



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

RED Fact Sheet for Methyl Bromide

July 10, 2008

RED Fact Sheet: Methyl Bromide Soil Uses

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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 Reregistration Eligibility Decision (RED) document. This fact sheet summarizes the information in the RED document for the pesticide methyl bromide, case number 0335.

Concurrent to EPA's review of the soil fumigant uses of methyl bromide, EPA assessed the risks and developed risk management decisions for four other soil fumigant pesticides, including chloropicrin, dazomet, metam sodium/metam potassium, 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 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

- Introduced as pesticide in 1932
- First registered in the U.S. in 1961
- Under the Clean Air Act and the Montreal Protocol on Substances that Deplete the Ozone Layer, as of January 1,

2005, U.S. production and import of methyl bromide is banned, except for uses that qualify for (1) a critical use exemption (CUE), (2) a quarantine and pre-shipment exemption (QPS), or (3) an emergency exemption.

- The report of the Food Quality Protection Act (FQPA) Tolerance Reassessment and Risk Management Decision (TRED) for Methyl Bromide and RED for Methyl Bromide's Commodity Uses was completed in 2006. The TRED/ RED included all of the methyl bromide uses that have food tolerances.
 - A few methyl bromide uses that do not have tolerances were also included in the 2006 TRED/RED since they involve similar application methods as the commodity uses that do have tolerances (e.g., fumigation of logs, tiles, equipment, etc. in chambers).
 - Many of mitigation measures required for the TRED/RED uses are also being required for methyl bromide soil uses (e.g., buffer zones, fumigant management plans, respiratory protection, and air monitoring).

Uses

- Methyl bromide is a broad-spectrum fumigant chemical that can be used as an acaricide, antimicrobial, fungicide, herbicide, insecticide, nematicide, and vertebrate control agent.
- Methyl bromide's most prevalent use pattern is as a soil fumigant. It is also used as a post harvest treatment of commodities and for structural fumigation. Structural non-food treatments (e.g., residential buildings) are reportedly no longer performed.
- Soil uses: Methyl bromide is injected in to the soil using tractors equipped with shanks at various depths, shapes, sizes, and orientations. Applications have historically been done with and without tarps but tarp use is prevalent. With the hot gas method, methyl bromide is forced through a heat exchanger into tubing under tarps. Applications can be made as broadcast treatments to an entire field or in user created raised beds. Applications are typically accompanied by some degree of soil compaction or devices to close shank traces.
- Other Uses: Methyl bromide gas is injected into an enclosure, chamber, structure, or under a tarp remotely using flexible tubing connected to pressurized gas tanks.
- In 2007, 5,482 metric tons of methyl bromide was applied (4,269 metric tons from new stock and 1,213 metric tons from pre-2005 stocks). This amount does not include QPS usage. QPS production is tracked by the Agency but usage is not. In a

2007 report by EPA's Office of Air and Radiation (OAR), there were 6,458 metric tons of pre-2005 methyl bromide stocks.

Health Effects & Risks

- EPA is concerned with human health risks (e.g., skin cancer) associated with methyl bromide's role in the depletion of stratospheric ozone.
- EPA has identified potential developmental and neurological human health risks of concern associated with the registered methyl bromide use from inhalation exposure to handlers, bystanders, and workers.
- Acute (1 day) inhalation exposures to methyl bromide concentrations of 0.33 ppm or greater for a 24-hour time weighted average (TWA) for non-occupational (residential) bystanders are of concern.
- Acute (1 day) inhalation exposures to methyl bromide concentrations of 1 ppm for an 8-hour TWA for occupational handlers and bystanders are of concern.
- Short- and intermediate-term (1-day to 6 months) exposures to methyl bromide concentrations of 0.15 ppm for an 8-hour TWA for occupational handlers and workers are of concern.
- Risk assessments show risks of concern for occupational handlers involved in methyl bromide applications and tarp perforation/removal activities.
- Risks are also of concern for workers who may re-enter treated areas shortly after fumigation or tarp perforation has been completed.
- Monitoring and modeling data indicate that there can be risks of concern associated with methyl bromide use at a broad range of distances from treated fields, depending on application method, emission control methods employed, application rate, and size of the area treated.
- Incidents from methyl bromide and other fumigants have occurred involving handlers, workers and bystanders.
- Bystander incidents from methyl bromide and other fumigants have occurred to people who were located close to fields and up to several thousand feet from the fumigated field.

Ecological Effects & Risks

- The acute endangered species Level of Concern (LOC) for methyl bromide is exceeded for aquatic invertebrates in two of four modeled sites.
- Non-target plants off-site will likely also be at some risk from off-gassed methyl bromide.

- There does not appear to be an acute inhalation concern to wild mammals or birds.

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 many growers. Methyl Bromide uses that have been granted CUE, QPS and emergency status under the Montreal Protocol have been demonstrated to have very high benefits. Based on information from stakeholders, public comments, and the Agency's analyses, all other uses have lower benefits and/or viable alternatives.

Risk Mitigation for Soil Uses

EPA has identified several measures which will work together to protect fumigant handlers, reentry workers, and bystanders from risks resulting from exposure to methyl bromide. These are summarized below.

- ***Ineligible Uses:*** All uses except for those granted CUE, QPS and emergency status under the Montreal Protocol are ineligible for reregistration and need to be removed from all methyl bromide labels.
- ***Application Method, Practice, and Rate Restrictions:*** The Agency is restricting certain application methods and practices for which data are not currently available to determine appropriate protections, or which lead to risks that are otherwise difficult to address. These include certain untarped. EPA is also limiting application rates and formulations with high percentages of methyl bromide (i.e., 98%) to those needed for effective use.
- ***Buffer Zones:*** Buffer zones, of varying sizes based on application method, application rate, 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 Protections:*** The following additional measures will be required to protect those involved in handler activities.
 - ***Respiratory Protection*** – New labels will require air monitoring at regular intervals. If concentrations detected

are above action levels on labels, handlers must wear respirators.

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, soil temperature, air temperature, soil moisture, soil preparation, prevention of end row spillage, 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 FMP exists for each application block which includes site information, a map of the treated field, 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 GAPs, 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 application 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 methyl bromide and areas with significant interface between communities and fumigated fields.
- ***Training Program and Training Materials:*** The registrants must develop a training program approved by EPA that provides information 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.

Regulatory Conclusion

- EPA has concluded that uses granted a Critical Use Exemption (CUE), a Quarantine Pre-shipment (QPS) Exemption, or an emergency use exemption under the Montreal Protocol are eligible for reregistration provided the mitigation measures discussed above are adopted and labels are amended to implement these measures.
- All other uses are ineligible for reregistration. However, there may be some uses that would have significant impacts without some additional time to transition. If such uses are identified during the comment period, the Agency will consider requests for a reasonable phase-out.

For More Information

Electronic copies of the methyl bromide RED for soil uses as well as TRED/RED for commodity uses and all supporting documents are available in Docket #EPA-HQ-OPP-2005-0123 at <http://www.regulations.gov>. For more information about EPA's pesticide reregistration program, the Methyl Bromide RED, or reregistration of individual products containing Methyl Bromide, 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 pm 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>.