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Long Island Pesticide Pollution Prevention Strategy

June 23, 2015

1st Stakeholder Meeting – Introduction of Possible P2/BMPs for Atrazine

Today's Goals

1) Provide Brief Update/Overview on LI Strategy and Atrazine

2) Introduce Best Management Practices (BMPs)/Pollution Prevention (P2) Measures & Identify Priorities

3) Solicit Feedback from Stakeholders

4) Introduce Implementation Plans

Timeline

July 2014 - LI Strategy Finalized

October 2014 – Initial TRAC Meeting

February 2015 – Follow-Up TRAC Meeting

May 2015 – Data Packages Available

June 2015 Stakeholder Meetings

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Long Island Pesticide Pollution Prevention Strategy

The goal of the Strategy is to:

Prevent adverse effects on human health and the environment by protecting Long Island's groundwater and surface water resources from pesticide-related contamination

Continue to meet pest management needs of agricultural, residential, commercial, industrial, and institutional sectors

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HIGHLIGHTS OF THE STRATEGY

- **Pollution Prevention (P2)** principles to enhance DEC's regulatory program
- **Blueprint for Action** – stepwise actions to implement P2 measures
- **Coordinated Collaboration** with Stakeholders
  - Technical Review and Advisory Committee (**TRAC**)
  - Stakeholder Workgroups
- **Monitoring** focused on Strategy issues

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Comment Cards

- Available on Strategy Website & Hardcopies Here
- Format
  1) Modified Applications
  2) Possible Alternative Herbicides
  3) Possible Non-Pesticide Alternatives
  4) Education & Outreach
- Return Today
- Additional Comments to: LongIslandStrategy@dec.ny.gov by July 30, 2015

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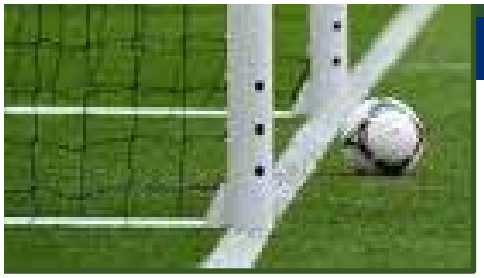

What is the Goal of this Process?

- Identify Priority Best Management Practices/Pollution Prevention Measures
- Develop Factsheets/Educational Material
- Provide Educational Programs

LI Strategy: Outreach and Training

Best Management Practices Seminar

PUTTING THE STRATEGY INTO ACTION…

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BMP Seminar Proposal:

- To conduct a series of trainings emphasizing pollution prevention strategies.
  - ✓ The target audiences will be divided into land use categories.
  - ✓ The topics and speakers will best represent each of the land use categories.
  - ✓ NYSDEC Core and Category specifics credits will be offered at each of the trainings.

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BMP Seminar Logistics

- Offered in late Winter 2015 and/or early Spring of 2016. Options include:
  - ✓ 3 days targeting a separate audience (smaller venues)
  - ✓ 1 day, having breakout sessions
  - ✓ Webinar – Host Sites
  - ✓ Or combine with an existing conference
  - Nassau and Suffolk Locations

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Potential Presenters

- Cornell Cooperative Extension of Suffolk County
- Cornell University IPM Program
- NYS DEC – Regional and CO
- SC Dept. of Health Services
- SC Water Authority
- Organic Producers, Industry Representatives, etc.

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Potential Audiences

- **Agricultural Uses**
  - ✓ Farmers
  - ✓ Greenhouses
  - ✓ Nurseries
  - ✓ Sod Farms
  - ✓ Vineyards
- **Turf Uses**
  - ✓ Golf Courses
  - ✓ Cemeteries
  - ✓ Athletic Fields
  - ✓ County Parks
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  - ✓ Community colleges

Commercial Applicators

- ✓ Landscape Contracting
- ✓ Arborist
- ✓ Aquatic Applicators
- ✓ County DPW
  - Operations
  - Highways
  - Vector

Optional Sessions

- ✓ Structural Applicators
- ✓ Anti-fouling Paint Applicators

Department of Environmental Conservation

General Topics

- IPM Philosophy
- Golf Courses and Athletic Fields
- Weed Management
- Specialist in the Different Commodities
- Equipment Calibration
- Product Registration
- Water Monitoring Innovations
- Alternative Farming and Sustainable Agriculture
- Utilizing Testing Labs

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SPECIFIC TOPICS…dynamic, innovative, science-based

Atrazine, **Mefenoxam**, Imidacloprid, **Rain Gardens**, NURSERY, RIPARIAN ZONES, Pesticide Rotation, Disinfestation Practices, Bio-controls, **Pollinators,** VINEYARDS, Worker Protection Standards, Soil Media, **Row Plantings**, Greenhouses, Irrigation, **Weed Burning**, Weather Station, Health Effects, AQUIFER, *Marketing - Making Alternatives Work,* **etc.**

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Getting the Word Out There! Volunteers'?

- NYSDEC Applicator's Mailing List
- NYSDEC Strategy website and the activities calendar
- Cornell Cooperative Extension's Mailing list, publications, events
- Pesticide Distributors
- Industry Organizations
- Environmental Organizations

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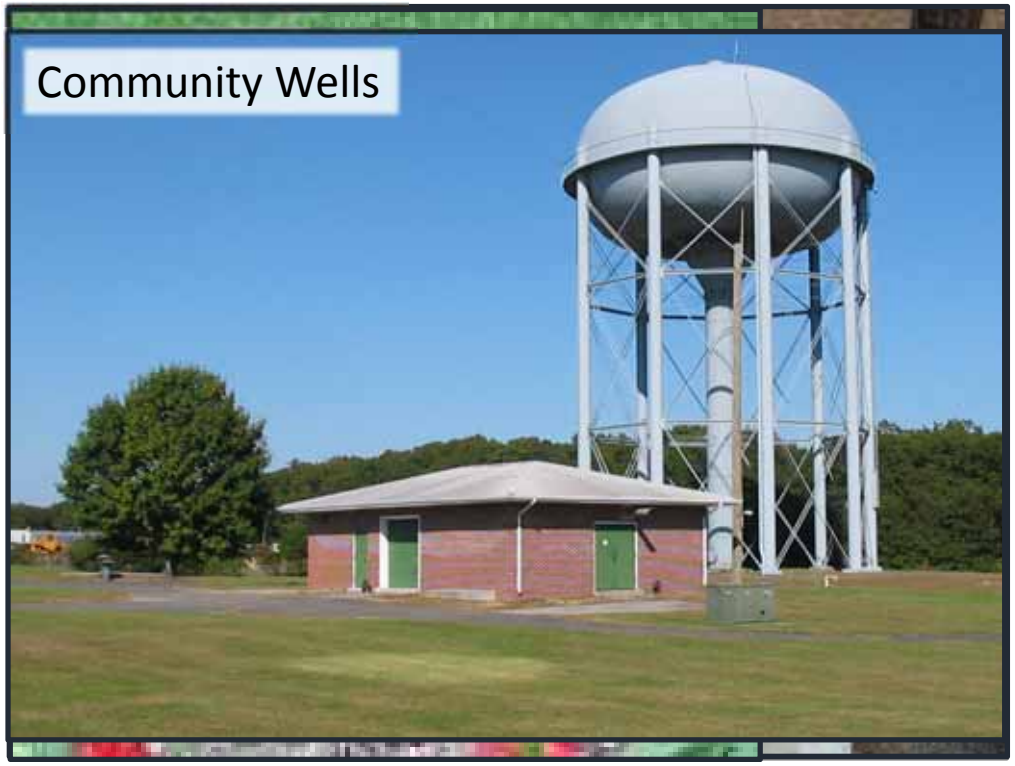
Atrazine Background

- Herbicide
- Primarily Used for Sweet Corn
- Registration in 1958
- 1992 Non-Crop Usage No Longer Allowed
- Maximum Application Rate = 2.5 lbs/A

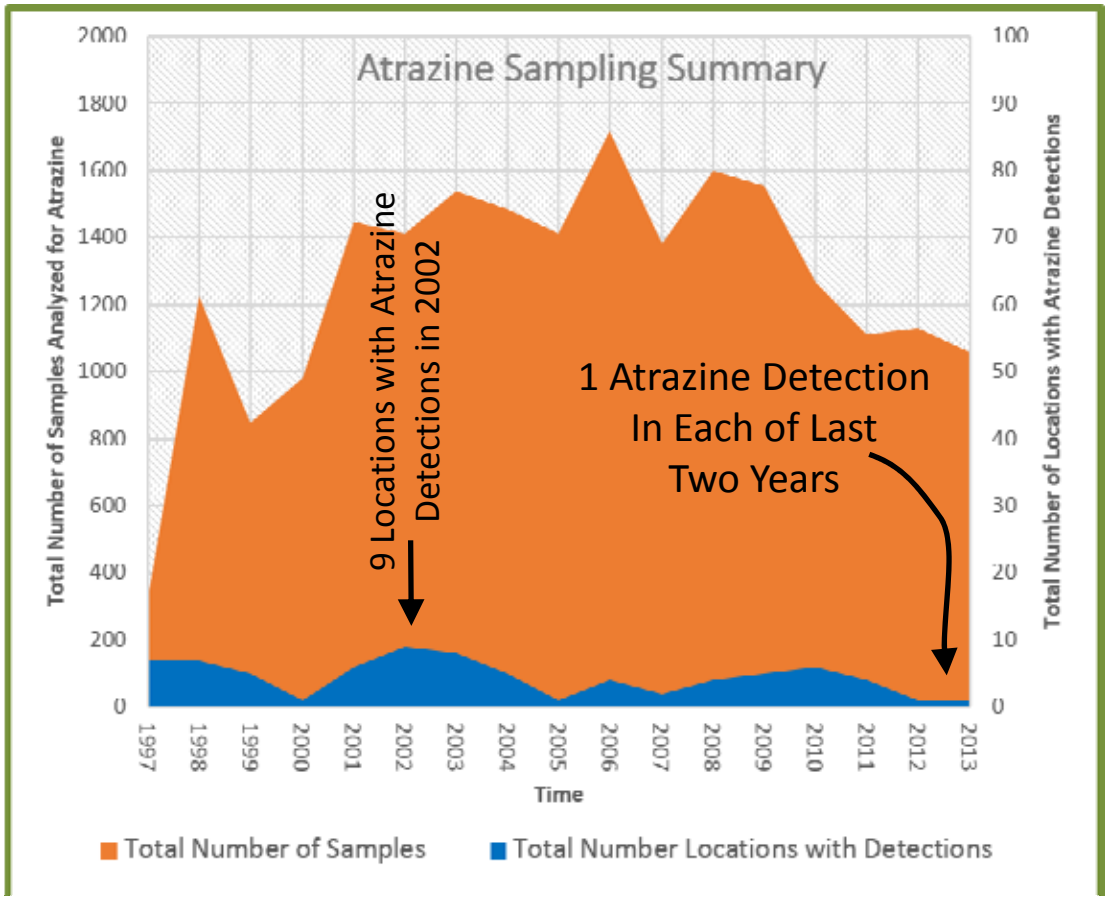
Atrazine in Long Island Groundwater

Groundwater Sampling Program



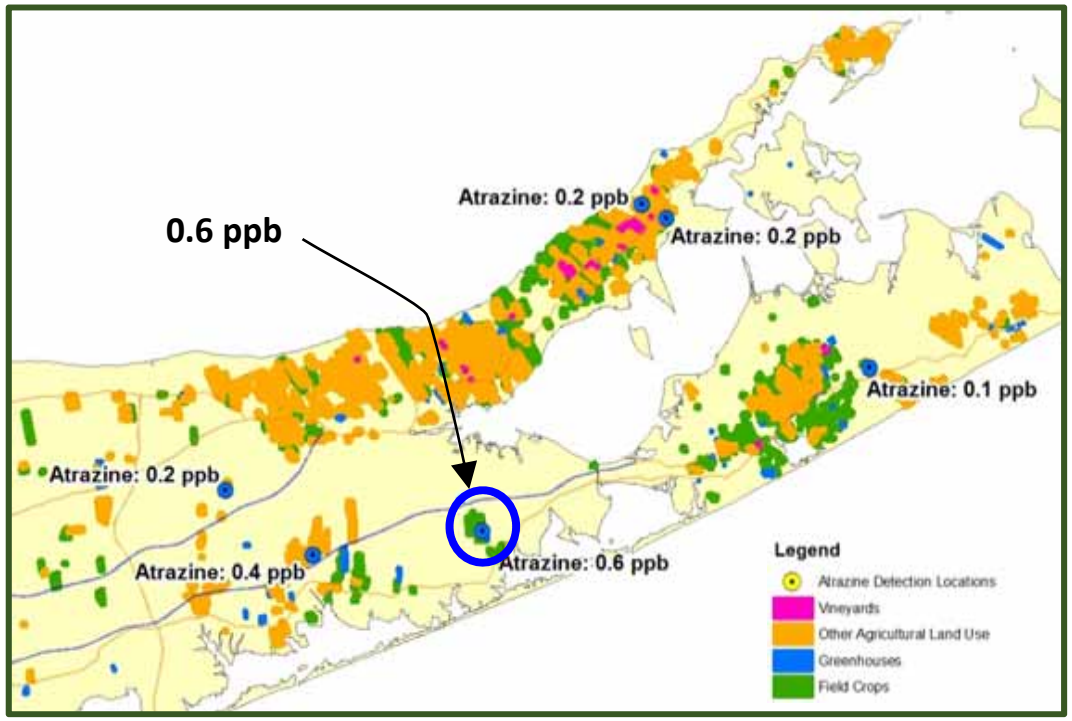
- Program between Department and Suffolk County
- In-Place Since 1997
- Analysis Includes ~300 Parameters
- Established ~200 Monitoring Wells
- 24,000 Groundwater Samples Since 1997
- Key Element to Strategy

Groundwater Sampling Program



- >1,000 samples collected/year since 2000
- Maximum locations with detections = 9 in 2002
- Locations with detections declining

2011 - 2013 Detection Locations – Suffolk County



- 6 Individual Locations
- Highest Concentration (0.6 ppb)
- Below Standard (3 ppb)
- Most Recent Detections Occurring in Areas with Surrounding Agricultural Land Uses

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Groundwater Monitoring Strategy – Plan for Measuring Success

Monitoring Program to Establish Baseline Conditions

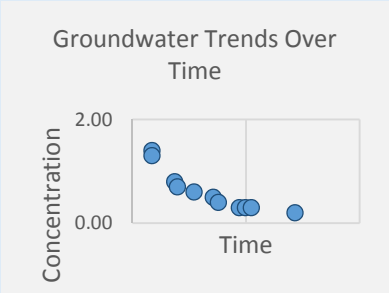
Identify Areas of Concern

Identify P2/BMP Measures

Implement Pollution Prevention Measures

Continue Monitoring Program

Assess Effectiveness of Pollution Prevention Measures



Adjust Pollution Prevention Measures as Necessary

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Possible Atrazine Alternatives

1. Modified Applications

Continued atrazine use, but possibly through improved application techniques

2. Possible Alternative Active Ingredients

Possible herbicide alternatives or rotational products

3. Non-Pesticide Options/IPM Practices

Possible cultural practices not involving use of herbicides

1) Modified Applications

1) Tank mix with other herbicides.
2) Apply atrazine by banding over the row and either cultivating or using post-emergence herbicides between the rows.
3) Restrict the use of atrazine to one (1) seasonal application per year.
4) Lower atrazine application rate to ≤1 pound active ingredient/acre/year.
5) Adjust application timing to maximize quantity staying on target and loss of atrazine through runoff.
6) Restrict the use of atrazine to corn crops.
7) Promote guidance on buffer zones necessary for atrazine usage.
8) Rotate atrazine with other herbicides.
9) Use of Precision application methods.
10) Improve calibration of application equipment.

Tank Mixing

Reducing overall atrazine usage by combining with other herbicides with different modes of action

Advantages

1) Reduced volume of atrazine being applied
2) Possible broader control of weeds

Disadvantages

1) Compatibility
2) Increased use of other pesticides

Lower Application Rate to ≤1 lb AI/Acre/Year

BMP would promote application rate to ≤1 lb/Acre/Year rather than current maximum rate of 2.5 lb/Acre/Year

Advantages

1) Overall reduction of amount of atrazine being applied
2) Reduced material cost

Disadvantages

1) May not provide season long control
2) Loss of carry over
3) Possible resistance development

Limit Atrazine Use to One Seasonal Application/Year

BMP would promote a single atrazine application per season

Advantages

1) Atrazine continues to be available when most-needed
2) Overall reduction of amount of atrazine being applied
3) Reduced material cost

Disadvantages

1) May not provide season long control

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Banding Over Row Crop

Reducing amount of atrazine by applying over crop and using other techniques between rows

Advantages

1) Reduces atrazine application area
2) Reduced material cost

Disadvantages

1) Specialized equipment
2) Cultivation may compromise soil health

Use of Precision Application Methods

Adjusting atrazine application rates based on real-time or pre-determined field conditions

Advantages

1) Reduced volume of atrazine being applied
2) Reduced material cost

Disadvantages

1) Specialized equipment
2) Increased equipment costs

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Rotation with other Herbicides

Reducing overall atrazine usage by rotating with other herbicides

Advantages

1) Reduced volume of atrazine being applied

2) Possible reduction in resistance development

Disadvantages

1) Alternative herbicides may require repeat applications

2) Increased use of other pesticides

Core/Standard BMPs

Common techniques to avoid loss of atrazine or over applications

1) Adjust application timing

   - Avoid applications prior to or immediately after heavy rain events

2) Promote guidance on buffer zones

   - Avoid susceptible areas

3) Improve calibration of application equipment

   - Ensure correct application rates

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Limit Usage to Corn Crops

Reduces amount of atrazine being applied through limited use on non-critical crops.

Advantages

1) Reduces overall atrazine usage
2) Does not impact corn growers where atrazine is an important part of weed control program

Disadvantages

1) Removes a possible weed control alternative for other uses
2) May require label changes

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2) Possible Atrazine Alternatives

Active Ingredient	Common Trade Names	Timing of Application	Restricted Use Herbicide	Weeds Controlled		
				Broadleaves	Grasses	Yellow Nutsedge
Atrazine	*Several*	Pre & Post Emergent	Yes	✓		
Glyphosate	Roundup Weathermax		No	✓	✓	✓
Halosulfuron	Sandea, Permit		No	✓		✓
Mesotrione	Callisto		No	✓	✓	
Pendimethalin	Prowl		No	✓	✓	
2,4-D	Weedar 64	Post Emergent	Yes	✓		
Bentazon	Basagran		No	✓		✓
Carfentrazone	Aim EC		No	✓		
Nicosulfuron	Accent		No	few broadleaves	✓	
Tembotrione	Laudis		No	✓	✓	
Topramezone	Impact		No	✓	✓	

Possible Outcome with No Weed Control

- Lower yield
- Reduced quality

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Possible Atrazine Alternatives

Active Ingredient	Common Trade Names
Atrazine	*Several*
Glyphosate	Roundup Weathermax
Halosulfuron	Sandea, Permit
Mesotrione	Callisto
Pendimethalin	Prowl
2,4-D	Weedar 64
Bentazon	Basagran
Carfentrazone	Aim EC
Nicosulfuron	Accent
Tembotrione	Laudis
Topramezone	Impact

1) Are there preferred rotational herbicides?

2) Are there products not included on this list?

3) Possible Non-Pesticide Alternatives

1	Scout and map weeds for selection of optimum weed control practices.
2	Plant a cover crop after harvest for weed competition.
3	Use of cultivation practices for weed control.
4	Improve soil health and quality.
5	Shorten corn crop rotations to disrupt weed cycles.
6	Use of early, post-crop planting tine weeding.
7	Control the field through mowing after harvest to reduce weed seed production.
8	Plant into a killed cover crop.
9	Interseed cover crops after last cultivation to reduce weed development.
10	Flame and hot weeding in row crops.
11	Promote guidance on handling of containers and excess product.
12	Improve irrigation practices/develop an irrigation water management plan.

Scout & Map Weeds

Understanding weed populations to select the most appropriate management practices.

Advantages

1) May reduce overall atrazine usage
2) Possible reduced costs if herbicides are not needed based on scouting

Disadvantages

1) May require increased labor as time in field is required to assess and map
2) May require increased costs if professional scout is used

Shorten Corn Crop Rotations

Shortening the rotation of corn crops to disrupt weed cycles.

Advantages

1) May reduce herbicide usage
2) Improvements to soil health
3) May increase crop yield

Disadvantages

1) Requires knowledge of weed life cycles
2) Demand for rotational crop

Use of Cultivation Practices

Cultivation for the control, or partial control, of weeds.

Advantages

1) May reduce herbicide usage

Disadvantages

1) Added costs
2) Adverse affect on soil health
3) Loss of organic matter may increase leaching potential

Tine Weeding

Use of early, post-crop planting tine weeding.

Advantages

1) By partial control of annual broadleaf weeds and annual grasses, may reduce herbicide usage

Disadvantages

1) Added labor and material costs
2) Possible adverse effect on soil health
3) Timing is important or damage to crop can occur.

Weed Management with Mowing

Following harvest, use mowing practices to reduce weed seed production.

Advantages

1) By reducing weed populations may reduce the need for herbicides.

Disadvantages

1) Added labor and material costs

2) Mowing may be require multiple times

Cover Crop Options

Use of cover crops as a form of competition with weeds.

1) Planting Cover Crop After Harvest
2) Planting Into a Killed Cover Crop
3) Interseeding Cover Crop

Advantages

1) May reduce atrazine usage
2) May improve soil health
3) Reduces erosion potential

Disadvantages

1) Added costs
2) Increased need for crop management
3) Cover crop may compete with target crop

Flame and Heat Weeding

Thermal treatment between row crops to manage weeds.

Advantages

1) Through heat treatment, may reduce the need for herbicides for weed control

Disadvantages

1) Typically applied for small weed control
2) Specialized equipment required for thermal treatment
3) Added equipment and fuel costs

Handling of Containers and Product

Improved guidance on the proper mixing of product and the handling of containers and excess product.

Advantages

1) Easy to implement
2) Reduces potential for concentrated product to enter subsurface

Disadvantages

1) Possible increased operational costs

Practices to Improve Soil Health and Quality

Applying a combination of cultivation practices and measures to increase soil organic matter to improve soil health.

Advantages

1) May reduce herbicide usage
2) May reduce leaching
3) May reduce runoff

Disadvantages

1) May increase costs
2) May take time to begin implementing

Improved Irrigation Practices

Improved irrigation and development of irrigation management plans.

Advantages

1) May reduce leaching
2) Reduced water expenses

Disadvantages

1) May require equipment upgrades
2) Requires soil moisture, crop condition, and weather monitoring

Stakeholder Meeting Summary

Comment Card Completion

- Not a Test
- Please Take Next 10-15 Minutes to Complete
- Return Today

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LI Strategy June 2015 Stakeholder Meeting

Atrazine Comment Card

To ensure all interests are factored into the development and implementation of Best Management Practices/Pollution Prevention Measures for Atrazine, the Department is requesting comments from all Stakeholders. The goal of these measures is to reduce or eliminate the movement of atrazine to Long Island's groundwater while continuing to meet the region's pest management needs.

Check the box below that applies to your interest in attending the Atrazine Stakeholder Meeting

☐ Atrazine Distributor

☐ Atrazine User

☐ Concerned About Atrazine in Long Island Groundwater

1) Application Modifications	
1	Tank mix with other herbicides.
2	Apply atrazine by banding over the row and either cultivating or using post-emergence herbicides between the rows.
3	Restrict the use of atrazine to one (1) spring application per year.
4	Lower atrazine application rate to below 1 pound active ingredient/acre/year
5	Adjust application timing to maximize quantity staying on target and loss of atrazine through runoff.
6	Restrict the use of atrazine to corn crops.
7	Promote guidance on buffer zones.
8	Rotate atrazine with other herbicides.
9	Use of Precision application methods.
10	Improve calibration of application equipment

Question #1: As a user of atrazine, order the top five approaches, of the ten that are listed to the left, that you feel will allow continued beneficial use of atrazine while at the same time reduce or eliminate movement of atrazine to Long Island's groundwater.

1) _____

2) _____

3) _____

4) _____

5) _____

Question #2: Based on your experience, are there possible Pollution Prevention (P2) Measures/Best Management Practices (BMPs) that are not included on this list? If so, please describe in the space below?

_____

_____

_____

_____

Question #3: Are there P2 measures/BMPs on this list that do not belong? If so, please describe in the space below?

_____

_____

_____

_____

Possible Alternative/Rotational Herbicides

Active Ingredient	Common Trade Names	Timing of Application
1) Glyphosate	Roundup Weathermax	Pre & Post Emergent
2) Halosulfuron	Sandea, Permit	
3) Mesotrione	Callisto	
4) Pendimethalin	Prowl	
5) 2,4-D	Weedar 64	Post Emergent
6) Bentazon	Basagran	
7) Carfentrazone	Aim EC	
8) Nicosulfuron	Accent	
9) Tembotrione	Laudis	
10) Topramezone	Impact	

Question #4: As an atrazine user, order the top five herbicides, of the ten that are listed to the left, that you feel are the most effective alternative or rotational products that may reduce atrazine usage.

1) _____

2) _____

3) _____

4) _____

5) _____

Possible Non-Pesticide/IPM Alternatives
Question #5

		✓For High Value Option	✓ If Already In Use	✓ If More Information/ Outreach is Necessary	✓ If Option Really Does Not Apply
1	Scout and map weeds for selection of optimum weed control practices.				
2	Plant a cover crop after harvest for weed competition.				
3	Use of cultivation practices for weed control.				
4	Improve soil health and quality.				
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Education and Outreach

Question #6: To avoid possible conflicts with offering BMP/P2 Education and Outreach Programs, please list dates and names of known events between October and December 2015?

Date/s	Event

Question #7: Are there specific areas where assistance is needed or where assistance would be helpful with implementing specific BMPs/P2 measures? If so, please indicate below.

Groundwater Quality

Question #8: Are there additional approaches that should be considered for protecting groundwater quality on Long Island? If so, please indicate below.

General Comments

Written comments can also be mailed to the Long Island Pesticide Pollution Prevention Strategy team at: NYSDEC, Division of Materials Management, 625 Broadway, Albany, NY 12233-7254 or emailed to: LongIslandStrategy@dec.ny.gov

Name: _____ Organization: _____ Phone: _____

Thank You

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Flickr: www.flickr.com/photos/nysdec

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Long Island Pesticide Pollution Prevention Strategy

June 23, 2015

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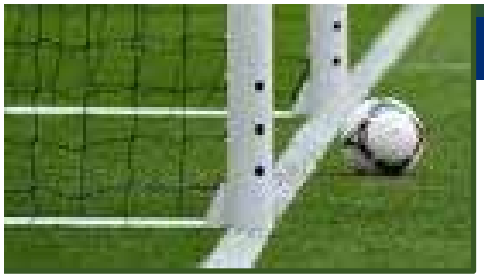

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- **Turf Uses**
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Metalaxyl/Mefenoxam Background

- Fungicide
- Important for Disease Management
- Metalaxyl NY Registration in 1980’s
- Mefenoxam NY Registration in 1996
- Mefenoxam is purified form with less needed

Metalaxyl/Mefenoxam Background

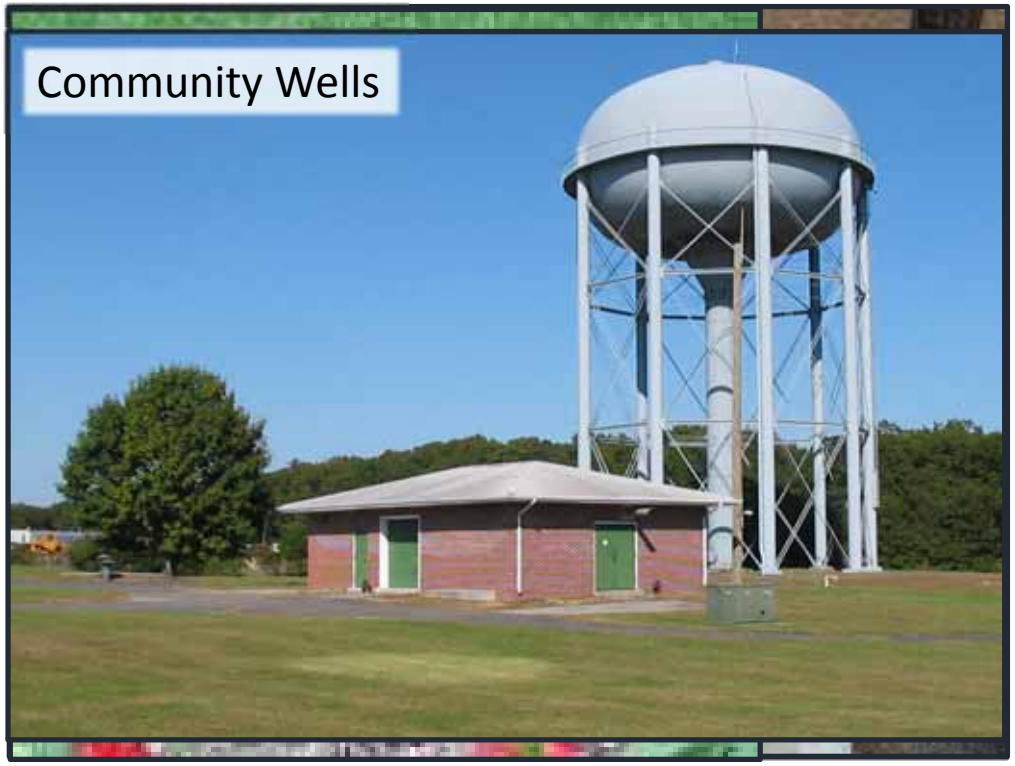
Subdue Maxx

Ridomil Gold

- Mefenoxam replaced Metalaxyl for all uses
- Metalaxyl currently registered in NYS for Seed Treatment

Mefenoxam in Long Island Groundwater

Groundwater Sampling Program



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- Analysis Includes ~300 Parameters
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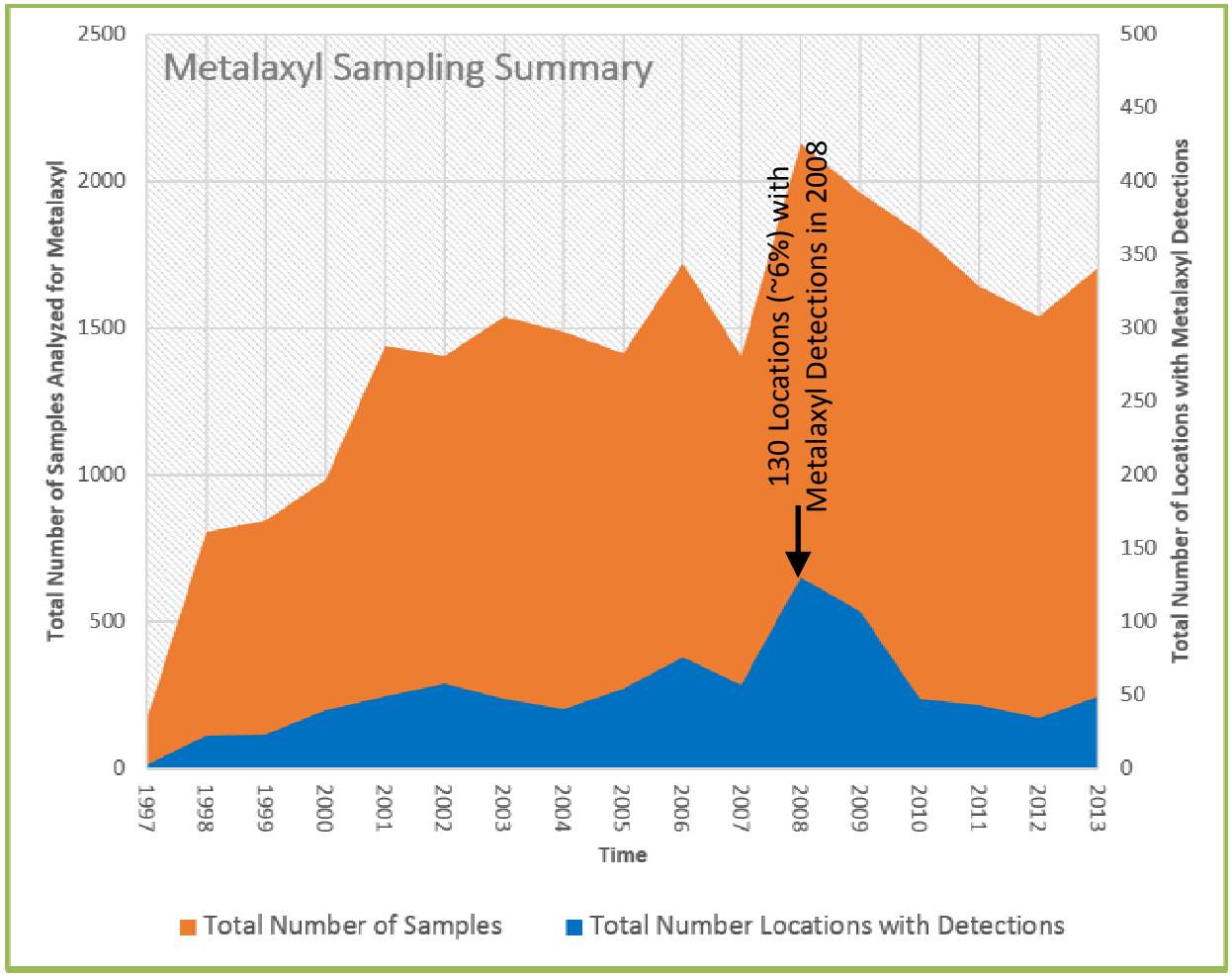
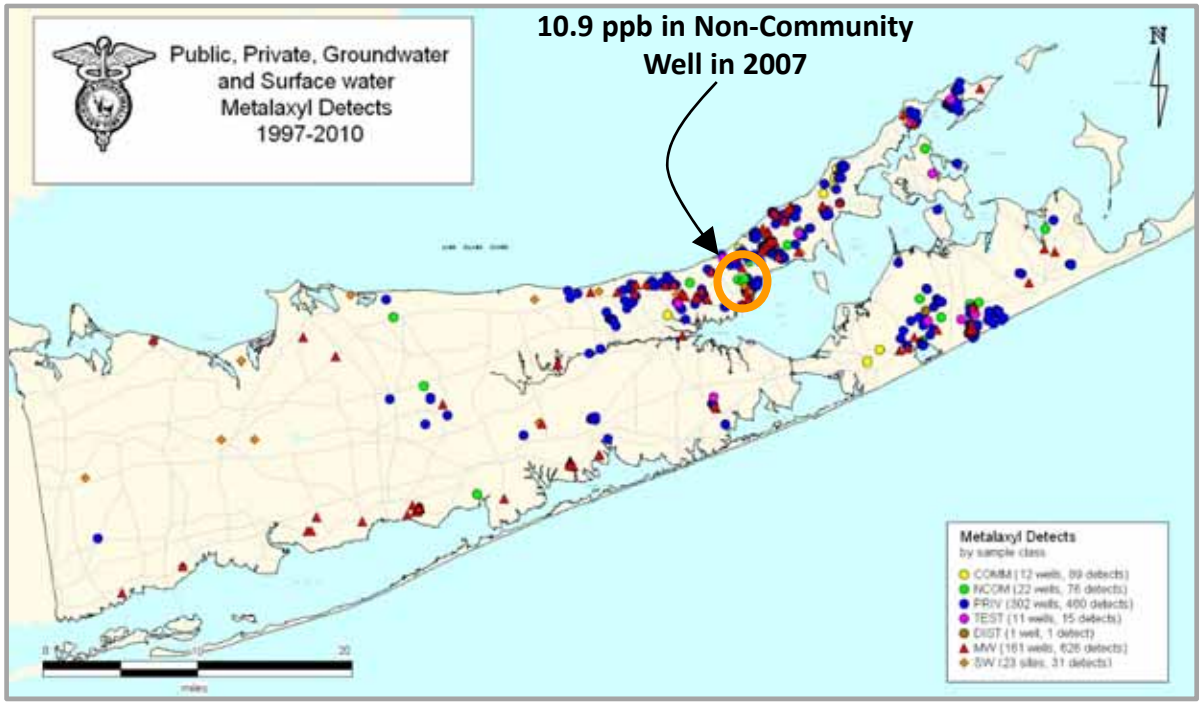
Suffolk County Groundwater Data



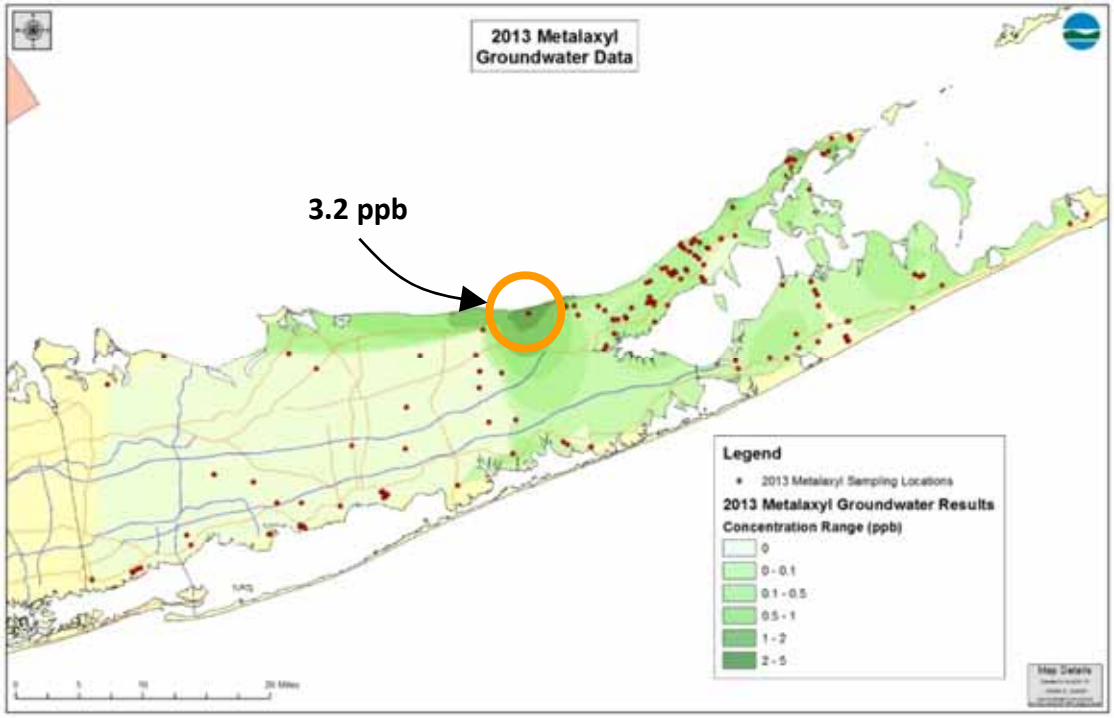
- ~1,600 samples collected/year since 2000
- Maximum locations with detections = 130 in 2008
- Typically detected in 2% - 6% of samples
- Highest percentage of detection in monitoring wells

1997 – 2010 Detection Locations – Suffolk County



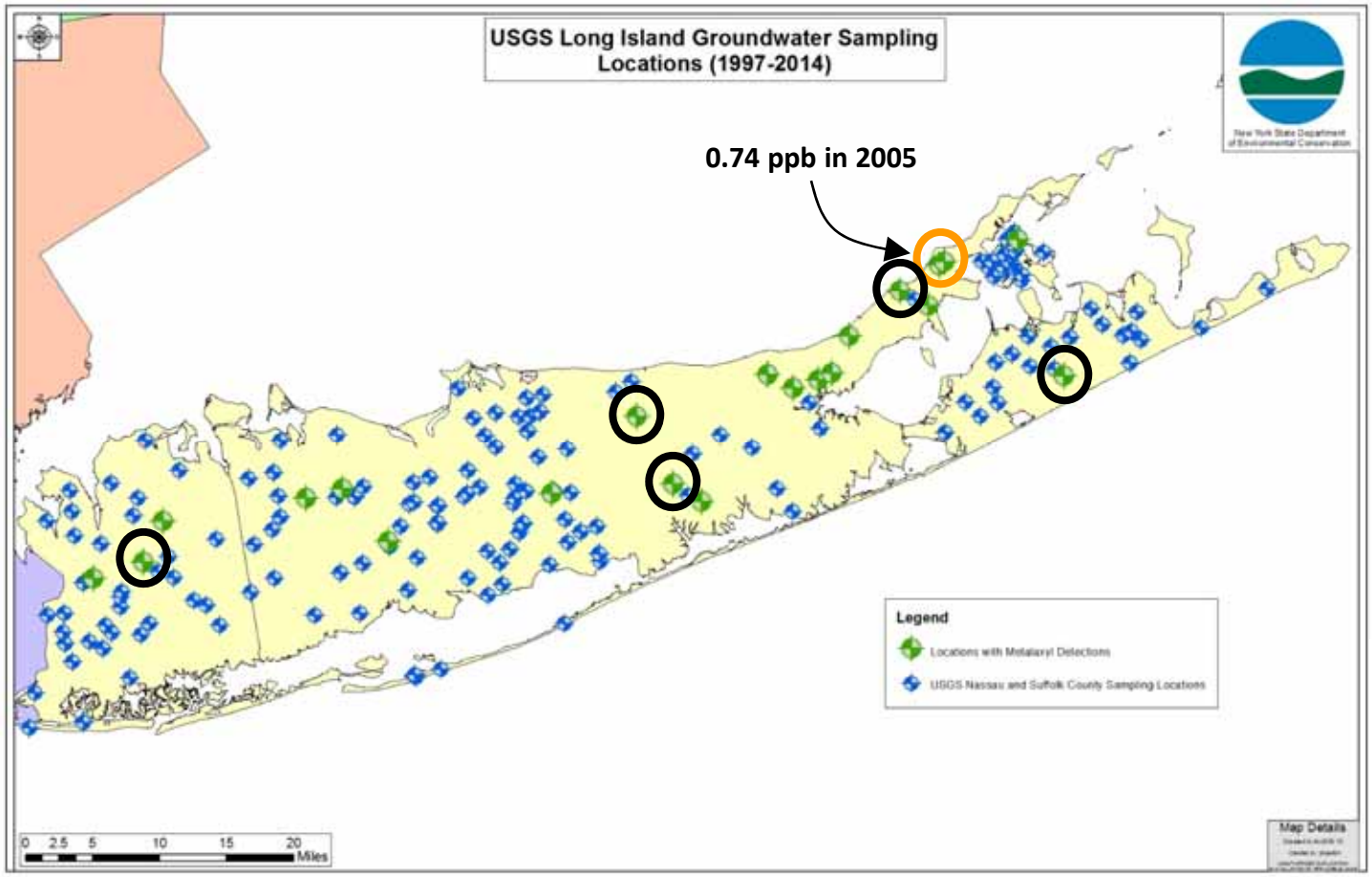
- 509 Individual Locations
- Primarily Detected in Monitoring and Private Wells – 463 of 509 Locations
- Most Detections in North and South Fork Areas
- No Drinking Water Exceedances (50 ppb)
- Max. Conc. = 10.9 ppb

2013 Metalaxyl Groundwater Data – Suffolk County



- Highest Concentration = 3.2 ppb
- Monitoring Well
- Continued Detections Occurring in North and South Fork Areas

1997 – 2014 Detection Locations – USGS



- 340 Total Samples
- 26 Metalaxyl Detections
- All Detections <1 ppb
- Highest Concentration in 2005
- Next highest Concentration = 0.25 ppb

Groundwater Monitoring Strategy – Plan for Measuring Success

Monitoring Program to Establish Baseline Conditions

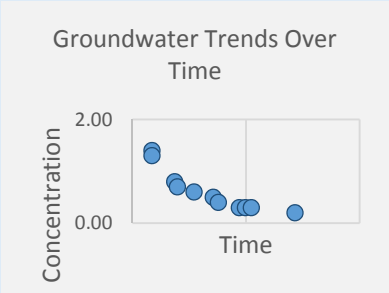
Identify Areas of Concern

Identify P2/BMP Measures

Implement Pollution Prevention Measures

Continue Monitoring Program

Assess Effectiveness of Pollution Prevention Measures



Adjust Pollution Prevention Measures as Necessary

Department of Environmental Conservation

Mefenoxam

Overview & Options

Possible Metalaxyl/Mefenoxam Alternatives

1. Modified Applications

Continued mefenoxam use, but possibly through improved application techniques

2. Possible Alternative Active Ingredients

Possible fungicide alternatives or rotational products

3. Non-Pesticide Options/IPM Practices

Possible cultural practices not involving use of fungicides

1) Modified Applications – Identified 4 Options

Options to Reduce or Increase Effectiveness of Mefenoxam Applications		Vegetable & Fruit Commodities	Floral, Nursery, Turf, and Landscape Commodities	
			(Soil Applications)	(Foliar Applications)
1)	Rotation of mefenoxam with other fungicides with different modes of action.	✘	✘	✘
2)	Limit to a maximum of two (2) annual applications or two (2) per crop cycle.	✘	✘	✘
3)	Improve calibration of application equipment.	✘	✘	✘
4)	Use of treated seed.	✘		

Rotation with other Fungicides

Reducing overall mefenoxam usage by rotating with other fungicides

Advantages

1) Reduced volume of mefenoxam being applied
2) Possible reduction in resistance development
3) Already being practiced

Disadvantages

1) Mefenoxam one of most effective fungicides on sensitive strains
2) May increase costs
3) Increased use of other pesticides

Applies To: **Most of the Commodities and Application Types (Soil & Foliar)**

Limit to a maximum of 2 annual applications or 2 per crop cycle

Reducing amount of mefenoxam being applied by limiting the overall usage

Advantages

1) Reduced volume of mefenoxam being applied
2) Possible reduction in resistance development
3) Already being practiced

Disadvantages

1) May be situations when mefenoxam use may be needed beyond 2 applications.
2) Increased use of other pesticides

Applies To: **Each of the Commodities and Application Types (Soil & Foliar)**

Improved Calibration & Properly Working Application Equipment

Advantages

1) By improving delivery, there can be a reduction in mefenoxam usage
2) Possible reduction in expenses
3) Already being practiced

Disadvantages

1) Possible increase in cost associated with replacing/upgrading equipment

Applies To: **Each of the Commodities and Application Types (Soil & Foliar)**

Use of Treated Seed
(mefenoxam and/or alternative fungicide)

Advantages

1) May reduce mefenoxam usage
2) Limits potential for disease development
3) May decrease cost

Disadvantages

1) May still require treatment

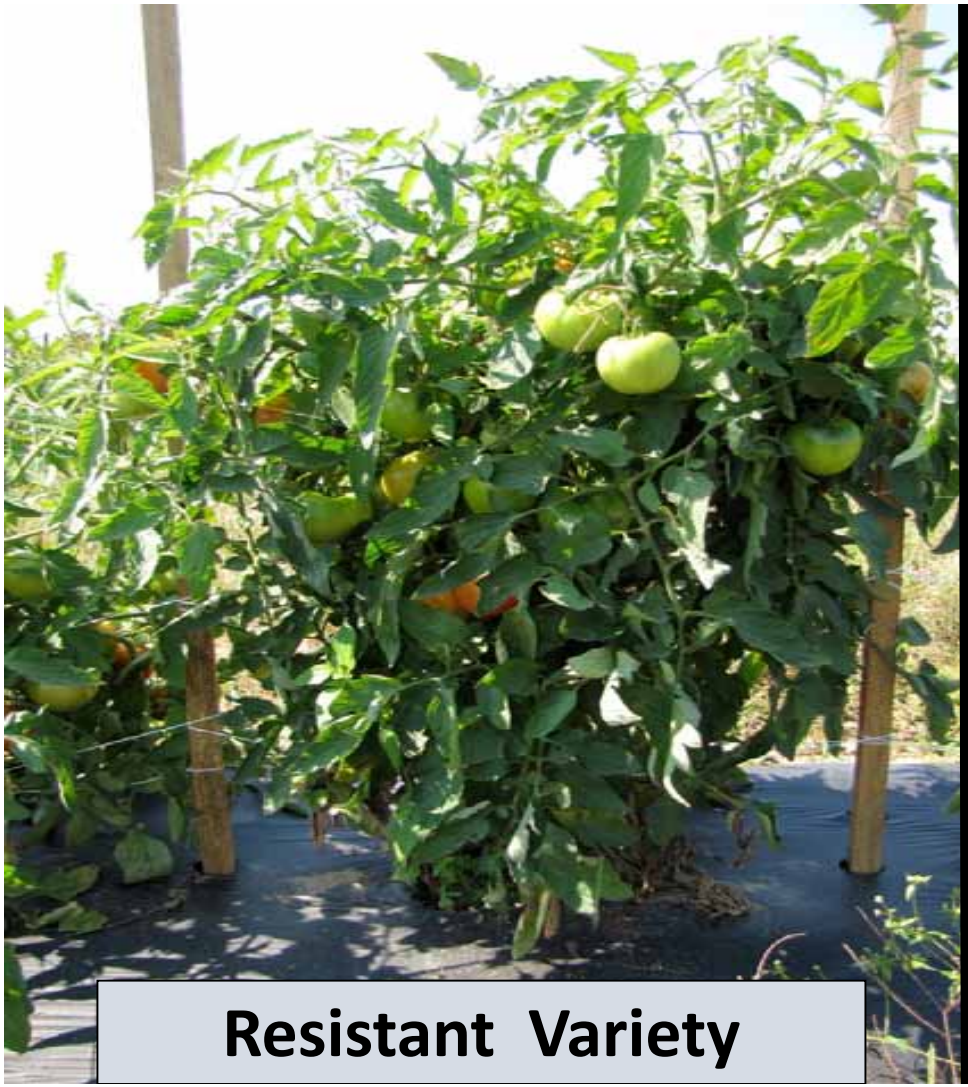
Mostly Applies To: **Vegetable Crops (pepper, tomato, potato, mixed vegetable, brassicas, & cucurbits)**

2) Possible Mefenoxam Alternatives		Vegetable & Fruit Commodities	Floral, Nursery, and Turf Commodities	Floral, Nursery, and Turf Commodities
Trade Names	Active Ingredient		(Soil Applications)	(Foliar Applications)
1) Captan	Captan (80's)	×		
2) Bravo, Daconil, Echo 720, etc.	Chlorothalonil (80's)	×		×
3) several	Copper fungicides (80's)	×		×
4) Ranman, Segway, etc.	Cyazofamid (2006)	×	×	×
5) Curzate, Tanos, etc.	Cymoxanil (1999)	× (Foliar)		
6) Stature, Forum, etc.	Dimethomorph (2005)	× (Foliar)	×	×
7) Truban, Terrazole, Banrot, etc.	Etridiazole (80's)		×	
8) Presidio, Adorn, Stellar, etc.	Fluopicolide (2010)	×	×	×
9) Aliette	Fosetyl-Aluminum (80's)		×	×
10) Dithane, Manzate, Protect, etc.	Mancozeb (80's)	×		×
11) Micora, Revus, etc.	Mandipropamid (2009)	× (Foliar)	×	×
12) K-Phite, Magellan, ProPhyt, Alude, Fosphite,	Phosphite fungicides (2002)	×	×	×
13) Previcur Flex (2003), Banol (1995)	Propamocarb hydrochloride	×	×	×
14) Pristine, Pageant	Pyraclostrobin and Boscalid (2004)	×		
15) Abound, Quadris, Heritage, Compass 0, etc.	Strobilurins (1997 to 2000)	×	×	×
16) Gavel	Zoxamide (2003)	× (Foliar)		

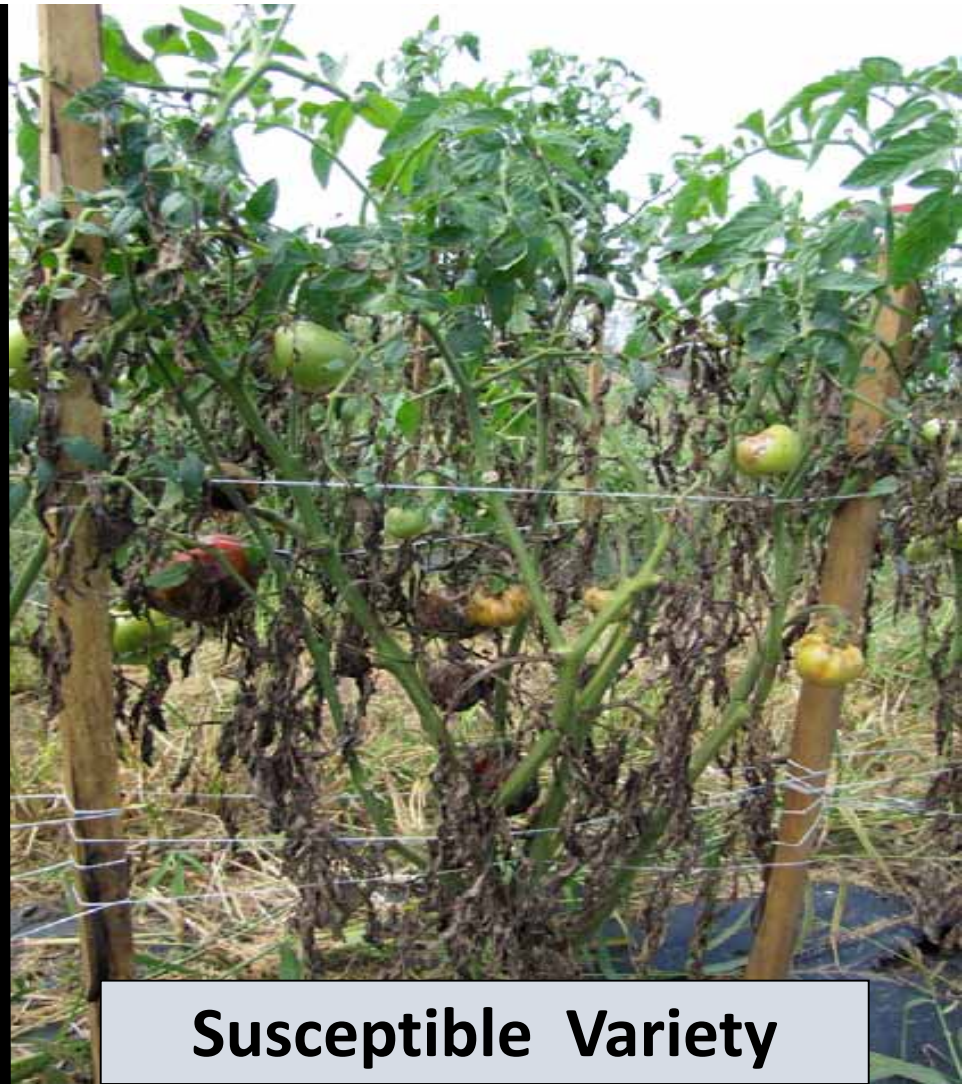
Possible Mefenoxam Alternatives		Vegetable & Fruit Commodities	Floral, Nursery, and Turf Commodities	Floral, Nursery, and Turf Commodities
Trade Names	Active Ingredient		(Soil Applications)	(Foliar Applications)
1) Captan	Captan	×		
2) Bravo, **Daconil, Echo 720,** etc.	Chlorothalonil	×		×
3) **Phyton 35, Camelot, Kocide, CuPRO 5000,** etc	Copper fungicides	×		×
4) Ranman, **Segway,** etc.	Cyazofamid	×	×	×
5) Curzate, Tanos, etc.	Cymoxanil	× (Foliar)		
6) Forum, **Stature,** etc.	Dimethomorph	× (Foliar)	×	×
7) **Truban, Terrazole, Banrot,** etc.	Etridiazole		×	
8) Presidio, **Adorn,** Stellar, etc.	Fluopicolide	×	×	×
9) **Aliette**	Fosetyl-Aluminum		×	×
10) Manzate, **Dithane, Protect,** etc.	Mancozeb	×		×
11) Revus, **Micora,** etc.	Mandipropamid	× (Foliar)	×	×
12) Magellan, ProPhyt, **K-Phite, Alude, Fosphite,** etc.	Phosphite fungicides	×	×	×
13) Previcur Flex, Banol, etc.	Propamocarb hydrochloride	×	×	×
14) Pristine, **Pageant,** etc.	Pyraclostrobin and Boscalid	×		
15) Abound, Quadris, **Heritage, Compass 0, Insignia,** etc.	Strobilurins	×	×	×
16) Gavel	Zoxamide	× (Foliar)		

Late Blight - Tomato

Late Blight – Very Destructive + Highly Contagious



Resistant Variety



Susceptible Variety

Cucurbit Downy Mildew

Mefenoxam no longer used because pathogen developed resistance.

MUM PYTHIUM CONTROL EXAMPLE

Wilt➔Death

Stem rot

Pythium aphanidermatum effects on chrysanthemum

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Garden Mum culture, LI

Pythium attack

Possible Alternative Fungicides - Ornamentals

Possible Mefenoxam Alternatives		Vegetable & Fruit Commodities	Floral, Nursery, and Turf Commodities	
Trade Names	Active Ingredient		(Soil Applications)	(Foliar Applications)
1)	Captan	×		
2) Daconil, Echo 720, etc.	Chlorothalonil	×		×
3) Phyton 35, Camelot, Kocide, CuPRO 5000 etc.	Copper fungicides	×		×
4) Segway	Cyazofamid	×	×	×
5)	Cymoxanil	× (Foliar)		
6) Stature	Dimethomorph	× (Foliar)	×	×
7) Truban, Terrazole, Banrot, etc.	Etridiazole		×	
8) Adorn	Fluopicolide	×	×	×
9) Aliette	Fosetyl-Aluminum		×	×
10) Dithane, Protect, etc.	Mancozeb	×		×
11) Micora	Mandipropamid	× (Foliar)	×	×
12) K-Phite, Alude, Fosphite, etc.	Phosphite fungicides	×	×	×
13)	Propamocarb hydrochloride	×	×	×
14) Pageant	Pyraclostrobin and Boscalid	×		
15) Heritage, Compass 0, Insignia, etc.	Strobilurins	×	×	×
16)		× (Foliar)		

Possible Alternative Fungicides – Pythium on Mum

Possible Mefenoxam Alternatives		Vegetable & Fruit Commodities	Floral, Nursery, and Turf Commodities	
Trade Names	Active Ingredient		(Soil Applications)	(Foliar Applications)
1)	Captan	×		
2)	Chlorothalonil	×		×
3) Phyton 35	Copper fungicides	×	×	×
4) Segway	Cyazofamid	×	×	×
5)	Cymoxanil	× (Foliar)		
6)	Dimethomorph	× (Foliar)	×	×
7) Truban, Terrazole, Banrot, etc.	Etridiazole		×	
8) Adorn	Fluopicolide	×	×	×
9) Aliette	Fosetyl-Aluminum		×	×
10)	Mancozeb	×		×
11)	Mandipropamid	× (Foliar)	×	×
12) K-Phite, Alude, Fosphite, etc.	Phosphite fungicides	×	×	×
13)	Propamocarb hydrochloride	×	×	×
14)	Pyraclostrobin and Boscalid	×		
15) Heritage, Insignia	Strobilurins	×	×	×
16)		× (Foliar)		

Sudden Oak Death SOD

Phytophthora ramorum

Serious canker disease

Coast live oak and other red oaks, tan oak (CA and OR), beech, and larch (UK)

Wide host range

Regulated by state and federal quarantines

Phytophthora on rhododendron (nursery and landscape)

3) Possible Non-Pesticide Alternatives

	Possible Mefenoxam Alternatives	Vegetable & Fruit Commodities		Greenhouse & Nursery		Turf Commodities		Landscapes	
	Application Type:	Soil	Foliar	Soil	Foliar	Soil	Foliar	Soil	Foliar
1	Improve irrigation practices/develop an irrigation water management plan.	✖	✖	✖	✖	✖	✖	✖	✖
2	Implement sanitation/disinfestation practices to avoid introducing or spread of disease; clean and disinfect.	✖		✖	✖	✖	✖	✖	✖
3	Avoidance of planting in low lying areas.	✖		✖	✖	✖	✖	✖	✖
4	Use of resistant plants/cultivars.	✖	✖	✖	✖			✖	✖
5	Use of biological techniques/biocontrols.	✖	✖	✖	✖	✖	✖		
6	Selection of planting sites with well drained soil/use of well drained growing media.	✖		✖		✖		✖	
7	Improve soil health and quality.	✖		✖		✖		✖	
8	Rotation of crops.	✖		✖	✖				
9	Use of raised beds.	✖		✖				✖	
10	Improved crop management (pruning, leaf/shoot removal, etc.).	✖	✖						
11	Removal/destruction of infected vegetation.	✖	✖						
12	Use of certified seed.		✖						
13	Adequate spacing of plants to promote air movement.			✖					
14	Encourage use of weather information and pest models found on NEWA for timing of scouting and management applications.		✖						

Use of Resistant Plants/Cultivars

BMP would promote use of plant-types that are resistant to select disease/pathogens

Primary Use Patterns	Option Applies
1) Fruit & Vegetable	✓
2) Greenhouse & Nursery	✓
3) Turf	
4) Landscape	✓

Advantages	Disadvantages
• Reduced pesticide usage • Reduced pesticide cost	• Increased plant costs • Resistance is not immunity; fungicides often still needed • Possible lower yield and quality

Use of Weather Information and Pest Models for Scouting and Management Purposes

In particular for LI fruit and vegetable commodities, promote use of forecasting models for timing of scouting and management applications.

Primary Use Patterns	Option Applies
1) Fruit & Vegetable	✓
2) Greenhouse & Nursery	
3) Turf	
4) Landscape	

Advantages	Disadvantages
• Preventative approach that may reduce need for pesticide usage	• May require training to apply models • Few models available

Use of Biological Techniques/Biocontrols

BMP would promote use of biopesticides as a mechanism to reduce conventional pesticide use

Primary Use Patterns	Option Applies
1) Fruit & Vegetable	✓
2) Greenhouse & Nursery	✓
3) Turf	✓
4) Landscape	

Advantages	Disadvantages
• Not a mefenoxam replacement, but to complement	• Often less effective. May still require fungicide treatment • Increased cost associated with biocontrols

Crop Rotations

BMP would promote the rotation of crops to minimize disease development. In particular for potato, strawberry, and certain nursery crops

Primary Use Patterns	Option Applies
1) Fruit & Vegetable	✓
2) Greenhouse & Nursery	✓
3) Turf	
4) Landscape	

Advantages	Disadvantages
• May reduce pathogen occurrence • Reduced pesticide cost	• Limitations on pathogens with broad range of host plants • Land area limitations

Practices to Improve Soil Health and Quality

In particular for soil applications, apply a combination of cultivation practices and measures to increase soil organic matter to improve soil health.

Primary Use Patterns	Option Applies
1) Fruit & Vegetable	✓
2) Greenhouse & Nursery	✓
3) Turf	
4) Landscape	

Advantages	Disadvantages
• May reduce disease occurrence • May reduce leaching • May reduce runoff	• Possible increased costs • May take time to begin seeing affects

Improved Sanitation Practices

Includes removal/destruction of infected vegetation, cleaning of equipment between crops, and sanitizing surfaces/equipment, etc. to prevent spreading.

Primary Use Patterns	Option Applies
1) Fruit & Vegetable	✓
2) Greenhouse & Nursery	✓
3) Turf	✓
4) Landscape	

Advantages	Disadvantages
• Reduced pesticide usage • Reduced pesticide cost	• Possible disposal costs

Improved Irrigation Practices/Development of Irrigation Management Plan

Use of irrigation practices to minimize conditions that lead to disease development.

Primary Use Patterns	Option Applies
1) Fruit & Vegetable	✓
2) Greenhouse & Nursery	✓
3) Turf	✓
4) Landscape	✓

Advantages	Disadvantages
• Reduced potential for leaching • Reduced potential for disease • Reduced water cost	• Possible added costs related to improvements to irrigation system • Requires monitoring of soil conditions

Use of Planting Sites with Well Drained Soil/Use of Well Drained Growing Media

Practices to minimize conditions leading to disease development due to excess moisture. Includes use of well drained material, avoiding low lying areas and the use of raised beds, etc.

Primary Use Patterns	Option Applies
1) Fruit & Vegetable	✓
2) Greenhouse & Nursery	✓
3) Turf	✓
4) Landscape	✓

Advantages	Disadvantages
• Reduced potential for disease • Reduced pesticide usage	• Possible added operational costs

Stakeholder Meeting Summary

NEW YORK STATE | Department of Environmental Conservation

Comment Card Completion

- Not a Test
- Please Take Next 10-15 Minutes to Complete
- Return Today

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LI Strategy June 2015 Stakeholder Meeting

Mefenoxam/Metalaxyl Comment Card

To ensure all interests are factored into the development and implementation of Best Management Practices/Pollution Prevention Measures for Mefenoxam/Metalaxyl, the Department is requesting comments from all Stakeholders. The goal of these measures is to reduce or eliminate the movement of Mefenoxam/Metalaxyl to Long Island's groundwater while continuing to meet the region's pest management needs.

Check the box below that best describes your interest in attending the Mefenoxam/Metalaxyl Stakeholder Meeting

☐ Mefenoxam/Metalaxyl Distributor

☐ Mefenoxam/Metalaxyl User

☐ Concerned About Mefenoxam/Metalaxyl in Long Island Groundwater

If you are a Mefenoxam/Metalaxyl user, check the box/boxes that apply to the commodities that you are involved with.

☐ Greenhouse Crops	☐ Golf Course Turf Maintenance
☐ Nursery Crops	☐ Vegetable Crops
☐ Sod Crops	☐ Fruit Crops
☐ Landscape Maintenance	☐ Other:_____

1) Application Modifications	
1	Rotation of mefenoxam with other fungicides with different modes of action.
2	Limit to a maximum of two (2) annual applications or two (2) per crop cycle.
3	Improve calibration of application equipment.
4	Use of treated seed.

Question #1: As a user, order those approaches listed to the left that you feel will allow continued beneficial use of mefenoxam/metalaxyl while at the same time reduce or eliminate movement of this fungicide to Long Island's groundwater.

1) _____

2) _____

3) _____

4) _____

Question #2: Based on your experience, are there possible Pollution Prevention (P2) Measures/Best Management Practices (BMPs) that are not included in this list? If so, please describe in the space below.

_____

_____

_____

_____

Question #3: Are there P2 measures/BMPs in this list that do not belong? If so, please describe in the space below.

_____

_____

_____

_____

Possible Alternative/Rotational Fungicides

Trade Names	Active Ingredient
1) Captan	Captan
2) Bravo, Daconil, etc.	Chlorothalonil
3) Cuprofix, Kocide, etc.	Copper fungicides
4) Ranman, Segway, etc.	Cyazofamid
5) Curzate, Tanos, etc.	Cymoxanil
6) Stature, Revus, etc.	Dimethomorph
7) Truban, Terrazole, Banrot, etc.	Etridiazole
8) Presidio, Adorn, Stellar, etc.	Fluopicolide
9) Aliette	Fosetyl-Aluminum
10) Dithane, Manzate, Protect	Mancozeb
11) Micora, Revus	Mandipropamid
12) K-Phite, ProPhyt, Alude, Fosphite, etc.	Phosphite fungicides
13) Previcur Flex	Propamocarb hydrochloride
14) Pristine	Pyraclostrobin and Boscalid
15) Abound, Quadris, Heritage, Compass 0, etc.	Strobilurins
16) Gavel	Zoxamide

Question #4: As a mefenoxam user, order the top five fungicides, of the 16 that are listed to the left, that you feel are the most effective alternatives or rotational products that may reduce mefenoxam usage.

1) _____

2) _____

3) _____

4) _____

5) _____

Possible Non-Pesticide/IPM Alternatives

Question #5: Select the Boxes that Apply for Each of the Possible Non-Pesticide/IPM Alternatives to Mefenoxam that Could be Used in Your Particular Business

		✓ A Good Option	✓ Already in the	✓ More Information Needed	✗ Option Really Does Not Apply
1	Use of resistant plants/cultivars.				
2	Use of certified, tested, and/or treated seed.				
3	Rotation of crops.				
4	Improved guidance on pruning and leaf/shoot removal.				
5	Removal/destruction of infected vegetation.				
6	Implement sanitation/disinfestation practices to avoid introducing or spreading pathogen in greenhouse or between fields; clean up crop residues and/or disinfect.				
7	Use of raised beds.				
8	Avoidance of planting in low lying areas.				
9	Selection of planting sites with well-drained soil/use of well drained growing media				
10	Adequate spacing of plants to promote air movement.				
11	Encourage use of weather information and pest models found on NEWA for timing of scouting and fungicide applications				
12	Improve irrigation practices/develop an irrigation water management plan.				
13	Use of biological techniques/biocontrols.				
14	Improve soil health and quality.				

Education and Outreach

Question #6: The Department intends on offering BMP/P2 Education and Outreach events. To help us schedule these, please list dates and names of known events between October and December 2015.

Date/s	Event

Question #7: Are there specific areas where assistance is needed or where assistance would be helpful with implementing specific BMPs/P2 measures? If so, please indicate below. This could include financial, educational, technical, planning assistance, etc.

_____

_____

_____

_____

_____

_____

Groundwater Quality

Question #8: Are there additional approaches that should be considered for protecting groundwater quality on Long Island? If so, please indicate below.

_____

_____

_____

_____

_____

_____

General Comments

_____

_____

_____

_____

_____

_____

_____

Written comments can also be mailed to the Long Island Pesticide Pollution Prevention Strategy team at: NYSDEC, Division of Materials Management, 625 Broadway, Albany, NY 12233-7254 or emailed to: LongIslandStrategy@dec.ny.gov

Name: _____ Business or Organization: _____ Phone: _____ Email: _____

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Long Island Pesticide Pollution Prevention Strategy

June 24, 2015

1st Stakeholder Meeting – Introduction of Possible P2/BMPs for Imidacloprid

Today's Goals

1) Provide Brief Update/Overview on Imidacloprid

2) Introduce Best Management Practices (BMPs)/Pollution Prevention (P2) Measures & Identify Priorities

3) Solicit Feedback from Stakeholders

4) Introduce Implementation Plans

Timeline

July 2014 - LI Strategy Finalized

October 2014 – Initial TRAC Meeting

February 2015 – Follow-Up TRAC Meeting

May 2015 – Data Packages Available

June 2015 Stakeholder Meetings

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Long Island Pesticide Pollution Prevention Strategy

The goal of the Strategy is to:

Prevent adverse effects on human health and the environment by protecting Long Island's groundwater and surface water resources from pesticide-related contamination

Continue to meet pest management needs of agricultural, residential, commercial, industrial, and institutional sectors

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Highlights of the Strategy

- **Pollution Prevention (P2)** principles to enhance DEC's regulatory program
- **Blueprint for Action** – stepwise actions to implement P2 measures
- **Coordinated Collaboration** with Stakeholders
  - Technical Review and Advisory Committee (**TRAC**)
  - Stakeholder Workgroups
- **Monitoring** focused on Strategy issues

New York State Department of Environmental Conservation

Comment Cards

- Available on Strategy Website & Hardcopies Here
- 4 Different Versions
  1) Turf Management & Sod
  2) Agricultural
  3) Arboricultural
  4) Greenhouse & Nursery
- Format
  1) Modified Applications
  2) Possible Alternative Insecticides
  3) Possible Non-Pesticide Alternatives
  4) Education& Outreach
- Return Today or by July 30, 2015
- Additional Comments to: LongIslandStrategy@dec.ny.gov by July 30, 2015

What is the Goal of this Process?

- Identify Priority Best Management Practices/Pollution Prevention Measures
- Develop Factsheets/Educational Material
- Provide Educational Programs

LI Strategy: Outreach and Training

Best Management Practices Seminar

PUTTING THE STRATEGY INTO ACTION…

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BMP Seminar Proposal:

- To conduct a series of trainings emphasizing pollution prevention strategies.
  - ✓ The target audiences will be divided into land use categories.
  - ✓ The topics and speakers will best represent each of the land use categories.
  - ✓ NYSDEC Core and Category specifics credits will be offered at each of the trainings.

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BMP Seminar Logistics

- Offered in late Winter 2015 and/or early Spring of 2016. Options include:
  - ✓ 3 days targeting a separate audience (smaller venues)
  - ✓ 1 day, having breakout sessions
  - ✓ Webinar – Host Sites
  - ✓ Or combine with an existing conference
  - Nassau and Suffolk Locations

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Potential Presenters

- Cornell Cooperative Extension of Suffolk County
- Cornell University IPM Program
- NYS DEC – Regional and CO
- SC Dept. of Health Services
- SC Water Authority
- Organic Producers, Industry Representatives, etc.

Potential Audiences

- **Agricultural Uses**
  - ✓ Farmers
  - ✓ Greenhouses
  - ✓ Nurseries
  - ✓ Sod Farms
  - ✓ Vineyards
- **Turf Uses**
  - ✓ Golf Courses
  - ✓ Cemeteries
  - ✓ Athletic Fields
  - ✓ County Parks
  - ✓ State Parks
  - ✓ Community colleges

Commercial Applicators

- ✓ Landscape Contracting
- ✓ Arborist
- ✓ Aquatic Applicators
- ✓ County DPW
  - Operations
  - Highways
  - Vector

Optional Sessions

- ✓ Structural Applicators
- ✓ Anti-fouling Paint Applicators

Department of Environmental Conservation

General Topics

- IPM Philosophy
- Golf Courses and Athletic Fields
- Weed Management
- Specialist in the Different Commodities
- Equipment Calibration
- Product Registration
- Water Monitoring Innovations
- Alternative Farming and Sustainable Agriculture
- Utilizing Testing Labs

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SPECIFIC TOPICS…dynamic, innovative, science-based

Atrazine, **Mefenoxam**, Imidacloprid, **Rain Gardens**, NURSERY, RIPARIAN ZONES, Pesticide Rotation, Disinfestation Practices, Bio-controls, **Pollinators,** VINEYARDS, Worker Protection Standards, Soil Media, **Row Plantings**, Greenhouses, Irrigation, **Weed Burning**, Weather Station, Health Effects, AQUIFER, *Marketing - Making Alternatives Work,* **etc.**

Department of Environmental Conservation

Getting the Word Out There! Volunteers'?

- NYSDEC Applicator's Mailing List
- NYSDEC Strategy website and the activities calendar
- Cornell Cooperative Extension's Mailing list, publications, events
- Pesticide Distributors
- Industry Organizations
- Environmental Organizations

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Imidacloprid Background

- Insecticide
- NY Registration in 1995
- Diverse Array of Uses
- Replaces Several Older Pesticides

Variety of Uses

Turf Management & Sod

Agricultural Food

- Soil Treatment
  - Granular
  - Drench
  - Tablet
- Foliar Spray
- Tree Injection
- Bark Treatment
- Seed Treatment

Arboricultural/Landscape

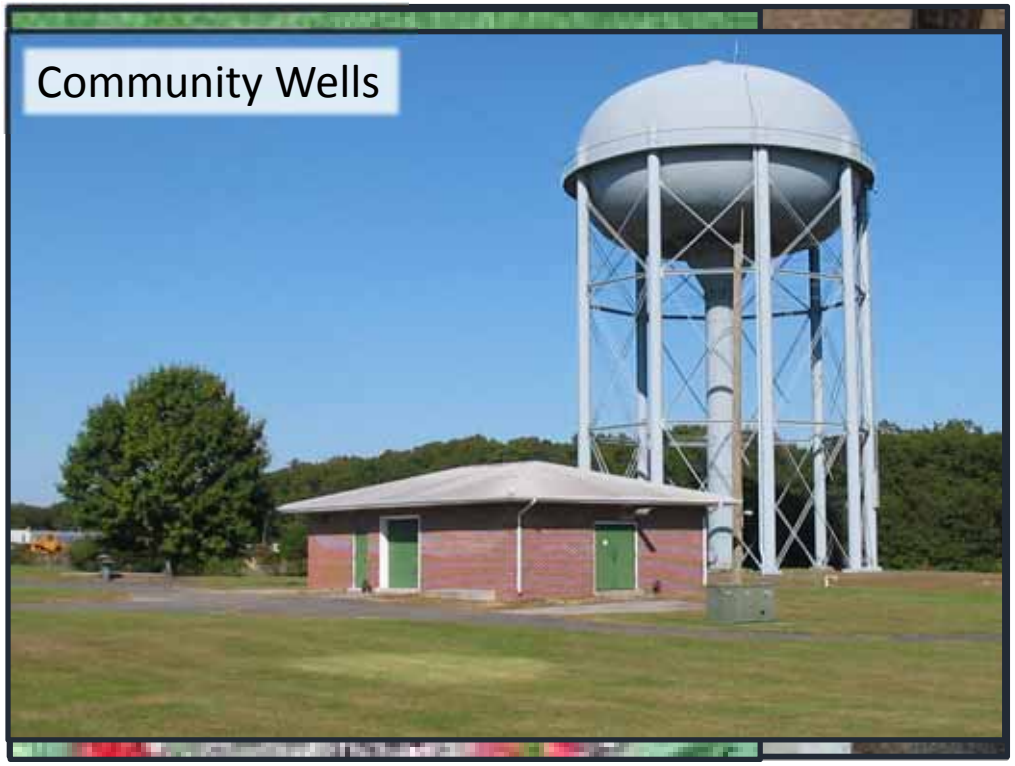
Greenhouse & Nursery

Actions Already Taken (2005)

- No Use of Homeowner Products on LI
- Restricted Use Pesticide
- No Soil Injection on LI

Imidacloprid in Long Island Groundwater

Groundwater Sampling Program



- Program between Department and Suffolk County
- In-Place Since 1997
- Established ~200 Monitoring Wells
- Analysis Includes ~300 Parameters
- Key Element to Strategy

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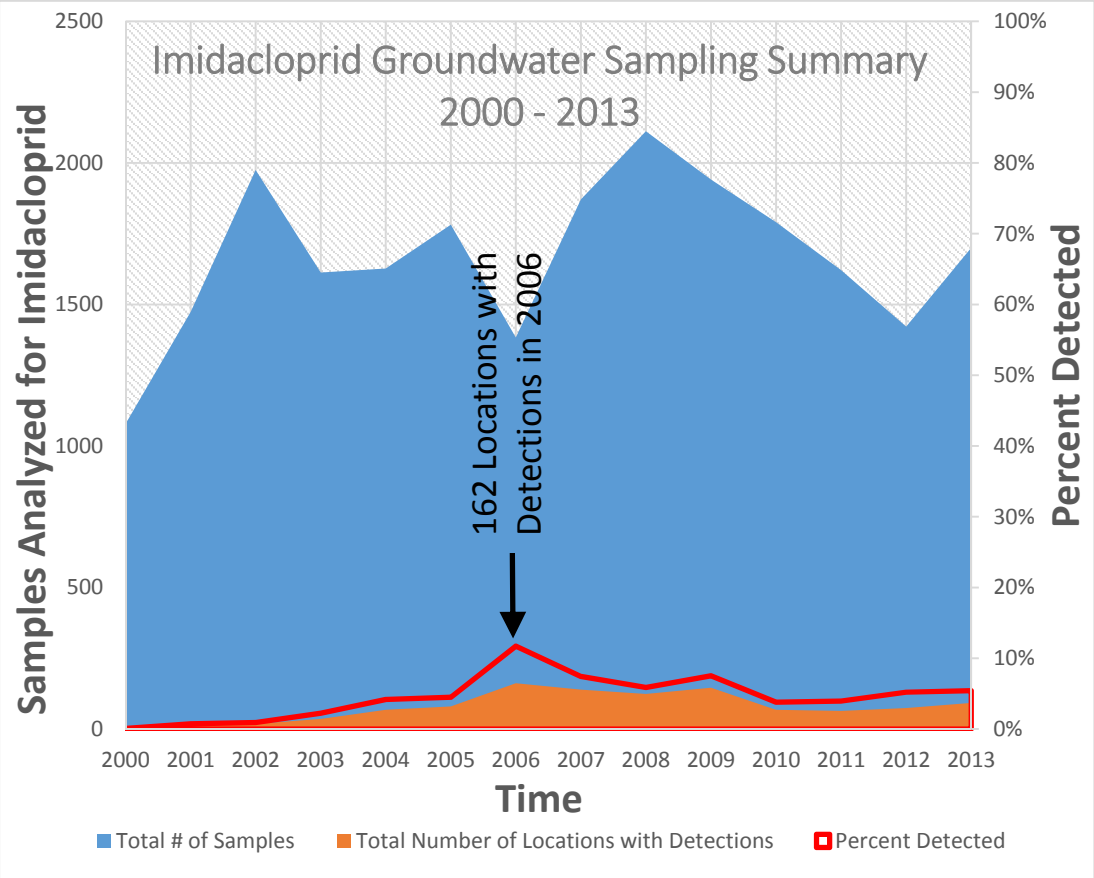
Groundwater Sampling Program



- Average of >1,600 samples collected/year since 2000
- Maximum locations with detections = 162 in 2006
- ~75% from monitoring wells
- Locations with detections steady since 2009

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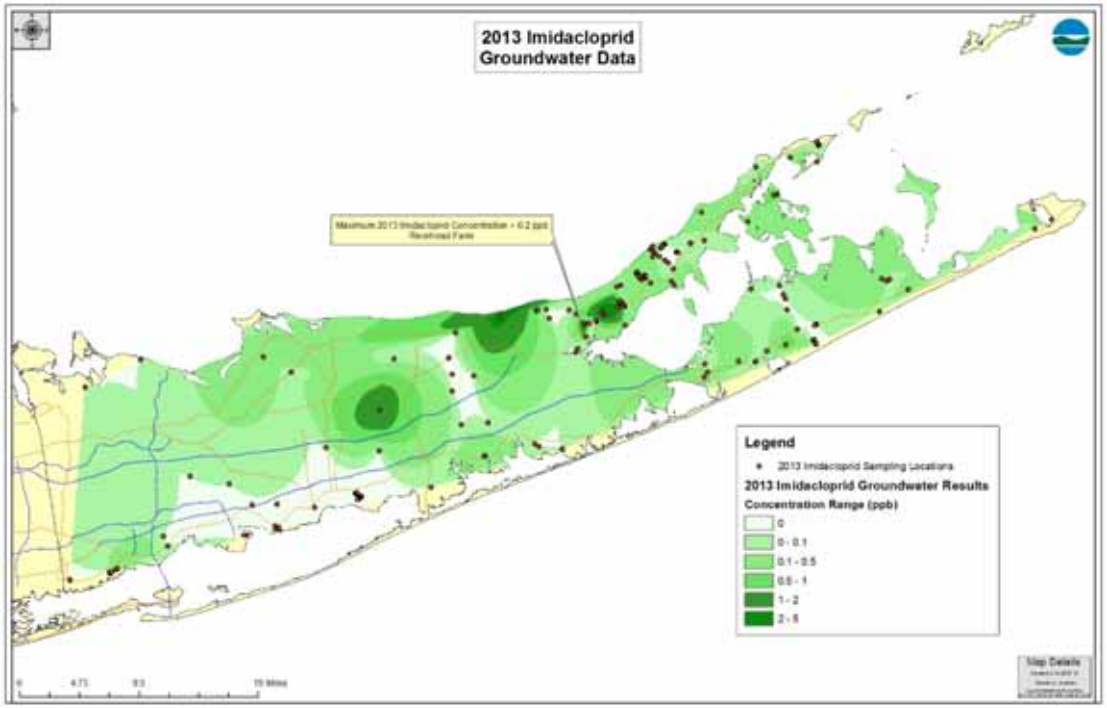
2013 Suffolk County Groundwater Data



- 92 Total Detections
- Highest Concentration (6.2 ppb) in Groundwater near Riverhead Farm
- Most Detections in North Fork Area

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Groundwater Monitoring Strategy – Plan for Measuring Success

Monitoring Program to Establish Baseline Conditions

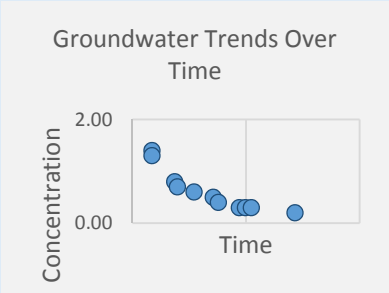
Identify Areas of Concern

Identify P2/BMP Measures

Implement Pollution Prevention Measures

Continue Monitoring Program

Assess Effectiveness of Pollution Prevention Measures



Adjust Pollution Prevention Measures as Necessary

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Imidacloprid

Discussion on Possible Best Management Practices/Pollution Prevention Measures

Possible Imidacloprid Alternatives

1. Modified Applications

Continued imidacloprid use, but possibly through improved application techniques

2. Possible Alternative Active Ingredients

Possible insecticide alternatives or rotational products

3. Non-Pesticide Options/IPM Practices

Possible cultural practices not involving use of insecticides

	1) Possible Modified Application Approaches	Vegetable & Fruit Commodities	Greenhouse & Nursery	Turf	Landscapes
1	Reduce application rates	✖	✖	✖	✖
2	Treatment of hot spot areas only	✖	✖		✖
3	Restrict use to perimeter trap crops	✖			
4	Use of precision banded soil applications	✖			
5	Use of a foliar application instead of soil treatment		✖		✖
6	Treat transplants in flats or beds rather than at planting in field	✖	✖		
7	Use of treated seed or seed piece treatment	✖			
8	Use only late in the season and not at-plant as a soil treatment	✖			
9	Use against the overwintered population and later in the season				✖ **(confirm with Dan)**
10	Trunk or bark injection or bark application instead of soil application				✖
11	Application via drop rather than broadcast spreaders for granular materials with runoff warning language			✖	
12	Develop guidance on timing of applications to maximize quantity staying on target and loss of imidacloprid through runoff and leaching	✖	✖ (Nursery)	✖	✖
13	Establish irrigation water management plan	✖	✖	✖	✖
14	Light irrigation to reduce unwanted movement (soil application) and avoid irrigation immediately following foliar sprays (except for light irrigation of turf)		✖	✖	✖
15	Improve calibration of application equipment	✖	✖	✖	✖
16	Establish agricultural handling facility for mixing of chemicals	✖	✖	✖	
17	Develop a supplemental label for soil applications	✖ **(confirm with Dan)**	✖ **(confirm with Dan)**		✖ **(confirm with Dan)**

Possible Non-Pesticide/IPM Alternatives Vegetable & Fruit Use Patterns	Vegetable & Fruit Commodities	Greenhouse & Nursery	Turf	Landscapes
1 Rotation of crops	x	x		
2 Use of intercropping techniques	x			
3 Interseeding cover crops	x			
4 Use of crop Isolation techniques	x	x		
5 Use of infield vegetative strips	x			
6 Use of resistant rootstocks	x (grape crops)			
7 Use of resistant cultivars	x (possibly cucurbits)	x (some nursery)	x (some tall fascue)	x (some boxwoods)
8 Row covers during early stages of plant growth	x			
9 Use of reflective or plastic mulch	x (certain vegetable crops)			
10 Physical removal of pests and infested foliage/plants	x (colorado pot. beetle)	x (limited applications)		x (limited applications)
11 Post-harvest crop destruction	x (brassica)	x (greenhouse)		
12 Use of trench trapping in the spring along field borders adjacent to overwintering sites	x (colorado pot. beetle)			
13 Use of propane flame treatment on field perimeters for newly emerged adults as plants emerge	x (colorado pot. beetle)			
14 Improve soil health and quality.	x	x (limited ornamentals)	x	x
15 Reduced tillage	x			
16 Improved guidance on timing of tillage to avoid soil compaction and tillage during pesticide applications	x			
17 Encourage use of weather information and pest models found on NEWA for timing of scouting and management applications		x (nursery)		
18 Improve irrigation practices/develop an irrigation water management plan	x	x	x	x
19 Use of mating disruption techniques		x	x (limited	

Possible Alternative Active Ingredients

	Trade Names	Active Ingredient
1	Adept	Diflubenzuron
2	Agri-Mek, Reaper, etc.	Abamectin
3	Akari	Fenpyroximate
4	Aria, Beleaf	Flonicamid
5	Assail	Acetamiprid
6	Astro, Decathlon, Tame, Talstar S, Scimitar GC, Mavrik AQ, etc.	Pyrethroids
7	Avaunt	Indoxacarb
8	Avid	Abamectin
9	Azatin, Neemix, Aza-Direct, etc.	Azadirachtin
11	Baythroid, Warrior, Asana, Ambush, Brigade, Danitol, Pounce, etc.	Pyrethroids
12	Beleaf	Flonicamid
13	BotaniGard, Mycotrol O, etc.	Beauveria bassiana
14	Citation	Cyromazine
15	Conserve, Entruist	Spinosad
16	Cygon 400, Dimethoate, etc.	Dimethoate
17	Dibrom	Naled
18	Dimethoate	Dimethoate
19	Distance, Fulcrum	Pyriproxyfen
20	DuraGuard ME, Lorsban, Dursban, etc.	Chlorpyrifos
21	Dylox	Trichlorfon
22	Endeavor	Pymetrozine
23	Entrust	Spinosad
24	Esteem	Pyriproxyfen
25	Fulfill	Pymetrozine
26	Gnatrol	Bacillus thuringiensis israelensis
27	Imidan	Phosmet

	Trade Names	Active Ingredient
28	Inject-a-Cide	Dicrotophos
29	Judo	Spiromesifen
30	Kontos, Movento	Spirotetramat
31	Kryocide, Prokil Cryolite	Cryolite
32	Lannate	Methomyl
33	Malathion	Malathion
34	Mesurol	Methiocarb
35	Met52	Metarhizium anisopliae
36	Movento	Spirotetramat
37	M-Pede	Potassium Laurate
38	Oriental Beetle MD	z-tetradec-7-en-one
39	Orthene, Orthene 97, Acephate, etc.	Acephate
40	Overture	Pyridalyl
41	Pedestal	Novaluron
42	Preferal	Isaria fumosorosea
43	Prentox Malathion, Malathion 8 Aquamul	Malathion
44	Pylon	Chlorfenapyr
45	Radiant	Spinetoram
46	Rimon	Novaluron
47	Safari	Dinotefuran
48	Sevin, Carbaryl, etc.	Carbaryl
49	SuffOil-X, Ultra-Pure Oil, Sunspray Ultra-Fine, JMS Stylet Oil, etc.	Horticultural Oil
50	Super Tin	Fentin Hydroxide
51	Tree-Age	Emamectin Benzoate
52	Triact 70	Neem oil
53	TriStar	Acetamipirid

Critical or Significant Uses

Food Crops – Potatoes, Fruiting Vegetable (soil treatment)

Colorado potato beetle

- Alternative Insecticides:
  - Foliar insecticides cryolite (potatoes, washes off readily),
  - Rimon (potatoes, timing issue – smallest larvae in June; 24(c)),
  - Possibly azadirachtin (timing);
  - Imidacloprid also controls leafhoppers, aphids; long-residual

- Partial control: spinetoram, spinosad, abamectin, acetamiprid, indoxacarb+PBO (potatoes)

Trench traps, flamers (spring, field borders)

Imidacloprid seedpiece trt, foliar application

- Shorter residual
- Limit use: area, amount, frequency (lower label rate, treat borders only)

Possible Alternatives Potato Crops (Soil Treatment)		Major Pest: Colorado Potato Beetle Application/Special Conditions
Modified Applications		
1	Reduce application rates	Area, Amount, and/or Frequency for both Soil and Foliar Applications
2	Treatment of hot spots only	Results in imidacloprid being applied where most needed
3	Use of a foliar application instead of soil treatment	Greater opportunity for pesticide to break down when applied foliarly
4	Use of treated seed or seed piece treatment	May reduce the need for soil applications
5	Limit use to perimeter trap crops	May reduce imidacloprid usage, but trap crop needs to be established and maintained
6	Use only late in the season and not at-plant as a soil treatment	May reduce the need for soil applications
Possible Non-Pesticide/IPM Alternatives		
1	Use of trench trapping in the spring along field borders adjacent to overwintering sites	May reduce pest pressure and need for insecticide use
2	Propane flame treatment on field perimeters for newly emerged adults as plants emerge	May reduce need for chemicals for insect control
3	Crop rotation	May reduce pest pressure and need for insecticide use
4	Crop isolation	Colorado Potato Beetle may be slower to colonize
5	Use of intercropping techniques	May reduce pest pressure and need for insecticide use
6	Interseeding cover crops	Cover crop may be host for natural predators of potato beetle
7	Use of infield vegetative strips	Vegetation may be host for natural predators of potato beetle Strip may intercept imidacloprid
8	Physical removal of pests and infested foliage/plants	May be effective for small plantings, but not practical on larger-scale

Critical or Significant Uses

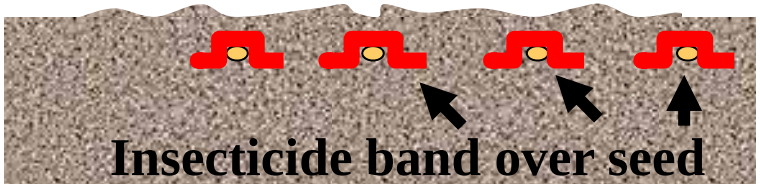
Food Crops – Cucurbits (soil treatment)

Cucumber beetle/wilt – emergence, early growth

- Alternative Insecticides: foliar application of acetamiprid, pyrethroids, carbaryl, methomyl

Aphids – early growth

- Alternative Insecticides : foliar application of Assail, pyrethroids, Sevin, Lannate (not pumpkin or winter squash), Beleaf, Fulfill, (Closer/sulfoxaflor not yet reg. NY)



Possible Alternatives
Food Crops – Cucurbits (soil treatment)

	Possible Alternatives	Major Pests	
		Cucumber Beetle	Aphids
	Modified Applications		
1	Reduce application rates - Area, Amount, and/or Frequency	✓	✓
2	Use of precision banded soil applications	✓	✓
3	Use of a foliar application instead of soil treatment	✓	✓
4	Treat transplants in flats or beds rather than at planting in field		✓
	Possible Non-Pesticide/IPM Alternatives		
1	Use of intercropping techniques	✓	✓
2	Interseeding cover crops	✓	✓
3	Use of infield vegetative strips	✓	✓
4	Row covers during early stages of plant growth	✓	✓
5	Use of reflective or plastic mulch	✓	✓
6	Improve soil health and quality.	✓	✓
7	Improve irrigation practices/develop an irrigation water management plan	✓	✓

Critical or Significant Uses

Food Crops – Greenhouse Tomato/Cucumber Production (soil treatment)

(not currently common use on LI)

Whiteflies

Alternative Insecticides: foliar application of others less effective (e.g. Akari, M-Pede) incl products with outdoor-use labels (e.g. Assail)

Aphids

Alternatives: foliar application of flonicamid; others less effective. Possible use of products with outdoor-use labels (e.g. Assail)

Biocontrol may be effective for some species (green peach aphid. greenhouse whitefly)

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Possible Alternatives

Food Crops – Greenhouse Tomato/Cucumber Production (soil treatment)

	Possible Alternatives	Major Pests	
		Whiteflies	Aphids
	Modified Applications		
1	Reduce application rates - Area, Amount, and/or Frequency	✓	✓
2	Treatment of hot spot areas only	✓	✓
3	Use of a foliar application instead of soil treatment	✓	✓
4	Light irrigation to reduce unwanted movement (soil application) and avoid irrigation immediately following foliar sprays	✓	✓
	Possible Non-Pesticide/IPM Alternatives		
1	Rotation of crops	✓	✓
2	Physical removal of pests and infested foliage/plants	✓	✓
3	Use of biological techniques/biocontrols.	✓	✓
4	Retrofitting/maintaining vent screens and doors	✓	✓
5	Use of trapping products (monitoring)	✓	✓
6	Post-harvest crop destruction	✓	✓
7	Improve irrigation practices/develop an irrigation water management plan	✓	✓

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Critical or Significant Uses

Greenhouse Ornamental Crops

Whiteflies (drench) - especially long-term pot crops (1° poinsettia), SPWF

<u>Alternative Insecticides</u>:

- Safari [24(c) restr.], Kontos (some sensitive plants), Mainspring (drench)
- Foliar treatments (Safari, Judo – some sensitive plants; others generally less effective)
- Biological control

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Critical or Significant Uses
Greenhouse Ornamental Crops

Aphids (drench) – especially hanging basket spring crops, long-term pot crops, root aphids in perennials

Alternative Insecticides:

- Safari [24(c) restr.], Kontos (some sensitive plants), Mainspring (drench)
- Foliar treatments (several effective – Endeavor, Aria, others)

- Biological control

Possible Alternatives
Greenhouse Ornamental Crops

	Possible Alternatives	Major Pests: Whiteflies & Aphids	Special Conditions
	Modified Applications		
1	Reduce application rates - Area, Amount, and/or Frequency	✓	
2	Treatment of hot spot areas only	✓	
3	Use of a foliar application instead of soil treatment	✓	
4	Treat transplants in flats or beds rather than at planting in field	✓	
5	Incorporate imidacloprid into irrigation	✓	No runoff system, but not too common on LI
6	Light irrigation to reduce unwanted movement (soil application) and avoid irrigation immediately following foliar sprays	✓	
	Possible Non-Pesticide/IPM Alternatives		
1	Rotation of crops	✓	
2	Physical removal of pests and infested foliage/plants	✓	
3	Use of biological techniques/biocontrols.	✓	Early stage only Preventative & as Supplement
4	Retrofitting/maintaining vent screens and doors	✓	
5	Use of trapping products (monitoring)	✓	
6	Post-harvest crop destruction	✓	
7	Improve irrigation practices/develop an irrigation water management plan	✓	

Critical or Significant Uses

Nursery Ornamental Crops

Oriental beetle grubs

Oriental beetle grubs (drench) – especially certain container plants

Alternative Insecticides:

- Chlorpyrifos (not highly effective, high toxicity), bifenthrin in media (preventive)

- Oriental Beetle MD – mating disruption (large areas only)

Critical or Significant Uses

Nursery Ornamental Crops

Lacebugs, aphids, whiteflies

Lacebugs, aphids, whiteflies - drench uncommon (high cost)

- Alternative Insecticide: Kontos (some sensitive plants)

Lacebugs, aphids, whiteflies - foliar spray

- Alternative Insecticides: Acephate/Orthene, TriStar, pyrethroids, Aria, Endeavor, & some others less effective

Critical or Significant Uses

Nursery Ornamental Crops

Boxwood leafminer

Boxwood leafminer – drench, uncommon (high cost)

- No alternative

Boxwood leafminer - foliar spray

- Alternative Insecticides: TriStar, Avid/generic, malathion
  - Timing can be difficult (especially Avid)

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Possible Alternatives - Nursery Ornamental Crops

	Possible Alternatives	Major Pests					Special Conditions
		Oriental Beetle Grubs	Lacebugs	Aphids	Whiteflies	Boxwood Leafminer	
	Modified Applications						
1	Reduce application rates			✓			Area, Amount, and/or Frequency
2	Treatment of hot spot areas only			✓			
3	Use of a foliar application instead of soil treatment			✓			
4	Incorporate imidacloprid into irrigation			✓			
5	Light irrigation to reduce unwanted movement (soil application) and avoid irrigation immediately following foliar sprays			✓			
	Possible Non-Pesticide/IPM Alternatives						
1	Rotation of crops			✓			
2	Encourage use of weather information and pest models found on NEWA for timing of scouting and management applications			✓			Some applications with outdoor ornamentals
3	Physical removal of pests and infested foliage/plants			✓			
4	Use of biological techniques/biocontrols	✓					Limited effectiveness for oriental beetle control
5	Rotation of crops			✓			Limited based on available land
6	Use of trapping products (monitoring)			✓			For detection & timing management purposes
7	Use of resistant cultivars					✓	Some boxwoods are resistant to leafminers
8	Mating disruption	✓					Most effective over larger areas (>5 acres)

Critical or Significant Uses

Landscapes

Woody and herbaceous ornamentals - Mainly soil application

- Borers – flatheaded esp. (bronze birch, emerald ash, others)
- Hemlock woolly adelgid
- Asian longhorned beetle (trunk inj. only)
  - 2ee labels
- Boxwood leafminer
- Holly leafminers
- Lacebugs
- Aphids, phylloxera
- Scale insects
- Leafhoppers (esp. potato)
- Leaf beetles (viburnum, elm leaf)
- Japanese beetle
- Psyllids
- Sawflies

Difficult situations for sprays/drift

- Property line treatments
- Children nearby
- Public areas
- Decks
- Pools, ponds, aquatic areas
- Perception issues
- Tall/large trees, shrubs
- Neighbor Notification

Critical or Significant Uses
Landscapes cont'd

Hemlock woolly adelgid

Imidacloprid applied as soil drench*, foliar spray, basal trunk spray (2ee)*, trunk injection*

Alternative Insecticides:

- TriStar basal trunk spray, trunk injection
- Safari basal trunk spray [24(c) label]
- Foliar spray with hort. oil, M-Pede, Mavrik

- Basal trunk spray or injection rather than drench?
- Biocontrol not available/reliable

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Possible Alternatives - Landscapes		Major Pest: Adelgids, aphids, beetles, scales, borers, etc. Application/Special Conditions
Modified Applications		
1	Reduce application rates	Area, Amount, and/or Frequency
2	Treatment of hot spot areas only	In particular for foliar applications Results in imidacloprid being applied where most needed
3	Use of a foliar application instead of soil treatment	Good for some situations & pests but not others
4	Trunk or bark injection or bark application instead of soil application	Little or no drift Injections are labeled for most pests
5	Light irrigation to reduce unwanted movement (soil application) and avoid irrigation immediately following foliar sprays	More insecticide stays on target
Possible Non-Pesticide/IPM Alternatives		
1	Physical removal of pests and infested foliage/plants	
2	Use of resistant cultivars	Some boxwoods resistant to resistant to leafminer Few to no pest-resistant ornamental crops
3	Use of biological techniques/biocontrols	Not many available and tend not to be reliable

Critical or Significant Uses
Turf

Oriental beetle & other white grubs – especially in residential settings

<u>Alternative Insecticides</u>:

- Dylox (granular mostly)
- Oriental MD not eval. in turf, mainly areas ≥5A
  - OB only
- Possible Bt material coming but efficacy unclear
- Acelepryn not allowed on LI

European crane fly – recent pest on Long Is, some alternatives

Possible Alternatives - Turf		Major Pest: White Grubs Application/Special Conditions
Modified Applications		
1	Reduce application rates	Area, Amount, and/or Frequency
2	Treatment of hot spot areas only	Results in imidacloprid being applied where most needed
3	Application via drop rather than broadcast spreaders for granular materials with runoff warning language	Improves delivery accuracy, but requires more time to apply
4	Light irrigation to reduce unwanted movement (soil application) and avoid irrigation immediately following foliar sprays	Allows more of the insecticide to stay on target
Possible Non-Pesticide/IPM Alternatives		
1	Use of resistant/tolerant cultivars	Some tall fescue more tolerant to grub damage
2	Use of biological techniques/biocontrols	Possibly with nematodes, but variable performance and only for warmer, late summer soil

Additional Practices

- Use scouting and action thresholds to determine need for treatment (many growers using)
- Physical barrier (rowcover) early in crop
- Avoid application prior to heavy rain or irrigation
- Physical removal of pests (by hand; power-washing scales on trees/shrubs)
- Minimize N application (hemlock w. adelgid, aphids, scales)

Improved Calibration & Properly Working Application Equipment

Improve delivery by calibrating equipment

Primary Use Patterns	Option Applies?
1) Turf Management & Sod	✓
2) Agricultural	✓
3) Arboricultural	✓
4) Greenhouse & Nursery	✓

Advantages	Disadvantages
• By improving delivery, there can be a reduction in imidacloprid usage • Possible reduction in expenses • Already being practiced	• Possible increase in cost associated with replacing/upgrading equipment

Guidance on Application Timing

To avoid loss of imidacloprid, BMP would provide guidance on the timing of applications

Primary Use Patterns	Option Applies?
1) Turf Management & Sod	✓
2) Agricultural	✓
3) Arboricultural	✓
4) Greenhouse & Nursery	✓

Advantages	Disadvantages
• Reduced potential for repeat applications • Reduced potential for migration to groundwater • Better efficacy	• Not always predictable

Practices to Improve Soil Health and Quality

In particular for soil applications, apply a combination of cultivation practices and measures to increase soil organic matter to improve soil health.

Primary Use Patterns	Option Applies
1) Fruit & Vegetable	✓
2) Greenhouse & Nursery	✓
3) Turf	
4) Landscape	

Advantages	Disadvantages
• May reduce susceptibility to disease • May reduce leaching • May reduce runoff	• Possible increased costs • May take time to begin implementing

Improved Irrigation Practices/Development of Irrigation Management Plan

Use of irrigation practices to minimize conditions that lead to disease development.

Primary Use Patterns	Option Applies
1) Fruit & Vegetable	✓
2) Greenhouse & Nursery	✓
3) Turf	✓
4) Landscape	✓

Advantages	Disadvantages
• Reduced potential for leaching • Reduced potential for disease • Reduced water cost	• Possible added costs related to improvements to irrigation system • Requires monitoring of soil conditions

Stakeholder Meeting Summary

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Comment Card Completion

- Not a Test
- Please Take Next 10-15 Minutes to Complete
- Return Today

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