RESTRICTED USE PESTICIDE
Due to acute inhalation toxicity to humans.

For 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 ORNAMENTAL, 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, Lambsquarter, Pigweed, Watercress, Amaranth species, Watercress, Johnsongrass, Pigweed, Wild Morning-Glory and Purslane, Nematodes and Symphytids. Soil-borne diseases such as Rhizoctonia, Pythium, Phytophthora, Verticillium, Sclerotinia, Oak Root Fungus and Club Root of Crucifers. Refer to specific crops and application methods to determine control or suppression of the target.

ACTIVE INGREDIENT:
Potassium N-isopropylcarbamate* 

45.0%

INERT INGREDIENTS:

55.0%

TOTAL:

100.0%

*Contains 5.8 lbs. active ingredient per gallon
U.S. Patent No. 5,994,487 and 5,075,332

KEEP OUT OF REACH OF CHILDREN
DANGER - PELIGRO
Si usted no entienda la etiqueta, busque a alguien que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)

FIRST AID
If on skin or clothing:
• Take off contaminated clothing.
• Rinse skin immediately with plenty of water for 15-20 minutes.
• Call a poison control center or doctor for treatment advice.

If in eyes:
• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
• Call a poison control center or doctor for treatment advice.

If inhaled:
• Move person to fresh air.
• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.
• Call a poison control center or doctor for treatment advice.

If swallowed:
• Call a poison control center or doctor immediately for treatment advice.
• Do not induce vomiting unless told to do so by a poison control center or doctor.
• Do not give anything by mouth to an unconscious person.

EMERGENCY INFORMATION
Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

FOR THE FOLLOWING EMERGENCIES, PHONE 24 HOURS A DAY:
Transportation: CHEMTREC

1-800-424-9300
Or: AMVAC

1-323-264-3910

SEE INSIDE BOOKLET FOR ADDITIONAL PRECAUTIONARY STATEMENTS AND DIRECTIONS FOR USE.

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
DANGER: Corrosive. Causes skin damage. May be fatal if absorbed through the skin. Do not get on skin or clothing. Prolonged or frequent repeated skin contact may cause allergic reactions in some individuals. Harmful if swallowed or inhaled. Irritating to eyes, nose and throat. Avoid breathing vapor or spray mist. Do not get in eyes.

PERSONAL PROTECTIVE EQUIPMENT (PPE)
Some materials that are chemical-resistant to this product are barrier laminate or vinyl ≥ 14 mils.

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

Handlers applying via field sprayer while irrigation sprinklers are running or handlers who may be exposed to liquid spray or Granular application systems or spraying equipment must wear:
• Chemical-resistant overalls long-sleeve shirt and long pants,
• Chemical-resistant gloves,
• Chemical-resistant footwear plus socks,
• Chemical-resistant headgear,
• 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 or monitoring ground equipment with open cabs, handlers repairing or maintaining irrigation or chemical equipment during application, and handlers cleaning up spills or equipment must wear:
• Overalls 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 section 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,
• 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:
• An organic-vapor respirator with the pre-filter approved for pesticides (NIOSH approval number prefilter TC-23C), or
• A respirator with a canister approved for pesticides (NIOSH approval number prefilter TC-14G) or
canister with any N, R, P or HE prefilter.

EPA Reg. No. 5491-483
EPA Est. No. Q5481-CA-1 Q144-MO-1 61842-WA-1 Q Other

Net Contents:
As Marked on Container

AMVAC
4100 E. Washington Blvd. Los Angeles, CA 90023 U.S.A
1-323-264-3910

11295-7
USER SAFETY REQUIREMENTS

Follow manufacturer's instructions for cleaning/maintaining PPE. If not such instructions for wash-ables 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 contain-er. Wash or dispose as specified.

User Safety Recommendations

- 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 remove-ning. 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 water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash waters or rainwater. Metam sodium has toxic properties and characteristics in common with chemicals that have been detected in groundwater (highly soluble in water and has low adsorption to soil).

For untargeted applications, leaching 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 permitted 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 infor-mation 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 gender and shredder equipment is prohibited. Open-pour applications are prohibited.

The following activities are prohibited from being performed in the fumigant 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; by anyone other than persons who have been appropriately trained and equipped as handlers in accordance with the requirements in the Worker Protection Standard (40 CFR Part 170), from the start of the applica-tion until the entry-restricted period ends (NOTE: persons installing, perforating, removing, re-pairing, and monitoring tanks are considered handlers for the durations listed below). Those activities include those persons:

- Participating in the application as supervisors, loaders, drivers, tractor co-pilots, shovellers, cross ditchers, or as other direct application participants (the application starts when the fumi-gant is first introduced into the soil and ends after the fumigant has stopped being deliver-ed/dispersed to the soil);
- Using devices to take air samples to monitor fumigant air concentrations;
- Persons cleaning up fumigant spills (this does not include emergency personnel not associated with the fumigation application);
- Handling or disposing of fumigant containers;
- Cleaning, handling, adjusting, or repairing the parts of fumigation equipment that may contain fumigant residues;
- Installing, repairing, 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 tanks:
  - until 14 days after application is complete if tanks are not perforated and removed during those 14 days, or
  - until 48 hours after tanks perforation is complete if they will not be removed within 14 days after application.

FOR HANDLERS

For all applications except water run: from the start of the application until the fumigant has stopped being delivered/dispersed 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 applicator to start the application (including setup, calibration, and initiation of the application). If the certified applicator leaves the site but must return at least every two hours to visually re-inspect the equipment to ensure proper functioning and must directly supervise all Worker Protect-ion 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/dispersed into the soil until the entry-restricted period expires, the certified applicator does not have to be on-site, but must have communicated, in a manner that can be understood by the site owner/operator and handlers responsible for carrying out those activities, the information necessary to comply with the applicable label and procedures specified 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 agri-cultural establishments and commercial pesticide applicators.

The certified applicator must provide Fumigant Safe Handling information to each handler in-cluded 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 or at www.epa.gov/fo/nmamtctraining.

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 are not performing one 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 pro-vided with 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 fitted, 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 ap-parent, if the measured concentration of MTC 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 type 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 eval-uation consists of a questionnaire that asks about medical conditions (such as a heart moni-tor) that might be problematic for respirator use. If conditions 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 type 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 re-quired or if operations must cease for any person performing a handling task as defined in this labeling.

- at all time any handler experiences sensory irritation (tearing, burning of the eyes or nose) then either:
  - 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 MTC have de-creased 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 O2sens or Sensdyne device must be used. The devices must have a sen-sitivity of at least 600 ppb for MTC.
- 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 an animal handler experiences any sensory irritation when wearing an air-purifying respirator, or (2) an air sample is greater than or equal to 6,000 ppm, then all handler activities must cease and handlers must be removed from the application block. If operations cease, the emergency plan established in the FMP must be implemented.

Handlers can resume work activities without respiratory protection, if two consecutive breathing zone samples at the handling site at least 15 minutes apart show levels of MITC have decreased to less than 600 ppm, 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 first experienced.

Work activities can resume if all the following conditions exist provided that the appropriate air-purifying respirator is worn:

1. Two consecutive breathing zone samples for MITC taken at the handling site at least 15 minutes apart must be less than 6,000 ppm.
2. Handlers do not experience sensory irritation while wearing the air-purifying respirator, and
3. 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 tarping are defined, within certain time limitations, as handlers (see definition of tarp handler in this labelling) and must be provided the PPE and other protections for handlers as required on this labelling and in the Worker Protection Standard for Agricultural Pesticides.

Tars must not be perforated until a minimum of 5 days (120 hours) have elapsed after the fugitive injection into the soil is complete (e.g., injection of the fugitive product and tarping have been done). If tarping has been done 10 hours after injection of the product and tars have been laid or after drip lines have been planted and tarps have been laid, unless a weather condition exists which necessitates the need for early perforation or removal. See Early Tarp Perforation for Broadcast Applications Only and Early Tarp Perforation for Flood Prevention Activities sections.

It tarp(s) will be removed immediately after planting, tarp removal must not begin until 2 hours after tarp perforation is complete. If tarp(s) will not be removed after planting, planting or transplanting must not begin until at least 48 hours after the tarp perforation is complete.

Taps used for tarping may be removed manually ONLY for the following situations:

- At the beginning of each row where a couther 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 tars must be perforated (cut, punched, pricked or sliced) only by mechanical methods.

Tarp perforation for broadcast turgitions must be completed before noon.

For broadcast turgitions, tars must not be perforated if rainfall is expected within 12 hours.

Early Tarp Removal for Broadcast Applications Only:

Tars 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 (i.e. wind and rain may cause high wind, hail, or storms that blow tarp(s) off the field and create a hazard, e.g., tarp(s) 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 tarp(s) are removed before the required 5 days have elapsed due to adverse weather, the events must be documented in the post-turgination 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.

Tars must be immediately retouched and packed after soil removal.

AGRICULTURAL USE REQUIREMENTS

5 days (120 hours) after application is complete if tars are not perforated and removed for at least 14 days following application (Note: persons installing, repairing, or monitoring tarping are handlers until 14 days after the application is complete if tars are not perforated and removed during those 14 days). If 48 hours after tarp perforation is complete if they will not be removed for at least 14 days following application, or

Tarp removal is completed if tars are both perforated and removed less than 14 days after application.

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

NOTIFICATION REQUIREMENT

Notify workers of the application by warning them orally and by posting Fumigant Treated Area sign. The signs must bear the skull and crossbones symbol and state:

- DANGER/FELIGRO,
- "Do not handle. DO NOT ENTER NO ONE ENTRE.",
- "Metam Sodium Fumigant in Use."
- The date and time of fumigation,
- The date and time the entry restricted period is lifted,
- "KRM II," 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 of the signs.

Post the Fumigant Treated Area sign 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 of, 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 if 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.wyo.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 detected 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 tilled 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, to a minimum 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 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.
- The injection point for bedded and broadcast applications shall be a minimum of 3 inches from the final soil surface. 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-shaker, roller, press wheel or by similar device, OR
  - Covering the treated soil with 3-4 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.

(AContinued)
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. The wind speed must 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 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 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.
- Apply the product on the soil immediately after the bed-shaping equipment. The soil surface must be compacted immediately after application using one or more of the following methods: incorporation with a bed-shaper, roller, press wheel or similar device, OR
  - Covering the treated soil with 5-6 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.

Sprays
- When sprays are used for erosion control, tarp must be installed immediately after application.
- When sprays are 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 after 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 planning,
  - 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.

Schedule, equipment, and procedures for tarp removal.

Soil Moisture
- 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 ball (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 Field 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 (50-70% 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 (50-70% available soil water moisture) to form a ball of 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 smooth ball with defined finger marks, very light water staining on fingers, ribbons between 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, very light 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 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 other have a check valve located as close as possible to the final injection point, or drainpurge the line of any remaining fumigant prior to 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 off via air compression) 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 disconnect 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 meter, e.g. mechanical, electronic, or Red-ball type monitor.
- For coated 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 fumigant 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.
- Make all filters and valves to make sure they are free of debris and obstructions.
- Check and clean the orifice plates.
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 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 sticking 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 starting on fingers, darkened color, will not stick.

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

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

- **poor 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 furrowed under conditions of higher soil moisture than finer textured soils; however, if the soil moisture is too high, furrow movement will be retarded and effectiveness of the treatment will be reduced. Previous and/or local experience will guide 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 tilling 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 furrow water to drain or drip onto the soil surface.

- Equipment should 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. (The weight 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 furrowing, and a check valve that is visible to the tractor pilot during application to prevent backflow of the furrowing into the system.

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

Weather Conditions

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

- Do not apply if a shallow, compacted (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 furrowing is planned.

- Detailed local forecasts for weather conditions, wind speed, and air stagnation advisories may be obtained online at [http://www.mws.nasa.gov](http://www.mws.nasa.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 turbulent vortices 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 nighttime. Unfavorable conditions are common on nights with limited cloud cover and light to moderate 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 furrowing treatment zone, a deep tillage to fracture these layers must occur prior to or as part of the soil furrowing 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 furrowing. 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 furrows 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 furrowing. Plant residue on the field serves to prevent soil erosion from both wind and water. Spray or drop 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:
  - Compost 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 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:
  - Minimum size of damage that will be repaired.
  - Minimum size of tarp that will be repaired.
  - Other factors used to determine when tarp repair will be conducted.
  - Schedule, equipment and methods used to cut tarp.
  - Application plans and procedures following cutting and/or sitting 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.

- EXCEPT: 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 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 sticking on fingers, will not ribbon.

- **medium** textured soils (sandy clay loam, and silt loam): there must be enough moisture (50-75% available soil water moisture) to form a smooth ball with definite finger marks, light soil/water starting on fingers, ribbons between thumb and forefinger.

- **fine** textured soils (clay, clay loam, and silt loam): 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, pliable and forms a weak ribbon between the thumb and forefinger.

- **poor 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 furrowed under conditions of higher soil moisture than finer textured soils; however, if the soil moisture is too high, furrow movement will be retarded and effectiveness of the treatment will be reduced. Previous and/or local experience will guide 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 content 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 furrowirrigant to drain or drip onto the soil surface.
- Dry connect fittings (closed transfer system) must be installed on all tanks and transfer hoses.
- Application equipment must be in good working order.
- All tanks, hoses, fittings, valves and connections must be serviceable, tightened, sealed and not leaking.
- 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 metam.
- Each nozzle must be equipped with a flow meter, e.g., mechanical, electronic, or Flow-ball type monitor.
- For undrilled product, aluminum, brass, copper, galvanized iron, and zinc materials cannot be used.
- All tanks must include a filter to remove any particulates from the furvigorant, and a check valve that is visible to the tractor pilot during application to prevent backflow of the furvigorant into the pressurizing cylinder.
- Before using a furvigorant rig for the first time, or when preparing it for use after storage, the operator must check the following components 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.

Center Pivot Applications

Wind Speed

- 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 or forecasted to reach 5 mph during the application and the maximum wind speed is 10 mph.
- For sprinkler or center pivot applications using: 1) a solid stream, AND 2) having release height and spray height less than 4 feet, AND 3) having 29 lbs or less 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.

Weather Conditions

- Prior to furvigorant, the weather forecast for the day of the application and the 48-hour period following furvigorant application must be checked to determine if unfavorable weather conditions exist or are predicted (see Identifying Unfavorable Weather Conditions section) and whether furvigorant application 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 furvigorant 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 fugvigorant vapors near the ground. The resulting air mass can move off-site in unpredictable directions. These conditions typically exist prior to sunrise and continue past sunrise and persist as far 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 be identified by smoke from a ground 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 seeder and reduce effectiveness of the application. If subsurface soil compaction layers (hardpans) are present within the intended furvigorant 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 that is present must not interfere with the application or the soil seal. Non-decomposing plant material may harbor pests that may not be controlled by furvigorant. 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 form when the furvigorant is applied. These "chimneys" allow the soil furvigorant 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 furvigorant. 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 80°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.
- 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:
  - If 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, drenched color, moderate water flowing on fingers, will not ribbon.
  - If moderately coarse textured soils (sandy loam and silty loam) 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.
  - Fine textured soils (clay, clay loam, and silty clay loam) must be enough moisture (50-75% available soil water moisture) to form a ball, very light staining on fingers, darkened color, will be sticky.
  - For fields with more than one soil texture, soil moisture content in the lightest textured (fine sands) 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 furvigorated under conditions of higher soil moisture than fine textured soils; however, if the soil moisture is too high, furvigorant 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 the 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 as close to the time of application as possible.

Flushing Irrigation Lines

- Do not allow furvigorant to remain in the irrigation system after the application is complete. After application of the furvigorant, flush the irrigation and irrigation system with untreated water. The flush time must be adequate to purge the furvigorant from the irrigation and irrigation system, but should not be less than the time it takes to flush the irrigation system. Common lines are used for both the furvigorant application and the water treatment/seal (if applied), these lines must be adequately flushed before starting the water treatment/seal.

Application and Equipment Considerations

- Anti-siphon and back-flow prevention devices must be installed and working properly.
- Use only tanks constructed with materials approved for handling furvigorant. Tanks must be in good condition to ensure product does not spill or leak.
- Tanks must have proper pesticide seals on them.
- All tanks, hoses, fittings, valves and connections must be serviceable, tight, sealed and not leaking.
- Use only tanks, hoses and fittings designed to withstand the pressure of the system and resistant to metam.
- Use only positive displacement pumps. Do NOT use impellers made of brass, aluminum, or galvanized materials.
- For undrilled product, aluminum, brass, copper, galvanized iron, and zinc materials cannot be used.
- 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 contain a functional, automatic, quick-closing check valve to prevent the flow of fluids toward the injection pump.
- 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 injection 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.

Solid Set Sprinkler 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 and the maximum wind speed is 10 mph.
Weather Conditions
- Prior to fogging, the weather forecast for the day of the application and the 48-hour period following the application 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](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
- Soil must be good in light and free of large clods. Large clods can prevent effective soil sealing and reduce effectiveness of the application. If soil clod formation layer (the 6 inches) 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-decomposable 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, crops that are 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.

Soil Moisture
- The soil moisture in the top six inches of soil must be between 60% to 60% of soil capacity (field capacity) immediately prior to the application.
- If appropriate measuring equipment is not used to determine whether soil moisture in the top six inches of soil is between 60% to 85% of soil capacity (field capacity) immediately prior to the application, the USDA Feeder 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 crumbly sand grains on fingers, darkened color, moderately wetting out 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, leaves wetting out on fingers, darkened color, pliable and forms a weak ribbon between the thumb and forefinger.
  - medium textured soils (sandy clay loam, and silty loam) there must be enough moisture (50-75% available soil water moisture) to form a ball, very light stirring on fingers, leaves wetting out 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 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 as close to the time of application as possible.

Flushing Irrigation Lines
- Do not allow fumigant to remain in the irrigation system after the application is complete. After application of the fumigant, flush the irrigation and injection system with untreated water. The flushing water must be adequate to remove the fumigant from the injection and irrigation system, but should be less than the amount that could over-saturate the beds. It is common practice to use a sufficient volume of water to flush the fumigant from the injection and irrigation system, but only the volume necessary to flush the beds should be used. Use the maximum amount of water necessary to ensure the fumigant is flushed from the entire irrigation system, but make sure not to oversaturate the beds.

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 metam. Tanks must be in good condition to ensure product does not split or leak.
- Tanks must have proper pesticide labels on them.
- All tanks, hoses, fittings, valves and connections must be serviceable, tightened and not leaking.
- Use only tanks, hoses and fittings designed to withstand the pressure of the system and resistant to metam.
- Use only positive displacement pumps. Do NOT use impellers made of brass, aluminum, or galvanized material.
- For undiluted product, aluminum, brass, copper, galvanized iron, and zinc materials cannot be used.
- 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 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-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.

Drench 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 5 mph during the application.

Weather Conditions
- Prior to fogging, 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](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
- Soil must be good in light and free of large clods. Large clods can prevent effective soil sealing and reduce effectiveness of the application. If subsoil/surface 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 fumigation 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-decomposable plant material may harbor pests that will not be controlled by fumigation. 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.
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 Field 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 roll.

- 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 slight 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.

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 estimated 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 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 but moisture is available to the surface by tillage prior to the application. To conserve soil moisture, tillage should be done as close to the time of application as possible.

Applications must be followed immediately with 0.20 to 0.50 inches of water through solid set sprinklers.

- A minimum of two water soils must be applied; one water soil on the first evening of the application and the second on the evening of the day after application.

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 nematode. Tanks must be in good condition to ensure product does not split 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.

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

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

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

Each nozzle must be equipped with a flow monitor, e.g., mechanical, electronic, or flow-chat type monitors.

- To inject fumigant, using a metering system, effectively designed and constructed of materials that are compatible with the fumigant and capable of being fitted with system interlocking controls.

- Nozzles and metering devices are of correct size and are sealed and undischarged.

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

- 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-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 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 at least 12 to 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.nes.nws.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 morning. 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 tiled 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-decomposed plant material may harbor pests that will not be controlled by fumigation. 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 fumigant to move through the soil quickly and escape into the atmosphere. This may create potentially harmful conditions for workers and bystanders and limit 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, 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 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 Field 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 roll.

  - 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, pliable and forms a weak ribbon between the thumb and forefinger.

  - Fine textured soils (clay, clay loam, and silt 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 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 estimated 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 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 as close to the time of application as possible.

Targs

- When targs are used for emission control in drip irrigation, the targs must be installed immediately after application.

- When targs are used, a written targ plan must be developed and included in the FMP that includes:

  - Schedule and procedures for checking targs for damage, tears, and other problems,
Soil Conditions
- Soil must be in good tilth and free of large clogs. Large clogs can prevent effective soil sealing and reduce effectiveness of the application. Subsurface soil compaction layers (hardpans) are present within the intended fumigation treatment zone, tilling 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-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.

Tarp
- When tarps are used for emission control, the 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 tarps 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 planting.

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., certain 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 Feed 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 clumped sand grains on fingers, darkened color, moderate water staining on fingers, will not roll.
  - 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 soilwater 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, pliable and forms a weak ribbon between the thumb and forefinger.
  - Fine textured soils (clay, clay loam, and silt clay): there must be enough moisture (50-75% available soil water moisture) to form a smooth ball with defined finger rinkles, light soilwater staining on fingers, ribbons between thumbs 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 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 tilling prior to the application. To conserve soil moisture, tilling should be done as close to the time of application 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 structure 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.
Backflow prevention devices must be installed and in working order.

Use only tanks constructed with materials approved for handling insecticides. Tanks must be in good condition to ensure product does not spill or leak.

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

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 resistant to insecticides.

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

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.

Flow rates must be calibrated and checked for each application.

All previous materials applied with the system must be cleaned thoroughly prior to fumigation.

System must be flushed after application to totally remove all fumigant.

**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 (e.g., 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 (age 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, quadrant), 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 tarps.
  - Schedule and dates for cutting tarp.
  - Schedule and dates for removing tarps.
- **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 fumigation 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, federal/state/local/tribal contacts, key personnel and emergency procedures/responsibilities in case of an incident, equipment/partial/total 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 contact is made.**
- **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.
    - 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 the 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.
  - 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/local/tribal prophylaxis, health, safety, or 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 24-hour period following the fumigation.**
- **Tarp damage and repair information:**
  - Location and size of tarp damage.
  - Description of tarp.tarp sealant equipment failure.
  - Date and time of repair.
  - Tarp perforation/removal details (if applicable).
  - Description of tarp removal (different than in the FMP).
  - Date tarps were perforated.
  - Date tarps were 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 complaint.
  - 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.
    - Location where irritation was observed.
  - Resulting action (e.g., cease operations, continue operations with air-purifying respirators).
  - When using a direct-read instrument:
    - Sample date and time.
    - Handler task/activity.
    - Location.
    - Air concentration.
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 retain higher rates. For example, a heavy clay 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. Clean mix tanks, 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 following the procedure.

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., 30 gallons of K-PAM HL and 30 gallons of liquid fertilizer are to be applied per treated acre, then the mixture should be mixed in a 30:30 or 1:1 ratio. Mix in a glass container. 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. Should the mixture separate after 30 minutes but is readily remixed with agitation, the mixture can be used. Inadequate agitation is maintained in the tank.

DO NOT PLACE CAPS ON MIX JAR AS INCOMPATIBLE MIXES MAY EVOLVE HYDROGEN SULFIDE GAS. USE PROMPTLY AFTER MIXING WITH WATER OR FERTILIZER. DO NOT ALLOW THE SOLUTION TO STAND. FLUSH ALL EQUIPMENT WITH WATER AFTER EACH DAY’S USE. DISASSEMBLE VALVES AND CLEAN CAREFULLY.

CHEMICATION OF K-PAM HL

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

Apply this product only through sprinkler including center pivot, lateral move, end tow, side (wheel) roll, trailer, big gun, solid set, or hand move: Flood (basin); furrow; border, or drip (frillke) 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 Specialist, equipment manufacturer or other experts. Do not connect an 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: AMVIC 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 making 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 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 (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

Effect 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.

Recontamination

Precipitation must be taken to prevent recontamination 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 cool following the application, planting can begin 14 to 21 days after treatment. If soils are heavy or especially heavy 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 to 30 days 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 treatment 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 a few days after application, if it 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 (1) low rates of fumigants, (2) light soil, (3) high soil temperatures, (4) low soil moisture, (5) shallow cultivation depth, and (6) repeated cultivation after fumigation. Seedbeds are less susceptible to residual soil fumigant injury than transplanted crops. In general, fumigants escape slowly from cold, wet, heavy soils. If in doubt, perform either the lettuce sees 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 days, the product is still available and an extended wait period must be observed.

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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 seeding indicator plant with a hot cap to check for activity or fumes (follow instructions in preceding paragraph). DO NOT PLANT if fumes are detectable or injury to plant has occurred. Re-seed 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 troeze, dig into the treated soil to a depth of 3 inches. Remove 2 to 3 soil samples, mix, 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 the 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.

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, Maverick, Starr, Willacy, Zapata.

SOIL INJECTION

Apply with injection equipment such as shanks, blades, fertilizer wheels, plows, etc. Apply K-PAM HL at the rate of 30 to 67 gallons per treated acre (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 raking or tarping after rolling helps prevent fumigant escape. It may be necessary to stagger the injection placement on two or more tool bars to prevent soil build up during application.
FIELD APPLICATION TO BEDS OR ROWS
SOIL INJECTION (Pre-formed beds): K-PAM HL may be injected into pre-formed plant beds following the directions in the "Soil Injection" section above. If a wider treated band is desired, space 2 or more shanks at intervals of 5 inches to cover the desired treated width. Use thin injection shanks and inject K-PAM into 4 inches deep into well prepared soil. Follow immediately with a bedshaper, roller press wheel or similar device, or cover with an adequate amount of soil to seal the fumigant inside the soil. Light watering or a tarp after rolling may be used to help prevent fumigant escape. Apply at the rate of 30 to 62 gallons per treated acre (or see crop-specific considerations in the Additional Information section of this label) (see "Method of Determining Fluid Ounces per 100 Feet of Linear Row" section). Place shanks 5 inches apart to cover the desired treated width.

SOIL INJECTION (At Bed Forming Operation): K-PAM HL may be injected during the bedding or row building processes, or to pre-formed beds, using one of the following delivery systems: (1) single narrow knife blade (2) a series of narrow knife blades set no more than 5 inches apart, (3) a spray blade, (4) tined shanks, (5) spray rake or (6) similar equipment that places K-PAM HL in contact with the pest to be controlled or suppressed. The use rate for the above operations is 30 to 62 gallons per treated acre (or see crop-specific considerations in the Additional Information section of this label). Reduced rates will vary depending upon the actual width of the treated bed desired (see "Method of Determining Fluid Ounces per 100 Feet of Linear Row" section). Apply the K-PAM HL, at the desired depth in the soil and follow immediately with the soil capping operation, bedding process, or roller/pan to seal the fumigant into the soil. SOIL COVERING METHOD (Bed Over Methods): K-PAM HL may be sprayed in a bed wide band onto the soil immediately ahead of bed shaping equipment. Cover the K-PAM HL with soil to a depth of 3 to 6 inches. The soil should be rolled and compacted immediately. At the rate of 30 to 62 gallons per acre of treated soil (or see crop-specific considerations in the Additional Information section of this label) (see "Method of Determining Fluid Ounces per 100 Feet of Linear Row" section). DRENCH APPLICATION ON BEDS OR ROWS: K-PAM HL may be applied to finished beds for annuals or perennials as a drench application. Follow the instructions on the label for the correct rate of application. Do NOT APPLY INTO ANY AIREAL DITCHES.

DRIP IRRIGATION SYSTEM: K-PAM HL must be applied through a drip irrigation system designed to wet the soil thoroughly in the area being treated. Meter 50 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 APPLIED 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 shank spaced no more than 12 inches apart and spray nozzles spaced 6 inches apart; (4) a single nozzle spaced 12 to 16 inches deep and 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/pan 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 Noble Plott Blades in Spring, the following precautions must be taken:

- 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 the combination thereof, to allow the fumigant to dissipate. (If tarp is used, refer to the Tarpon Perforation and/or Removal Section for additional guidance on timing of these activities). Do not work soil deeper than the depth of treatment.
- Planting may take place 14 to 21 days after the K-PAM HL application provided no fumigates are detected at the time of planting.
- If noxious fumes are noticeable at planting, do not plant and rewet the soil.
- If the air temperature is less than 40°F, delay planting of treated beds 2 to 3 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.

SEED TREATMENT: A suitable fungicide should be used to treat all crop seed being planted into the treated soil.

PEANUTS: For the prevention and/or control of Rhizoctonia Black Rot (RB) and nematodes, apply K-PAM HL at the rate of 6 gallons per treated acre (0.5 lb. oz. per 100 linear feet of row). Use with partially resistant cultivars (NC-19C or others as designated by your local Agricultural Extension Service) in cases of severe disease pressure. Plant other varieties only in cases of light CSR pressure.

Soil Preparations: Before applying K-PAM HL, all residues from the previous crop should be removed (manually by fall disking) and plowed under in the spring with a moldboard plow. Soil incorporated pre-plant herbicides must be applied prior to the application of K-PAM HL.

Application: Apply 8 to 10 inches below seed placement with injector shank or coulter type applicator placed in front of a bedshaper to mark rows. Soil temperatures must be in the range of 60°F to 90°F at a 3-inch depth at time of treatment.

Tillage and Planting After Application: Do not mix untreated soil with treated soil by tillage or other cultural practices. Plant the peanuts in the center of the treated beds no earlier than 14 days following the application of K-PAM HL. An at-planting nematocide treatment will be necessary in fields with heavy infestations of Root Knot, ring, and/or sting nematodes.

MINT (SUPPRESSION OF VERTICILLIUM WILT): When infestation is limited to small spots in the field, Verticillium wilt may be controlled by treating the infected spots. Apply at the rate of up to 62 gallons of K-PAM HL per treated acre using injector blade or thin shank injector rig. Follow directions for "Field Application Where Entire Area Is Being Treated."
POTATOES: For suppression of potato pests such as nematodes, weeded seeds and Verticillium dahliae (Early Maturity Potato). For soil injection, apply a minimum of 30 gallons per treated acre of K-PAM HL following the directions for "Field Application Where Entire Area Is Treated." K-PAM HL may also be applied at the rate of 50 to 60 gallons per treated acre using a Noble Flow Blade set to 12 to 14 inches deep with spray nozzles spaced every 6 inches apart to give uniform coverage plus a surface application using a disc to immediately incorporate the K-PAM HL placed on the surface. Early spring downhill application for the Pacific Northwest: Apply 40 to 60 gallons per acre using the soil injection method as described in the "Field Application Where Entire Area Is Treated" section.

TREATS: The following crops are treated in COMMERCIAL ORCHARDS: After removing old or diseased trees and as much of the root system as possible, make a shallow basin over the planting site. Add K-PAM HL to the stream of water while filling the basin. Use 20 fl. oz. of K-PAM HL per 100 sq. ft. in sufficient water (depending on the soil type) to penetrate at least 6 ft. For control of Oak Root Fuseng, use a basin of at least 20 ft. x 20 ft., increase dosage to 240-300 fl. oz. per 100 sq. ft. in sufficient water to penetrate to the depth of the root system. If water is tanked to the trees, make sure the tank is not contaminated with the crop residues prior to spraying the trees.

ESTABLISHMENT OF TRANSPLANTS AND VINEYARDS: Apply 40 to 60 gallons of K-PAM HL per broadcast acre to properly prepared fields by churning in sufficient water (e.g. 3 to 18 inches) to place the K-PAM HL in contact with the target pest in the treated soil zone. To penetrate the desired root zone (6 to 8) of the crop to be transplanted. The percent field capacity of the soil prior to irrigation will help determine the amount of water to use to penetrate the desired zone. A lateral application at a K-PAM HL rate must be present while the target species is actively respiring. K-PAM HL should be placed at or slightly below the soil level of the target pest. Deep-soil ripping is recommended prior to treatment.

SYMPTOMIC SUPPRESSION: Soil should be in good seeded condition to a depth of 8 to 10 inches. Maintain adequate moisture during the spring season to bring symptotaxis to the upper soil surface. Treat during July to August when symptotaxis are in the upper soil surface. Apply a minimum of 15 gallons of K-PAM HL per treated acre (0.3 pts. per acre). Treat 100 sq. ft. of soil using broadcast or thin blade chisel injectors spaced 5 inches apart. Inject below the level of symptom concentration, usually 6 to 8 inches. Pack soil immediately after the application.

TOBACCO PLANT BEDS: Fall applications are recommended whenever possible. Read and follow the uses directions carefully.

DRENCH METHOD: Apply 1.5 gallons K-PAM HL in 150 to 200 gallons of water per 100 square yards. Application may be made with sprinklers, sprayers with nozzles or any suitable equipment. Follow directions given above for "Field Applications Where Entire Area Is Being Treated" section.

TANK MIX WITH TILLAM 86 HERBICIDE (ANTHOCYANIN ONLY): A tank mix of K-PAM HL soil fumigant plus TILLAM 86 herbicide may be used to provide the additional benefit of residual weed control. Prior to application, the mixture must be well mixed and the herbicide should penetrate to both K-PAM HL and TILLAM 86.

Method of Determining Fluid Ounces per 100 Feet of Linear Band

<table>
<thead>
<tr>
<th>Description</th>
<th>Fluid Ounces per 100 Feet of Linear Band</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Determine width or band in foot by dividing width of band in inches by 12. Example: 5 inch band</td>
<td>5 inches divided by 12 = 0.4167 inches</td>
</tr>
<tr>
<td>2. Determine square feet in 100 linear foot band by multiplying the width by the band by 100. Example: 4.166 feet x 100 feet = 416.6 square feet</td>
<td></td>
</tr>
<tr>
<td>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 per acre divided by 43,560 = 0.009596 acres</td>
<td></td>
</tr>
<tr>
<td>4. To determine the fluid ounces per 100 linear feet</td>
<td>a) 1 gallon = 128 fluid ounces; 50 gallons = 6,400 fluid ounces; 75 gallons = 6,060 fluid ounces</td>
</tr>
<tr>
<td></td>
<td>b) Multiply fluid ounces by acres. Example: 50 gallons = 6,400 fluid ounces x 0.009596 = 61.14 fluid ounces per 100 linear feet of band</td>
</tr>
</tbody>
</table>

Fluid Ounces per 100 feet of Linear Band: 61.14

SUGAR BEETS: Apply a broadcast or banded application of 30 to 60 gallons per treated acre of K-PAM HL for the suppression of Root Knot Nemrados or 30 to 60 gallons per acre for pre-plant suppression of soilborne diseases.

MINT (INCLUDING PEPPERMINT AND SPEARMINT): Apply a pre-plant broadcast application of 30 to 60 gallons per treated acre of K-PAM HL for the suppression of Root Knot Nemrados and Verticillium dahliae.

ONIONS: Apply a broadcast or banded application of 30 to 60 gallons per treated acre of K-PAM HL for the suppression of Root Knot Nemrados or 30 to 60 gallons per acre for suppression of soilborne disease.

POTATOES: Apply a broadcast sprinkler application of 30 to 60 gallons per treated acre of K-PAM HL for the suppression of Root Knot Nemrados and Verticillium dahliae. Apply a broadcast soil application of 30 to 60 gallons per treated acre of K-PAM HL for the suppression of Verticillium dahliae.

SUGAR BEETS: Apply a broadcast or banded application of 30 to 60 gallons per treated acre of K-PAM HL for the suppression of Root Knot Nemrados or 30 to 60 gallons per acre for pre-plant suppression of soilborne diseases. A full application of RO-NEET herbicide followed by tank mix with K-PAM HL in a broadcast application or band application will enhance the overall weed control.

ORCHARD RE-PLANT: Apply a broadcast application rate of 50 to 60 gallons per treated acre of K-PAM HL in a minimum of 1-acre inch of water through a sprinkler system, or a row treatment of 50 to 60 gallons broadcast equivalent to the future tree row using a weede sprayer by applying multiple passes while gradually increasing the pressure until the desired pressure is reached. This method has been applied for the treatment of specific orchard replant diseases. Trees should not be replanted into the replant site for at least 21 days after treatment. Check for fumones in the soil before planting. K-PAM HL may also be applied at the rate of 40 to 60 gallons per treated acre using a Noble Flow Blade set 12 to 14 inches deep with spray nozzles spaced every 6 inches apart to give uniform coverage with a surface application using a disc to immediately incorporate the K-PAM HL placed on the surface.

WHEAT AND BARLEY: Apply K-PAM HL at a rate of 1.5 to 6 gallons per treated acre 14 to 21 days prior to planting for the suppression of certain early season soil fungi which cause root diseases of small grains. K-PAM HL may be diluted with water or, if compatible, non-acidic liquid fertilizers (see "Application in Tank Mix with Liquid Fertilizer" section) and injected into moist soil 0 to 6 inches deep before planting.

In the PACIFIC NORTHWEST, if THE FIELD HISTORY OR SOIL SAMPLING SHOWS HIGH POPULATIONS OF NEMATODES, FUMIGATION USING BOTH K-PAM HL AND TELONE® II (SHINOHAMA CORPORATION) IS RECOMMENDED. CONSULT DOW AGROSCIESCENCES LLC REPRESENTATIVE FOR ADDITIONAL INFORMATION.

At PLANTING USES, RATES AND APPLICATION METHODS FOR K-PAM HL ON ANNUAL CROPS:

FIELD APPLICATION WHERE ENTIRE AREA IS BEING TREATED

SOIL INJECTION: Apply with injectors (shanks) blades etc. NOTE: It may be necessary to stagger the injector placement on two or more tool bars to prevent soil build up during application. Apply K-PAM HL from 2 to 6 inches deep at the rate of 2.2 to 7.25 gallons per broadcasted overall acre. 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 tiller or mulcher. Use 2.2 to 7.25 gallons per broadcast overall acre. Incorporate 4 to 6 inches deep.

The treated 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 5.5 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 immediately in front of a (1) rotary tiller equipped with "L" or sweep blades; (2) opposing discs 4 to 6 inches deep, or (3) any mechanical device that will mix the soil 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 into the seed furrow. Seed Furrow Spraying or Drug Tubes: Apply diluted fumigant through low-pressure tips spraying the soil covering the seed or through drug tubes directly into the seed furrow. Using the drum tip 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 drum tube method (0.5 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 water 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 sides of the seed. Shank stings to run in front of the planters on the same equipment. Apply at the rate of 0.38 to 0.5 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 band zone. Apply at the rate of 2.2 to 7.25 gallons per broadcast overall acre. The fluid ounces per treated row will depend on the width of the desired treated band. (See "Method of Determining Flow Ounces per 100 Feet of Linear Band.")
ASPARAGUS: To suppress garden symphty, apply 8 to 12 gallons in the early spring before the asparagus starts to grow and the syphrits are in the upper levels of the soil. Apply in enough irrigation water to penetrate to the depth of the asparagus crown.

MINTS: To suppress veronica dahliae 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: Use 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 use precautions and limits.

Sequential application of TELONE II and K-PAM HL for suppression of Veronica dahliae 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 fungitain and K-PAM HL soil fungitain. 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 the 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 fungitain as well as effective penetration of the soil surface will be more than 10 inches deep within the treated zone must be factored in before or during application of the fungitain. Soil temperature must be between 40°F and 80°F at the depth of injection, moisture must be 2 inches below the soil surface 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 Equipment
Apply TELONE II as a broadcast treatment at the minimum rate of 15 gallons per treated acre (44.3 fl oz/1000 feet of rowvool based on 15-inch centers) using either chisel (shank), Noble Plow (sweep) or modified Para Tll application equipment. Chemical equipment must have ripper-type shanks. Para Tll equipment may be modified so that outlet spacing is evenly distributed under the tool bar. With chisel and Para Tll equipment, a shank spacing of 12 to 24 inches is recommended. For chisels, 24 inches of overlap should be maintained at 6 to 12 inches per inch of overlap. For Para Tll equipment, the 12 to 24 inch overlap should be maintained at 6 to 12 inches per inch of overlap. Then follow immediately with a roll, rubber or multi-packer to seal the soil surface. Little or no crop residue should be exposed at the surface following the sealing operation. Any remaining crop residue should be the following sequence. Following application and sealing, the soil should be watered for 7-14 days. The longer interval may be necessary if the soil is or becomes cold or wet during this period.

APPLICATION DIRECTIONS FOR K-PAM HL

Soil Conditions
Soil conditions at the time of application of K-PAM HL must be between 40°F and 90°F in the treated zone and at 80% to 90% field capacity. If necessary, pre-irrigate about a week prior to treatment to adjust soil moisture to desired levels. Immediately before application, cultivate lightly if the soil has crusted.

Application Methods and Equipment
Apply K-PAM HL either by chiseling 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 chiseling, apply K-PAM HL at the minimum rate of 24 gallons per treated acre in a maximum 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 provide large water droplets to prevent excessive irrigation losses. If for any reason the irrigation is interrupted prior to completion (e.g., excessive wind, equipment malfunction, etc.), back the system up prior to restarting to ensure full application to the area affected prior to shutting down the system and to allow full distribution of the K-PAM HL solution throughout the irrigation system prior to moving over untreated soil. After application is completed, flush equipment until all K-PAM HL is eliminated from the system. 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 8 inches apart with either single injection outlet or multi-funnel outlet spaced at 4 to 6 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 shanks or sweep blades should be spaced no more than 12 inches apart with 9 inches between adjacent wings and a spray nozzle that provides uniform coverage. The Noble Plow blade should have spray nozzles spaced 6 inches apart to give uniform coverage, an injection outlet spaced at 12 to 14 inches deep, and be combined with an application using a disc to immediately incorporate the K-PAM HL placed on the surface. Follow all the above applications immediately with a roller/packer to smooth and compact the soil surface.

For surface irrigation, 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 lifters, discs, etc., to a minimum depth of 6 inches using a single-pass incorporation followed immediately by a roller/packer 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. Use the 21-day interval if soil temperatures are below 60°F regardless of any other precautions that may have been taken. In addition to watering 21 days later, do indicator plants are placed. 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 intended period before planting the crop. If fumigant odors are present at planting, thoroughly aerate the soil following shallow ripping and/or discing to allow fumigant 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 application program of reduced rates of TELONE II and K-PAM HL does not guarantee post-treatment 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 fumigation then will vary depending on the volume of irrigation applications, irrigation rate, application methods used, depth of fumigation application, soil moisture, soil type, soil temperature and soil pH (including soil compaction and soil porosity). The sequential combination of reduced rates of TELONE II and K-PAM HL will provide effective fumigation of the treated zone. Post treatments may be made to the fumigated zone from irrigation water, equipment, potato seed or other sources of contamination 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 on 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 unsifted soil until the treated soil is uniformly incorporated 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 use 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 Veronica dahliae 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 fungitain and K-PAM HL soil fungitain. For best results, a full application is recommended. For sites with no 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 temperature must be between 40°F and 80°F in the treated zone.

Use a dual equipment setup to apply TELONE II and K-PAM HL during a single pass. Calibrate equipment for simultaneous application of each product. Because of shallower product placement and the need to disrupt chisel traces from application of TELONE II, mount equipment for application of K-PAM HL behind that of TELONE II.

Apply TELONE II as a broadcast treatment at a minimum rate of 15 gallons per treated acre (44.3 fl oz/1000 feet of rowvool based on 12 inch centers) using either chisel (shank), Noble Plow (sweep) or modified Para Tll application equipment. Chemical equipment must have ripper-type shanks. Para Tll equipment must be modified so that outlet spacing is evenly distributed under the tool bar. With chisel and Para Tll 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 outlet spacing should not exceed 12 inches and should be made at a depth of at least 15 inches. Fumigant penetration may be limited if a slow pan exists below the depth of the Noble blade. Do not use slow-plow application immediately after application of TELONE II, use a disc, paddle wheel or similar device to uniformly mix the top 4 to 6 inches of soil to eliminate fumigant traces. Then follow immediately with a roll, rubber or multi-packer to seal the soil surface. Little or no crop residue should be exposed at the surface following the sealing operation. Any remaining crop residue should be the following sequence. Following application and sealing, the soil should be watered for 7-14 days. The longer interval may be necessary if the soil is or becomes cold or wet during this period.
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 or 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 8 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 harrows, discs, etc. 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 cultipacker.

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 or diskin to allow the fumigant odors to dissipate. Allow 21 days prior to planting. In addition to waiting 21 days, place indicator plants (e.g., potted tomato seedlings) in various places in the treated field and cover the plants with a “hot cap”, plastic sheeting, bucket, etc. to trap and confine any fumes present. Leave the plants undisturbed for a maximum of 24 hours then examine for 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.

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 TELONGE II and K-PAM HL according to these use directions will control Root Knot and Lension 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 taph (including soil compaction and soil porosity). The simultaneous combination of reduced rates of TELONGE II and K-PAM HL will not control or prevent re-infestation subsequent to the treatment. Subsequent to fumigation, populations may infest the fumigated zone from irrigation water, equipment, potting soil 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 soil.
- 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 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 satisfactory performance.

**LIMTED WARRANTY AND DISCLAIMER**

The manufacturer warrants that this product conforms to the chemical description on the label. (b) that this product is reasonably fit for the purposes set forth in the directions for use, subject to the inherent risks referred to herein, when it is used in accordance with such directions; and (c) that the directions, warnings, and other statements on this label are based upon responsible experts' evaluations of reasonable tests of effectiveness, of toxicity to laboratory animals and to plants and residues on food crops, and upon reports of field experience. Tests have not been made on all varieties of fruit crops and plants, or on all soils or under all conditions.

There are no express warranties, either written or implied, on this product. The manufacturer expressly and specifically excludes any and all loss or damage which results from the use of this product in any manner which is inconsistent with the label directions, warnings or cautions.

Buyer's exclusive remedy and manufacturer's or seller's exclusive liability for any and all claims, losses, damages, or injuries resulting from the use or handling of this product, whether or not based on contract, negligence, strict liability in tort or otherwise, shall be limited, at the manufacturer's option, to replacement of, or the repayment of the purchase price for, the quantity of product with respect to which damages are claimed. To the extent consistent with applicable law, manufacturer or seller shall not be liable for special, indirect or consequential damages resulting from the use or handling of this product.

AMVAC offers this product, and Buyer accepts it, subject to the foregoing Limited Warranty which may be varied only by agreement in writing signed by an authorized representative of AMVAC.

**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 drums high. Leaking or damaged drums should be placed in overpack drums for disposal. Spills should be absorbed in sawdust or sand and disposed of in a sanitary landfill. Keep container closed when not in use.

PESTICIDE DISPOSAL: Pesticide wastes are toxic. Improper disposal of excess pesticide spray mixtures or residues is a violation of Federal law. If these wastes cannot be disposed of by use according to label 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 application equipment or a mix tank and drain for 10 seconds after the flow begins to drop. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Empty the rinse into application equipment or a mix tank. Repeat this procedure two more times.

Refillable container. Refill this container with sodium or potassium methylthiocarbamate only. Do not reuse this container for any other purpose. Clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tanks. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinse into application equipment or rinse collection system. Repeat this rinsing procedure two more times.
Agricultural Use Requirements

Product is only in accordance with its labeling and the Worker Protection Standard. It contains requirements for training, decontamination, and emergency assistance. The requirements in this box apply only to uses of this product that are by the Worker Protection Standard (WPS). Restricted period and notification requirements, see the Entry Restricted Period section of this label.

Restricted Period

Applying early entry that would otherwise be permitted under the Worker Protection Standards by any - other than a correctly trained and PPE-equipped handler who is performing a handling task listed below - a PROHIBITED from the start of the application. If 96 hours after the application is completed, it is no longer than 14 days to application. If 96 hours after the application is complete, it is completed and removed for at least 14 days. The application is complete after application, but if not before 14 days after application, does not apply.

Agricultural Use Requirements

To be a registered pesticide in California, the chemical must pass the following test:

- Complete text related to pesticide application requirements.
- Instructions for use.
- Application rates.
- Storage and disposal guidelines.
- Precautionary statements.
- Safety recommendations.
- Environmental hazards.

Restricted Use Pesticide

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.

User Safety Recommendations

Use safety recommendations:

- 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 high water mark. Do not contaminate water when dispersing of equipment wash water or rinsates. Metam sodium has certain properties and characteristics in common with chemicals that have been detected in ground water (highly soluble in water and has strong adsorption to soil). For unlabeled applications, training and runoff may occur if there is heavy rainfall after soil fumigation.

Storage and Disposal

Do not contaminate water, food or feed by storage or disposal. Pesticide Storage:

Do not store more than four drums high. Leaking or damaged drums should be placed in overpack drums for disposal. Spills should be absorbed in sawdust or sand and disposed of in a sanitary landfill. Keep container closed when not in use.

Pesticide Disposal:

Pesticide wastes are toxic. Improper disposal of excess pesticide spray mixture or rinsates is a violation of Federal law. If these wastes cannot be disposed of by use according to label 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 application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ½ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 3 minutes. Stand 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. Empty the rinsate into application equipment or a mix tank. Repeat this procedure two more times. Refillable container. Refill this container with sodium or potassium metohydridocarbonate or another. Do not reuse container for any other purpose. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Place the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump. Empty the container into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.