

Subject: Docket ID Number OPP-2004-0348  
November 22, 2005

Comments in Response to *Malathion; Revised Risk Assessments, Notice of Availability, and Solicitation of Risk Reduction Options*

### 1. **Macadamia Nuts**

Information provided by a representative of the macadamia nut industry.

Malathion is a very effective insecticide that macadamia growers use to control the Red Banded Thrips (RBT), *Selenothrips rubrocinctus*, in the nursery where grafted macadamia trees are propagated. These thrips have a life cycle that lasts 28 to 43 days. The egg, larvae, pre-pupa and pupal stages last 8-16, 8-16, 1-4, and 4-7 days, respectively. The trees are grown outdoors (no roof or enclosures) and are exposed to infestations from surrounding host plants. Serious outbreaks of RBT can arrest the development of rootstock and grafted trees. These outbreaks are normally brought under control with the use of Malathion.

Macadamia seeds are planted in a seed bed and will germinate in 4 to 6 weeks. The seedlings are then transplanted into pots and allowed to grow until the tree diameter at 18" above the pot surface is approximately 1 cm. Ten to twelve months of growth is needed to reach this stage before the seedling can be grafted with a scion from a preferred cultivar. RBT infestations will suppress seedling growth particularly during the first six months when growth is normally slow where seedling height will be 10"-12" tall. Growth thereafter is relatively good where seedlings can reach heights of 4'-6' in the remaining 4 to 6 months. Serious outbreaks of RBT can also suppress seedling growth during the last 6 months of the first year. After the trees are grafted, the growth from the scion must also be protected from RBT infestation. The total propagation time to develop a grafted tree that is ready for field planting takes a total of two years .

The insecticide Malathion is normally prepared at the dilution rate of 1.5 pints per 100 gallons of water (0.9375 lbs. ai per 100 gals. H<sub>2</sub>O) and applied at the rate of 24 gallons of prepared solution per acre (0.225 lbs. ai per acre). Two applications spaced 1 to 14 days apart are required to reduce the population. A third treatment with Spinosad is made 21 days later to control any larvae and adults that remain. Spinosad has a longer residual activity, about a week, than malathion and is used to extend the pest control and to keep its population low. Only 4 applications of Spinosad are allowed per year and therefore its use is limited to when it is most beneficial. This cycle can be repeated 3 to 6 times per year.

Both insecticides have a short Restricted Entry Interval (REI) and this allows operations (grafting, fertilizing, hand weeding and pruning) in the nursery to continue without any interruptions. The "days after treatment" (REI) in Table 11 of the *Overview of Malathion Risk Assessment September 2005* is calculated to be 4 days to reach the target MOE of 100. A 4-day REI would interfere with the nursery operations, particularly with grafting and pruning, which are slow and requires the most time to complete. A grafter, for example, can graft between 80 to 125 trees per day and have a success rate of 75%-80%. With a nursery of 10,000 to 40,000 trees to graft any delays would increase production costs. A 4-day REI would limit the number of days per week that these operations can be performed and delay the time to have a grafted tree ready for field planting.

Note, however, that the normal application rate is considerably lower than maximum application rate--5lbs ai/acre--indicated in Table 11.

There are alternatives available. Two restricted insecticides, Endosulfan and Lambda Cyhalothrin, are also available for use and can be incorporated in the treatment program. However, these insecticides are not used in the pest management program in an effort to mitigate worker exposure.

Malathion is a very good general use insecticide and Hawaii's macadamia growers need it to protect their trees and nuts from potential new economic pest introduction. Annually the Hawaii Department of Agriculture records 25 or more new insects that are introduced into Hawaii. With the cosmopolitan

population, air travel and shipment of goods into Hawaii, our agricultural industry, and particularly macadamia nuts, are highly vulnerable to any new economic pests for which no natural enemies are present. Malathion is an effective tool and can be a good deterrent to this newly introduced pest. And it is highly probable that multiple treatments with Malathion may be necessary to eradicate these new pests if they are found in mature orchards with full tree canopies where thorough coverage is required.

For the type of use described for nursery operations, long pants, long sleeved shirts, shoes and socks would be sufficient. Usually, it is recommended that workers wear rubber boots as a precaution.

The use of additional PPE, i.e. respirators, coveralls, for high application rates with use of airblast sprayers would be appropriate. There is the possibility that airblast sprayers could be used in macadamia orchards to cover large areas to control new pests.

None of the orchards use engineering controls or tractors with airconditioned cabs. Cost is a factor. However a more important consideration is that enclosed cabs would need to be protected from damage caused by branches. All of the orchards' equipment is reinforced with grated steel to protect the driver. At times these branches come through or dent the grate. Growers would need a strong glass or plastic shield to withstand damage and scratches that could reduce operator visibility while driving. Windshield wipers do not work very well on wet sticks, branches, moss, and senescent flower parts that fall during operation.

## 2. Pineapple

Information provided by a representative of the pineapple industry.

Malathion EC is applied at 1.0 to 2.0 lbs. active ingredient as foliar broadcast spray using groundboom equipment to control mealybugs. Typical application intervals are listed below. It is not widely used in pineapple culture in Hawaii.

Malathion EC is the only registered alternative to Diazinon for mealybug control in pineapple. Due to risk mitigation measures for Diazinon (reduction in cumulative application rates and number of applications per crop), reregistration of Malathion is important to provide an effective alternative for mealybug control

### a. Typical Application Rates

1.0 to 2.0 lbs. active ingredient per acre applied as foliar broadcast spray using groundboom equipment.

### b. Typical Number of Applications

Two (2) to four (4) applications per crop

Applications made based on the results of mealybug population surveys. Usually, immediately after planting, at 6 months of age, prior to induction of floral differentiation, and at least one week before fruit harvest.

### c. Comments on the feasibility of the levels of protection assessed for pesticide handlers.

Hawaiian pineapple growers require use of baseline clothing, tyvek coveralls, rubber gloves (when handling), chemical resistant goggles, and respirator when handling or applying Malathion.

### d. Comments on the maximum restricted entry intervals being evaluated (refer to Table 11 in the *Overview*)

The proposed restricted entry interval for pineapples is 2 days. A more restrictive restricted entry interval of 7 days is acceptable to Hawaiian Pineapple growers if necessary for risk mitigation.

### e. Post-application activities which need to be performed.

Post-application activities include field surveying, manual weeding, drip and overhead irrigation, fruit harvesting, and slip harvesting.

- f. Storage information.  
Malation EC is stored in cool, dry locked storage areas. It is stored away from other pesticides and away from food and feed to prevent cross contamination.

Product is typically stored for about 3 months at farming location prior to use.

### 3. Papaya

Information provided University of Hawaii Cooperative Extension staff and a chemical vendor.

These are some general use patterns for Malathion in papaya. There may be some variance, depending on circumstances and growers, on frequency of application, rates, etc.

- a. Typical Application Rates  
Malathion 8 Aquamul: 1.25 pt./100gal applied to 1 acre.  
Malathion 57EC: 1.5-2pt./100gal applied to 1 acre.
- b. Typical Application Intervals  
Most growers do not use malathion weekly. They will spray at one to two week intervals (if trying to get leafhoppers or white peach scale under control) and not spray for another month or two (if needed). Then, they will spray once per month.

For growers using malathion primarily for fruit fly and leafhopper control, they use malathion at the rate of 1 to 1 and a half pints per acre and apply, on average, at about 10 day intervals.

- c. REIs and Post-application Worker Activities  
The 12 hour REI works well for papaya growers. They need to get back into the field as soon as possible to weed, fertilize, trim, rogue, re-plant, reapply pesticides (pest pressures require application prior to their next scheduled spray).

All the papaya fields are in open fields, so workers must perform their activities between rains and have a very difficult time maintain their schedules.

Other growers may follow a different schedule: their workers enter the field about 3 days after application for harvesting (usually twice per week).

- d. Storage information  
Most growers will purchase only enough product to cover their immediate needs, so they usually do not store too much material. They will use up their supply pretty quickly. Some growers may store malathion up to one year.
- e. PPE  
Most employers make sure their workers use the required protective equipment when spraying. Private growers may use the least amount of protective equipment, due to it being very cumbersome when working in sunny conditions in rough terrain.

### 4. Vegetable crops (general)

Information provided by the Hawaii Farm Bureau Federation

Malathion is used on a number of crops so it is difficult to characterize every scenario in which it may be used. It is a very inexpensive insecticide that is not an RUP so availability and use are widespread. It is effective on some species of aphids and on caterpillars, which are the main uses for the product in Hawaii.

- a. Typical application rates.  
Application rates vary from 1 to 2 pints per acre as a directed foliar spray.

- b. Typical application frequency  
Depending on the situation, malathion is applied approximately 2 to 3 times per crop cycle.
- c. REIs and Post-application Worker Activities  
Increasing the REI from 12 hours to 2 to 4 days (most likely scenario according to the calculation in Table 11) will limit the use of the product.
- d. Storage information.  
No special storage conditions are needed here. Most growers store at room temperature in their pesticide sheds and it is a product that is typically stored for up to 3 months before it is used.
- e. PPE  
Any changes regarding PPE are not much of an issue as most growers are concerned about the safety of their employees and often provide PPE in excess of label requirements. The main concern will be the huge increase in REI.

## 5. Seed corn

Information provided by the Hawaii Farm Bureau Federation

- a. REIs and Post-application Worker Activities  
Increasing the REI from 12 hours to 2 to 4 days (most likely scenario according to the calculation in Table 11) will limit the use of the product in seed corn where it is critical to get workers back into the field the next day to perform detasseling, roguing, and other hand tasks.

## 6. Ornamental Use

Information provided by a chemical vendor.

- a. Application Rates  
Malathion 8 Aquamul: up to 2.5 pt./100 gal applied to 1 acre.  
Malathion 57EC: up to 4 pt./100 gal applied to 1 acre.
- b. Application Frequency  
Many growers practice IPM, so they tend to spray only when they have to. Gone are the days when everyone sprayed every two weeks, regardless of pest pressures.  
  
Frequency of application: mostly used only as needed, may spray three times in a month, then will not spray until needed (maybe two to three months later).
- c. REIs and Post-application Worker Activities  
In general, the 12-hour REI works well for ornamental producers. Workers have to re-enter fields to harvest, do repairs on irrigation equipment, weed, do sanitation/cultural practices, and re-apply pesticides if heavy rains fall prior to next scheduled application.  
  
Most growers are in “outdoor nursery” settings, so they have to work in-between passing showers and have to work accordingly.
- d. Storage information  
Most growers are on tight budgets, so they tend to not store extra pesticides in their warehouses. Rather, they will usually purchase only enough product to take care of their immediate needs, and use fresh material whenever possible.

The only people who may be storing product longer would be smaller growers and backyard farmers who spray by backpacks and use up their pesticides very slowly.

Pesticides are stored away from foods, kept in cool storage areas away from children, etc.

- e. PPE  
Most growers are very aware of the hazards of pesticides.

They make sure their employees are utilizing the proper protective equipment whenever applying pesticides.

#### **7. Orchids (cut flowers and potted plants)**

Information provided by University of Hawaii Cooperative Extension staff

- a. Typical application rate  
1 pt / 100 gal
- b. Typical application frequency  
3 or 4 / year
- c. REIs and Post-application Worker Activities  
Since harvesting is done virtually every day, a 5 day REI would make the use of Malathion unfeasible.
- d. Storage information  
Growers typically store malathion from 1 to 3 years.

#### **8. Jasmine (Pikake)**

Information provided by University of Hawaii Cooperative Extension staff

- a. Typical application rate  
about 1 pt / 100 gal
- b. Typical application frequency  
2 – 3 / year
- c. REIs and Post-application Worker Activities  
For jasmine (Pikake), a longer (more than 1-day) re-entry interval is unfeasible since the flower buds have to be harvested daily. It would make Malathion's use impractical.
- d. Storage information  
Most pikake growers are small scale operations and store malathion from 1 – 3 years.

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