



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

JAN 16 1992

Ms. Shaun L. Helmhout
Buckman Labs, Inc.
1256 McLean Blvd.
Memphis, TN 38108

Dear Ms. Helmhout:

Subject: Metam-Sodium Label Amendment for Busan 1020
EPA Registration No. 1448-85
Your Application of October 30, 1991

Labeling you submitted pursuant to the agreement signed by the Metam-Sodium Task Force and the United States Environmental Protection Agency (EPA) has been reviewed and found to be acceptable with the following comments.

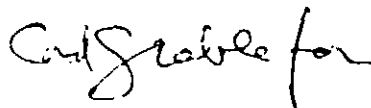
1. Under Environmental Hazards, change the second sentence to "Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark".
2. Under Personal Protective Clothing and Equipment, paragraph A, line 4, add "equipment" following "application" and "chemigation".
3. Under Busan 1020 Treatment Guidelines, Time of Application, delete "application over cover crops" at the end of the paragraph since this is in the next heading.
4. Under Preparing a Field for Application, Measuring the Soil Moisture, in the second line, add "percent" following the number 80.

5. Under Chemigation - General Precautions, paragraph 1, delete "[choose one or more of" and also the closing bracket in this paragraph.
6. Under the Warning Statement, delete the statement, "Wear protective clothing and rubber gloves" and add the statement, "Use proper protective clothing when handling as described in the Protective Clothing and Equipment Statement."
7. In Section C of the Personal Protective Clothing and Equipment Statement, insert the following statement between "ground application equipment" and "or entering treated fields": "or monitoring application equipment."

Submit five (5) copies of the final printed label(s).

If you have any questions regarding this matter, please contact me or Sidney Jackson at (703) 305-7610.

Sincerely yours,



Susan Lewis
Product Manager (21)
Fungicide-Herbicide Branch
Registration Division (H7505C)

BUSAN 1020

ACTIVE INGREDIENT:

Sodium N-methyldithiocarbamate.....33%

INERT INGREDIENTS.....67%

100

This product contains 3.1 lb. of active ingredient per gallon and weighs 9.5 lb. per gallon.

ACCEPTED
with COMMENTS
in EPA L

JAN 16 1992

Under the Federal Insecticide,
Fungicide, and Rodenticide
Act as amended, this pesticide
registered under FFA Reg. No.

1448-85

Manufactured by
Buckman Laboratories, Inc.
Memphis, Tennessee 38108, U.S.A.

NET CONTENTS: AS MARKED ON CONTAINER

EPA Reg. No. 1448-85

EPA Est. 1448-TN-1

EPA Est. 1448-MO-1

KEEP OUT OF REACH OF CHILDREN

WARNING

WARNING: May be fatal if absorbed through skin. Causes skin and eye irritation. Harmful if swallowed. Do not get in eyes, on skin, or on clothing. Wear protective clothing and rubber gloves. Wash thoroughly with soap and water after handling and before eating or smoking. Remove contaminated clothing and wash before reuse.

Delete

FIRST AID: If on skin: Wash with plenty of soap and water. Get medical attention. If product gets in the eyes: Flush immediately with copious amounts of clean, cool water for at least 15 minutes. Get medical attention immediately. If swallowed: Drink promptly a large quantity of milk, egg whites, gelatin solution, or if these are not available, drink large quantities of water. Do not give anything by mouth to an unconscious person. Avoid alcohol. Get medical attention.

ENVIRONMENTAL HAZARDS: This pesticide is toxic to fish. Do not apply directly to water. Do not discard into lakes, streams, ponds, or public waters unless in accordance with an NPDES permit. For guidance, contact your regional office of the EPA.

USE PRECAUTIONS

Keep children and pets out of treated area. Keep off desirable lawns and plants. Do not apply within 3 feet of the drip line of desirable plants, shrubs or trees. Do not use in confined areas without adequate ventilation OR where fumes may enter nearby houses containing growing plants. Do not use in greenhouses where desirable plants are present. Keep container tightly closed when not in use.

PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT

A. The following protective clothing and equipment are required to be used by persons actually engaged in carrying out any operations that are likely to involve direct contact with Busan 1020 including mixing/loading, equipment calibrations or adjustments, cleanup and repair of application (equipment includes but is not restricted to; chemigation, shanks, tillers, drop lines, and holding tanks), sampling, cleanup of spills, fumigant transfer, and rinsate disposal, or by any other person engaged in activities likely to result in direct contact with the product. This protective equipment must also be used for any operations that are done within 6 feet of unshielded, pressurized hoses containing Busan 1020.

(1) A properly FIT TESTED NIOSH or MSHA approved half-face respirator with organic vapor cartridges plus non-venting chemical goggles, or a NIOSH or MSHA approved full-face respirator with organic vapor cartridges.

(2) Body covering that has long sleeves and long pants. When a closed system is not used, mixers and loaders must also wear a chemical resistant apron or cloth coveralls.

(3) Chemical resistant gloves and boots.

B. The following protective clothing must be worn at all times by persons operating or monitoring application equipment or entering treated fields within 48 hours after completion of application. See: REENTRY AND WORKER SAFETY STATEMENT on this label.

(1) Chemical resistant footwear

(2) Body protective covering that has long sleeves and long pants.

C. The Following protective clothing and equipment must be immediately available at all times for use by persons operating tractor drawn ground application equipment, or entering treated fields within 48 hours after completion of application. See: REENTRY AND WORKER SAFETY STATEMENT on this label.

(1) A properly FIT TESTED NIOSH or MSHA approved half-face respirator with organic vapor cartridges plus non-venting chemical goggles, or a NIOSH or MSHA approved full-face respirator with organic vapor cartridges. This equipment must be worn when the pungent, rotten egg odor of Busan 1020 is detected.

(2) Chemical resistant gloves. These must be worn when a person is engaged in carrying out any operation that is likely to involve direct contact with the product, including operations listed in Paragraph A, above.

REENTRY AND WORKER SAFETY STATEMENT

Do not apply this product in such a manner as to directly or through drift expose workers or other persons. The area being treated must be vacated by unprotected persons. Do not enter the treated areas for 48 hours after application unless protective clothing is worn. (Chemical resistant footwear and body covering with long sleeves and long pants; and respirator, if odor is detected, and chemical resistant gloves, if direct contact with product is involved.). Because

certain states may require more restrictive reentry intervals for various crops treated with this product, consult your State Department of Agriculture for further information.

Written or oral warnings must be given to workers who are expected to be in treated areas or in an area to be treated with this product. (Indicate specific oral warnings which inform workers of areas or fields that may not be entered without specific protective clothing, period of time field must be vacated and appropriate actions to take in case of accidental exposure. When oral warnings are given, warnings shall be given in a language customarily understood by workers. Oral warnings must be given if there is reason to believe that written warnings cannot be understood by workers. Written warnings must include the following information: **WARNING: Area treated with metam-sodium on (DATE)_____.** Do not enter without appropriate protective clothing for 48 hours after application. In case of accidental exposure, see STATEMENT OF PRACTICAL TREATMENT found on the Busan 1020 label.

Posting is also required. Consult your State Department of Agriculture for further information.

STORAGE AND DISPOSAL

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

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 mixture, or rinsate 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 Control Agency, or the Hazardous Waste representative at your EPA Regional Office for guidance.

CONTAINER DISPOSAL: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

PRODUCT INFORMATION

Busan 1020 is a water-soluble liquid. When applied to properly prepared soil, the liquid is converted into a gaseous fumigant. After a sufficient waiting period, the gas dissipates, leaving the soil ready for planting. Busan 1020 is recommended for the control of weeds, plant parasitic nematodes, and soilborne fungi that cause reductions in the yield and quality of ornamental, food, and fiber crops.

Busan 1020 will control only those pests in the fumigation zone at the time of treatment. Recontamination may occur subsequent to the fumigant's dissipation from the soil.

Weeds and germinating weed seeds that are controlled include grasses (annual bluegrass,

Bermuda grass, water grass, Johnson grass), sedges (nutgrass), composites (dandelion, ragweed), pinks (chickweed), mints (henbit), goosefoots (lambsquarters), amaranths (pigweed, careless weed), convolvulus (wild morning glory), purslanes, and nightshades. The best weed control is obtained when Busan 1020 is applied to weeds that are in an active vegetative growth phase.

The **plant parasitic nematodes** which Busan 1020 controls include root knot, lesion, dagger, lance, needle, pin, reniform, stunt, stubby root, sting, and spiral. Note: In Oregon and Washington, Busan 1020 will only suppress *Meloidogyne chitwoodi*.

The **plant pathogenic fungi** controlled include species of *Verticillium*, *Rhizoctonia*, *Pythium*, *Phytophthora*, *Sclerotinia*, as well as *Sclerotium rolfsii*, *Armillaria mellea* (Oak root fungus), and *Plasmodiophora brassicae* (Club root fungus).

BUSAN 1020 TREATMENT GUIDELINES

For optimum results from soil fumigation with Busan 1020, certain procedures should be observed at designated times in the treatment program. Described in this section are important guidelines for each of the four stages of the treatment process:

- Planning a Busan 1020 application
- Preparing a field for application applying Busan 1020
- Applying Busan 1020
- Preparing for planting after application of Busan 1020.

Your Buckman Laboratories representative will help you select the best treatment program for your particular needs.

Planning a Busan 1020 Application

Time of Application

Busan 1020 is applied after harvest and 21 days before a new crop is planted. In some area of North America, fall applications are preferred because the fumes dissipate over the winter, allowing planting to begin as soon as favorable springtime conditions arrive. Application over Cover Crops

Application Over Cover Crops

Busan 1020 can be applied through sprinkler irrigation systems over cover crops such as alfalfa, clover, and such grasses as rye, oats, wheat, and sudan grass. When the product is applied over cover crops, no cultivation of the soil is required before the application of Busan 1020.

Application Rate

Apply 20 to 100 gallons of Busan 1020 per treated acre depending on crop, target pest, and soil properties. Soil properties to consider when determining the application rate include the depth of soil to be treated, soil texture, and percent organic matter.

Target Pest and Depth of Treatment

For control of weeds and fungi causing seed or seedling diseases, treatment of only the top 2 to 4 inches of soil may be required. For control of nematodes and fungi which occur throughout the rhizosphere, treatment to depths greater than 4 inches may be required. For a given soil type, the required application rate will increase proportionately with the depth of treatment required. For example, if 25 gallons of Busan 1020 per acre is required to treat 4 inches, then 50 gallons of Busan 1020 will be required to treat to a depth of 8 inches. Choose the appropriate application method to distribute Busan 1020 evenly throughout the soil to the required depth.

Organic Matter in the Soil

Except in the case of cover crops, plant material under the soil surface should be thoroughly decomposed before Busan 1020 is applied. Because of the absorbing effect of humus, soils with high levels of organic matter under the surface require higher than usual doses of Busan 1020. For example, muck soils require twice the amount of fumigant that would be used in mineral soils.

Soil Texture

Application rates will vary with the soil texture. For instance, heavy clay soils require more Busan 1020 than light sandy soils.

Preparing a Field for Application

Soil Cultivation

Cultivate the soil thoroughly before treatment, breaking up all large clods. If the soil crusts following pretreatment irrigation, lightly cultivate it again before treatment with Busan 1020.

Soil Temperature During Treatment

At the time of fumigation, the soil temperature should be in the range of 90°F (32°C) at a depth of 3 inches.

To prevent rapid evaporation of the product from the soil, avoid treating soil during times of the day when soil temperatures exceed 90°F (32°C). Instead, make the application during the early morning hours when the soil temperature is coolest.

Measuring the Soil Moisture

Application should be made under "good seed bed moisture conditions"; that is, the soil moisture should be about 80 of field capacity. As a simple field test, squeeze a handful of soil into a ball and then gently try to break it apart with your fingers. If it breaks easily, the soil moisture content is sufficient. If it will not break apart or if water can be squeezed out, it is too wet. When necessary, weeks prior to treatment sprinkle or flood irrigate the soil to increase the moisture content. The soil must be moistened to at least the desired treatment depth.

Area To Be Treated

Busan 1020 can be applied either broadcast or in bands, depending on the crop to be planted. For example, in the production of row crops, band applications are most economical.

Phytotoxicity

Busan 1020 is phytotoxic. Protect valuable, non-target plants by stopping soil applications of Busan 1020 at least 3 feet short of the drip line of trees, shrubs, and other desirable plants. Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from nonuniform distribution of treated water.

Applying Busan 1020

Busan 1020 may be applied by chemigation, soil injection, disc, rotary tiller, power mulcher, and soil covering methods.

Use of Diluted Busan 1020

DO NOT STORE THE DILUTED PRODUCT. Use Busan 1020 promptly after it has been mixed with water. In dilute solutions in water, Busan 1020 decomposes over a period of weeks. Although Busan 1020 is stable in its concentrated form, it is unstable in acid dilutions.

Odors During Treatment

Strong odors during or after treatment are a signal that the fumigant is escaping and needs to be sealed in the soil.

Sealing Busan 1020 in Soil

To be most effective, Busan 1020 should be sealed in the soil. Sealing methods include applying irrigation water or plastic tarpaulins and packing soil with a roller or drag. Tarpaulins should be spread loosely over the treated area and secured to prevent removal by wind. They should remain in place for at least 48 hours. Seven days after treatment, the sealed area should be cultivated to a depth of 2 inches to aerate the soil. When tarpaulins are used to seal the soil, wait at least 21 days before planting.

Chemigation--General Precautions

When applying by chemigation methods the following precautions must be observed:

1. Apply this product only through (choose one or more of the following types of systems:

sprinkler including center pivot, lateral move, end tow, side (wheel) roll, traveler, big gun, solid set, or hand move; flood (basin); furrow; border; or drip (trickle) irrigation system(s). Do not apply this product through any other type of irrigation system.

2. Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from nonuniform distribution of treated water.

3. If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers or other experts.

4. Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place.

5. 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 Systems Connected to Public Water Systems

A "public water system" is one that provides piped water for human consumption to the public, and the system also either has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days a year.

Chemigation systems connected to public water systems must contain a functional, reduced-pressure zone, backflow preventor (RPZ) or the functional equivalent in the water supply line upstream 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 should be a complete physical break (air gap) between the outlet end of the fill pipe and the top or overflow rim of the reservoir tank measuring at least twice 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 back toward the injection pump.

The pesticide injection pipeline must contain a functional, normally closed solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock. This valve prevents 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 shut off the pesticide injection pump automatically when the water pump motor stops. In cases where there is no water pump, controls on the pesticide injection pump are also needed 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.

Field Application--Where Entire Area Is Being Treated

● Chemigation Methods

Sprinkler Chemigation: Use 50 to 100 gallons Busan 1020 per acre for control of nematodes and fungi at a depth of 24 inches. For control of weeds and fungi at a depth of 6 inches or less, use 20 to 100 gallons per acre. Inject the Busan 1020 in enough water to reach the desired treatment depth. The product should be continuously metered into the irrigation system throughout the entire application period. Flush the system with only enough water to clear lines. If the soil surface dried quickly, reseal it with 15 minutes of water once a day for the next day or two.

Use sprinkler systems that give uniform coverage. Apply only through central pivot or solid set sprinkler irrigation systems containing antisiphon and check valves which will prevent water source contamination and overflow of the slurry tank. The system must contain a functional check valve, vacuum relief valve 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 back 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 also contain interlocking controls between the metering device and the water pump to ensure simultaneous shut-off. 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 which 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.

● Drift Prevention

Do not apply when wind speed favors drift beyond the area intended for treatment.

● Effect of Air Temperature and Winds on Sprinkler Application

When using a sprinkler application method, apply Busan 1020 only when the air temperature is below 90°F (32°C). This precaution is recommended to guard against evaporation of the product. Either low humidity or high winds can also cause the evaporation of Busan 1020 before it can be drenched into the soil. To prevent wind drift of the fumigant, apply only when wind conditions are suitable.

● Runoff of Treatment Solution

To prevent runoff of treatment solution during sprinkler application, do not exceed the infiltration rate of the solution into the soil. Should runoff occur, isolate it from growing crops and water sources. Once collected, reapply it to the treated area.

Check, Flood (Basin), Furrow and Border Chemigation: Meter Busan 1020 at a steady rate into

water during irrigation. Depending upon the kind of pest and the treatment depth desired, use 20 to 100 gallons of Busan 1020 per acre in 3 to 18 inches of water per acre.

Systems using a gravity flow pesticide dispensing 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 the potential for contaminating the water source from backflow should the water flow stop.

Systems utilizing a pressurized water and pesticide injection system must meet the following requirements:

1. The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.
2. The pesticide injection pipeline must contain a functional, automatic, quick closing check valve to prevent the flow of fluid back toward the injection pump.
3. 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.
4. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
5. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
6. 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.

● Other Field Application Methods

Soil Injection: Use chisel or shank-type injectors to apply 20 to 100 gallons of Busan 1020 per acre into well prepared soil. Seal immediately after treatment.

Disc Applied Method: Spray dilute Busan 1020 immediately in front of disc. Use 20 to 100 gallons per acre. Follow immediately with a roller to smooth and compact the soil surface.

● Application on Beds or Rows Chemigation Methods

Drench Method: Busan 1020 may be applied to finished beds in enough water to soak at least 2 inches deep for control of shallow seeded weeds. To avoid contamination by untreated soil, do not disturb the treated area. Apply 20 to 100 gallons of Busan 1020 per treated acre

"Drip Chemigation": During pre-irrigation, check drip tape for uniform distribution and repair if necessary. Apply 20 to 100 gallons per treated acre. Inject Busan 1020 continuously into drip line as close as possible to treatment area. Use enough water to thoroughly wet entire desired treatment zone. Two or more lines per bed may be needed to ensure full coverage.

The system must contain a functional check valve, vacuum relief valve, 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 back 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 which 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.

● Other Bed or Row Application Methods

Rotary Tiller or Power Mulcher: Spray dilute Busan 1020 immediately in front of tiller or mulcher. Use 20 to 100 gallons per treated acre. Follow immediately with roller or bed shaper to seal soil surface.

Soil Injection: Busan 1020 can be injected into pre-formed plant beds using chisel or shank-type injectors. If a wider treated band is desired, space 2 or more shanks to cover the desired treating width. Seal after treatment. Use 20 to 100 gallons per treated acre.

Soil Covering Methods (Bed-over methods): Busan 1020 may be sprayed or dripped onto the soil immediately ahead of bed-shaping equipment. Cover the Busan 1020 with soil to a depth of 3 to 6 inches. The recommended rate of Busan 1020 is 20 to 100 gallons per treated acre.

Preparing for Planting After Application of Busan 1020

Effect of Rain

If a Busan 1020 application is rained on less than 24 hours after treatment, lack of control at and near the soil surface may result.

Recontamination

Precautions must be taken to prevent recontamination of treated soil with plant pathogenic fungi and plant parasitic nematodes. Use clean seeds and plants. Before farm equipment is driven into

the treated area, it should be rinsed free of the untreated soil from other fields.

Interval Between Treatment and Planting

Because Busan 1020 is harmful to living plants, an appropriate interval must be observed between soil fumigation and planting. On well drained soils which have a light to medium texture and which are not excessively wet or cold following application, planting can begin 14 - 21 days after treatment. If soils are heavy or especially high in organic matter, or if they remain wet and/or cold (below 60°F or 15°C) following application, a minimum interval of 30 days should be observed. Where the dosage is greater than 100 gallons per acre, wait at least 60 days.

Aeration Before Planting

Soils, including soils high in clay or organic matter, should be allowed to aerate and dry thoroughly after treatment with Busan 1020. During cold and/or wet weather, frequent shallow cultivation can aid the escape of Busan 1020 from the soil.

Testing for Dissipation of Busan 1020

After the waiting period has passed, if there is any question about the complete escape of Busan 1020 from the soil, transplant a seedling into the treated soil. If the plant develops normally without any signs of chemical injury, crop planting can begin.