Cornell University | Cornell University Cooperative Extension of Suffolk County | NEW YORK STATE OF OPPORTUNITY Department of Environmental Conservation

IMIDACLOPRID: Reducing Risks to Groundwater from Agricultural Uses: Cucurbit (Vine) Crops

Practical Approaches for Users

Introduction. The pesticide imidacloprid (Admire Pro, Advise, Alias, Couraze, Leverage, etc.), commonly used in agricultural production and landscapes, is showing up in Long Island's groundwater. This fact sheet was prepared to help cucurbit (pumpkin, squash, cucumber, melon) growers use imidacloprid more conservatively while continuing to effectively manage pests and protect Long Island's groundwater.

This and other factsheets are 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 agriculture 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, growers should modify day-to-day practices especially where soil applications are used:

Application Rates – When applying imidacloprid as a soil treatment use the lowest label rate. Labels allow for a range of rates when making soil applications. Although residual activity may be reduced, lower rates can still provide acceptable control for vine crops during early establishment and reduce the amount applied per acre by 33%. Always stay below the maximum allowable use per crop season (0.38 lb active ingredient/A = 10.5 fl oz/A Admire Pro, e.g.).

Application Timing and Application Methods – Imidacloprid is only used as soil treatment in cucurbits. For transplanted crops, it can be applied to plants in flats within 7 days of transplanting, instead of soil application at planting in the field, to control aphids during early establishment. Avoid overdosing, as some vine crops are sensitive, and leaching from flats may occur after application. When used at *transplanting*, apply in transplant water, which places material closer to plant roots and not in bare-ground areas between plants. This is preferable to applying in a continuous band, side-dress or via chemigation. Where used *at planting for direct-seeded crops*, apply as an in-furrow spray band (2 - 4" wide) on or below seed at planting, rather than in a continuous stream. Precision banding can reduce use 58 - 85% in pumpkin, cucumber, & zucchini while providing equivalent control of cucumber beetles during early establishment (http://www.ncipmc.org/glvwg/pdfs/PrecBandColumbPres_06.pdf). Special equipment is required but cost-sharing may be possible. Placement under plastic mulch with careful irrigation may help reduce leaching losses from high rainfall events. Avoid making soil applications when heavy rain is predicted within 24 hours or when soil is frozen or saturated.

KEY POINTS

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

- Use lowest label rates
- Use other effective insecticides or practices
- Avoid spills, drift, or runoff to drains and sumps

Some Alternative Insecticides

Other insecticides approved for use on Long Island control many of the same pests. Some are summarized below for 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
Melon aphid	*Assail	acetamiprid	Foliar spray as needed
	*Fulfill	pymetrozine	Foliar spray as needed
	Beleaf	flonicamid	Foliar spray as needed. Reduced-risk for greenhouse cucumber
	Lannate	Methomyl	Foliar spray as needed; melons, summer squash only
	FarMore DI400 seed treatment	Thiamethoxam	Seed pretreated by supplier, up to 21 days control
	^SuffOil-X, BioCover UL, Damoil, Glacial Spray Fluid, Mite-E-Oil, SunSpray Ultra-Fine, TriTek, Ultra-Pure Oil, Omni Supreme Spray	Mineral oil (paraffinic horticultural oil)	Foliar spray as needed; good contact essential. Incompatible with some fungicides
	^M-Pede	Insecticidal soap (potassium salts of fatty acids)	Foliar spray as needed; good contact essential. Cucumbers are sensitive
Cucumber beetles	*Assail	Acetamiprid	Foliar spray as needed starting at emergence or transplanting
	FarMore DI400 seed treatment	Thiamethoxam	Applied to seed by supplier, up to 21 days control
	Sevin	carbaryl	Foliar spray as needed starting at emergence or transplanting
	Lannate	Methomyl	Foliar spray as needed starting at emergence or transplanting. Melons, summer squash only
	Baythroid XL, Bifenture, Warrior II, Asana XL, Danitol, Mustang Maxx, Perm-Up, etc.	Pyrethroids (various)	Foliar spray as needed starting at emergence or transplanting
	^M-Pede	Insecticidal soap (potassium salts of fatty acids/potassium laurate)	Foliar spray late April to early May. Cucumbers may be sensitive. Incompatible with sulfur and some other materials – see label

Integrated Pest Management Practices

Scout plants, especially along field edges, twice weekly checking five plants at five sites. The following non-pesticide practices 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: Suggested threshold >20% of runners with aphids unless natural enemies present. Plant virus-resistant winter and summer squash varieties. Reflective mulch (direct-seeded crops) can reduce aphid-transmitted mosaic virus incidence by 50 - 60%. Avoid use of broad-spectrum pyrethroids especially early in production, which impact aphid natural enemies.

Cucumber beetles: Suggested thresholds are ≥5 beetles/plant, heavy damage noticed to leaves or flowers, or beetles are feeding on fruit; use lower threshold for seedlings and young transplants and especially if bacterial wilt is present and variety is susceptible. Watermelons are less prone to wilt. Use rowcover prior to flowering and perimeter trap cropping early in production.

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

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For more information about the Long Island Pesticide Pollution Prevention Strategy go to http://www.dec.ny.gov/chemical/87125.html

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