL may be injected in a mixture with liquid fertilizers, however, a dual injection system is preferred. Since the composition of liquid fertilizers vary considerably, the physical compatibility of each K-PAM HL/fertilizer tank mix should be checked by using the following procedure:

1. Mix a small quantity of K-PAM HL and liquid fertilizer in the same ratio as they will be applied to the field e.g., if 30 gallons of K-PAM HL and 30 gallons of liquid fertilizer are to be applied per acre treated, then the mixture should be mixed in a 30:30 or 1:1 ratio. Mix in a glass container.
2. Mixing should be done outdoors and out of direct sunlight. Agitate the liquids to attain a complete uniform mixture. If a UNIFORM MIX CANNOT BE MADE, THE MIXTURE SHOULD NOT BE USED! If the mixture remains uniform for 30 minutes without agitation, the combination may be used. Shoul the mixture separate after 30 minutes but is readily remixed with agitation, the mixture can be used if adequate agitation is maintained in the tank.

**Chemigation of K-PAM HL**

When applying by chemigation methods, the following directions or warnings must be observed:

1. Apply this product only through sprinkler including center pivot, lateral move, end tow, side (wheel) roll, traveler, big gun, solid set, or hand move, flood (basin); furrow, border, or drip (trickle) irrigation systems. **DO NOT APPLY** this product through any other type of irrigation system. Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from non-uniform distribution of treated water. If you have questions about calibration, you should contact your State Extension Service Specialists, equipment manufacturers or other experts. Do not connect the irrigation system used for pesticide application to a public water system unless prescribed safety devices for public water systems stated on the pesticide label are in place. A person knowledgeable of the chemigation system and responsible for its operation or under the supervision of the responsible person shall shut the system down and make necessary adjustments should the need arise.

**Chemigation Using a Public Water System**

**NOTE:** AMVAC does not encourage connection of chemigation systems to public water systems. The following information is provided for users who have evaluated alternative application and water source options before choosing a such a connection.

**Observe the Following Precautions if your Chemigation System is Connected to a Public Water System:**

Public water system is defined as a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. Chemigation systems must contain a functional, reduced pressure zone (RPZ), backflow connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. Chemigation systems must contain a functional, reduced pressure zone (RPZ), backflow preventer or the functional equivalents in the upstream water supply line from the point of pesticide introduction. As an option to the RPZ, the water from the public water system should be discharged into a reservoir tank prior to pesticide introduction. There shall be a complete physical break (air gap) between the outlet end of the fill pipe and top of overflow rim of the reservoir tank of at least the inside diameter of the fill pipe. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid toward the injection pump. Any alternatives to the required safety devices in this label must conform to the list of EPA-approved alternative devices.

**Sprinkler & Drip Chemigation Systems**

See “Field Application Where Entire Area is Being Treated” under Use, Rates and Application Methods section of this label.

**Pre-Planting After Application of K-PAM HL**

**Effects of Rain**

If rain occurs within 24 hours after an K-PAM HL application, lack of control at and near the soil surface may occur.

**Recommentation**

Precautions must be taken to prevent recommentation of treated fields with plant pathogenic fungi, plant parasitic nematodes or weed seed. Use clean seeds or plants. Before farm equipment is driven into the treated area, it should be rinsed free of untreated soil and weed seeds from other fields.

**Days to Cultivating or Planting After Application**

Because K-PAM HL is harmful to germinating seeds and living plants, an appropriate interval must be observed between treatments and planting. On well-drained soils which have a light to medium texture and which are not excessively wet or cold following the application, planting can begin 14 to 21 days after treatment. If soils are heavy or especially high in organic matter or if the soil remains wet (>80% field capacity) and/or cold (below 60°F) following the application, a minimum interval of 21 days or greater should be observed. The interval before planting should be extended until the soil is sufficiently dry to allow for cultivation.

**Cultivation of Soil Before Planting**

**IMPORTANT:** Heavier soils including soils high in clay or organic matter should be allowed to aerate and dry thoroughly after application with K-PAM HL. During cold and/or wet weather, frequent shallow cultivation can aid dissipation of K-PAM HL from the treated soil. On heavy, wet soils, light surface cultivation to break up crusts and promote drying should be done 5 to 7 days after treatment if planting is to occur within 14 to 21 days after treatment. This cultivation may be repeated as necessary.

**NOTE OF CAUTION:** To avoid contaminating treated soils, care should be taken to assure that untreated soils are not mixed with treated soils.

**Testing of Treated Soils Before Planting**

Fields are fumigated to control soil-borne fungi, nematodes, insects, and weeds. The length of time required for fumigants to dissipate/escape from the soil before plants can safely be planted varies greatly. Typically 14 to 21 days are needed under typical conditions; however, circumstances which do not favor evaporation of the fumigant can greatly lengthen the waiting period as much as up to 30 days. The release period is short with (1) low rates of fumigants, (2) light soil, (3) high soil temperatures, (4) low soil moisture, (5) shallow application depth, and (6) repeated cultivation after fumigation. Seeded crops are less susceptible to residual soil fumigate than non-seeded crops. In general, fumigants evolve slowly from cold, wet soils. If in doubt, perform either the lettuce seed test or the tomato transplant test as described elsewhere in this label. If germination occurs in 1 to 3 days or if tomato plant shows signs of wilting or root burn in 2 weeks, the product is still available and an extended wait period must be observed.

**Pacific Northwest States of Idaho, Nevada, Oregon and Washington**

**NOTE:** When applied in the spring, allow a minimum of 14 to 21 days before planting providing no fumes are detectable. When the soil temperature is below 60°F, allow a minimum of 21 days before planting. Check for fumes and aerate as needed. Use a seedling indicator plant with a hot cap to check for activity or fumes (or follow instructions in preceding paragraph). DO NOT PLANT if fumes are detectable or injury to plant has occurred. Re-aerate the soil and check again.

The information below describes two simple tests to assay for harmful residual soil fumigants before planting.

**Lettuce Seed Test**

1. With a trowel, dig into the treated soil to or just below the depth of application. Remove 2 to 4 small (1 to 2 oz) soil samples, mix lightly, and immediately place a portion in an air-tight jar so that fumes will not escape. Use mason, wheat germ or similar jars with gas-tight lids.
2. Sprinkle lettuce seeds on the moistened surface of the soil and recap immediately. Prepare a similar jar with untreated soil (untreated check) for comparison.
3. Keep the jars at 65°F to 85°F; do not place in direct sunlight. Direct sunlight may kill the seed by overheating. Lettuce seed will not germinate in the dark.
4. Inspect the jars for germination in 1 to 3 days.
5. The soil is safe for planting if seeds in the treated jar germinate the same as seeds in the untreated one.

**Tomato Transplant Test**

Transplant 5 to 10 succulent, fast-growing tomato seedlings into fumigated beds approximately 4 to 6 inches deep. Do the same in a non-fumigated area. If there is variation in the field, plant into the heaviest, wettest soil. Inspect the seedlings in 2 days for wilting or “root burn”, if plants in the fumigated zone look the same as those in the non-fumigated zone, it is safe to plant.

**Which Test is Best?**

Both the lettuce seed and tomato transplant tests can serve the purpose. The response of tomato seedlings varies somewhat depending on how succulent they are, the relative humidity, soil moisture and temperature. Relative differences between plants in fumigated and non-fumigated areas are key to detecting low level residues. High concentrations should produce clear-cut symptoms. Lettuce seed tested in jars are not subjected to the variations in the field that can affect the response of tomato transplants. However, the process of collecting a soil sample allows some fumigant to escape prior to sealing the jar. In addition, excess soil moisture can inhibit normal lettuce seed germination reducing the sensitivity of the test.

**Uses, Rates and Application Methods**

**Field Application Where Entire Area is Being Treated**

This product is not to be used in the following counties of Texas: Atascosa, Cameron, Duval, Hidalgo, Hockley, Starr, Wallacy, Zapata.

**SOIL INJECTION**

Apply with injectors such as shanks, blades, fertilizer wheels, plows, etc. Apply K-PAM HL at the rate of 30 to 62 gallons per treated acre (or see crop-specific considerations in the Additional Information section of this label). Follow immediately with a roller to smooth and compact the soil surface. Light watering or tarping after rolling helps prevent soil escape. It may be necessary to stagger the injector placement on two or more tool bars to prevent soil build up during application.
When setting up your soil injection equipment with either spray blades, injection knives or coulters make sure they are evenly and closely placed to create an even application width and depth. To accomplish this, it may require multiple tool bars with the injection tools staggered. This will help prevent build up of trash and aid in the soil sealing. For example, apply K-PAM HL through injectors placed 4 inches below the soil surface and 5 inches apart.

**SOIL COVERING:** K-PAM HL may be applied as a broadcast application immediately in front of soil injection equipment after the disposal of any fumigant spray residue, discs, etc. to a minimum depth of 6 inches using a single pass to incorporate. Use 30 to 62 gallons of K-PAM HL per treated acre (or see crop-specific considerations in the Additional Information section of this label) followed immediately by a roller/packer to smooth and compact the soil surface.

**ROTARY TILLER OR POWER MULCHER:** Spray K-PAM HL immediately in front of the tiller or mulcher, set to the depth where control is desired. Use 30 to 62 gallons per treated acre (or see crop-specific considerations in the Additional Information section of this label). Follow immediately with a roller, power roller or bed shaper to seal soil surface. Light watering or a tarp after roller may be used to help prevent fumigant escape.

**SPRINKLER SYSTEM:** Use only those sprinkler systems which give large water droplets to prevent excessive loss. Use 30 to 62 gallons of K-PAM HL per treated acre (or see crop-specific considerations in the Additional Information section of this label). Meter K-PAM HL into the irrigation water at the head of the field at a point with enough turbulence to assure adequate mixing of the product in the water. Apply only into field head ditch. DO NOT APPLY INTO ANY LATERAL DITCHES.

**DROPPER SYSTEM:** K-PAM HL must be applied through a drip irrigation system designed to wet the soil thoroughly in the area being treated. Meter 30 to 62 gallons of K-PAM HL per treated acre (or see crop-specific considerations in the Additional Information section of this label) into the drip system during the entire irrigation period. Flush irrigation system with adequate water after completion of application.

Important: **WEED ELIMINATION WILL NOT BE SATISFACTORY IF TOO MUCH WATER IS APPLIED. AN ADEQUATE CONCENTRATION OF K-PAM HL MUST BE PRESENT AT THE TIME OF WEED SEED GERMINATION IN ORDER TO BE EFFECTIVE.**

**NOTE:** If K-PAM HL is applied to established plant beds under plastic tarps to terminate growth of a previous crop and to fumigate the bed in preparation of planting a subsequent crop, the terminated crop must not be used for any food or feed purposes after K-PAM HL has been applied.

**PACIFIC NORTHWEST ONLY**

**SOIL INJECTION:** K-PAM HL may be applied using (1) a single shank spaced no more than 6 inches apart and a spray nozzle 6 inches deep; (2) a single shank spaced no more than 6 inches apart and spray nozzles spaced 6 to 12 inches deep; (3) a single sweep spaced no more than 12 inches apart and sweep blades 12 inches wide with a spray nozzle that will give broadcast coverage from sweep tip to sweep tip; (4) a double-winged shank spaced no more than 12 inches apart and 9 inches between the wings with spray nozzles giving uniform coverage; (5) a Noblet and Plow Blade with spray nozzles spaced every 6 inches and set to 12 to 14 inches deep using a disc to immediately incorporate the K-PAM HL placed on the surface. All soil injection applications must be followed immediately with a roller/packer to smooth and compact the soil surface. REGARDLESS of which method used, you must use 30 to 62 gallons of K-PAM HL per treated acre (or see crop-specific considerations in the Additional Information section of this label).

When applying K-PAM HL with injector blades, such as Noblet Plow Blades in spring, the following precautions must be followed:

- Apply all fertilizers after the K-PAM HL application. Wait a minimum of 7 days before making the fertilizer application.
- Thoroughly aerate the soil 5 to 7 days after the K-PAM HL application by plowing, shallow ripping or discing, or the combination thereof, to allow the fumes to dissipate (if tarps are used, refer to the Tarp Perforation and/or Removal Section for additional guidance on timing of these operations). Damage to living crops will occur if fumes develop. Apply only into field head ditch. DO NOT APPLY INTO ANY LATERAL DITCHES.
- Planting may take place 14 to 21 days after the K-PAM HL application provided no fumes are detected at the time of planting.
- If noxious fumes are noticeable at planting, do not plant and rework the soil.
- If soil temperatures are below 60°F, delay planting for a minimum of 21 days from the day of the K-PAM HL application regardless of any other precautions that may have been taken.
- In conjunction with the delayed planting, set indicator plants (such as tomatoes) in various places in the treated field with a ‘hot cap’ left undisturbed for a minimum of 24 hours to ensure all of the K-PAM HL has left the soil. (See “Testing of Treated Soil Before Planting” section.)
EASES OF SMALL GRAINS. K-PAM HL may be diluted with water or, if compatible, non-acidic liquid
before planting. The soil surface must be compacted immediately and before seeding with a basket or
smooth roller. K-PAM HL can be applied with the planter mounted on the same implement or the
fumigant incorporated and the field planted immediately.

ROTARY TILLER OR POWER MULCHER: Spray diluted K-PAM HL immediately in front of teller
or mulcher. Use 2.2 to 7.25 gallons per broadcast overall acre. Incorporate 4 to 6 inches deep. The
seeded surface must be compacted immediately and before seeding with a basket or smooth
roller. K-PAM HL can be applied with the planter mounted on the same implement or the
fumigant incorporated and the field planted immediately.

BAND TREATMENT: K-PAM HL can be applied as a band treatment. Apply at the rate of 6.5 to
21.3 fl. oz. per 1,000 feet of 12-inch band (2.2 to 7.25 gallons per broadcast overall acre). See
“Method of Determining Fluid Ounces per 100 Feet of Linear Band” section. Spray fumigant im-
mmediately in front of (1) a rotary tiller equipped with “L” or sweep blades; (2) opposing discs 4 to
(3) any mechanical device that will mix 4 to 6 inches deep. Following the incorporation the soil surface
must be immediately compacted with a basket or smooth roller prior to or at planting time. The planter
should be mounted on the same implement used to apply and incorporate the fumigant.

IN-FURROW TREATMENT: Dilute K-PAM HL in sufficient water to allow for uniform metering of the
solution through the seed furrow.

Seed Furrow Spraying or Drag Tubes: Apply diluted fumigant through low-pressure tips spraying
the soil covering the seed or through drag tubes directly into the seed furrow. Using the drag
tube method, the fumigant can be applied either in the seed furrow prior to the seed dropping or
on the seed prior to covering of seed with soil. Apply at the rate of 0.25 to 1.2 fl. oz. per 1,000
feet of seed row using the drag tube method (0.50 to 3.0 fl. oz. per 1,000 feet of row using the
spray method). The rate with the spray method should be increased with the increasing volume of soil
being treated. The wider the spray bands the higher the rate.

Shank Injection Method: Apply diluted fumigant solution with thin soil injection shanks 2 to 4
inches below the seed and 1 inch to the side of the seed. Set shanks to run in front of the planters
on the same equipment. Apply at the rate 0.38 to 5.8 fl. oz. per 1,000 feet of seed row.

DRIP IRRIGATION APPLICATION: Apply as soon as possible after planting. K-PAM HL must be
applied through a drip irrigation system to wet the soil thoroughly in the desired treatment
zone. Apply at the rate of 2.2 to 7.25 gallons per broadcast overall acre. The fluid ounces per
broadcast row will depend on the width of the desired treated band. (See “Method of Determining
Fluid Ounces per 100 Feet of Linear Band”)

Method of Determining Fluid Ounces per 100 Feet of Linear Band

1) Determine width or band in foot by dividing width of band in inches by 12. Example: 5 inch
band = 5 inches divided by 12 = 0.4166 feet.

2) Determine square feet in 100 linear feet of band by multiplying the width by the band by 100.
Example: 416 feet x 100 feet = 416.6 square feet.

3) Determine the treated acres per 100 linear feet of band by dividing the square foot by 43,560
(square feet/acre). Example: 416.6 square feet divided by 43,560 = 0.00966 acre.

4) To determine the fluid ounces per 100 linear feet
a) 1 gallon = 128 fluid ounces; 50 gallons = 6,400 fluid ounces; 75 gallons = 9,600 fluid
ounces.

b) Multiply fluid ounces by acres. Example: 50 gallons = 6,400 fluid ounces x 0.00966 = 6.14
fluid ounces per 100 linear feet.

Fluid Ounces per 100 Feet of Linear Band.

SPRINKLER SYSTEM APPLICATIONS ON PERENNIAL CROPS: Apply the recommended
amount of K-PAM HL per acre in sufficient water to penetrate to the desired treatment depth. Meter
continuously into the irrigation system throughout the entire application period. Soil condition must
facilitate even water penetration without runoff. Important: Flush lines to remove all product to
avoid application and possible phytotoxicity to crop prior to shutting down irrigation system.

ROTARY TILLER OR POWER MULCHER: Spray diluted K-PAM HL immediately in front of teller
or mulcher. Incorporate 4 to 6 inches deep. The treated surface must be compacted immediately
with a basket or smooth roller. Sealing the roto-tilled area with irrigation is recommended. All
other conditions pertaining to temperature and soil moisture under sprinkler applications above
must be followed.

ALFALFA: To control Clover root curculio, apply 3 to 6 gallons per treated acre in enough irriga-
tion water to penetrate to the depth of the pest prior to the larvae pupating in late spring. An
application between the first and second cutting of hay generally gives good control.

APPLES: To suppress nematodes and soil diseases such as phytophthora and fusarium, apply
4 to 12 gallons per treated acre in enough irrigation water to penetrate 9 to 12 inches deep. Apply
in early spring or late fall prior to a new flush of root growth. For a row treatment a herbicide
sprayer may be used making the appropriate application while the sprinklers are running. The
rate per acre should be adjusted to correspond to the area treated.
ASPARAGUS: To suppress garden symphylid, apply 8 to 12 gallons in the early spring before the asparagus starts to grow and the symphylids are in the upper levels of the soil. Apply in enough irrigation water to penetrate to the dept of the asparagus crown.

MINT: To suppress verticillium dahiae and nematodes, apply 3 to 6 gallons per treated acre in enough irrigation water to wet the top 4 to 6 inches of soil where the majority of the roots are concentrated.

USE DIRECTIONS FOR SEQUENTIAL GROUND APPLICATION OF TELONE II AND K-PAM HL

NOTE: Read the label affixed to the container of TELONE II before applying. Carefully follow all precautionary statements and applicable use directions. Except as specified in this section, the labels affixed to the containers for TELONE II and K-PAM HL are subject to all user precautions and limitations imposed.

Sequential application of TELONE II and K-PAM HL for suppression of Verticillium dahiae and control of Root Knot and lesion nematodes in soils to be planted to potatoes in the Pacific Northwest.

The following use directions provide information for a sequential treatment program of applications of TELONE II soil fumigant and K-PAM HL soil fumigant. For best results, apply both TELONE II and K-PAM HL in the fall. Alternative treatment schedules include a fall application of TELONE II followed by a spring application of K-PAM HL, a fall application of K-PAM HL followed by a spring application of TELONE II, or a spring application of both products. Due to time constraints resulting from varying weather conditions, a spring application may result in delayed planting.

APPLICATION DIRECTIONS FOR TELONE II

Soil Conditions

Soil conditions at the time of application of TELONE II that allow rapid diffusion of the fumigant as a gas through the soil normally give best results. Compacted soil layers within the desired treatment zone must be fractured before or during application of the fumigant. Soil temperature must be between 40°F and 80°F at the depth of injection, moist from 2 inches below the soil surface to at least 12 inches deep as determined by the feel method, free of clods, and with crop residue thoroughly incorporated into the soil at least at the time of application and sealing.

Application Methods and Conditions

Apply TELONE II as a broadcast treatment at the minimum rate of 15 gallons per treated acre (44.3 fl oz/1000 feet of row/outlet based on 12-inch centers) using either chisel (shank), Noble Plow (sweep) or modified Para Till application equipment. Chisel equipment must have ripper-type shanks. Para Till equipment must be modified so that outlet spacing is evenly distributed. The tool bar under the tool bar. With chisel and Para Till equipment, a shank spacing of 12 to 24 inches is recommended. Do not exceed a shank spacing of 24 inches. Outlet depth should be at least 18 inches below the final soil surface. Noble Plow equipment may be used only when either shallow soils (less than 18 inches deep) or soils containing excessive live root material such as alfalfa or corn stubble prevents the use of shank application. Noble Plow outlet spacing should not exceed 12 inches and application should be made to a depth of at least 15 inches. Fumigant penetration may be limited if a plow pan exists below the depth of the Noble blade. Do not use para till, modified para till, or other equipment that outlet spacing is not evenly distributed. Para Till equipment must be modified so that outlet spacing is evenly distributed. Subsequent pest populations may infest the fumigated zone from irrigation water, equipment for simultaneous application of each product. Because of shallower product placement, potato seed or other sources of contamination or may invade the fumigated zone from surrounding untreated soil such as from beneath the fumigated zone or from non-fumigated pockets within the fumigated zone.

In fields with a history of severe Columbia Root Knot nematode problems, the maximum Federal label rate of 20 gallons TELONE II per treated acre is recommended in sequential combination with a minimum of 30 gallons K-PAM HL per treated acre per these label directions.

If the application of TELONE II occurs in the fall and the application of K-PAM HL is not planned until spring, a cover crop such as wheat or grass can be planted following the undisturbed soil interval associated with the application of TELONE II to reduce the potential for over-winter soil erosion.

Refer to the product labels affixed to the containers for both TELONE II and K-PAM HL for recommended soil conditions, product performance can be expected to improve as the soil conditions move toward optimum. Use of this sequential application program of TELONE II and K-PAM HL under soil conditions outside the recommended range of soil conditions can be expected to yield less than satisfactory performance.

NOTE: Read the label affixed to the container of TELONE II before applying. Carefully follow all precautionary statements and applicable use directions. Except as specified in this section, use of TELONE II or K-PAM HL is subject to all user precautions and limitations imposed by the labels affixed to the containers for TELONE II and K-PAM HL, respectively.

USE DIRECTIONS FOR SIMULTANEOUS GROUND APPLICATION OF TELONE II AND K-PAM HL

Simultaneous application of TELONE II and K-PAM HL for suppression of Verticillium dahiae and control of Root Knot and lesion nematodes in soils to be planted to potatoes in the Pacific Northwest.

The following use directions provide information for simultaneous ground application of TELONE II soil fumigant and K-PAM HL soil fumigant. For best results, a fall application is recommended. Due to time constraints resulting from varying weather conditions, a spring application may result in delayed planting.

NOTE: When TELONE II and K-PAM HL are applied simultaneously, the most restrictive personal protective equipment, worker notification and re-entry restrictions specified on labels for each product must be followed.

Soil Conditions

Soil conditions at the time of application of K-PAM HL must be between 40°F and 80°F in the treated zone and at 60% to 80% field capacity. If necessary, pre-irrigate about a week prior to treatment to add soil moisture to desired levels. Immediately before application, cultivate light if the soil has crusted.

Application Methods and Equipment

Apply K-PAM HL either by chernigation or by soil injection or surface incorporation as a sequential application with TELONE II. When K-PAM HL is used prior to TELONE II, allow a minimum of 7 days between treatments. When TELONE II is applied prior to K-PAM HL, allow a minimum of 7 days before disturbing the soil or beginning any pre-irrigation for the application of K-PAM HL.

For chernigation, apply K-PAM HL at the minimum rate of 24 gallons per treated acre in a minimum of 0.5 acre-inch of water to the desired depth of treatment. Heavier soils may require a higher amount of water. Use only those sprinkler systems that give large water droplets to prevent excessive fumigant loss. If any residential sprinkler irrigation is integrated with the irrigation system, create separate irrigation systems or install a minimum of 12 inches between adjacent sprinklers.

For soil injection, apply K-PAM HL at the minimum rate of 24 gallons per treated acre using either shanks, sweep blades, double-winged shanks, or a Noble Plow blade combined with a surface application. Single shanks should be spaced no more than 6 inches apart with either single in-channels or 3 channels in-channels (or dual injection outlets spaced at 6 to 12 inches deep). Single sweep blades should be spaced no more than 12 inches apart with sweeps 6 inches wide and a spray nozzle that will provide broadcast coverage from sweep tip to sweep tip. Double-winged shanks should be spaced no more than 12 inches apart with no more than 9 inches between adjacent wings and 8 to 12 inches deep. Single sweep blades should have spray nozzles spaced 6 inches apart to give uniform coverage, an injection depth set at 12 to 14 inches deep, and be combined with a surface application using a disc to immediately incorporate the K-PAM HL placed on the surface. Follow all the above applications immediately with a roller/jacketer to smooth and compact the soil surface.

For surface incorporation, apply K-PAM HL at the minimum rate of 24 gallons per treated acre as a broadcast application to the soil surface immediately in front of soil covering equipment such as rotary tillers, discs, etc., to a minimum depth of 6 inches using a single-pass incorporation followed immediately by a roller/jacketer to smooth and compact the soil surface.

SOIL FUMIGATION INTERVAL: Planting may take place only after odors of either TELONE II or K-PAM HL are no longer present within the zone of fumigation. If K-PAM HL follows TELONE II and is applied in the spring with the Noble Plow Blade, apply all fertilizers at least 7 days after the application of K-PAM HL. Thoroughly aerate the soil 5 to 7 days after the application of K-PAM HL by shallow plowing and/or discing to allow the fumigant odors to dissipate. Wait 14 to 21 days after the application of K-PAM HL before planting the crop. Use the 21-day interval if temperatures are below 60°F regardless of any other precautions that may have been taken. In addition to waiting 21 days, set indicator plants (e.g., tomato seedlings) in various places in the treated field and cover the plants with a “hot cap”, plastic sheeting, bucket, etc., to trap and contain any fumigant odors present. Failure to do so may result in injury before planting the crop. Do not plant the crop if injury to indicator plants is observed. If fumes are noticeable at time of planting, stop planting and rework the soil. If TELONE II follows K-PAM HL and is applied in the spring, wait at least one week for each 10 gallons of TELONE II applied beyond the initial undisturbed period before planting the crop. If fumigant odors are present in the planting, thoroughly aerate the soil following shallow ripping and/or discing to allow fumi-

gant odors to dissipate. Do not till the soil so deep as to move untreated soil from below the treated zone into the treated soil.

Special Considerations and Precautions:

• Use of this sequential program of reduced rates of TELONE II and K-PAM HL does not guarantee pest-free potatoes at harvest.

• Use of TELONE II and K-PAM HL according to these use directions will control Root Knot and Lesion nematode populations present within the fumigated zone at the time of fumigation. The fumigated zone can vary depending upon the number of factors such as fumigant rate, application methods, product placement, soil moisture, soil type, soil temperature and soil till (including soil compaction and soil porosity). The sequential combination of reduced rates of TELONE II and K-PAM HL will not control or prevent re-infestation subsequent to the treatment. Subsequent pest populations may infest the fumigated zone from irrigation water, equipment for simultaneous application of each product.

• The application of TELONE II to reduce the potential for over-winter soil erosion.

• Refer to the product labels affixed to the containers for both TELONE II and K-PAM HL for recommended soil conditions, product performance can be expected to improve as the soil conditions move toward optimum. Use of this sequential application program of TELONE II and K-PAM HL under soil conditions outside the recommended range of soil conditions can be expected to yield less than satisfactory performance.

NOTE: When TELONE II and K-PAM HL are applied simultaneously, the most restrictive personal protective equipment, worker notification and re-entry restrictions specified on labels for each product must be followed.
For soil injection, apply K-PAM HL as a broadcast treatment at a minimum rate of 24 gallons per treated acre using either shanks, sweep blades or double winged shanks. Single shanks should be spaced no more than 6 inches apart with either single injection outlets any more than 6 inches deep or dual injection outlets spaced at 6 and 12 inches deep. Single sweep blades should be spaced no more than 12 inches apart with sweeps 12 inches wide and a spray nozzle that will provide broadcast coverage from sweep tip to sweep tip. Double-winged shanks should be spaced no more than 12 inches apart with no more than 9 inches between adjacent wings and with spray nozzles that provide uniform coverage.

For surface incorporation, apply K-PAM HL at the minimum rate of 24 gallons per treated acre as a broadcast application to the soil surface immediately in front of soil covering equipment such as rotary tillers, discs, etc., set to a minimum depth of 6 inches.

Sealing The Soil After Application
Immediately after application the soil must be sealed to prevent fumigant loss and ensure that an effective concentration of fumigant is maintained within the soil. Chisel traces resulting from the TELONE II application must be disrupted to a depth of at least 4 to 6 inches. This may be accomplished with the K-PAM HL applicator or with a disc or similar device.

As a final step to compact the soil surface and help maximize soil sealing, all above applications must be followed with a ring roller or culti-packer.

Soil Fumigation Interval
Planting may take place only after the odors of both TELONE II and K-PAM HL are no longer present. Following application and sealing leave the soil undisturbed for 7 to 10 days. The longer undisturbed interval may be necessary if the soil is or becomes cold or wet during this period.

For spring applications, thoroughly aerate the soil after the initial undisturbed interval by shallow plowing and/or discing to allow the fumigant odors to dissipate. Allow 21 days prior to planting.

To promote the effective operation of the Ring Rite system, immediately in front of soil covering equipment and with spray nozzles that provide uniform coverage.

Repeat this rinsing procedure two more times.

Nonrefillable container. Do not reuse or refill this container. Offer for recycling if appropriate.

Special Considerations And Precautions:
- Use of this simultaneous application program of reduced rates of TELONE II and K-PAM HL does not guarantee pest-free potatoes at harvest.
- Use of TELONE II and K-PAM HL according to these use directions will control Root Knot and Lesion nematode populations present within the fumigated zone at the time of fumigation. The fumigated zone can vary depending upon a number of factors such as fumigant rate, application methods used, depth of fumigant application, soil moisture, soil type, soil temperature and soil tilth (including soil compaction and soil porosity). The simultaneous combination of reduced rates of TELONE II and K-PAM HL will not control or prevent re-infestation subsequent to the treatment. Subsequent pest populations may infest the fumigated zone from irrigation water, equipment, potato seed or other sources of contamination, or may invade the fumigated zone from surrounding untreated soil such as from beneath the fumigated zone or from within non-fumigated pockets within the fumigated zone.
- In fields with a history of severe Columbia Root Knot nematode problems, the maximum Federal label rate of 20 gallons of TELONE II per treated acre is recommended in simultaneous combination with a minimum of 30 gallons of K-PAM HL per treated acre, per these label directions.
- With fall applications, a cover crop such as wheat or grass may be planted following the undisturbed soil interval associated with this application to reduce the potential for over-winter soil erosion.
- Refer to the product labels affixed to the containers for both TELONE II and K-PAM HL for further recommendations and precautions for optimum fumigant performance. Within the range of recommended soil conditions, product performance can be expected to improve as the soil conditions move towards optimum. Use of this simultaneous application program of TELONE II and K-PAM HL under soil conditions outside the recommended range of soil conditions can be expected to yield less than satisfactory performance.

NOTE: The “Use Directions for the Pacific Northwest” may be used in other areas of the country, if not prohibited elsewhere on the label. Consult your local Sales Representative or extension personnel for further directions or recommendations.
**DIRECTIONS FOR USE**

**AGRICULTURAL USE REQUIREMENTS**

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 190. This standard contains requirements for the protection of agricultural workers on farms, nurseries, greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard (WPS).

**Entry-restricted period and notification requirements**, see the Entry Restricted Period section of this label.

**USER SAFETY REQUIREMENTS**

Follow manufacturer's instructions for cleaning/maintaining PPE. If more information not available, wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Do not wear contaminated clothing. If pesticide gets inside, wash thoroughly and put on clean clothing. Store undamaged containers out of reach of children.

**ENVIRONMENTAL HAZARDS**

This pesticide is toxic to mammals, birds, aquatic invertebrates and fish. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash water or rinsate. Metam-sodium has certain properties and characteristics in common with chemicals that have been detected in groundwater (highly soluble in water and has low adsorption to soil).

**STORAGE AND DISPOSAL**

Do not contaminate water, food, or feed by storage or disposal. **PESTICIDE STORAGE: Do not expose to extreme temperatures. Do not stack more than four containers on top of each other. Pesticide wastes are toxic. Improper disposal of excess pesticide spray mixture or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to the labeling instructions, contact your State Pesticide or Environmental Protection Agency or the Hazardous Waste representative at the nearest EPA Regional office for guidance.**

**CONTAINER DISPOSAL:** Nonrefillable container. Do not reuse or refill this container. Offer for recycling if appropriate. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into an application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container full with water. Replace and tighten closures. Stand the container on its end and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Store the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empties the rinsate into an application equipment or a mix tank. Keep and wash PPE separately from other laundry. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not place empty containers in the garbage or trash.

**USER SAFETY REQUIREMENTS**

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling product. Wash the outside of gloves before removing.

**EMERGENCY INFORMATION**

As soon as possible, wash thoroughly and change into clean clothing.

For untreated applications, leaching and runoff may occur if there is heavy rainfall after soil fumigation.