Re-evaluation Note REV2012-10

Label Amendments for Soil Fumigant Products Containing Dazomet

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Background

Dazomet is under re-evaluation by Health Canada's Pest Management Regulatory Agency (PMRA), and is one of the active ingredients included in the soil fumigant cluster.

Dazomet is a non-selective pre-plant soil fumigant and antimicrobial used to control pathogens including insects, nematodes, fungi and weeds. In Canada, dazomet is currently registered for use as a soil fumigant on terrestrial and greenhouse food/feed and non-food/non-feed crops, forests/woodlots, ornamentals and turf. End-use products formulated as granules are applied and incorporated into soil as a broadcast or row treatment. The soil is sealed and is aerated prior to planting. Dazomet is also used as a material preservative in water-based suspensions (for example, clay slurries, adhesives, coatings) and industrial process fluids (for example, pulp and paper mills, water cooling towers, oilfield industry). End-use products are formulated as liquids (for example, solution, suspension, emulsifiable concentrate) and wettable or soluble powders, which are added during the manufacturing process. All currently registered uses are being considered in the re-evaluation.

The regulatory approach and proposed label improvements for dazomet were first presented in Re-Evaluation Note REV2010-10, *Soil Fumigants Proposed Mitigation Measures* and REV2010-13, *Dazomet – Proposed Mitigation Measures*, published on 13 August 2010. Please refer to Re-evaluation Note REV2012-08, *Chloropicrin, Dazomet, Metam Sodium and Metam Potassium-Label Improvements for Soil Fumigants* for a summary of the comments received during the consultation, and the PMRA's response to these comments. This Re-evaluation Note describes this stage of PMRA's regulatory process for the re-evaluation of the soil fumigant cluster and outlines label improvements required for soil fumigant products containing dazomet. The regulatory process for the re-evaluation of antimicrobial products containing chloropicrin, dazomet, metam sodium or metam potassium is communicated separately in Re-evaluation Note REV2012-07, *Chloropicrin, Dazomet, Metam Sodium and Metam Potassium Label Improvements for Antimicrobial Products*.

Regulatory Strategy

The PMRA's re-evaluation of dazomet is ongoing. At this time, the PMRA is requiring registrants of products containing dazomet to implement label improvements to further limit user exposure and further protect bystanders and the environment. These label improvements are considered a first step in the re-evaluation of the Canadian uses of the products containing dazomet.

A key component of the label improvements for soil fumigant products containing dazomet is the requirement of a Fumigation Management Plan (FMP) for all applications. A Fumigation Management Plan is an organized, written description of the required steps involved to help ensure a safe and effective fumigation. It will also assist in complying with pesticide products label requirements. Instructions for the preparation of a Fumigation Management Plan are required to be part of the product label. In addition, a Fumigation Management Plan template will be developed by the PMRA in consultation with registrants in order to help users meet the

Fumigation Management Plan requirements. Specific label improvements are also required for all soil fumigant products containing dazomet.

Appendix I outlines the required label amendments for products containing dazomet.

Additional Information

Any person may file a notice of objection[1] regarding this decision for dazomet within 60 days from the date of publication of this Re-evaluation Note. For more information regarding the basis for objecting (which must be based on scientific grounds), please refer to the Pesticides and Pest Management portion of Health Canada's website (Request a Reconsideration of Decision) at www.hc-sc.gc.ca/cps-spc/pest/part/protect-proteger/publi-regist/index-eng.php#rrd or contact the PMRA's Pest Management Information Service.

PMRA documents can be found on the Pesticides and Pest Management portion of Health Canada's website. PMRA documents are also available through the Pest Management Information Service.

[1] As per subsection 35(1) of the *Pest Control Products Act*.

Appendix I Label Amendments for Products Containing Dazomet

The label amendments presented below do not include all label requirements for individual end-use products, such as first aid statements, disposal statements, precautionary statements and supplementary protective equipment. Additional information on labels of currently registered products that contradicts the amendments noted below should be removed from the labels.

The labels of products containing dazomet registered in Canada for soil fumigant uses must be revised to include the following amendments to further protect workers, bystanders and the environment. The different label sections and statements must appear in the order outlined below.

1. The following statements must be included on the primary display panel:

> RESTRICTED PRODUCT
>
> THIS PRODUCT CAN ONLY BE USED IN CONJUNCTION WITH A DETAILED FUMIGATION MANAGEMENT PLAN
>
> READ THE ENTIRE LABEL, INCLUDING INSTRUCTIONS FOR PREPARATION OF A FUMIGATION MANAGEMENT, PLAN BEFORE USING

The following statements must be included in the **NATURE OF RESTRICTION** section:

> This product is only to be used by individuals holding an appropriate pesticide applicator certificate or license recognized by the provincial/territorial pesticide regulatory agency where the pesticide application is to occur. This restriction applies to all fumigant handlers, as defined in the **HANDLER RESTRICTIONS** section of this label.
>
> This product can only be used in conjunction with a detailed Fumigation Management Plan. Prior to the start of application, the applicator must verify that a site-specific Fumigation Management Plan exists for each application block.
>
> This product is accompanied by an approved label, including Instructions for Preparation of a Fumigation Management Plan. READ AND UNDERSTAND THE ENTIRE LABEL BEFORE USING.

2. Product labels must be amended to reflect the following:

   The maximum application block size that can be treated in greenhouses is 4500 m^2.

Application Method	Maximum Broadcast Equivalent Application Rate (kg a.i./ha)
Open land uses - Physical/Mechanical IncorporatFion	476
Greenhouses	297

   NOTE: The maximum application rates above represent the maximum broadcast equivalent rates, i.e. amount of active ingredient per total area. For bedded or strip applications, the amount of active ingredient per treated area must be converted to the broadcast equivalent application rate (See the section entitled **Calculating the Broadcast Equivalent Application Rate**).

3. The following statements must be included in a section entitled **ENVIRONMENTAL HAZARD**:

   Toxic to aquatic organisms.

   To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay.

   Avoid application when heavy rain is forecast.

   Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

   The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable (for example, sandy soil) and/or the depth to the water table is shallow.

4. The following statements must be included in a section entitled **HANDLER RESTRICTIONS**:

   Any person involved in the use of this product is considered a fumigant handler. All fumigant handlers must hold an appropriate pesticide applicator certificate or license recognized by the provincial/territorial pesticide regulatory agency where the pesticide application is to occur.

Only fumigant handlers, emergency personnel, and local, provincial or federal officials performing inspections, sampling or similar duties may be in the application block from the start of the application until the Entry Restricted Period expires, and in the buffer zone during the Buffer Zone Period.

- The application block is the area within the perimeter of the fumigated portion of a field or greenhouse (including furrows, irrigation ditches, roadways).
- A buffer zone is an area established around the perimeter of an application block.
- Application *starts* when the fumigant is first introduced into the soil and is *complete* when the fumigant has stopped being delivered/dispensed into the soil and the soil has been sealed.
- The duration of the Entry Restricted Period and the Buffer Zone Period is outlined in the **Entry Restricted Period and Notification** and **Buffer Zone Requirements** sections of this label.

In addition, only fumigant handlers can perform tasks with potential for contact with fumigant including:

- cleaning up fumigant spills;
- handling or disposing of fumigant containers, and
- cleaning, handling, adjusting, or repairing the parts of fumigation equipment that contain fumigant residues.

All fumigant handlers, emergency personnel, and local, provincial or federal officials must wear the appropriate personnel protective equipment outlined in the **PRECAUTIONS, Personnel Protective Equipment** section of this label.

5. The following statements must be included under **PRECAUTIONS** in a section entitled **Handler Use Precautions**:

Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

Remove clothing immediately if pesticide comes in contact with skin through spills. Then wash skin thoroughly and put on clean clothing. Wash contaminated clothing separately from other clothes before re-use.

Store personal protective equipment out of reach of children and pets.

Avoid touching 'clean' surfaces while wearing personal protective equipment (for example, steering wheel, door handles, counter tops), or thoroughly clean these surfaces afterwards with water and detergent.

Remove personal protective equipment immediately after handling this product. Remove personal protective equipment outside in a pre-determined area separate from living or working areas.

Dust off any granules from the outside of the gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Avoid touching eyes and face until you have washed your hands.

Respirators should be stored in a sealed plastic bag until the next use, to preserve the life of the filter. Regularly change respirator cartridge filters.

Repair/replace torn or broken personal protective equipment.

Use hot water, heavy-duty liquid detergent, the highest water level setting, and the longest wash cycle. Keep and wash personal protective equipment separately from other laundry.

If heavily soiled, wash personal protective equipment two or three times. After washing, run the washing machine through a complete cycle with detergent. If possible, line-dry the clothing.

Discard clothing that has been heavily contaminated with this product. Do not reuse.

6. The following statements must be included under **PRECAUTIONS** in a section entitled **Personal Protective Equipment**:

Handlers must wear coveralls over a long-sleeved shirt and long pants, chemical-resistant gloves, boots plus socks, and protective eyewear.

Some materials that are chemical-resistant to this product are [*registrant inserts correct chemical-resistant material*]. The personal protective equipment must be adequately cleaned and maintained.

In addition, when an air-purifying respirator is required under this label's **DIRECTIONS FOR USE**, **Respiratory Protection and Stop Work Triggers** section, all fumigant handlers must wear at a minimum either:

- a NIOSH certified full facepiece air-purifying respirator equipped with an organic vapour (OV, NIOSH approval number prefix TC-23C) cartridge and a particulate pre-filter (Type N, R, P or HE, NIOSH approval number prefix number TC-84A), or
- a gas mask with a canister approved for organic vapour (NIOSH approval number prefix TC-14G).

Respirators must fit properly. Any obstruction to a proper fit should be removed (for example, beard, long sideburns).

All fumigant handlers must have an air-purifying respirator and appropriate cartridges immediately available to them.

7. The following statements must be included in a section entitled **SAFETY GERMINATION TEST**:

The following test can be carried out to establish when it is safe to use any soil following treatment.

Take a minimum of six random samples from the treated area. For large areas, take 15 samples for each hectare. These samples must be representative of the whole area and the depth of soil treated. Where the area treated is large, the samples may be bulked, then well-mixed and re-sampled. Samples should be taken down to the depth at which incorporation was made.

Put the soil into glass jars or similar non-porous containers. These should be about half filled. Level the soil, moisten if necessary, add moistened cotton pads or filter paper and sprinkle with cress seed. Carefully seal the top of the jars with screw tops or polyethylene held on with rubber band. Prepare a similar test sample using untreated soil. Place the jars in a warm room where germination should occur in approximately 48 hours, at which time they should be checked. Residues of the product are still present if there is any suppression of germination or discolouration of sprouting cress in the treated soil when compared with the untreated sample. In that case, the time before planting should be extended for a further few days. An additional aeration may help speed up removal of the gases from the soil.

Repeat the Safety Germination Test until the cress seeds germinate evenly in all the jars. It is then safe to plant in the soil.

8. The following statements must be included in a section entitled **DIRECTIONS FOR USE**:

> As this product is not registered for the control of pests in aquatic systems, DO NOT use to control aquatic pests. DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.
>
> DO NOT apply this product in a way that will contact workers or other persons.
>
> *For greenhouse applications:*
> DO NOT allow effluent or runoff from greenhouses containing this product to enter lakes, streams, ponds or other waters.

9. The following statements must be included under **DIRECTIONS FOR USE** in a section entitled **Respiratory Protection and Stop Work Triggers**:

> The procedures outlined in Table X must be followed to determine whether an air-purifying respirator is required, or if operations must cease, for any person performing a fumigant handling task as defined on this label.

Table X Respiratory Protection and Stop Work Triggers

1.	If at any time any handler experiences **sensory irritation** (tearing, burning of the eyes or nose), when not wearing a respirator:	Then EITHER: • An air-purifying respirator must be worn by all fumigant handlers who remain in the application block and surrounding buffer zone, and air monitoring samples must be collected at least every 2 hours in the breathing zone of a handler performing a representative handling task. OR • Operations must cease and handlers not wearing an air-purifying respirator must leave the application block and surrounding buffer zone
	Handlers can remove respirators or resume operations provided that:	• Two consecutive breathing-zone samples taken at the handling site at least 15 minutes apart show that levels of MITC have decreased to less than 0.6 ppm. Samples must be taken at the location where the irritation is first experienced or where sample(s) were greater or equal to 6 ppm, and • Handlers do not experience sensory irritation.

2.	If at any time any handler experiences **sensory irritation** when wearing a respirator, OR a MITC **air sample** is greater than or equal to **6 ppm**	• Operations must cease and handlers must leave the application block and surrounding buffer zone
	Handlers can resume work activities with air-purifying respirators provided that:	• Two consecutive breathing zone samples for MITC taken at least 15 minutes apart are less than 6 ppm at the location where irritation was first experienced, • Handlers do not experience sensory irritation while wearing the air-purifying respirator, • Respirator cartridges/canisters have been changed, and • Air monitoring samples must be collected at least every 2 hours in the breathing zone of a handler performing a representative handling task.
	Handlers can resume work activities without air-purifying respirators provided that:	• Two consecutive breathing zone samples for MITC taken at the handling site at least 15 minutes apart show levels of MITC have decreased to less than 0.6 ppm at the location where the irritation was first experienced, and • Handlers do not experience sensory irritation.

IMPORTANT:

- The respiratory protection and stop work triggers outlined in Table X apply to anyone present in the application block from the start of the application until the Entry Restricted Period expires, or in the buffer zone during the Buffer Zone Period, including emergency personnel, and local, provincial or federal officials.
- See the air monitoring requirements in the **Fumigant Air Monitoring** section of this label.
- When air monitoring samples must be collected in the breathing zone of a handler performing a representative task, the locations and handler activities sampled must represent the exposure occurring for each handler exposure present in the application block.

10. The following statements must be included under **DIRECTIONS FOR USE** in a section entitled **Fumigant Air Monitoring**:

When using monitoring devices to monitor air concentration levels, a direct reading detection device, such as a colorimetric device (for example, Matheson-kitagawa, Draeger or Sensidyne) must be used. The devices must have a sensitivity of at least 0.6 ppm for MITC.

When breathing zones samples are required, they must be taken outside respiratory protection equipment and within a 25 cm radius of the handler's nose and mouth.

11. The following statements must be included under **DIRECTIONS FOR USE** in a section entitled **Tarp Perforation and/or Removal**:

Tarps must be perforated (cut, punched, poked, or sliced) by mechanical methods, except for the following situations (where tarps can be perforated manually):

- At the beginning of each row when a coulter blade (or other device which performs similarly) is used on a motorized vehicle such as an ATV.
- In fields that are 0.4 hectare or less.
- During flood prevention activities.

Tarps must not be perforated or removed until a minimum of 5 days (120 hours) have elapsed after the application is complete, unless a weather condition exists which necessitates early tarp perforation or removal, as follows:

- *Early tarp perforation following bedded applications*: Tarp perforation is allowed before the 5 days (120 hours) have elapsed for flood prevention activities.
- *Early tarp removal following broadcast applications*: Tarps may be removed before the required 5 days (120 hours) if adverse weather conditions have compromised the integrity of the tarp, provided that the compromised tarp poses a safety hazard. *Adverse weather* includes high wind, hail, or storms that blow tarps off the field and create a hazard, for example, tarps blowing into power lines and onto roads. A *compromised tarp* is a tarp that due to an adverse weather condition is no longer performing its intended function and is creating a hazard.

If tarps are perforated within 14 days after the application is complete, tarp removal must not begin until at least 2 hours after tarp perforation is complete.

If tarps are not perforated or removed within 14 days after application is complete, planting or transplanting may take place while the tarps are being perforated.

Additional Requirements for Broadcast Applications:

- Each tarp panel must be perforated.
- Tarp perforation must be completed before noon.
- Tarps must not be perforated if rainfall is expected within 12 hours.

For products with a planting interval requirement shorter than 14 days, add:

If tarps are perforated but not removed within 14 days after the application is complete, planting or transplanting must not begin until at least 48 hours after the tarp perforation is complete.

12. The following statements must be included under **DIRECTIONS FOR USE** in a section entitled **Entry Restricted Period and Notification**:

Entry Restricted Period
Entry into the application block by any person (other than PPE-equipped handlers, emergency personnel, and local, provincial, or federal officials performing inspection, sampling, or other similar official duties) is PROHIBITED during the Entry Restricted Period.

For all non-tarped applications, the Entry Restricted Period begins at the start of application and expires 5 days after the application is complete.

For all tarped applications, the Entry Restricted Period begins at the start of the application, and expires a minimum of 5 days after application is complete, as specified in Table X.

Table X Required Entry Restricted Period following soil fumigation

IF	Tarps are not perforated within 14 days after application	**AND**	Tarps are not removed for at least 14 days after application	**THE ENTRY RESTRICTED PERIOD EXPIRES**	5 days after application is complete
	Tarps are perforated within 14 days after application		Tarps are not removed for at least 14 days after application		48 hours after tarp perforation is complete (minimum 7 days[a])
			Tarps are removed within 14 days of application		after tarp perforation and removal is complete (minimum 5 days[a])

[a] Unless tarps were perforated or removed earlier than 5 days following application based on weather conditions (see **Tarp Perforation and/or Removal**).

Notification
The applicator must verbally warn workers of the application. Fumigant Application signs must be posted on all entrances to the application block.

Fumigant Application signs must conform to the following requirements:

- The printed side of the sign must face away from the treated area toward areas from which people can approach.
- Signs must be clearly legible during entire posting period. The sign must be at least 35 cm by 25 cm in size, and made of substantial material that can be expected to withstand adverse weather conditions. Letters must be at least 7 cm in height.
- Signs must be posted prior to the start of the application (but no sooner than 24 hours prior to application) and remain posted for the duration of the Entry Restricted Period.

- Signs must be removed within 3 days after the end of the Entry Restricted Period.
- Only a certified handler may remove Fumigant Application signs.
- The signs must contain the following information:
  - The "skull and crossbones" symbol
  - "DANGER"
  - "Area under fumigation, DO NOT ENTER"
  - "Dazomet Fumigant in USE"
  - The date and time of fumigation
  - The date and time the Entry Restricted Period is over
  - The name of the product
  - Name, address, and telephone number of the applicator

13. The following statements must be included under **DIRECTIONS FOR USE** in a section entitled **Mandatory Good Agricultural Practices**:

The following Good Agricultural Practices must be followed during all fumigant applications.

Tarps (when tarps are used)

- A written tarp plan must be developed and included in the Fumigation Management Plan.
- Tarps must be installed immediately after the fumigant is applied to the soil.
- Once a tarp is perforated, the application is no longer considered tarped.
- Tarps must be checked regularly for damage, tears, and other problems.

Weather Conditions

To determine if unfavourable weather conditions exist or are predicted (see *Identifying Unfavourable Weather Conditions*) and whether an application should proceed, the weather forecast must be checked by the applicator:

- on the day of, but prior to the start of the application, and
- on a daily basis during the application if the time period from the start of the application until the application is complete is greater than 24 hours.

DO NOT apply if an air stagnation advisory is in effect or is forecast for the area in which the application is planned, either during the application or until the 48 hours after the application is complete.

DO NOT apply if light wind conditions (< 3 km/hr) are forecast to persist for more than 18 consecutive hours from the time the application starts until 48 hours after the application is complete.

Identifying Unfavourable Weather Conditions

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

Application Restrictions

- Do not use dazomet when the soil temperature is over 32°C, 5 cm deep.
- Do not apply within 0.9 to 1.2 metres of growing plants or closer than the drop line of trees and large shrubs. If slopes are treated with this product, take precautions to prevent the chemical from washing downward to growing plants.
- The area intended for treatment should be in seedbed condition with a fine tilth, free of clods. Do not apply dazomet to dry or improperly tilled soil. Repeated cultivation before treating will improve control of perennial weeds. Ditching around the site will prevent weed seeds, nematodes, and fungi from washing into the treated area and contaminating it.
- For optimal effect, the soil to be fumigated must have sufficient moisture for good plant growth (at least 50% available water capacity) for 5-14 days (depending on temperature) before the treatment.
- Do not apply dazomet if ambient air temperature exceeds 39°C.
- After application, the soil must be kept uniformly moist for 5-7 days. As soon as possible after incorporation, the soil should be sealed to retain the concentration of gases in the soil which can be achieved by:
    - Compacting the soil surface after incorporation with a roller attached behind the compacting implement.
    - Moistening the surface after incorporation so a crust forms.
    - Lightly moistening the soil on the third and fourth days after treatment in case the weather dries out the soil surface to avoid surface cracks.
    - In difficult situations best results may be obtained by tarping the treated area.
- Do not store dazomet in an open spreader overnight.

- Do not apply dazomet when wind may cause granules to drift from target area.
- Do not apply dazomet through any type of irrigation equipment.
- Before using dazomet be aware that the three most critical factors for a successful fumigation program are: soil preparation, soil temperature, and soil moisture.

14. The following statements and buffer zone look-up tables must be included under **DIRECTIONS FOR USE** in a section entitled **Buffer Zone Requirements**.

A buffer zone must be established for every fumigant application. A buffer zone is an area established around the perimeter of each application block. The following describes the buffer zone requirements:

- The buffer zone must extend outward from the edge of the application block perimeter equally in all directions.
- The Buffer Zone Period begins at the start of the application and lasts for a minimum of 48 hours after the application is complete.
- Only fumigant handlers, emergency personnel, and local, provincial, or federal officials performing inspection, sampling, or other similar official duties may be in the buffer zone during the Buffer Zone Period.
- All non-handlers, including field workers, nearby residents, pedestrians, and other bystanders, must be excluded from the buffer zone during the Buffer Zone Period except for transit (i.e. vehicular and bicycle traffic) through the buffer zone.

Buffer Zone Proximity

Before the start of the application, the applicator must determine whether the buffer zone will overlap any other dazomet (or other MITC generating pesticide) buffer zone(s).

To reduce the potential for off-site movement from multiple fumigated fields, buffer zones from multiple dazomet (or other MITC generating pesticide) application blocks must not overlap UNLESS a minimum of 12 hours have elapsed from the time the earlier application(s) is complete until the start of the latter application.

Buffer zones must not include buildings used for storage (such as sheds, barns, garages) UNLESS these buildings are not occupied during the Buffer Zone Period and do not share a common wall with an occupied structure.

Buffer zones must not include residential areas (for example, employee housing, private property), buildings (for example, commercial, industrial), outdoor residential areas (for example, lawns, gardens, play areas) and other areas that people may occupy, UNLESS:

- the occupants provide written agreement, prior to the start of the application, that they will voluntarily vacate the buffer zone during the entire Buffer Zone Period, and
- re-entry by occupants and other non-handlers must not occur until:
  - the Buffer Zone Period has ended, and
  - no sensory irritation (tearing, burning of the eyes of nose) is experienced upon re-entry.

Buffer zones must not include agricultural areas owned/operated by persons other than the owner/operator of the application block, UNLESS:

- the owner/operator of the application block can ensure that the buffer zone will not overlap with a dazomet (or other MITC generating pesticide) buffer zone from any adjacent property owners, except as provided for above, and
- the owner of the other property provides written agreement to the applicator that they, their employees, and other persons will stay out of the buffer zone during the entire Buffer Zone Period.

Buffer zones must not include public or private roadways and rights of way UNLESS:

- the area is not occupied during the Buffer Zone Period, and
- entry by non-handlers is prohibited during the Buffer Zone Period, except for transit (i.e. vehicular and bicycle traffic) through the buffet zone.

IMPORTANT: Buffer zones are not permitted to include bus stops or other locations where persons wait for public transit.

Buffer zones must not include any other publicly owned and/or operated areas such as parks, sidewalks, permanent walking paths, playgrounds and athletic fields UNLESS:

- the area is not occupied during the Buffer Zone Period,
- entry by non-handlers is prohibited during the Buffer Zone Period, and
- written permission to include the public area in the buffer zone is granted by the appropriate provincial/territorial and/or local authorities responsible for management and operation of the area.

Restrictions for Difficult to Evacuate Sites

Difficult-to-evacuate sites include schools (preschool to grade 12), provincial/territorial-licensed daycare centers, nursing homes, assisted living facilities, hospitals, in-patient clinics, and prisons.

No fumigant application with a buffer zone greater than 90 metres is permitted within 400 metres of difficult to evacuate sites unless the site is not occupied by children, students (preschool to grade 12), patients, or prisoners during the application and the 36-hour period following the end of application.

No fumigant application with a buffer zone of 90 metres or less is permitted within 200 metres of the difficult to evacuate sites unless the site is not occupied during the application by children, students (preschool to grade 12), patients, or prisoners and the 36-hour period following the end of application.

Posting Requirements for Buffer Zones

Posting of Buffer Zone signs is required unless there is a physical barrier that prevents bystander access to the buffer zone.

Buffer Zone signs must be placed along or outside the perimeter of the buffer zone, at all usual points of entry and along likely routes of approach from areas where people not under the owner's control may approach the buffer zone.

- Some examples of points of entry include, but are not limited to, roadways, sidewalks, paths, and bike trails.
- Some examples of likely routes of approach include, but are not limited to, the area between a buffer zone and a roadway, or the area between a buffer zone and a housing development.
- When posting, the applicator must ensure compliance with local/provincial laws and regulations.

Buffer Zone signs must conform to the following requirements:

- The printed side of the sign must face away from the application block toward areas from which people could approach.
- Signs must be clearly legible during entire posting period. The sign must be at least 35 cm by 25 cm in size, and made of substantial material that can be expected to withstand adverse weather conditions. Letter must be at least 7 cm in height.
- Signs must be posted prior to the start of the application (but no sooner than 24 hours prior to application) and remain posted until the Buffer Zone Period has expired.
- Signs must be removed within 3 days after the end of the Buffer Zone Period.
- Only a fumigant handler may remove Buffer Zone signs.
- The Buffer Zone signs must contain the following information:

- The "Do not walk" symbol
- "DO NOT ENTER except for vehicular or bicycle traffic"
- "Dazomet [name of product] Fumigant BUFFER ZONE"
- The date and time the Buffer Zone Period is over
- The name, address, and telephone number of the applicator

- Exception: If multiple contiguous blocks are fumigated within a 14-day period, the entire periphery of the contiguous blocks' buffer zones may be posted. Buffer Zone signs must be posted no sooner than 24 hours prior to the start of the first application. The signs must remain posted until the last Buffer Zone Period expires and signs must be removed within 3 days after the Buffer Zone Period for the last block has expired.

15. The following table must be included under **DIRECTIONS FOR USE** in a section entitled **Maximum Broadcast Equivalent Application Rate**. The application rates outlined below must be expressed on the label in terms of the amount of product.

Application Method	Maximum Broadcast Equivalent Application Rate (kg a.i./ha)
Open land uses - Physical/Mechanical Incorporation	476
Greenhouses	297

For strip and bedded applications, the broadcast equivalent application rate must be calculated to determine the buffer zone distance required by this label. The broadcast equivalent application rate is the rate of fumigant applied within the entire perimeter of the application block.

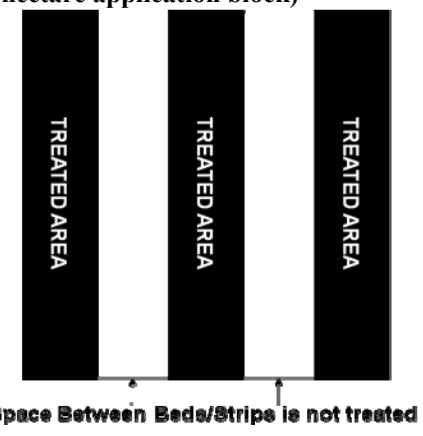
16. The following statements must be included under **DIRECTIONS FOR USE** in a section entitled **Calculating the Broadcast Equivalent Application Rate**:

To calculate the broadcast equivalent rate for bedded or strip applications the following information is needed:

- kilograms (or litres) of product per treated hectare
- strip or bed bottom width (cm)
- center-to-center row spacing (cm)
- application block size (hectares)

Kilograms (or litres) of product **per treated hectare** is the ratio of total amount of product applied to the size of the **total area treated** (for example, the rate of product applied in the bed). For bedded or strip applications, the **total area treated** is the summation of the area (i.e. length × width) of each treated bed bottom or strip that is located within the application block as shown by the black areas in Figure 1 (for example, black areas are 0.6 ha or 60% of the area within the application block). The area of the space between the beds/strips is not factored in the total area treated.

Figure 1. Bedded/Strip Application (1 hectare application block)



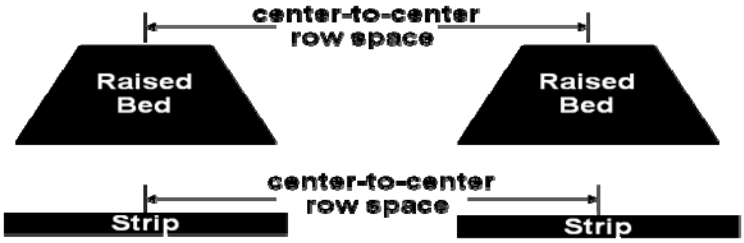
The **application block size** is the area within the perimeter of the fumigated portion of a field (including furrows, irrigation ditches, roadways). The perimeter of the application block is the border that connects the outermost edges of total area treated with the fumigant product.

The "broadcast equivalent rate" must be calculated with the following formula:

$$\textbf{Broadcast equivalent rate (kilograms (or litres) product/hectare)} = \frac{\textbf{strip or bed bottom width (cm)}}{\textbf{center-to-center row spacing (cm)}} \times \textbf{kg (or litres) of product/ treated hectare applied in the strip or bed}$$

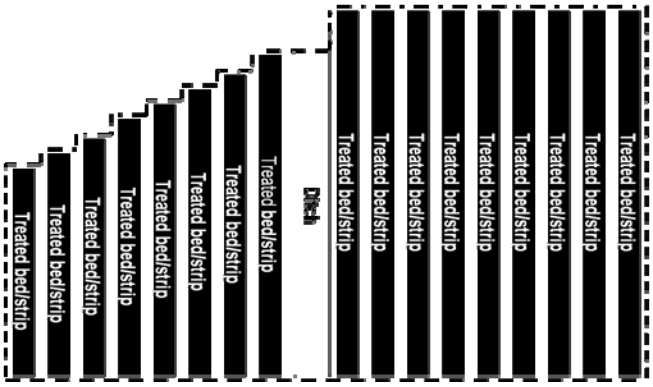
The bed width must be measured from the bottom edge of the bed.
The center-to-center row spacing must be calculated as shown in Figure 2.
If there are any ditches, waterways, drive rows and other areas that are not fumigated that are in the application block, multiply the above broadcast equivalent equation by: **(total area of strips or beds + row spacing)/(application block size).** A sample calculation is provided below.

Figure 2. Center Row Spacing



Sample broadcast equivalent rate calculation
Assumptions:

- Application method is shank bedded
- Strip/Bed width is 80 cm (measured at the bottom of bed)
- Center-to-center row spacing is 160 cm
- 90 kilograms of product per treated hectares is applied in the beds
- Total application block size is 4 hectares
- Ditch in the middle of application block is 0.1 hectare
- Area of strips/beds and row spacing is 3.9 hectares



$$\text{broadcast equivalent rate (kg product/ha)} = \frac{\text{strip or bed bottom width (cm)}}{\text{center-to-center row spacing (cm)}} \times \frac{\text{area of strips or beds and row spacing}}{\text{application block size}} \times \text{kg product/ treated hectare applied in the bed}$$

$$\text{broadcast equivalent rate (kg product/ha)} = \frac{\text{80 cm width strips/beds}}{\text{160 cm row spacing}} \times \frac{\text{3.9 ha}}{\text{4 ha}} \times \text{90 kg product/ treated ha}$$

$$\text{broadcast equivalent rate} = \text{43.9 kg product/ha}$$

17. The following statements and buffer zone tables must be included under **DIRECTIONS FOR USE** in a section entitled **Buffer Zone Distances**. The buffer zone look-up tables added to product labels must only reference registered uses, application rates and application methods specific to each product label. The application rates in look-up tables must be expressed in terms of the amount of product.

    Buffer zone distances must be calculated based on the buffer zone look-up tables provided on this label, using the broadcast equivalent application rate, see **Calculating the Broadcast Equivalent Application Rate** section) and the size of the application block. Where applicable, round up to the nearest block size. Applications are prohibited for rates and block sizes that exceed what is presented in the buffer zone tables.

    Eight (8) metres is the minimum buffer distance regardless of site-specific application parameters.

    If the buffer zone distance, after applying all applicable buffer zone credits (see **Buffer Zone Credits** section), is greater than 0.8 km (800 metres) then the application is prohibited.

Buffer Zone Look-Up Tables

Table X Dazomet Buffer Zone Distances (Meters) for Mechanically Incorporated Soil Applications (Non-Greenhouse Use)

Broadcast Equivalent Application Rate (kg a.i./ha)	Application Block Size (Hectares)											
	16	12	8	6	4	3.5	3	2.5	2	1.5	1	≤0.5
475-476	275	200	150	120	85	80	70	55	50	45	45	35
450-474	225	175	125	105	75	70	65	50	45	40	35	25
435-449	225	175	125	100	75	70	60	50	45	40	35	20
425-434	225	175	125	100	70	65	60	50	45	40	35	20
415-424	225	175	125	95	70	65	60	50	45	35	30	20
405-414	200	175	125	90	65	60	55	50	40	35	30	20
390-404	200	150	125	90	65	60	55	45	40	35	30	20

Broadcast Equivalent Application Rate (kg a.i./ha)	Application Block Size (Hectares)											
	16	12	8	6	4	3.5	3	2.5	2	1.5	1	≤0.5
380-389	200	150	100	85	65	60	55	45	40	35	30	15
370-379	200	150	100	85	60	55	50	45	40	35	30	15
360-369	175	150	100	80	60	55	50	40	40	30	25	15
345-359	175	150	95	75	55	55	50	40	35	30	25	15
335-344	175	125	95	75	55	50	45	40	35	30	25	15
325-334	175	125	90	70	50	50	45	35	35	30	25	15
315-324	150	125	85	65	50	45	45	35	35	25	20	10
305-314	150	125	80	65	50	45	40	35	30	25	20	10
295-304	150	125	75	60	45	45	40	35	30	25	20	10
290-294	150	100	75	60	45	40	35	30	25	20	15	10
280-289	150	100	70	55	40	35	35	25	25	20	15	10
270-279	150	100	70	50	35	35	30	25	20	15	15	10
260-269	125	100	65	50	35	30	25	20	15	15	10	10
245-259	125	95	60	45	30	25	25	15	15	10	10	10
235-244	125	90	60	40	25	25	20	15	10	10	10	10
225-234	125	85	55	40	25	20	15	10	10	10	10	10
215-224	100	80	55	40	25	20	15	10	10	10	10	10
200-214	100	80	50	35	20	20	15	10	10	10	10	10
190-199	100	75	50	35	20	20	15	10	10	10	10	10
180-189	90	70	45	35	20	20	15	10	10	10	10	10
170-179	85	65	45	30	20	15	15	10	10	10	10	10
155-169	80	60	40	30	20	15	15	10	10	10	10	10
150-154	75	55	40	30	20	15	15	10	10	10	10	10
145-149	75	55	40	30	20	15	10	10	10	10	10	10
135-144	65	50	35	25	15	15	10	10	10	10	10	10
125-134	55	45	30	20	15	10	10	10	10	10	10	10
110-124	45	35	25	20	15	10	10	10	10	10	10	10
100-109	35	30	20	15	10	10	10	10	10	10	10	10
90-99	25	20	15	15	10	10	10	10	10	10	10	10
80-89	20	15	10	10	10	10	10	10	10	10	10	10
75-79	10	10	10	10	10	10	10	10	10	10	10	10

Table X Dazomet Buffer Zone Distances (Meters) for All Greenhouse Applications.

Broadcast Equivalent Application Rate (kg a.i./ha)	Structure Size (m^2)								
	500	1000	1500	2000	2500	3000	3500	4000	4500
295-297	75	100	125	175	200	225	250	275	350
225-294	55	90	100	125	175	175	225	225	250
150-224	35	65	80	100	125	125	175	175	200
75-149	15	25	35	50	65	75	90	100	100

18. The following statements must be included under **DIRECTIONS FOR USE** in a section entitled **Buffer Zone Credits**:

The buffer zone distances (from the buffer zone look-up tables) for dazomet applications can be reduced by the percentages listed in Table X, if the conditions outlined below are met. Credits may be added, but cannot exceed 80%.

IMPORTANT: The buffer zone distance is a minimum of 8 metres regardless of the buffer zone credits available.

Table X Buffer Zone Credits and Conditions

Credit Type*	Buffer Zone Distance Reduction (%)	Condition
Soil organic content	10%	If the organic content of soil in the application block is ≥1%-2%.
	20%	If the organic content of the soil in the application block is >2%-3%.
	30%	If the organic content of the soil in the application block is >3%.
Soil temperature	10%	If the soil temperature is measured to be 10°C or less. Temperature measurements must be recorded at the application depth or at a soil depth of 30 cm, whichever is shallower.
Soil clay content	10%	If the clay content of the soil in the application block is greater than 27%.

Example of buffer calculations if a credit is applicable
If the buffer zone is 15 metres, and the application qualifies for a buffer zone reduction credit since the soil organic content is 1.5%, then the buffer zone can be reduced by 10% (i.e. reduced by 1.5 metres based on the following calculation: 15 metres – [15 metres × 10%] = 13.5 metres).

If the buffer zone is 15 metres and the application qualifies for two buffer zone credits since the soil organic content is 1.5% and the clay content is greater than 27%, then the buffer zone can be reduced by 20% (10% organic content credit + 10% clay content credit), i.e. reduced by 3 metres based on the following calculation 15 metres - (15 metres x 20%) = 12 metres.

19. The following statements must be included under **DIRECTIONS FOR USE** in a section entitled **Emergency Preparedness and Response Measures**:

If the buffer zone is 8 meters, then the Emergency Preparedness and Response Measures are not applicable.

If any of the conditions outlined in Table X apply, either the directions for Fumigant Site Monitoring **or** the directions for Response Information for Neighbours must be followed:

Table X Triggers for Emergency Preparedness and Response Measures

The Emergency Preparedness and Response Measures are triggered if	**Buffer zone distance is**	**and**	**Residences and businesses are located**
	>8 to ≤ 30 m		Within 15 m from the outer edge of the buffer zone
	>30 to ≤ 60 m		Within 30 m from the outer edge of the buffer zone
	>60 to ≤ 90 m		Within 90 m from the outer edge of the buffer zone
	>90 m or if buffer zone overlaps another dazomet (or other MITC generating pesticide) buffer zone		Within 90 m from the outer edge of the buffer zone

Fumigation Site Monitoring

From the start of the fumigant application until the Buffer Zone Period expires, the applicator must monitor for sensory irritation (tearing, burning of the eyes or nose) in areas between the buffer zone outer perimeter and residences and businesses that trigger this requirement.

Monitoring for sensory irritation must begin in the evening on the day of application and continue until the Buffer Zone Period expires. Monitor a minimum of 8 times during the Buffer Zone Period, including these periods:

- one (1) hour before sunset,
- during the night,
- one (1) hour after sunrise, and
- during daylight hours.

Implement the emergency response plan stated in the Fumigation Management Plan immediately if a handler conducting air monitoring experiences sensory irritation.

Response Information for Neighbours

The applicator must ensure that residences and businesses that trigger the requirement have been provided the response information at least **1 week** before the application starts. The information provided may include application dates that range no more than **4 weeks**. If the application does not occur when specified, the information must be delivered again.

The response information must include:

- The location of the application block.
- The fumigant(s) applied including the active ingredient, name of the fumigant product(s), and the Product Registration Number.
- Contact information for the applicator and property owner/operator.
- Time period in which the fumigation is planned to take place.
- Early signs and symptoms of exposure to the fumigant(s) applied, what to do, and who to call if you believe you are being exposed (911 in most cases).
- How to find additional information about fumigants.

The method used to share the response information for neighbours can be accomplished through mailings, door hangers, or other methods that will effectively inform people in residences and businesses within the required distance from the edge of the buffer zone.

20. The following statements must be included under **DIRECTIONS FOR USE** in a section entitled **Emergency Response Plan**:

The applicator must include in the Fumigation Management Plan a written emergency response plan that identifies:

- evacuation routes,
- locations of telephones,
- contact information for first responders,
- local, provincial and federal health and environment authorities, and
- emergency procedures/responsibilities (for example, adding water to the field, repairing tarps, fixing equipment, evacuating upwind) if:
  - there is an incident,
  - sensory irritation is experienced outside of the buffer zone, and/or
  - there are equipment/tarp/seal failure or complaints, or other emergencies.

21. The following statements must be included in a section entitled **FUMIGATION MANAGEMENT PLAN**:

Prior to the start of application, the applicator must verify that a site-specific Fumigation Management Plan (FMP) exists for each application block.

The Fumigation Management Plan must be prepared by the applicator or the site owner/operator.

The applicator must verify in writing (sign and date) that the site-specific Fumigation Management Plan(s) reflects current site conditions before the start of the application.

The applicator must ensure the Fumigation Management Plan is at the application block during all handling activities.

In addition, the applicator must complete a Post-Application Summary within 30 days after the application is complete.

Instructions for Preparation of a Fumigation Management Plan

Each site-specific Fumigation Management Plan must contain the following elements:

1. *Applicator information*: name, phone number, certificate/license number, date of certification/licensing, specify if commercial or private applicator, employer name, and employer address.

2. *General site information*:
   - Application block location, address or global positioning system (GPS) coordinates.
   - Name, address, and phone number of owner/operator of the application block.
   - Map, aerial photo, or detailed sketch showing:
     - application block location,
     - application block dimensions,
     - buffer zones dimensions,
     - property lines,
     - roadways, rights-of-ways, sidewalks, permanent walking paths and bus stops,
     - nearby application blocks,
     - surrounding structures (occupied and non-occupied),
     - locations of Buffer Zone signs, and
     - locations of difficult to evacuate sites with distances from the application site.

3. *General application information*:
   - Target application date/window
   - Fumigant product name of fumigant
   - Product Registration Number

4. *Tarp plan* (if tarps are used):
   - Schedule for checking tarps for damage, tears, and other problems
   - Equipment/methods used to perforate tarps
   - Target dates for perforating tarps
   - Target dates for removing tarps

5. *Soil Conditions*:
   - Description of soil texture and moisture in application block
   - Method used to determine soil moisture
   - Soil temperature measurements

6. *Buffer zones*:
   - Application method
   - Application rate from the buffer zone look-up table on label
   - Application block size from the buffer zone look-up table on label
   - Buffer zone credits applied and measurements taken (if applicable)
   - Buffer zone distance
   - Description of areas in the buffer zone that are not under the control of the owner/operator of the application block. If buffer zones extend onto areas not under the control of the owner, the written agreement must be attached to the Fumigation Management Plan.

7. Details of the *Emergency Response Plan* as described in the Emergency Response Plan section of this label.

8. *Posting of Fumigant Treated Area and Buffer Zone*:
   - Person(s) who will post and remove (if different) Fumigant Treated Area and Buffer Zone signs
   - *Location of Buffer Zone signs.*

9. *Emergency Preparedness and Response Measures* (if applicable):
   - Fumigant site monitoring (if applicable):
     - When and where it will be conducted
   - Response information from neighbours (if applicable):
     - List of residences and businesses informed
     - Name and phone number of person providing information
     - Method of providing the information

10. *Handler (including applicator) Information and Personal Protective Equipment*:
    - Name, address and phone numbers of handlers
    - Names, addresses, and phone numbers for employers of handlers

- Date of certification/licensing recognized by the provincial or territorial pesticide regulatory agency for each handler
- Applicable handler personal protective equipment.

11. *Air monitoring plan*:
    - Indicate whether operations will cease, or continue with use of an air-purifying respirator, in the case sensory irritation is experienced
    - For monitoring the breathing zone:
        - representative handler tasks to be monitored
        - monitoring equipment to be used
        - timing of the monitoring

12. *Good Agricultural Practices* (GAPs):
    - Identify applicable mandatory Good Agricultural Practices

13. *Pesticide product labels and material safety data sheets* (MSDS) :
    - Ensure that pesticide product labels and material safety data sheets are on-site and readily available for employees to review.

Instructions for Preparation of Post-Application Summary

The Post-Application Summary must contain the following elements:

1. *Application Information*
    - Actual date and time of the application
    - Application rate
    - Size of application block

2. *Weather conditions*
    - Summary of the weather during application and the 48-hour period after the application is complete, including:
        - wind speed, and
        - air stagnation advisory (if applicable).

3. *Tarp damage and repair information* (if applicable):
    - Date of tarp damage discovery
    - Location and size of tarp damage
    - Description of tarp, tarp seal and/or tarp equipment failure
    - Date and time of tarp repair completion

4. *Tarp perforation/removal details* (if applicable):
    - Date and time tarps were perforated
    - Date and time tarps were removed
    - Record if tarps were perforated and/or removed early (as per conditions specified on the label). Describe the conditions that caused early tarp perforation and/or removal.

5. *Complaint details* (if applicable):
   - Person filing complaint (for example, on-site handler, person off-site)
   - If off-site person, name, address, and phone number of person filing complaint
   - Description of control measures or emergency procedures followed after complaint

6. Description of *incidents, equipment failure, or other emergency and emergency procedures* followed (if applicable).

7. *Air monitoring results*:
   - When sensory irritation was experienced:
     - Date, time, location, and handler task/activity where irritation was observed
     - Resulting action (for example, implement emergency response plan, cease operations, continue operations with air-purifying respirators)
   - When using a direct read detection device:
     - Sample date(s), time(s), location(s), and concentration(s)
     - Handler task/activity monitored (if applicable)
     - Resulting action (for example, cease operations, continue operations with air-purifying respirators)

8. *Fumigant Treated Area and Buffer Zone Signs*:
   - Dates of posting and removal

9. *Deviations from the Fumigation Management Plan*
   - For example, changes in emergency response actions, changes in handler information, changes in handlers responsible for completing emergency tasks, and changes in communication between applicator, owner/operator, and other handlers.

Record keeping procedures

The owner/operator of the application block as well as the applicator must keep signed copies of the site-specific Fumigation Management Plan and the Post-Application Summary for 2 years from the date of application.