



STATE OF MAINE  
DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY  
BOARD OF PESTICIDES CONTROL  
28 STATE HOUSE STATION  
AUGUSTA, MAINE 04333

PAUL R. LEPAGE  
GOVERNOR

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12/29/16

TO: Board Members  
FROM: Lebelle Hicks PhD DABT  
RE: Active Ingredients for Approval for Use in the 50 to 250 Foot Area from the Mean High Tide Mark, in Accordance with Chapter 29 Section 5 for Control of Browntail Moths

## Background

In 2006, the Board's Environmental Risk Advisory Committee reviewed insecticides for aquatic toxicity to marine invertebrates. The relative aquatic risks for marine and freshwater invertebrates were evaluated for insecticides currently registered for:

- foliar applications to hardwood,
- use on landscape ornamental trees, and
- demonstrated efficacy for Browntail moth caterpillar control

Since 2006, new chemistries with known browntail moth efficacy have become available including, neonicotinoids and spinosad. Other active ingredients with potential efficacy are also available such as azadirachtin, several Bt strains, chlorantraniliprole, cyantraniliprole, indoxacarb, methoxyfenozide and tebufenozide. These latter compounds may be evaluated for relative risks when specific efficacy on browntail moth is available.

## December 2016 Review

The methodology for the relative risk determination is similar to that used by the ERAC in 2006. The most sensitive marine invertebrate toxicity endpoint (acute LC50) was chosen and an Estimated Environmental Concentration (EEC) based on use rates from the product label were determined. EECs for a worst case scenario, of a spill of 100 gallons of use mix into a 1 acre body of water with depths of ½ foot (shallow), 6 feet (deep) and 23 feet deep (this is the average depth of inner Casco bay according to Gustafsson 1998) were determined.

The ratios (modified risk quotients (modRQ), based on the worst case scenario) of the EEC to the LC50 were calculated and the resulting relative risks were analyzed. Active ingredients and their relative risk quotients are presented in Tables 1 and 2, with a risk quotient of 500 used to segregate the active ingredients.

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**Table 1. Invertebrate Modified Risk Quotients less than 500 for Aquatic Invertebrates, for Acute Worst Case Scenarios of 100 gallons of use mix spilled into a ½ foot deep, 1 Acre body of Water**

Compound	Invertebrate Modified Risk Quotients		Status in 2006 Review
	Marine	Freshwater	
Acetamiprid	11	36	Not registered for this use
Bifenthrin	4	28	Not registered for this use
Clothianidin	6	14	Not registered for this use
Deltamethrin	54	2	Not evaluated
<b>Diflubenzuron</b>	<b>125</b>	<b>31</b>	<b>Approved by the Board</b>
Dinotefuran	1	0	Not registered for this use
<b>Fluvalinate</b>	<b>278</b>	<b>16</b>	<b>Approved by the Board</b>
Imidacloprid	5	3	Not registered for this use
<b>Permethrin</b>	<b>306</b>	<b>833</b>	<b>Approved by the Board</b>
Spinosad	1	0	Not registered for this use

**Table 2. Invertebrate Modified Risk Quotients Greater than 500 for Aquatic Invertebrates, for Acute Worst Case Scenarios of 100 gallons of use mix spilled into a ½ foot deep, 1 Acre body of Water**

Compound	Invertebrate Modified Risk Quotients		Status in 2006 Review
	Marine	Freshwater	
Acephate	no data	454	Not evaluated
<i>Carbaryl</i>	<i>1,326</i>	<i>4,447</i>	<i>Not approved by Board in 2006</i>
<b>Cyfluthrin</b>	<b>967</b>	<b>93</b>	<b>Approved by the Board, new Marine toxicity data in 2010; 2016</b>
Cyhalothrin	1,220	62,500	Not evaluated
Malathion	8,591	192,857	Not evaluated