California Department of Pesticide Regulation

About DPR's Decision to Register Methyl Iodide

Revised December 2010

DPR's decision to register methyl iodide follows an unprecedented level of evaluation by the department to ensure methyl iodide can be used safely in California.

In December 2010, the Department of Pesticide Regulation (DPR) finalized its decision to register five pesticide products containing the fumigant methyl iodide following approval by the U.S. Environmental Protection Agency (U.S. EPA) of California-specific labels. DPR's decision came after several years of assessment and an unprecedented level of evaluation by the department to ensure methyl iodide can be used safely in California. This included evaluation of public comments received after DPR proposed the registration in April 2010.

Use of methyl iodide can begin after DPR's emergency regulations go into effect, making it a restricted material. (Restricted pesticides require a permit from the county agricultural commissioner to buy or use.) DPR expects this to occur in late December 2010.

Methyl iodide use in California will be subject to the nation's strictest controls on its use, designed to ensure that workers and the public are not exposed to harmful levels of the fumigant.

What is methyl iodide?

Methyl iodide, also called iodomethane, is used in agriculture as a fumigant. Injected into soil before crops are planted, the fumigant spreads through the soil to kill plant diseases, weeds and nematodes. It can be applied by drip irrigation under a special protective tarp or injected into the soil using a tractor that automatically places a tarp over the ground after application.

Methyl iodide products are made by Arysta LifeScience Corp. and sold under the brand name, Midas. The five products registered are Iodomethane Technical (used in manufacturing end-use products); Midas 98:2; Midas 50:50; Midas 33:67; and Midas EC Gold. The four end-use products also contain the fumigant chloropicrin in concentrations ranging from 2 to 67 percent.

What does pesticide "registration" mean?

Pesticides must be registered—that is, licensed for sale and use—with the U.S. EPA before they can be registered in California. DPR's pre-registration evaluation is in addition to and complements U.S. EPA's.

Before a pesticide can be sold or used, both agencies require data on a product's toxicology and chemistry, how it behaves in the environment, and its effectiveness against targeted pests. The agencies also evaluate data on the hazards it poses to nontarget organisms, effects on fish and wildlife, and the degree of worker exposure.

DPR gives specific attention to evaluating pesticide use under California's unique climate and geography, and may require more or different studies than U.S. EPA requires. California is home to the nation's greatest concentration of fruit, vegetable and nut crops. Tens of thousands of men and women work these fields, and their protection is one of DPR's primary concerns.

DPR must also evaluate the potential impact of pesticide use at the agricultural-urban boundary. DPR, for example, often establishes buffer zones and other restrictions to reduce exposures to off-site movement of pesticides.

What did DPR's methyl iodide evaluation involve?

For methyl iodide, DPR's scientists reviewed more than 175 studies on possible health and environmental effects. DPR paid particular attention to potential exposures of people who live, work or spend time in areas close to fields where methyl iodide might be used. DPR estimated potential exposure of bystanders using a computer model that calculates air concentrations to which people could be exposed at various distances around treated fields.

This information helped regulators determine if and how exposures to methyl iodide could be kept below unsafe levels. To register a pesticide, DPR must ensure it can be used safely. In developing effective measures to avoid potentially unsafe pesticide exposures, DPR considered a wide range of scientific input and followed protocols of both U.S. EPA and the World Health Organization.

DPR took a more health-protective stance than U. S. EPA. California's allowable exposure of 96 parts per billion (ppb) for trained workers who apply or handle methyl iodide is half of what U.S.EPA allows (193 ppb). For others (those not using methyl iodide), DPR's controls are designed to keep exposures below 32 ppb averaged over 24 hours. This is five times lower (that is, more strict) than the U.S. EPA level of 150 ppb.

Before registering a pesticide, DPR gives specific attention to evaluating its use under California's unique climate, geography, and population patterns.

To meet these lower exposure levels, with U.S. EPA approval, DPR is imposing stricter controls on methyl iodide than other states.

How can methyl iodide affect human health?

Because they are intended to control a wide range of pests, fumigants are highly toxic. Toxic effects of methyl iodide are the same as those of iodide, a naturally occurring form of the chemical element iodine commonly found in soil and ground water.

Some methyl iodide breaks down to iodide in the environment and the body. The human body needs the right amount of iodide for good health. However, too much iodide can also be harmful and can disrupt thyroid hormones, which can potentially affect pregnancy and cause other health problems.

Some test animals that inhaled high amounts of methyl iodide over many months developed thyroid cancer. However, this happened only when animals breathed methyl iodide at levels and for durations much higher than workers or the public would be likely to breathe. Inhaling very high amounts of methyl iodide also affect the central nervous system. Breathing methyl iodide at lower levels can irritate the respiratory tract and lungs. Prolonged contact with the skin may cause severe irritation and splashes into the eye may cause permanent eye damage.

To avoid such effects, applicators are trained and required to wear protective equipment, like long-sleeved pants and shirts, and face shields. People outside the application area, where the levels in air are much lower, should not be affected.

In short, DPR has concluded that people will not be exposed to harmful levels when methyl iodide products are used according to California's strict controls.

What protective measures does DPR require?

With U.S. EPA's approval, DPR is imposing a wide range of controls in addition to those required by U.S. EPA in other states. California's extra controls include reduced application rates, a requirement that fewer acres be treated at once, stronger respiratory protections for workers, larger buffer zones, prohibition of night applications (when still night air results in higher fumigant levels), a requirement that only highly retentive tarps be used, and stricter ground water protections. The manufacturer has added these and other restrictions to new, California-specific product labels. (*See next page for detailed description of controls.)*

DPR is also adopting regulations which will add methyl iodide to California's list of restricted materials.

If risks cannot be reduced to avoid unsafe exposures, DPR will not allow a pesticide to be used.

California's Rules Are Stricter

There are major differences between how methyl iodide is used in other states and how it can be used in California with extra, U.S.EPA-approved restrictions that DPR required. The stricter controls are necessary because DPR's allowable exposure levels are lower and more health-protective. For trained workers applying or handling methyl iodide, DPR's controls are designed to keep exposures below 96 ppb, half of what U.S.EPA allows. For the public and others not using methyl iodide, DPR rules are designed to keep exposures below 32 ppb averaged over 24 hours, five times lower than the U.S. EPA target level.

- **Larger buffer zones** of 100 to 1,400 feet around all applications, depending on application method and rate, and treated acreage. *U.S. EPA's buffer zones are smaller, ranging from 25 to 500 feet*. (A buffer zone is an area surrounding a pesticide application in which certain activities are restricted for a specified period to protect human health and safety. Pesticides are not applied in the buffer zone.)
- **Bigger minimum buffer zones around *schools*, *hospitals*,** nursing homes, licensed day care centers, prisons, and playgrounds, a buffer zone of one-half mile. *U.S. EPA's buffer zone around these types of sites is smaller at one-quarter mile*.
- **Buffer zones cannot extend into properties not under the control of the applicator** unless written permission is obtained from the responsible parties for those properties. Buffer zones also cannot extend onto public roads or areas, or any other land for which written consent is not attainable. *U.S. EPA does not have these requirements*.
- **Prohibit standard tarps**, only virtually impermeable film (VIF) and other highly retentive tarps allowed. These tarps are designed to suppress the movement of fumigants into the air. *U.S. EPA allows both standard and highly retentive tarps*.
- **Fewer acres can be treated at once:** A maximum of 20 to 30 acres, depending on the method. *U.S. EPA acreage limit is higher, 40 acres regardless of application method*.
- **More stringent stop-work trigger:** Like U.S.EPA, air monitoring required during application. In California, monitoring required every hour and if air sample is 1 ppm or more, handler activities must stop and handlers must be removed from application block and buffer zone. *U.S.EPA requires monitoring every two hours and stop-work trigger is 50 percent higher*.
- **Prohibit night applications**, which typically result in higher levels of fumigant in the still night air. *U.S. EPA has no limits on time of application*.
- **More comprehensive respiratory protections for workers,** requiring them to follow all (not just part of) California's respiratory protection program specific to pesticides, including fit testing, training, medical evaluation, record keeping, equipment maintenance, and an annual evaluation of program effectiveness. *U.S. EPA's label includes part but not all of the U.S Occupational Safety and Health Administration program, rules not specific to pesticides*.
- **Reduced application rate** of up to 100 pounds an acre, depending on application method and crop. *U.S. EPA's maximum rate is higher, 175 pounds an acre*.
- **Stricter ground water protections,** including measures to prevent runoff into wells and limits on irrigation where soil is vulnerable to leaching. *U.S. EPA's ground water protections are more limited*.
- **Extended time before workers can re-enter fields,** 14 days or more. *U.S. EPA's reentry intervals range from 5 to 10 days*.

What is a California-restricted material?

In all states, users of federally restricted-use pesticides must have certain training. Only California has its own list of restricted pesticides and requires users of these pesticides to get a site-specific permit from a local regulatory official before they can be applied.

County agricultural commissioners are uniquely positioned to do this, with their extensive knowledge of agricultural practices, pesticides and local conditions. The commissioner may deny the permit based on local conditions or impose restrictions beyond those on the pesticide label.

Commissioners tailor these extra controls based on their knowledge of the area and local conditions, such as weather or nearby sensitive sites, including residential areas, playgrounds, schools, day care centers, and hospitals.

How will DPR's protective measures be enforced?

Pesticide labels are legally binding documents. "The label is the law" and use of a product in a way not allowed by the label is illegal. County agricultural commissioners enforce pesticide laws locally, under DPR oversight. People who use pesticides illegally can lose their permits to apply restricted pesticides and are subject to other penalties, including fines and criminal prosecution.

Does methyl iodide get into food?

No. Because methyl iodide damages plants, the fumigant is applied to bare soil. Before crops are planted, methyl iodide is allowed to degrade to very low levels safe for crop growth. According to U.S. EPA, "studies in plants assure that there is no reasonable expectation of … residues in or on food."

Is methyl iodide likely to contaminate drinking water?

No. U.S. EPA and DPR have independently assessed the potential for contamination of ground and surface water. Using computer modeling and assuming worst-case environmental conditions, the conclusion was that methyl iodide is unlikely to affect water quality. To provide an extra margin of safety, DPR requires more controls to protect ground water, including measures to prevent runoff into wells and limits on irrigation where soil is vulnerable to leaching.

As part of its obligation to continuously evaluate all registered pesticides, DPR will conduct groundwater sampling in areas with high methyl iodide use to monitor the effectiveness of the mitigation measures. Based on a recommendation by the State Water Board, DPR will conduct field soil monitoring to address its concerns.

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What crops can methyl iodide be used on? How much will be used?

Methyl iodide products can be used to treat soil before planting of a limited number of crops, including strawberries, tomatoes, stone fruits, tree nuts, vines, nurseries, peppers, turf and field-grown ornamentals.

Methyl iodide products are more costly than other fumigants. In other states where methyl iodide is registered, use is generally where high-value crops like strawberries and fresh-market tomatoes are to be planted.

U.S. EPA considers methyl iodide a feasible alternative to methyl bromide, which is being phased out. Under international treaty, the only remaining methyl bromide uses in the U.S. are those allowed under a "critical-use exemption." U.S. EPA can grant exemptions only for uses that do not have "technically and economically feasible alternatives." Registration of methyl iodide in California will likely result in U.S. EPA approving fewer critical-use exemptions for California crops. This occurred in Florida after that state's registration of methyl iodide, and growers turned to alternative fumigants, including methyl iodide.

When can methyl iodide be used?

Methyl iodide will be legal for use after DPR regulations go into effect making it a restricted material. This is expected in late December 2010.

What was DPR's response to the comments it received on the proposed methyl iodide registration?

DPR received more than 50,000 comments. Many commenters repeated concerns presented by others, meaning relatively few issues were raised. As required by law, DPR prepared a detailed written evaluation and response to comments that raised significant environmental points. DPR posted the response on its Web site, www.cdpr.ca.gov, click on "A-Z Index," "Methyl iodide registration," then scroll down to the document.

California's restrictions include reduced application rates, a requirement that fewer acres be treated at once, extra respiratory protections for workers, larger buffer zones, and stricter ground water protections.

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About the Department of Pesticide Regulation

The California Department of Pesticide Regulation (DPR) protects human health and the environment by regulating pesticide sales and use and by fostering reduced-risk pest management. DPR's strict oversight includes product evaluation and registration, environmental monitoring, residue testing of fresh produce, and local use enforcement through the County Agricultural Commissioners. DPR is one of five boards and departments within the California Environmental Protection Agency.