PI-90

UF UNIVERSITY of FLORIDA
IFAS Extension

Toxicity of Tomato and Bell Pepper Insecticides/Miticides to Beneficial Insects[1]

Mark A. Mossler[2]

The following table presents categories that were either obtained from the Environmental Protection Agency, Kopperts Side-Effects Database, UF/IFAS Pest Management Strategic Plans, or label interpretation. When different categories are listed for different life stages (e.g. highly toxic in larval stage but nontoxic as an adult), the more toxic category has been placed in the table.

1. This document is PI-90, one of a series of publications of the Pesticide Information Office, Agronomy Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. For additional Information, contact the Pesticide Information Office, University of Florida, P. O. Box 110710, Gainesville, Fl 32611-0710, (352) 392-4721. Published December 2005. Please visit the EDIS Web site at http://edis.ifas.ufl.edu.

2. Mark A. Mossler, Doctor of Plant Medicine, Pesticide Information Office, Agronomy Department. Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, 32611-0710.

Toxicity of chemical pest management tools to beneficial invertebrates in Florida tomato and bell pepper.

Beneficial Insects/ Mites / Pest Management Tools (IRAC MoA Class)	Beneficial mites	Big-eyed bugs	Damsel bugs	Ground beetles	Honeybees	Lacewings	Ladybird beetles	Minute pirate	Parasitic wasps	Predatory midges	Predatory thrips	Spiders	Syrphid fly larvae
Registered materials													
Abamectin (6)	H	O	H	O	H	H	S	O	H	H	H	O	S
Acephate (1)*	H	H	H	H	H	H	H	H	H	H	H	H	H
Acetamiprid (4)	S	O	O	O	M	M	M	O	M	H	H	O	O
Azadirachtin (18)	S	O	O	O	S	S	S	O	M	O	O	O	O
Azinphos-methyl (1)**	M	H	H	H	H	H	H	H	H	H	H	H	H
Bifenazate (25)	S	O	O	O	M	S	S	O	S	O	O	O	O
Bifenthrin (3)	H	H	H	H	H	H	H	H	H	H	H	H	H
Boric acid (no class)	M	O	O	O	S	S	S	S	O	M	M	O	M
Buprofezin (16)**	O	O	O	O	O	S	O	O	S	M	O	O	O
Carbaryl (1)	S	H	H	H	H	H	H	H	H	H	H	H	H
Chlorpyrifos (1)*	H	H	H	H	H	H	H	H	H	H	H	H	H
Cryolite (9)	O	O	O	O	O	O	O	O	O	O	O	O	O
Cyfluthrin (3)	H	H	H	H	H	H	H	H	H	H	H	H	H

Toxicity scale:

O = nontoxic
S = slightly toxic
M = moderately toxic
H = highly toxic

*Bell Pepper only
**Tomato only
***When applied on foliage

Toxicity of chemical pest management tools to beneficial invertebrates in Florida tomato and bell pepper.

Beneficial Insects/ Mites / Pest Management Tools (IRAC MoA Class)	Beneficial mites	Big-eyed bugs	Damsel bugs	Ground beetles	Honeybees	Lacewings	Ladybird beetles	Minute pirate	Parasitic wasps	Predatory midges	Predatory thrips	Spiders	Syrphid fly larvae
Cyhalothrin (gamma/lambda) (3)	H	H	H	H	H	H	H	H	H	H	H	H	H
Cyromazine (17)	O	M	M	O	O	O	O	M	O	O	O	O	O
Diazinon (1)**	H	H	H	H	H	H	H	H	H	H	H	H	H
Dicofol (20)	H	S	S	S	S	S	S	S	M	H	S	S	H
Diflubenzuron (15)*	O	O	M	O	M	H	M	H	O	O	O	O	O
Dimethoate (1)	H	H	H	H	H	H	H	H	H	M	H	H	H
Dinotefuran (4)	M	M	M	M	H	M	H	H	H	H	H	M	H
Disulfoton (1)*	O	O	O	O	O	O	O	O	O	O	O	O	O
Emamectin (6)	H	O	H	O	H	H	S	O	H	H	H	O	S
Endosulfan (2)	H	H	H	H	H	H	H	H	M	H	H	H	H
Esfenvalerate (3)	H	H	H	H	H	H	H	H	H	H	H	H	H
Fenpropathrin (3)**	H	H	H	H	H	H	H	H	H	H	H	H	H
Imidacloprid (4)	M	M	M	M	H	M	H	H	H	H	H	M	H
Indoxacarb (22)	S	S	S	S	H	S	S	S	H	S	S	O	H

Toxicity scale:

O = nontoxic
S = slightly toxic
M = moderately toxic
H = highly toxic

*Bell Pepper only
**Tomato only
***When applied on foliage

Toxicity of chemical pest management tools to beneficial invertebrates in Florida tomato and bell pepper.

Beneficial Insects/ Mites / Pest Management Tools (IRAC MoA Class)	Beneficial mites	Big-eyed bugs	Damsel bugs	Ground beetles	Honeybees	Lacewings	Ladybird beetles	Minute pirate	Parasitic wasps	Predatory midges	Predatory thrips	Spiders	Syrphid fly larvae
Malathion (1)	M	H	H	H	H	H	H	H	H	H	H	H	H
Methamidophos (1)**	H	H	H	H	H	H	H	H	H	H	H	H	H
Methomyl (1)	H	H	H	H	H	H	H	H	H	H	H	H	H
Methoxyfenozide (18)	O	O	S	O	O	O	O	S	O	O	O	O	O
Naled (1)*	H	H	H	H	H	H	H	H	H	H	H	H	H
Oils (no class)	M	O	O	O	O	S	S	O	S	S	S	O	S
Oxamyl (1)***	H	H	H	H	H	H	H	H	H	H	H	H	H
Oxydemeton-methyl (1)*	H	H	H	H	H	H	H	H	H	H	H	H	H
Permethrin (3)	H	H	H	H	H	H	H	H	H	H	H	H	H
Pymetrozine (9)	O	O	O	O	O	O	O	O	O	O	O	O	O
Pyrethrins + Rotenone (3)	M	M	M	M	H	M	M	M	M	M	M	M	M
Pyrethrins + PBO (3)	M	M	M	M	H	M	M	M	M	M	M	M	M
Pyriproxyfen (7)	S	S	S	S	O	S	H	S	S	S	S	S	M
Soaps (no class)	H	M	M	S	O	H	M	S	M	M	M	O	M

Toxicity scale:

O = nontoxic
S = slightly toxic
M = moderately toxic
H = highly toxic

*Bell Pepper only
**Tomato only
***When applied on foliage

Toxicity of chemical pest management tools to beneficial invertebrates in Florida tomato and bell pepper.

Beneficial Insects/ Mites / Pest Management Tools (IRAC MoA Class)	Beneficial mites	Big-eyed bugs	Damsel bugs	Ground beetles	Honeybees	Lacewings	Ladybird beetles	Minute pirate	Parasitic wasps	Predatory midges	Predatory thrips	Spiders	Syrphid fly larvae
Spinosad (5)	M	S	S	S	H	M	M	S	M	S	S	O	S
Spiromesifen (23)	M	O	O	O	O	S	S	S	S	S	S	O	S
Sulfur (8)	M	S	S	S	S	S	S	S	S	S	S	O	S
Tebufenozide (18)	O	O	S	O	O	O	O	S	O	O	O	O	O
Thiamethoxam (4)	S	M	H	M	H	S	H	H	H	H	H	M	H
zeta-Cypermethrin (3)	H	H	H	H	H	H	H	H	H	H	H	H	H

Toxicity scale:

O = nontoxic
S = slightly toxic
M = moderately toxic
H = highly toxic

*Bell Pepper only
**Tomato only
***When applied on foliage