

## U.S. ENVIRONMENTAL PROTECTION AGENCY



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Anthrax spore decontamination using Methyl Bromide

## Anthrax spore decontamination using methyl bromide

Current as of July 2007

[Bleach](#), [chlorine dioxide](#), [ethylene oxide](#), [hydrogen peroxide](#) and [peroxyacetic acid](#), [methyl bromide](#), [paraformaldehyde](#) and [vaporized hydrogen peroxide](#) were pesticides

used in federal decontamination responses to the bioterrorism attacks of October 2001. These attacks involved the intentional placement of *Bacillus anthracis* spores (the causative agent of the disease anthrax) into letters addressed to various locations on the East Coast of the United States. [More information about biological threats.](#)

This page describes the Agency's actions with regard to the chemicals used in the anthrax spore decontamination activities. EPA temporarily approved these pesticides for sale, distribution, and use based on the remediation action plans submitted for each specific site and only in accordance with the requirements of each crisis exemption under [Section 18 of FIFRA](#). These chemicals were not intended for use by the general public.

### What is methyl bromide?

Methyl bromide is a broad spectrum pesticide used to control insects, weeds, rodents, and plant pathogens. A colorless, odorless gas at room temperature, methyl bromide is normally applied as a liquid under pressure that converts to the gaseous state upon release at the point of application.

#### Resources

- Questions On Pesticides? [National Pesticide Information Center \(NPIC\)](#) 1-800-858-7378  
[EXIT Disclaimer](#)
- [Methyl Bromide reregistration information](#)
- [Phase out of Methyl Bromide](#)
- [Methyl Bromide Hazard Summary](#)

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## Registration of pesticides containing methyl bromide

Through various scientific assessments, atmospheric scientists have concluded that use of methyl bromide contributes to the destruction of the ozone layer. Accordingly, under the Montreal Protocol on Substances that Deplete the Ozone Layer and under the Clean Air Act, production of most uses of methyl bromide was eliminated in the United States and other countries covered by the Protocol. While most uses of methyl bromide have been phased out, certain "critical" uses (i.e., those for which there are no available alternatives) are exempted. The following are registered pesticidal uses:

- **Soil fumigant:** Methyl bromide gas is injected into the soil before a crop is planted. This treatment, which effectively sterilizes the soil, kills the vast majority of soil organisms.
- **Commodity treatment:** Methyl bromide gas is used for post-harvest pest control and can be injected into a chamber or under a tarp containing commodities such as grapes, raisins, cherries, nuts, and imported non-food materials.
- **Structural pest control treatment:** Methyl bromide gas is used to fumigate buildings for termites, warehouses and food processing facilities for insects and rodents, aircraft for rodents, and ships (and other transportation vehicles) for various pests.
- **Quarantine Uses:** USDA's Animal Plant and Health Inspection Service (APHIS) uses methyl bromide to treat imported commodities as required by quarantine regulations.

## Responding to emergencies under FIFRA

Under [Section 18 of FIFRA](#), the EPA "may exempt any Federal or State agency from any provision of this Act if the Administrator determines that emergency conditions exist which require such exemption." To respond as rapidly as possible to the bioterrorism attacks, the Agency decided in 2001 to develop and issue the crisis exemptions itself.

To obtain a crisis exemption from EPA for the unregistered use of a pesticide against anthrax, anyone who needed to use an antimicrobial product to inactivate *Bacillus anthracis* spores at contaminated sites had to submit:

1. a written request to the Agency listing the antimicrobial product(s) to be used and describing how, when and where they would be used;
2. data demonstrating efficacy of the product against bacillus spores; and
3. remediation, sampling, and monitoring plans specific to the location of use.

Before issuing an exemption, EPA reviewed the request and the supporting information and then determined whether the product could be used safely and effectively (i.e., cause "no unreasonable adverse effects").

If during this review data were found to be deficient or missing, or adverse human health or environmental concerns were identified, EPA could deny the exemption request.

If a crisis exemption was issued and EPA determined that use of the product would be needed beyond the 15 day use period, EPA completed an application for a public health exemption. This allowed the crisis exemption to continue in effect until the application was either withdrawn or EPA issued a public health exemption.

## **Crisis exemptions for methyl bromide**

EPA initially reviewed data related to the safety and effectiveness of using methyl bromide in tests intended to inactivate surrogates for *Bacillus anthracis* spores, but not the virulent agent itself. After this review, EPA issued a crisis exemption to conduct limited testing to explore whether methyl bromide would be safe and effective for inactivation of bacillus anthracis spores in structures.

EPA issued two crisis exemptions (February 14, 2002 and February 27, 2003) to the University of Florida and Cobra Termite Control for the limited sale, distribution, and use of methyl bromide

## **Use of methyl bromide for decontamination**

"Meth-O-Gas" (EPA Registration Number 5785-11) was used for testing purposes only in a vacant mobile home on the premises of the University of Florida.

These tests were conducted according to all use directions, safety precautions, and environmental monitoring as specified in:

1. "Methyl Bromide Field Test Procedures" (2/4/2002);

2. "UF MeBr Efficacy Test Buffer Zone Determination;" and
3. "Research Protocol for Whole-Structure Decontamination of *Bacillus* sp. by Methyl Bromide" (2/24/03) as approved by EPA.

The data for these studies helped demonstrate the efficacy of methyl bromide in inactivating surrogate bacillus anthracis spores during structural fumigation. Although further research is needed to address other issues such as how to reduce and remove methyl bromide after fumigation.

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