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Subject: **Docket ID Number EPA-HQ-OPP-2010-0230**

Comments in Response to *Carbaryl Registration Review: Draft Human Health Risk Assessment*

The following comments are being submitted in response to the August 3, 2017 *Federal Register* notice announcing the availability of and seeking public comment on EPA's draft human health risk assessment for the registration review of carbaryl and the August 31, 2017 memorandum (Document ID: EPA-HQ-OPP-2010-0230-0044) authorizing the extension of the comment deadline. These comments are being submitted on behalf of the Western Integrated Pest Management Center and provide input on provide input on the use of carbaryl on **vegetable crops, seed crops, turfgrass and macadamia nuts** in Hawai'i.

**Vegetable crops.** In Hawai'i, carbaryl is used on some small farms which produce a variety of vegetable crops to control sucking and chewing insects. Label maximum rates are typically used.

The number of applications and application intervals vary. Insect populations are monitored weekly to determine if the populations are high that control measures need to be applied. Loopers typically require multiple applications. And, because carbaryl does not kill insect eggs, multiple applications are needed to manage newly hatched immature insects.

There are no pesticide alternatives that control as broad a range of insect pests as carbaryl.

Systemic insecticides might be more effective against certain pests, but only against small insects like aphids. Control by systemics of larger loopers and beetles is poor. Additionally, growers consider systemic insecticides to be too expensive. *Bacillus thuringiensis* (Bt) is an alternative to carbaryl for caterpillar control. However, Bt does not control beetles or scales. Therefore, additional products--individual specialized and expensive pesticides--would be needed to be purchased and applied to control the pests that carbaryl controls. More time and labor would be required for pest management. Thus, using alternatives would be quite costly. Moreover, these additional insecticides would have to be stored and inventoried for longer periods of time, creating potential hazardous conditions. This is significant for growers, especially small growers, for whom it is very important to minimize the amount of pesticides they store.

Because carbaryl is an effective, broad-spectrum insecticide, it is useful to test against new invasive pests. If necessary, efficacy testing can be done using narrow-spectrum chemicals. Using these chemicals is

much less practical than testing with carbaryl, not only because they are expensive to purchase, but they are usually sold in package sizes that are large relative to the needs of the growers.

Where new pests emerge, if no controls can be identified and used, there can be total crop losses. This was the situation that occurred when sweet potato whitefly first appeared in Hawai'i.

**Turfgrass.** Carbaryl is also used on turfgrass; some golf courses still use carbaryl, but not as the primary pest control chemical. On turf, carbaryl is used to control some common turfgrass caterpillars (such as armyworm, cutworm, webworm, fiery skipper), some ant species and other insect pests such as billbugs. Carbaryl is no longer a frequently used chemical in Hawai'i's golf courses.

The pest to be controlled determines the application rate. For turfgrass, to control caterpillars (such as armyworm, cutworm, webworm, fiery skipper, etc.) and some ant species, carbaryl is applied at 4 lbs ai/acre. For billbug control the rate is 8 lbs ai/acre. Higher rates are not used for turf in Hawai'i. Curative applications are made as needed. The number of applications and application intervals vary, depending on the pest and pest pressures.

For some of the insects controlled by carbaryl, there are some newer insecticides, such as clothianidin, and imidacloprid, available for use in turf in turf settings.

However, there are episodic pests for which carbaryl is a control option. These pests are white grubs (such as Japanese beetle, masked chafer, etc.), chinch bug and other insect pests.

**Seed corn.** To control corn earworm, the application rate for carbaryl is typically 1 lb ai/acre. One application is made per crop cycle. A crop cycle is 3-4 months, and, typically, one crop is planted in the same field per year. (The field is planted in cover crops or fallow between crops.)

Chinese rose beetle is an episodic pest for corn production in Hawai'i. When needed, the application rate, typically, is 2 lbs ai/acre. There is usually only one application per crop cycle. There may be two applications if necessary, but this hasn't been the trend in the last few years

**Macadamia nuts.** Macadamia nuts growers do not use carbaryl on a regular basis. However, carbaryl would probably be applied if there were a large outbreak of mites or aphids in a nursery setting.

Comments were received from Extension personnel of the College of Tropical Agriculture and Human Resources of the University of Hawai'i at Mānoa and representatives of the seed crop producers and macadamia nut growers.

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