



**US Environmental Protection Agency
Office of Pesticide Programs**

RED Fact Sheet: Dazomet

July 10, 2008

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Pesticide Reregistration

All pesticides sold or distributed in the United States must be registered by EPA, based on scientific studies showing that they can be used without posing unreasonable risks to people or the environment. Because of advances in scientific knowledge, the law requires that pesticides first registered before November 1, 1984, be reregistered to ensure that they meet today's more stringent standards.

In evaluating pesticides for reregistration, EPA obtains and reviews a complete set of studies from pesticide producers that describe the human health and environmental effects of each pesticide. The Agency develops any mitigation measures or regulatory controls needed to effectively reduce each pesticide's risks. EPA then reregisters pesticides that meet current human health and safety standards and can be used without posing unreasonable risks to human health and the environment.

When a pesticide is eligible for reregistration, EPA explains the basis for its decision in a RED document. This fact sheet summarizes the information in the RED document for the pesticide Dazomet, case number 2135.

Concurrent to EPA's review of the soil fumigant uses of dazomet, EPA assessed the risks and developed risk management decisions for four other soil fumigant pesticides, including: chloropicrin, metam sodium/metam potassium, methyl bromide, and a new active ingredient, iodomethane. Risks of a fifth soil fumigant, 1,3-dichloropropene (1,3-D), were also analyzed along with the other soil fumigants for comparative purposes; the reregistration eligibility document (RED) for 1,3-D was completed in 1998. The Agency evaluated these soil fumigants concurrently to ensure that human health risk assessment approaches are consistent, and that risk tradeoffs and economic outcomes were considered appropriately in reaching risk management decisions. This review is part of EPA's program to ensure that all pesticides meet current health and safety standards.

Regulatory History

- Dazomet was first registered in the United States in 1967 as an algaecide, a bacteriostat, and a microbicide.
- In the late 1980s pre-plant soil uses of dazomet were registered.
- A Phase IV data call-in (DCI) was issued for dazomet in January 1991 and included data requirements for ecotoxicity, toxicology, and

environment fate. A follow-up DCI was issued in May of 1992 which included data requirements for neurotoxicity and the nature of residue in plants. Dazomet was also included in the October 1995 agricultural reentry data call-in.

Uses

- Dazomet is a non-selective soil fumigant with fungicidal, herbicidal and nematicidal properties. Soil fumigants form gasses when applied to soil. Once in the soil, the fumigants work by controlling pests that can disrupt plant growth and crop production. When dazomet is applied, it is quickly broken down into several degradates; the major degradate being methyl isothiocyanate (MITC). MITC is highly volatile and is responsible for the fumigant properties of dazomet. Dazomet is used on a wide range of sites including golf greens or tees, nonbearing crops, turf sites, ornamental sites, field nurseries, compost piles, potting soils, and strawberries and tomatoes (in California only).
- Unlike other soil fumigants, dazomet is applied as a dry granule and incorporated into the soil or applied to the soil surface and watered into the soil to activate it.
- Dazomet is also registered as an antimicrobial agent with algaecidal, bacteriocidal, fungicidal, microbicidal, and mildewcidal properties on a number of use sites, including: 1) a treatment during the production of pulp and paper; 2) a material preservative treatment for coatings, adhesives, epoxy flooring compounds, slurries, and high viscous suspensions; 3) a biocide treatment used during petroleum operations; 4) a biocide treatment to recirculating cooling water systems; and 5) a remedial wood treatment to utility poles.
- There are no residential uses of Dazomet.
- The maximum application rate for incorporated applications is 530 pounds of active ingredient per acre (lbs a.i./A) and 265 lbs a.i./A for surface applications in soil fumigant applications. For antimicrobial uses, rates vary by application use site and method.
- Dazomet does not currently require food tolerances for the registered uses.
- Currently, dazomet products are not restricted use but will be as a result of the reregistration decision.

Health Effects & Risks

- Acute inhalation exposures to MITC of 22 parts per billion (ppb) or greater for residential bystanders and occupational handlers exceed the Agency's level of concern. Such exposures could cause eye irritation, systemic, or respiratory effects. Eye irritation is protective

of other human health effects and acts as a warning sign for potentially more adverse systemic effects.

- Acute exposure to bystanders or fumigant handlers is possible following dazomet application due to volatilization and off-site movement of MITC.
- Dazomet is not a dermal sensitizer but MITC is a dermal sensitizer.
- The Agency currently has no data on MITC carcinogenicity, but data are being required as a result of the reregistration.
- Based on the currently registered use patterns for dazomet, dietary exposure, including exposure from drinking water, is not expected and no dietary risk mitigation is warranted for dazomet at this time.
- Occupational risks have been identified for handlers exposed to dazomet during the application process and post-application workers and/or reentry workers exposed to MITC.
- The Agency also has identified potential human health risks of concern associated with the registered antimicrobial uses of dazomet.

Ecological Effects & Risks

- Dazomet is acutely toxic to mammals, and birds that could be exposed to unincorporated dazomet granules. Exposure to terrestrial organisms such as birds and mammals could occur two ways, as either oral exposure to dazomet granules or by the inhalation route of exposure to the breakdown product, MITC. Potential exposure to aquatic organisms may occur from surface runoff/leaching and/or volatilization and deposition of MITC in water bodies. MITC is acutely toxic to aquatic invertebrates and fish.
- Due to the current data gaps for dazomet and MITC, the Agency is requiring additional eco-toxicity studies for both terrestrial and aquatic organisms.

Benefits

Due to the broad range of pests controlled, soil fumigants are used in the production of a wide variety of crops and provide high benefits for growers and consumers. For consumers, it means more fresh fruits and vegetables can be cheaply produced year-round because severe pest problems can be efficiently controlled. Growers benefit because crops grown in fumigated soil produce fewer blemished products, which translates into an increase in marketable yields. Fumigation can also provide benefits to growers by increasing crop management flexibility. The magnitude of benefits depends on pest pressure, which varies over space and time, and the availability and costs associated with the use of alternatives.

Risk Mitigation

EPA has developed a multi-faceted approach to addressing bystander and handler risk for fumigants. This involves label changes, education of fumigant applicators and handlers, monitoring of fumigant air concentrations, and development of additional data to refine risk assessments. Specific mitigation for bystanders and handlers from soil use of dazomet includes:

- **Maximum Rate Reduction** – A change in the maximum application rate will be a reduction from 530 to 425 lbs a.i./A, which will directly reduce the potential risks to both humans and non-target organisms.
- **Restricted Use Pesticide (RUP) Classification** – MITC, the byproduct of dazomet, meets the criteria for restricted use based on human hazard criteria and exposure incidents. All soil fumigant products containing dazomet will be RUPs.
- **Buffer Zones** – Buffer zones, of varying sizes based on application method, application rate, and application block size, and emission control measures are required. Buffer zones will be in effect from the time the fumigation begins until 48 hours following the application.
- **Posting** – EPA is requiring that buffer zones be posted at usual points of entry and along likely routes of approach to the buffer unless (1) a physical barrier such as a fence prevents access to the buffer, or (2) all of the area within 300' of the buffer is under the control of the owner/operator. The posting requirement is intended to prevent passersby from entering a buffer zone.
- **Worker Protection Measures:**
 - Respiratory Protection - Handlers exposed to MITC vapors from dazomet applications will either wear respirators or follow an air monitoring program. Additional dermal PPE is required for some handler tasks.
 - Tarp Perforation and Removal –
 - Tarps cannot be perforated (cut/punched) until a minimum of 5 days (120 hours) have passed after the fumigant application is complete;
 - A minimum interval of 24 hours must pass between perforation and tarp removal;
 - Use of respiratory protection is required for tarp perforation if concentrations exceed labeled action levels; and
 - Use of mechanical devices (e.g., using all terrain vehicles with cutting implements attached) is required.
 - Entry – Only properly trained and equipped handlers can be in the field during treatment and for 5 days after the application is complete.

- ***Good Agricultural Practices (GAPs)*** – Mandatory GAPs must be followed during all soil applications. GAPs specify appropriate weather conditions, injection depth, soil sealing, use of tarps, soil temperature, air temperature, soil moisture, soil preparation, prevention of end row spillage, flushing of drip irrigation lines, and calibration, set-up, repair and maintenance of application equipment.
- ***Fumigant Management Plans (FMPs)*** – The certified applicator supervising the application must verify that a site-specific fumigant management plan (FMP) exists for each application block, which includes site information, a map of the treated field and adjacent property, authorized personnel, application procedures, posting plans, and emergency procedures. 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 the FMP that occurred, measurements taken to comply with FMPs, as well as any complaints and/or incidents that have been reported to him/her. The summary must include the actual date of the application, application rate, and size of applications block fumigated.
- ***Emergency Preparedness and Response*** – The Agency is requiring emergency preparedness measures at the community level in the form of information and education for first responders, and site-specific response and management activities. These measures will ensure early detection and quick response to situations as they arise.
- ***Notice to State and Tribal Lead Agencies*** – Assuring compliance with new label requirements is an important part of the package of mitigation measures. Therefore, before the application, fumigators must notify State and Tribal Lead Agencies for pesticide enforcement about applications they plan to conduct. This information will aid states in planning compliance assurance activities.
- ***Outreach Program for Communities*** – Registrants must disseminate health and safety information to communities including first responders, in areas where there is high use of dazomet and areas with significant interface between communities and fumigated fields. While EPA's decisions for the fumigants will not alleviate challenges that already exist, EPA has selected a flexible approach to mitigation that is designed to reduce impacts to growers while protecting bystanders at the agriculture-urban interface.
- ***Training Program and Training Materials*** – The registrants must propose and develop a training program approved by EPA that provides information to the applicators and handlers on how to correctly apply the fumigant including how to protect themselves,

other handlers and bystanders, how to determine buffer zone distances, how to develop an FMP, and how to determine when weather and other site-specific factors are not favorable for fumigant application.

The Agency also has identified potential human health risks of concern associated with the registered antimicrobial uses of dazomet. To reduce these exposures, the Agency is requiring a number of mitigation measures, including additional PPE for handlers engaged in these applications: pulp and paper use, cooling tower use, and metering pumps. For the epoxy flooring uses, the labels must be amended to reduce the amount of dazomet formulated in end use products.

Regulatory Conclusion

The Agency has determined dazomet uses are eligible for reregistration and will not pose unreasonable risks or adverse effects to humans or the environment, provided the risk mitigation measures and label changes outlined in this RED are implemented.

For More Information

Electronic copies of the Dazomet RED and all supporting documents are available in Docket #EPA-HQ-OPP-2005-0128 at <http://www.regulations.gov>. For more information about EPA's pesticide reregistration program, the Dazomet RED, or reregistration of individual products containing dazomet, please contact the Special Review and Reregistration Division (7508C), Office of Pesticide Programs, US EPA, Washington, DC 20460, telephone 703-308-8000.

For information about the health effects of pesticides, or for assistance in recognizing and managing pesticide poisoning symptoms, please contact the National Pesticide Information Center (NPIC). Call toll-free 1-800-858-7378, from 6:30 am to 4:30 am Pacific Time, or 9:30 am to 7:30 pm Eastern Standard Time, seven days a week. The NPIC internet address is <http://npic.orst.edu>.