

Thanks to support from:



Intro to Integrated Pest Management (IPM)

Jubilee Farmstead & Urban Harvest STL
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What is IPM?

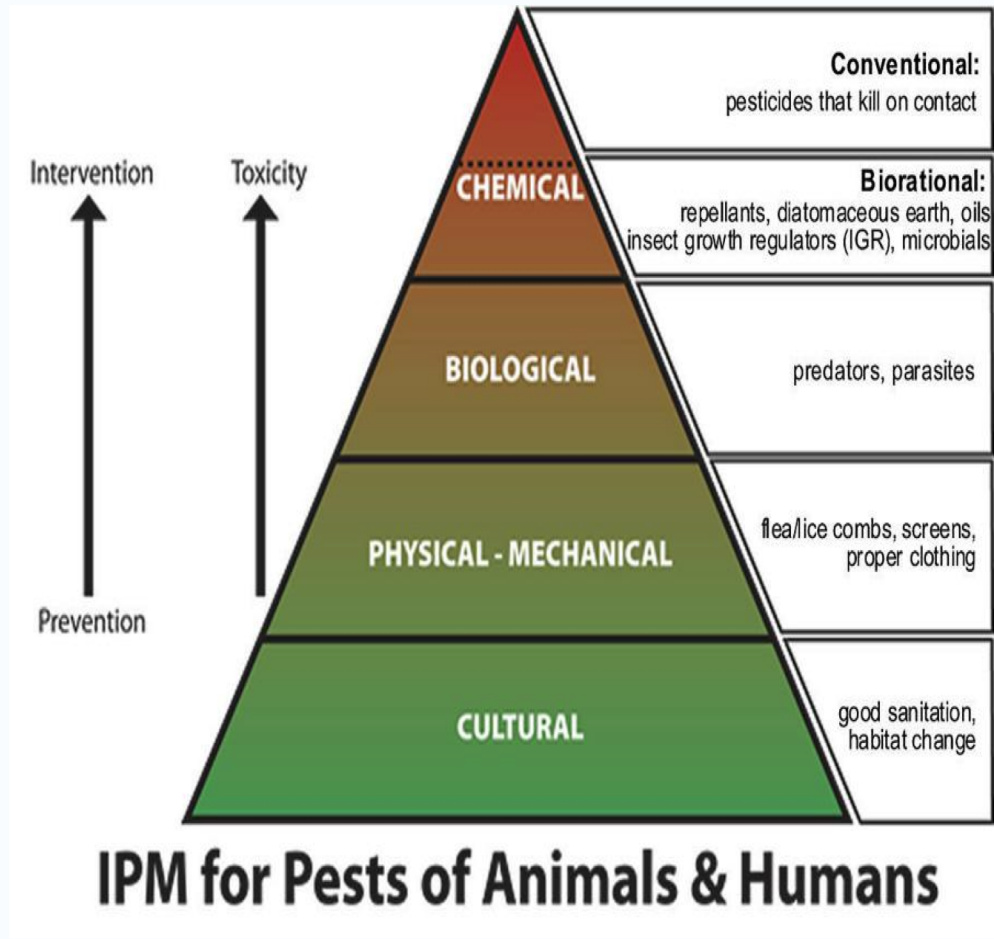
- **Integrated Pest Management** is a protocol for preventing & mitigating pests & diseases in an environment.
 - **Integrated** = Incorporated into routine practices
 - **Pest** = the problem insect or disease
 - **Management** = working against the pest & with the environment in a sustainable way

What we'll cover:

- Schools of thought & principles
- Steps to take
- Supporting habitats for beneficial animals
- Tips & question session

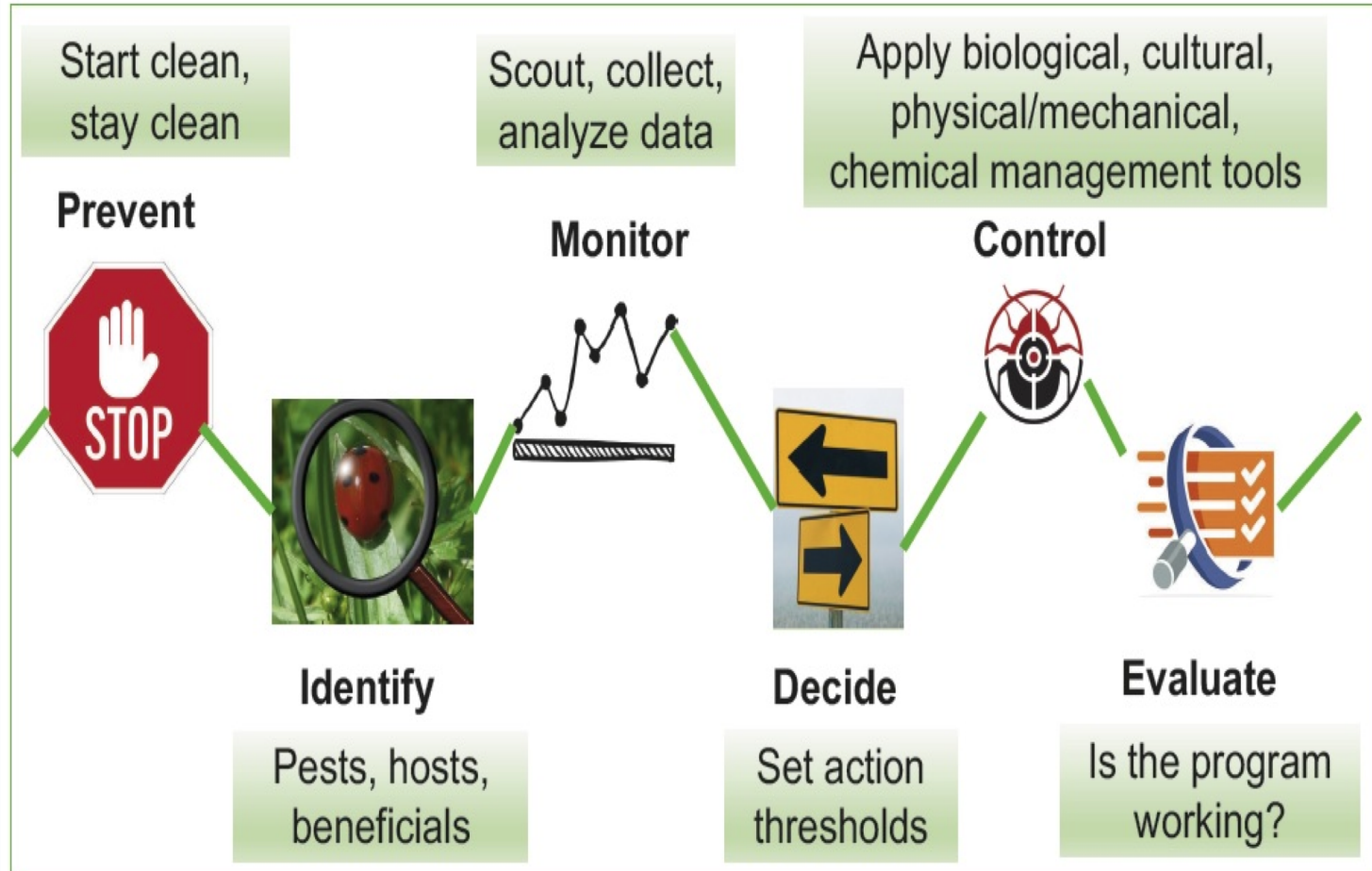


Schools of thought



- Applicable to both insects and plant disease
- Prevention is better than intervention
- More intervention can lead to higher toxicity, less sustainability
- Cost can sometimes increase with more intervention
- *Goal is long term strategy that is:*
 - Effective
 - Ecologically viable
 - Socially acceptable
 - Economical

Principles



- Principles are a set of guidelines to follow
- Journaling what you see can help with decision making
- Set SMART goals to help track & evaluate effectiveness

Prevention

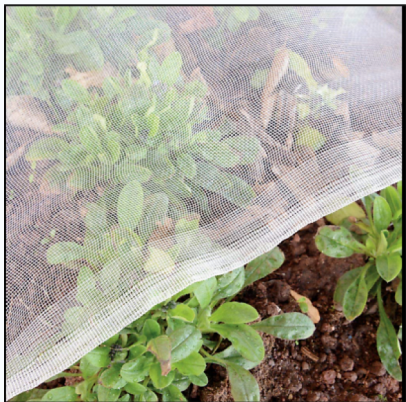
- Practices or habits
- Avoid detritus in growing space
- Sanitizing tools
- Observation & monitoring
 - Look at all parts of the plant closely from root to tip
- Proper crop location and rotation



<i>General prevention tips</i>	
Insects	Plants
Learn about insect life cycles	Follow proper spacing
Observe insects visiting crops	Use appropriate watering techniques
Check for evidence of damage	Practice companion planting or intercropping
Vary color in plant varieties – purple vs. green	Choose resistant varieties

Physical & Mechanical Controls

- Includes manual removal of eggs, bugs or infected plants
- Use of barriers like insect netting
- Trapping with physical or natural agents (beer cans, fruit rinds)
- Drowning pests in soapy water



<i>General physical & mechanical tips</i>	
Insects	Plants
Removing or culling eggs or larvae	Removing diseased plants
Using insect netting, row cover, sticky traps, fruit rinds	Pulling weeds, pruning plants
Kaolin clay aka Surround	Fences to deter larger pests like racoons, deer
Boards for snails & slugs	

Biological Controls

- Introducing another living thing to control problems
- Consider beneficial insects
- Inviting natural predators
- Planting crops that attract both beneficial and predators



<i>General Biological Control Tips</i>	
Insects	Plants
Plant for parasitic wasps	Introduce nematodes
Use BT, diatomaceous earth	Soil drenches or dressings
Purchase predators	

Chemical Controls

- 2 types:
 - Biorational & Conventional
- Use targeted pesticides vs. broad spectrum pesticides
- Use sparingly to minimize negative impact
- Look for OMRI certified products
- Avoid conventional controls
 - Glyphosate aka Round up
 - DEET
 - Dicamba, Naled

General Chemical Control Tips <i>*Biorational methods listed below</i>	
Insects	Plants
Insecticidal soap or spray	Neem oil
Use BT, diatomaceous earth	Copper fungicide
Use repellants, growth regulators	Pyganic (pyrethrum)



Fostering habitat for beneficial insects, less disease

- **Biodiversity & polyculture**
 - Plant a variety different cultivars
 - Staggered bloom times
 - Various colors of plants
 - **Avoid broad spectrum pesticides !**
- **Create habitats for beneficials**
 - Toad abodes or bat boxes
 - Bird Baths, perches or feeders
 - Shallow watering trays for bees
 - Leave the leaves on the ground in fall
 - Avoid an overly tidy greenspace
 - Feed the bees with weeds



Helpful tips – Sample Log

Plant family	Plants in family	Common Pests	Pest control methods	Common Diseases	Disease control methods
Cucurbits	Melons, cucumbers, zucchini, gourds	Cucumber beetles	Succession planting, trap crops, row cover, trellising, kaolin clay, hand pick, vacuuming,	Bacterial Wilt	Plant wilt resistant cultivars, remove affected plants, control cucumber beetles
		Squash bugs	Pick off, trap crops, painter's tape, scrape eggs off plants	Powdery Mildew	Proper spacing, disease resistant varieties, succession planting, baking soda solution
Lactuca, Asterceae	Lettuce, daisies, sunflowers, asters, marigolds, zinnia, coneflowers, yarrow, chicory, sage, tarragon, chamomile	Rabbits, slugs	Rabbits: Fencing, netting, wire clothes for rabbits	Heat stress	Plant heat tolerant varieties, use 50% light blocking shade cloth
			Slugs: Sluggo, beer or raw potato traps, diatomaceous earth, hand pick		
Solanaceous	Tomatoes	Hornworms, whiteflies, thrips, stink bugs		Fungal pathogens, blossom end rot	Cover soil, prune lower branches off, don't touch wet plants, plant successions, plant diversity, copper fungicide
	Peppers	Cutworms, Aphids		Blossom end rot	Manage pH to 6.5, check lime levels, cut back on fertilizer, Cal-mag, water evenly
	Eggplants	Flea beetle	Floating row cover, trap crop with radishes, neem oil		

Resources

- Insect, plant & plant identification
 - Missouri Botanical Garden website
- EPA.gov or local cooperative extension
- Keep a log with photos & describe results
- Arbico Organics
 - Nematodes, beneficials for purchase
- Check Organic Materials Review Institute (OMRI) before purchasing remediation products

Thank you!

Diagrams from EPA.gov, Uconn.edu, & OMRI.org

What Does it Mean to be OMRI Listed®?

“OMRI Listed” means a strong and efficient organic industry!

