



# IMIDACLOPRID: Reducing Risks to Groundwater from Commercial Greenhouse Production Uses

## Practical Approaches for Users

**Introduction.** The pesticide imidacloprid (found in Marathon, Discus N/G, Benefit, etc.) is showing up in Long Island’s groundwater. Imidacloprid insecticide is commonly used in commercial greenhouse production. This fact sheet was prepared to help greenhouse growers use imidacloprid more conservatively while continuing to effectively manage pests and protect Long Island’s groundwater.

This and other factsheets have been developed as part of The Long Island Pesticide Pollution Prevention Strategy, which became effective July 2014. The strategy was developed by the NYS Department of Environmental Conservation (DEC) in collaboration with numerous stakeholders. The goal of the strategy is to protect groundwater and surface water from pesticide-related contamination while continuing to meet the region’s pest management needs.

### Protect Our Drinking Water

The Long Island aquifer is used by nearly three million people as a source of high-quality potable water. The aquifer is an underground water source that yields over 300 million gallons of water every day. The characteristics that allow the aquifer to reliably supply this much water also make it vulnerable to contamination from above ground. This is especially important for materials like imidacloprid that have widespread use and can move easily through soil to the underlying groundwater. For these reasons, the commercial greenhouse industry needs to exercise careful environmental stewardship when using imidacloprid.



*A profile of a Long Island's sandy/gravelly subsoil.*

### Modify Practices (Best Management Practices)

To reduce or eliminate the risk of imidacloprid movement to Long Island’s groundwater, greenhouse growers should modify day-to-day practices especially where media applications (drench, bulk incorporation, topical broadcast) are used:

**Application Rates** – When applying imidacloprid as a media (systemic) treatment use the lowest label rate. Labels allow for a range of rates when used as a systemic in most cases. Although residual activity may be reduced, lower rates can still provide acceptable control especially for younger or smaller plants. Always stay below the maximum allowable per-acre use of 0.4 pounds of active ingredient/acre/year (e.g. 0.4 lb active ingredient = 40 lb Marathon 1%G or 1.6pt Marathon II or 244 fl oz Discus N/G).



**Application Timing** – Best results with media treatment are usually obtained when applications are made early in the crop to very young and vigorously growing plants after roots have reached the outer pot edge. After application water lightly to avoid leaching for at least three cycles. For outdoor plants such as mums, apply when there is little chance of heavy rain within 24 hours and only in sufficient water to wet the root zone. Irrigate lightly for at least 10 days to allow uptake and minimize risk of leaching. When treating container-grown plants, apply material to individual pots rather than broadcast over an area to avoid off-target movement of material. Avoid any drench or topical applications where media is saturated or in areas with shallow water tables.

**Application Method** – For drip systems use pressure-compensating emitters to evenly distribute insecticide and apply without runoff. For closed ebb-and-flood systems, calculate amount of irrigation water per plant and apply material in a minimal amount of water for good uptake. Irrigation water should remain in the system for repeat cycles. Where drift and residual control are not issues, foliar application can be very effective against some pests such as aphids but note label restrictions. Keep application equipment in good working order with no leaks and fill tanks away from drains, sumps and other routes to groundwater.

#### KEY POINTS

Three key practice modifications can be applied to reduce risk of imidacloprid movement to groundwater:

- Use lowest label rates – avoid overapplication
- Use or alternate with other effective insecticides or practices
- Avoid leaching and spills, drift, or runoff to drains

## Some Alternative Insecticides

Other insecticides approved for use on Long Island control many of the same pests. Some alternatives are summarized below for a few target species including organic (^), reduced-risk (\*) and conventional options. Note that imidacloprid is not effective against mites and most caterpillars – use other products or methods if needed for these pests. Use insecticides selectively and as a last resort to help maintain biological controls.

Pest	Insecticide	Active Ingredient	Notes
Aphids	*TriStar SL	acetamiprid	Foliar spray; some verbenas sensitive
	Aria	flonicamid	Foliar spray; note sensitive plants
	*Endeavor	pymetrozine	Foliar spray
	Kontos	spirotetramat	Spray or drench; note sensitive plants
	^M-Pede	insecticidal soap (potassium salts of fatty acids)	Foliar spray; note sensitive plants
Whiteflies	*TriStar SL	acetamiprid	Foliar spray; some verbenas sensitive
	*Mainspring	cyantranilprole	Foliar spray (with adjuvant) or drench for sweetpotato whitefly
	Safari	dinotefuran	Drench or spray to indoor plants (with SLN label only – see restrictions)
	*Judo	spiromesifen	Spray for indoor plants only (with SLN label only – see restrictions & sensitive plants)
	^Aza-Direct, AzaGuard, Azatin O, Molt-X, Neemix, Ornazin	azadirachtin	Foliar spray, immature stages only
	BotaniGard; ^Preferal	<i>Beauveria bassiana</i> ; <i>Isaria fumosorosea</i>	Foliar spray
	^SunSpray, Ultra-Pure, SuffOil-X	paraffinic horticultural oil	Foliar spray; note sensitive plants
	^M-Pede	insecticidal soap (potassium salts of fatty acids)	Foliar spray; note sensitive plants
Fungus Gnats (larvae)	^Aza-Direct, AzaGuard, Azatin O, Molt-X, Neemix, Ornazin	azadirachtin	Media drench for larvae
	*TriStar SL	acetamiprid	Media surface 'sprenc'h'
	Pylon	chlorfenapyr	Media surface 'sprenc'h', note sensitive plants. Greenhouse-use only
	Adept	diflubenzuron	Media surface 'sprenc'h'
	Distance, Fulcrum	pyriproxyfen	Media surface 'sprenc'h'
	Citation	cyromazine	Media surface 'sprenc'h'

## Integrated Pest Management Practices

The following are non-pesticide practices that can be utilized as part of an IPM program to manage pests targeted by imidacloprid. If not sure of the pest or cause of a plant problem submit samples to a diagnostic laboratory for identification.

**Aphids and whiteflies:** Scout plants regularly. A scouting plan for whiteflies in poinsettia is at

<http://www.greenhouse.cornell.edu/pests/pdfs/insects/SamplingWF.pdf>. Dislodge aphids with jet of water. Introduce biocontrols appropriate for aphid or whitefly species present. Isolate infested plants and vegetatively propagated material from seed-grown. Monitor populations with yellow sticky cards. Avoid wearing yellow, which attracts pests, when working in the greenhouse. Screening or other barriers may be helpful to exclude insects.

**Fungus gnats:** Drench with beneficial nematodes. Monitor populations with yellow sticky cards. Avoid using immature composts and overwatering. Keep stored media dry and clean up spilled media. Cycle plants through the greenhouse as quickly as possible. Yellow sticky tape stretched over pots or below benches can trap large numbers of fungus gnats. Cut potato halves pressed lightly into media can be used to detect fungus gnat larvae.

More information on monitoring and management for these pests can be found in the *Cornell Guide for Integrated Management of Greenhouse Crops and Herbaceous Perennials*.

*Trade names used in this publication are for convenience only. No endorsement of products is intended, nor is criticism of unnamed products implied.*

### CONTACT INFORMATION

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For more information or electronic copies of this factsheet go to <http://ccesuffolk.org>

Cornell Cooperative Extension of Suffolk County Diagnostic Lab: <http://ccesuffolk.org/agriculture/horticulture-diagnostic-labs>

For more information on the Long Island Pesticide Pollution Prevention Strategy: <http://www.dec.ny.gov/chemical/87125.html>