

# Information on recent and novel pesticides



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## **Chemical class/mode of activity**

### **1. Organophosphates and Carbamates**

**Inhibit the enzyme cholinesterase.**

**This prevents the termination of nerve impulse transmission.**

**Chemical class/mode of activity**

**2. Pyrethroids and Chlorinated Hydrocarbons**

**Destabilize nerve cell membranes.**

## **Chemical class/mode of activity**

### **3. Neonicotinyls**

**Work on central nervous system, cause over-stimulation and blockage of the postsynaptic nicotine acetylcholine receptors.**

**Chemical class/mode of activity**

**4. Novel pesticides**

**Mode of action specific.**

## **Pesticide toxicity to humans**

**Toxicity is defined by the lethal dose or LD<sub>50</sub> of a pesticide.**

**LD<sub>50</sub> is expressed as milligrams (mg) of toxicant (pesticide active ingredient) per kilogram (kg) of body weight based on the dose that kills 50 percent of the test animals, normally rodents, under laboratory conditions.**

**This can be based on either acute or chronic toxicity.**

## **Pesticide toxicity to humans**

**In addition, LD<sub>50</sub> may be determined based on how a pesticide enter the body such as oral (ingestion), dermal (skin), or inhalation (breathing).**

**This information is then extrapolated to humans.**

**The lower the LD<sub>50</sub> value the more toxic the pesticide is to humans.**

## **Pesticide toxicity to humans**

**Pesticide (Common Name)**

**abamectin**

**Trade Name(s)**

**Avid**

**Classification**

**microbial toxin**

**LD<sub>50</sub>**

**Oral (mg/kg)**

**650**

**LD<sub>50</sub>**

**Dermal (mg/kg)**

**>2000**

**Manufacturer**

**Syngenta**



## Pesticide toxicity to humans

**Pesticide (Common Name)**

acephate

**Trade Name(s)**

Orthene

**Classification**

organophosphate

**LD<sub>50</sub>**

**Oral (mg/kg)**

235

**LD<sub>50</sub>**

**Dermal (mg/kg)**

400

**Manufacturer**

Valent

## Pesticide toxicity to humans

**Pesticide (Common Name)**

dimethoate

**Trade Name(s)**

Cygon

**Classification**

organophosphate

**LD<sub>50</sub>**

**Oral (mg/kg)**

235

**LD<sub>50</sub>**

**Dermal (mg/kg)**

400

**Manufacturer**

UAP

## Pesticide toxicity to humans

**Pesticide (Common Name)**

imidacloprid

**Trade Name(s)**

Merit, Marathon,  
Provado, Admire

**Classification**

neonicotinyl

**LD<sub>50</sub>**

**Oral (mg/kg)**

460

**LD<sub>50</sub>**

**Dermal (mg/kg)**

2000

**Manufacturer**

Bayer

## **Category I. Contain signal words—Danger/Poison.**

**In addition, a skull and crossbones symbol is required on labels which are described as highly toxic.**

**These pesticides have an acute oral LD<sub>50</sub> range of 0 to 50 mg/kg.**

**Category II. Contain the signal word—Warning.**

**Pesticides in this category are described as moderately toxic.**

**They have an acute oral LD<sub>50</sub> range of 50 to 500 mg/kg.**

**Category III. Contain the signal word—Caution.**

**These are slightly toxic pesticides.**

**They have an acute oral LD<sub>50</sub> range of 500 to 5000 mg/kg.**

**Category IV. Contain the signal word—Caution.**

**These are very low toxicity pesticides that have an acute oral LD<sub>50</sub> greater than 5000 mg/kg.**

# **1. Properties: Pyrethroids**

**Contact insecticides that destabilize nerve cell membranes. Chemistry based on botanical extracts of pyrethrum.**

**Long residuals.**

**Toxic to fish and cats.**

**Toxic to bees.**

**Low mammalian toxicity.**



## **Pyrethroids**

**Bifenthrin (Talstar) \*M**

**Cyfluthrin (Decathalon) \*HO**

**Deltamethrin (Deltagard)**

**Fluvalinate (Mavrik) \*HO**

**Lamda cyhalothrin (Scimitar, Battle) \*M**

**Permethrin (Astro, Spectracide) \*B, \*HO**

**NURSERY ASTO LOST BORER LABEL; USE**

**Permethrin pro, Micro Flo**

**\*M = miticide**

**\*B = borers**

**\*HO= for home owners**

## **2. Properties: Neonicotynils**

**Neurotoxins with action similar to chlorinated hydrocarbons.**

**Low mammalian toxicity.**

**Low duration of environmental persistence.**

# **Neonicotynils**

**Merit/Marathon (Bayer, Olympic),**

**AI: Imidacloprid**

**Action: Soil applied systemic, foliar, injected**

**Target: Honeydew producing insects,  
beetle larvae, leaf miners, pine tip moth**

**Labeled sites: Nursery, greenhouse,  
Christmas tree, landscape interiorscape, turf**

**Compatibility with beneficial insects: Mod;**

**Long residual gives control for months**

### **3. Properties: Insect Growth Regulators**

**Kill immature insects as they develop, by either disrupting the moulting process, or by producing sterile adults.**

**All but neem products can kill aquatic crustaceans.**

**Do not apply near streams.**

**Somewhat compatible with biological control.**

## **Insect Growth Regulators**

**Confirm (Dow Agrosiences), AI: Tebufenozide**

**Target: Caterpillars, gypsy moth, pine tip moth**

**Target stage: Young larvae**

**Labeled sites: Landscape**

**Compatibility with beneficial insects: Only kills caterpillars**

**Other stuff: Long residual**

## **Insect Growth Regulators**

**Mach 2 (Dow Agrosiences), AI: Halofenozide**

**Target: White grubs, caterpillars**

**Target stage: Young larvae**

**Labeled sites: Turf**

**Compatibility with beneficial insects: Only kills immature stages**

**Other stuff: Long residual in turf**

## **Insect Growth Regulators**

**Citation (Syngenta), AI: Cyromazine**

**Target: Fly leaf miners (only allowed landscape use); fungus gnats, shore flies, fly leaf miners**

**Labeled sites: Interiorscape, nursery, greenhouse**

**Target stage: Young larvae**

**Compatibility with beneficials: Does not kill parasitoids already in pupal stage**

# **Insect Growth Regulators**

**Dimilin (Uniroyal), AI: Diflubenzuron**

**Target: Caterpillars, gypsy moth, Zimmerman pine moth**

**Target stage: Young larvae**

**Labeled sites: Nursery, greenhouse, Christmas tree**

**Compatibility with beneficial insects: Does not kill parasitoids already in pupal stage**

**Other stuff: Long residual**



# **Insect Growth Regulators**

**Precision (Syngenta), AI: Fenoxycarb**

**Target: Whiteflies, soft scales, fungus gnats, shoreflies, caterpillars, leaf miners, honeylocust pod gall midge**

**Target stage: Young larvae**

**Labeled sites: Nursery, greenhouse, Christmas tree**

**Compatibility with beneficial insects: Does not kill parasitoids already in pupal stage**

## **4. Microbial Pesticides**

**Conserve, Bulls-Eye Bio-insecticide, Fertilome Caterpillar and Bagworm Killer (Dow AgroSciences), AI: Spinosad**

**Action: Lamellar systemic**

**Target: Many caterpillars, sawflies, leaf beetles (not JB), tip moths, thrips, gall midges, fly leaf miners, cat fleas**

**Labeled sites: Nursery, greenhouse, Christmas tree, landscape, interiorscape, turf**

**Compatibility with beneficial insects: Mod-Hi, short residual, does not kill predatory mites, minute pirate bugs, lacewings, or ladybeetles.**

# **Microbial Pesticides**

**Avid (Syngenta), AI: Abamectin**

**Action: Lamellar systemic, injection**

**Target: Spider mites, leaf miners, aphids, thrips, whiteflies**

**Labeled sites: Nursery, greenhouse, Christmas tree, landscape**

**Compatibility with beneficial insects: Low**

## **Microbial Pesticides**

**BT (many companies), AI: *Bacillus thuringiensis* Dipel (*Btk*); Raven, Novodor (*Btt*)**

**Action: Contact**

**Target: Caterpillar or beetle larvae**

**Labeled sites: Nursery, greenhouse, Christmas tree, landscape**

**Compatibility with beneficial insects: High; 4 Hr REI**

# **Microbial Pesticides**

**Endeavor (Syngenta), AI: Pymetrozine**

**Action: Contact**

**Target: Aphids, Whiteflies**

**Labeled sites: Nursery, greenhouse, Christmas tree, landscape, interiorscape**

**Compatibility with beneficial insects: Mod**

## **5. Properties: Miticides compatible with beneficials**

**Long residual: Floramite, Ovation, Hexygon, Vendex, Akari**

**Short residual: Oil, Soap**

**Rescue treatments, not selective, will kill beneficial mites and beneficial insects:  
Talstar, Scimitar, Battle, Avid, Sanmite, Pylon**

## **Miticides**

**Floramite (Uniroyal), AI: Bifenazate**

**Target: Spider and clover mite**

**Target stage: All mobile stages (not eggs) except two spotted spider mites eggs (*Tetranychus*)**

**Residual activity: 3-4 weeks**

**Labeled sites: Nursery, greenhouse, landscape, interiorscape**

**Compatibility with beneficial insects: Does not kill predatory mites, rust, or broad mites**

## **Miticides**

**Ovation SC (Scotts), AI: Clofentazine**

**Target: Spider and clover mite**

**Target stage: Eggs and newly hatched**

**Residual activity: 3-4 weeks**

**Labeled sites: Greenhouse, nursery**

**Compatibility with beneficial insects: Does not kill predatory, rust, or broad mites**



## **Miticides**

**Hexygon (Gowan), AI: Hexythiazox**

**Target: Spider and clover mites**

**Target stage: Eggs and newly hatched mites**

**Labeled sites: Nursery, greenhouse, landscape**

**Compatibility with beneficial insects: Does not kill predatory, rust, or broad mites**

## **Miticides**

**Vendex (Griffin), AI: Fenbutatin- oxide**

**Target: Mites**

**Target stage: All mobile stages**

**Takes 7-10 days to kill**

**Labeled sites: Nursery, greenhouse, landscape**

**Compatibility with beneficial insects: Moderate toxicity to beneficials or rust and broad mites**

## **Miticides**

**Avid (Syngenta), AI: Abamectin**

**Target: Mites, leaf miners, aphids, thrips, whiteflies**

**Target stage: All stages but eggs**

**Labeled sites: Nursery, greenhouse, Christmas tree, landscape**

**Compatibility with beneficial insects: Kills predatory, rust, and broad mites**

## **Miticides**

**Sanmite (BASF), AI: Pyradiben**

**Target: Mites, Whiteflies**

**Target stage: All stages but eggs**

**Labeled sites: Nursery, greenhouse**

**Compatibility with beneficial insects: Kills predatory mites**

## **Miticides**

**Pylon (Olympic), AI: Chlorfenapyr**

**Target: Mites, Fungus Gnats, Thrips**

**Target stage: All stages but eggs**

**Labeled sites: Greenhouse**

**Compatibility with beneficial insects: Kills predatory mites**

## **Miticides**

**Akari (Sepro), AI: Fenpyroximate**

**Target: Spider mites**

**Target stage: All stages but eggs**

**Labeled sites: Greenhouse**

**Compatibility with beneficial insects: Kills predatory mites**