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September 2003

Malathion Mosquito Adulticide Questions and Answers

What is malathion?

Malathion is an organophosphate insecticide that is registered by Health Canada to control adult mosquitoes. It is also widely used to control a variety of other insect pests on numerous agricultural crops.

All pesticides used or sold in Canada must be registered by Health Canada's Pest Management Regulatory Agency (PMRA). Before registration, each product undergoes an extensive scientific assessment to determine that it poses no unacceptable risks to human health or the environment, and that the product is effective.

How is it applied?

Malathion is applied using ultra-low volume (ULV) equipment by ground or air. ULV equipment creates a very fine mist that allows the product to be applied at up to 60 grams/hectare on the ground and at up to 260 grams/hectare by air. These very low concentration rates are lower than those typically used to control pests on agricultural crops.

Who decides whether or not to spray?

The decision to spray a specific area to control mosquitoes is made at the local or provincial level based on local considerations. The pesticides are applied by people trained and licensed for the task as per provincial requirements. Only pesticides registered by PMRA can be used. During mosquito control programs, local authorities inform the public when pesticides will be applied so that individuals may take measures to minimize their exposure.

Are there any health concerns over malathion?

The PMRA has recently completed its re-evaluation of public health uses of malathion and found it to continue to be acceptable for use in controlling adult mosquitoes. The re-evaluation included an assessment of the most current scientific information and the use of stringent safety factors. Special attention was paid to the protection of children. Based on this re-evaluation, the

PMRA found malathion acceptable for use in controlling mosquitoes that pose a public health hazard.

Spraying to control adult mosquitoes typically occurs at night or early morning, usually when people are indoors. Malathion is applied at a rate up to 60 grams per hectare by ground or up to 260 grams per hectare by air. Even for someone who is outside during a spray application, this application rate results in estimated exposures that are much lower than the exposures that produce adverse health effects in animal tests.

Malathion has been registered and used safely since the 1950s in a number of large-scale pest control programs. In Canada, it has been used in Winnipeg to control mosquitoes and in Florida and California to control Mediterranean fruit fly.

Should I be concerned about my children?

As part of this re-evaluation, special attention was paid to the protection of children. The PMRA found malathion acceptable for use in controlling mosquitoes that pose a public health hazard.

While recent scientific information indicated that young laboratory animals are more sensitive to the toxic effects of malathion than adult animals, the amount of malathion ingested by the young animals far exceeds the amount that children might be exposed to as a result of the use of malathion. The re-evaluation specifically considered children's potential exposure to malathion through skin contact with treated outdoor surfaces while crawling and playing and through incidental ingestion from behaviors such as hand to mouth transfer as well as inhalation exposure.

Should I be concerned about cancer because of a spray program?

Malathion is not considered to pose a cancer risk in humans as a result of its use to control mosquitoes.

Although experimental studies have reported an increase in the number of liver tumors and a very small increase in the number of tumors in the nose or mouth in laboratory animals fed diets containing very high levels of malathion over a long period of time, the amount of malathion ingested by animals in these studies, however, far exceeds the amount humans would be exposed to as a result of the use of malathion to control mosquitoes.

If I'm pregnant, can the spraying affect this pregnancy or harm my baby?

Studies conducted in California following a spraying program with corn syrup bait containing malathion to control Mediterranean fruit flies showed no connection between malathion spraying and extra risk of miscarriage or birth defects. As with chemical exposures in general, pregnant women should take care to avoid exposures to malathion when practical.

Although adverse developmental effects were observed in offspring of laboratory animals given large amounts of malathion, these amounts far exceeded what individuals would be exposed to from the spraying of malathion in a mosquito control program.

Are some people more likely than others to experience symptoms after they have been in contact with malathion spray (e.g., individuals who have asthma, other respiratory ailments, compromised immune systems or multiple chemical sensitivity)?

Most people, even those with medical conditions, would not be expected to experience any symptoms when malathion is sprayed for mosquito control.

Exposure can be minimized through measures such as remaining indoors with windows and doors shut during and immediately after spraying. If for some unforeseen reason an individual has been overexposed to malathion, they could possibly experience short-term effects such as eye, skin, nose or throat irritation, nausea or breathing problems. If any of these effects are experienced, people should seek attention from their health care provider.

What are the potential effects on the environment?

The PMRA has determined that malathion degrades rapidly in the environment, especially in moist soil, and displays a low toxicity to birds and mammals.

Malathion degrades rapidly in the environment, with a half-life in soil of less than 1 day and in water of 0.5 to 19 days. It is not persistent on foliage, with a foliar half-life of 5.5 days. It also breaks down rapidly in air, with a half-life of 1.5 days.

Being an insecticide, malathion is highly toxic to insects, including beneficial ones such as honeybees. However, since adult mosquito control programs occur at night or early morning, its impact on bees is minimal, since this is when they are least active.

Malathion is also highly toxic to fish and aquatic insects. However, the impact on aquatic organisms will be limited in view of the ULV method of spray application. The spray droplets are very fine and thus deposit into aquatic systems from this type of application is reduced, exposure is minimized and adverse effects are, as a result, limited.

To further limit effects to aquatic organisms, care should also be taken not to allow malathion spray to drift to aquatic environments like sloughs, ponds, prairie potholes, lakes, rivers, streams and wetlands when it is being applied or when cleaning and rinsing spraying equipment and containers.

How can I minimize my exposure?

If your community is to be sprayed, the PMRA recommends the following actions to reduce your exposure to malathion:

- Whenever possible, remain indoors during and immediately after spraying
- Close all windows and doors. Turn off air conditioning units and close vents to circulate indoor air before spraying begins
- Cover swimming pool surfaces when it is feasible
- Cover outdoor furniture and play equipment or rinse them off with water after spraying is finished.
- Wash homegrown fruits and vegetables with water before cooking or eating them.
- Cover ornamental fish ponds to avoid direct exposure.

What do I do if I come into direct contact with the spray?

If you come in direct contact with malathion spray:

- Protect your eyes.
- If you get malathion spray in your eyes, immediately rinse them with water.
- Wash exposed skin.
- Wash clothes that come in direct contact with spray separately from other laundry.

What can we do to control mosquitoes?

There are a number of measures you can take to control mosquitoes around you and to protect yourself from being bitten:

- Avoid being outdoors between dusk and dawn, the time when mosquitoes are most active.
- Wear light coloured long-sleeved shirts and pants made with tightly woven fabric when outdoors.
- Use an insect repellent that is registered in Canada. They have a registration number granted under the *Pest Control Products Act* and are labelled as insect repellents for use on humans.
- Ensure that all windows and doors have screens and that they are in good condition.
- Remove sources of standing water such as bird baths and old tires and remove weeds from your property.

For further information, please go to the Mosquito Control page at www.pmra.ca

Do I still have to protect myself from mosquito bites after a mosquito spray program?

You still need to protect yourself from mosquito bites to avoid being exposed to mosquito-borne diseases, such as West Nile virus. Programs to kill adult mosquitos do not eliminate all mosquitoes. They reduce the overall mosquito populations, thus reducing the chances of being bitten.

What other pesticides are used in mosquito control?

There are a number of pesticides registered to control mosquitoes at different stages of their life cycle. Larvicides control mosquito larvae and adulticides control adult mosquitoes. Registered larvicides include methoprene, an insect growth regulator that prevents the mosquito from developing beyond the larval stage, and *Bacillus thuringiensis israelensis*, a bacterium that affects the mosquito's stomach. Adulticides registered for mosquito control include malathion and pyrethrins.

The type of product chosen in mosquito control programs depends on local conditions such as season, proximity to residential areas, the number of adult mosquitoes present and the risks of mosquito-borne disease, such as West Nile Virus. Larviciding is typically done in the late spring/early summer to prevent mosquitoes from emerging to the adult stage. Should populations of adult mosquitoes grow to be too large and/or if there is a risk of diseases such as West Nile Virus, an adulticiding program may be initiated.

There are plant-based insecticides available to control mosquitoes. Why not use them?

Because malathion has recently undergone a re-evaluation, it has the most comprehensive and up-to-date data package and safety profile of all products registered to control adult mosquitoes. This re-evaluation concluded that malathion continues to be acceptable for this use, based on the latest available data and risk assessment standards, including additional protection for children.