



# Beyond IPM: Reducing Pesticides in the Landscape

Metro Hort Group Presentation

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# Why use Pesticides ?

They are needed when historic, rare or accessioned plants are threatened. Economic crops may demand pesticides.



A home valued at \$450,000 with no landscape (lawn only) could be worth \$24,750 (5.5%) to \$57,150 (11.4%) more with a landscape with color and large plants.



Some pests cannot be controlled any other way. Identify those pests that must have pesticide control. Decisions must be made if it is more economical and environmental to spray a plant annually or replace with better material.

# Why Reduce Pesticides?

Changes in law have required the reduction or elimination of pesticides in the aesthetic landscape, especially in public venues and schools. Note: The DEC does not write the laws they are obligated to enforce them. Your 'representative' submits the bills.

**Reduction of resistance.** It has been shown many organisms can develop resistance to certain chemicals requiring more toxic chemicals or combinations of chemicals to gain control of populations. ie: Aphids will consume Acephate within 5 generations.

**Direct spray damage to Non-target organisms:** pollinators, beneficial insects, predators, bats, birds, cold blooded animals, soil organisms and the environment. Innocent casualties.



**Most Important:** Less exposure to the **Applicator** who handles undiluted product for mixing.

Possible exposure to powders, broken injection capsules, etc.

# Can we Reduce Pesticides?

Pests that ingest neo-nics and other persistent and systemic chemicals are poisonous to Ladybugs and other predatory beetles, parasitoids, soldier bugs & soil predators such as Rove beetles.\*

Bans on products: Due to bee colony decline, 1994 France banned Imidicloprid on Sunflowers, 1999 on corn. 2008 Italy and Germany joined the ban.\*

The European Union 2013 enacted a two year ban on “Neo-nics” (neo-nicotiniod pesticides): ex imidicloprid, thiamethoxam, clothianindan which are extremely toxic to bees and are persistent in the environment. **They have not lifted the ban to date.\***

It's healthier for the planet and its inhabitants.

It's the **Right** thing to do and the **Future Demands** it.



\*(Common Sense Pest Control, several issues )



## “PHM”: Plant Health Maintenance Beyond IPM, Focuses on Plant Health not Pests

Insects, pest or beneficial, are a natural occurrence in any healthy landscape.

Pests are **necessary** for the presence & long term survival of Beneficial organisms.

Balancing damage *threshold levels* is the **KEY** to successful plant care.

There are two damage thresholds: Aesthetic and Plant Health.

The aesthetic threshold is much Higher than the plant health level.



Plants can take a lot of abuse and damage.

They have evolved with ‘fight rather than flight’ to deal with whatever may come along.

# Growing Degree Days - GDD & Plant Phenologic Indicators - PPI

**GDD** and Phenologic indicators should be utilized to indicate emergence of known pests.

GDD is based on accumulated heat. The formula is:

$$\text{Daily Min temp} + \text{Max temp} / 2 - 50 = \text{GDD}$$



This is not effective early in the season, the temperatures are too cool to accumulate measurements. Another tool available is PPI.

**Plant Phenologic Indicators- PPI** work with plant bloom. Insects and plants work in unison, so this is an effective method for scouting early in the season and throughout the year.



All of this information is in “**Pest Management Guide**” by Cornell University, a **MUST** for all Applicators.

# Should some Plants come with a warning label?

Boxwoods:



Robusta Green Junipers/Pears: Pear trellis rust



Amelanchiers: Quince rust



Fir/Spruce: Cooley Spruce Gall Adelgid



Black Pine Family:



# Execution of PHM



**Get a magnifier:** Glass, Loupe or Macro/micro scope. It is amazing what will appear before your eyes when you look. Have a magnifying glass available for clients.

Traps, sticky cards and spheres, barriers and other physical methods of control should be in place before emergence.



**Base lines must be established.** Soil profiles, scouting and noting pest emergence, noting beneficial insects, pollinators and animals (Birds, etc.) in the garden. Soil issues should be addressed, it is a key factor to plant health and pest control. Proper nutrition and water levels are important to PHM.

The use of water gauges is helpful. Irrigation systems are often installed for the lawn not the trees. Climatic changes are raising water levels, so soil can be saturated from below. Berms are a new trend on landscapes near bodies of water. Coffee cans can be used to determine the need for additional irrigation.



# Co- Operating



**Quarantine** of new material is recommended. Inspection of all material introduced to the gardens is crucial to keeping pests to a minimum and eliminating those pests that require pesticide intervention.



Soil inspection or removal is big factor for soil borne insects or disease.

**“Cue of Care”**: An area assigned for the safety of Beneficial Insects or animals when multiple operators are on site. A hedge, fence, Belgian fence, perennial or herb border.



**Mission Statement** of the property is very important. There are many ways to approach ‘Ecological Landscaping’. Zero green waste, Native plants, ‘Natives’ as a term, Less intervention: pruning, raking, cleaning limbs, etc. Each can contribute or detract from the property.

# NOFA is not DEC

Many NOFA certified practitioners use pesticides and non pesticides as control and without records. Read the label and SDS sheets on all products used.

*DEC Part 325 Rules and Regulations Page 7: "Pesticide"*(1) Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any insects, rodents, fungi, weeds, or other forms of plant or animal life or viruses, except viruses on or in living humans/ or other animals, which the department shall declare a pest; and (2) any substance or mixture of substances intended as a plant regulator, defoliant or desiccant.

**Pesticides requiring an Applicator Certification:** DE: Reg # 89104-2 Neem (Trilogy) Reg # 70051-2  
Bt thur: Reg # 4-NY-1

\*\*\* Cedar Oils: Kills by Desiccation: 'Minimum risk' **Pesticide** under EPA FIFRA rule 25b. *No EPA Reg #*

**Precautions:** Do not spray on reptiles, birds or beneficial insects. Not intended for animal or human application. Avoid directly spraying surface water as this product is not designed for aquatic use. Keep out of reach of children. Use in a well-ventilated area. Avoid eye contact. In case of eye contact, flush with water. If ingested, rinse mouth and drink plenty of water. If irritation persists, seek medical attention. Keep out of area until product has dried.

**NON-Pesticide applications:** Follow Label! Ex: Plant Wash, Anti-Transpirants, Compost Teas, Fertilizers. These cannot be used to eliminate pests, only as the label prescribes.

**"Organic" does NOT equal Safe. Gasoline, Strychnine and Nicotine are organic.**

**Killing is Killing.** If you are trying to kill insects these products will kill insects or they're not working.

Most products are "Bee-centric" as far as environmentalism. They kill others too, the ones I need.

# Examples of Biological Control

**Predators:** They must hunt down prey to continue life. Ex: Lady bugs must consume insects everyday. They eat many stages and large populations of pests .

**Parasites:** They live on or within a single host, usually for their immature stages of development. Braconid wasps are an enemy of Gypsy moth larva, commonly found in the Northeast.

**Pathogens:** Agents that cause disease such as Bt.

Biological control is usually specific to the pest. Buying a container of ladybugs does not reduce all pests in the landscape. Knowledge of your pest optimum.

**SCOUT FIRST !!!**

*Many of these controls are found in the field* if you are looking for them and when you reduce sprays. Scouting first should be part of any application.

**Releasing should be rare.**

# Some Common 'Beneficials'

There are too many beneficial organisms to address. We'll cover commonly found, efficient, usable insects and arachnids.

Beneficial mites: 'Phytoseiid mites': Effective on Spider mites, eriophyid mites, scales, whiteflies, thrips, and insect eggs. They tend to move faster than pest mites. A slap test can help you locate these predators.



Lacewings: Neuroptera: The 'alligator-like' larva are voracious feeders. Effective on aphids, scales and mites, soft bodied pests. Can be 'Over-released'.



# Spiders!



One of the most hated beneficials. VERY helpful in gardens and homes.

NOT aggressive, very few are a concern to humans.

Eat damaging pests, nectar, pollen

Funnel Web Weavers: Nocturnal feeders



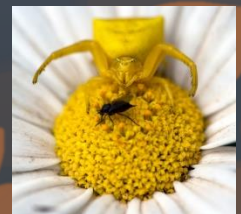
Orb Weavers: Many consume old and build new daily, hundreds born in one event

Wolf Spiders: Soil feeders, solitary, feed anytime, silk protects eggs.



Jumping spiders: can jump 25x their body length, common, webs for eggs

Crab Spiders: Color depends on where it hunts: likes flowers, and soil foraging.



# Lady Beetles: Many different types

Lady bugs: Coccinellidae: Effective on aphids, scales, mites, eggs of insect pests. They are the most widely used Beneficial insect. There are many sizes, colors and types of Lady bugs. The lady bugs available now are raised in insectaries. They tend to be specific to their hosts, Some examples:

**Vidalia beetle-** cottony cushion scales



**Mealybug destroyer-** mealybugs



**Twice stabbed- LB**

Aphids and Armored scales

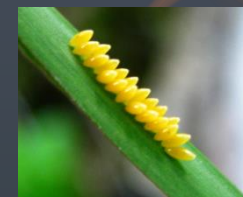


**Ash Gray LB -**Aphids, Caterpillar

eggs & larvae in trees



There is concern the imported lady bugs kill off native species. Research shows there is a wasp that attacks the eggs of lady beetles and may actually prefer the imported species, allowing the native populations to grow.



# Common Beneficial Wasps

Ichneumonid wasp: Lepidoptera and sawflies, Borers



Encarsia wasp: Whitefly control



Triclistus wasp: Moth eggs



Braconid wasps: Caterpillars, beetle larvae, aphids

Ecto-parasitic

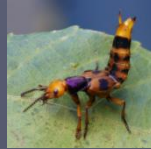


Endo-parasitic

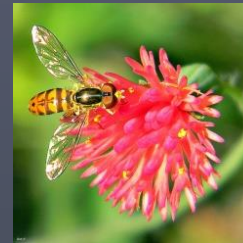


# Other Beneficial Insects

**Rove beetles:** Ground dwellers, attack all stages of insects. Effective. They bite.



**Syrphid Flies:** aka Flower flies, Hover flies. Look like very small bees. Aphids, scales, soft bodied pests. Effective.



**Soldier Beetles:** soft bodied insects and caterpillars such as bagworm.



**Assassin Bugs:** Many types. Wide variety of prey.





## Don't forget...

Bats: Nocturnal Pollinators! Mosquito eaters! 70% eat insects-30% eat fruit, one born at a time-drink milk-vulnerable about 6 weeks, avg. lifespan- 20yrs, NOT rodents. Live in narrow rough spaces. 12-20 above ground, 20-30 from trees, near water- ¼ mile.



Opossum: Tick Eaters! Nocturnal. Only NA Marsupial, eat : carrion, slugs cockroaches, snails, mice, live in tree cavities, harmless. Up to 20 per litter- 8 survive, 3 litters in warm climates.



Italian Wall Lizard: Escaped from a Pet shop- 1966, not seen as a negative impact, eat- aphids, grasshoppers, caterpillars, snails.



Geese: Selectively eat Sedge from lawns.



Toads: eat grubs, spiders, worms, insects, slugs, snails, crickets, other invertebrates. Use broken pottery for shelters.



## Conclusion: “ORCHESTRATE, DON’T ANNIHILATE”

Get a loupe or magnifier.

Scout before spraying.



Provide water, flowers for pollen and nectar, alternate foods for beneficial insects. Don’t eliminate all pests, this is what they feed on primarily.

“Extrafloral Nectaries”: Asclepias, Catalpa, Helianthus, Malus, Populus, Prunus, Pyrus, Sambucus, Syringa, Viburnums

Alternate work: Girdling roots, soil testing (field kits are a good start), mulching, small pruning, putting out and monitoring traps, inventories, irrigation monitoring, etc.

There are many alternative controls: Insects, arachnids, nematodes, barriers, traps, trap crops, companion crops, indicator plants and the list is growing.

In almost ALL cases they already exist, release is not necessary. **IF NEEDED:** Insectaries are on-line: Green Methods, Rincon-Vitova, The Insectary- are some I’ve used for years. Green Method websites is very informative and worth a look.

**Be open to new ideas and methods, it’s the future of our industry.**

**Good Luck and Have Fun!**

# Thank You !!

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