

# Integrated Pest Management (IPM)

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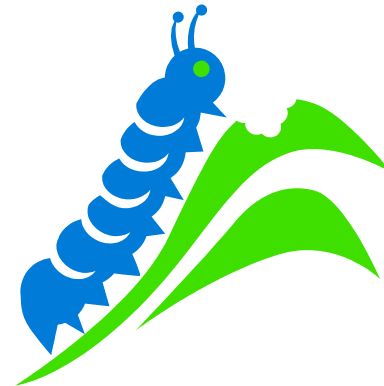
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# Integrated Pest Management (IPM)

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- What is Integrated Pest Management ?
  - IPM is a decision making process that anticipates & prevents pest activity & infestation by combining several tactics to achieve long term solutions



# Integrated Pest Management (IPM)

- IPM approach to pest control not NEW
  - China - 1200 B.C. - records of fumigation by burning toxic plants preceded by mechanical removal of as many insect pests as possible
- IPM in US agriculture took root in the 60's & 70s
  - response to **over-reliance** and **overuse** of synthetic insecticides across all crops post- WWII



# Integrated Pest Management (IPM)

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- **Over-reliance & overuse of pesticides led to:**
  - Selection of resistance in pest populations
  - Destruction of beneficial species
  - Resurgence of target pest populations
  - Outbreaks of secondary pests
  - Hazards to humans and the environment



# Integrated Pest Management (IPM)

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- **Five basic steps in an IPM Program:**
  1. **Inspection / Monitoring**
  2. **Identification of pest**
  3. **Establishing an action threshold**
  4. **Employment of 2 or more control measures that are:**
    - environmentally compatible
    - economically feasible
  5. **Evaluation of effectiveness**
    - continued monitoring
    - record keeping



# IPM Step 1 - **Inspection**

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- Why Inspect or Monitor?
  - Determine location & extent of pest problem
  - Note damage to the foliage, stems, and other plant parts
  - Determine conditions conducive to infestation
  - Identify other items or factors that could impact control program





# IPM Step 2 - Identification

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- Proper ID allows you to choose the right strategy.
  - Pest information you need to know:
    - Food preference
    - Habitat requirements
    - Disease triangle
    - Behavioral patterns of insects
    - Life cycle / Biology (Pest & Host)
    - Potential for damage to host







# Avoid plants with known problems



# IPM Step 3 - Establishment of Threshold Levels

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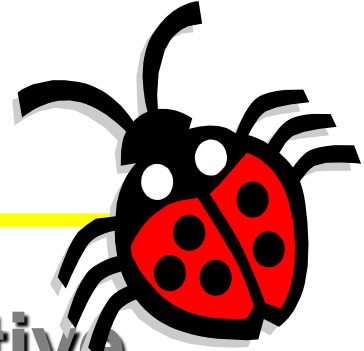
- **Threshold concept originated in agricultural pest control**





# IPM Step 3 - Establishment of Threshold Levels

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## Garden and Landscape Perspective

### **thresholds based on aesthetics or individual tolerance to damage**

- Goal is not to kill every last pest out there but to manage populations/damage at tolerable levels
- That tolerance level called the Economic Injury Level

# IPM Step 3 - Establishment of Threshold Levels

## Economic Threshold

**Pest population level at which control measures are implemented**

Change In Pest Population Density Over Time



# IPM Step 3 - Establishment of Threshold Levels

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## Economic threshold

- Traditionally based on:
  - Value of plants
  - Amount of potential pest damage
  - Cost of control





# IPM Step 3 - Establishment of Threshold Levels





## Brown Rot



## Apple Scab on crabapples



# IPM Step 4 - Employment of 2 or More Control Measures

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- Control tactics chosen should be:
  - most likely to produce reduction of pest population
  - easiest to carry out effectively
  - most cost-effective over the short & long term
  - least disruptive of natural controls
  - least hazardous to human health
  - least toxic to non-target organisms
  - least damaging to the general environment

# IPM Step 4 - Employment of 2 or More Control Measures

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- Control Measure Categories:
  - Cultural
  - Mechanical
  - Biological
  - Chemical
  - Regulatory



# Step 4

## Control Measures - Cultural

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– Healthy plants are more resistant and resilient.





# Cultural Practices



# Step 4

## Control Measures - Mechanical / Physical

- From a lawn and landscape perspective:
  - Physical pest reduction (mowing, hoeing, or trimming)
  - Reduce direct competition through careful tillage or mulching
  - Reduce pest problems by avoiding mechanical damage to plants (String trimmer wounds)





# Step 4

## Control Measures - Mechanical / Physical

- traps, sealants, barriers, to inhibit pest establishment



Pest proofing -  
(screens, nets, &  
caulking



Manual  
removal









# Step 4

## Control Measures - Biological

- Use of beneficial insects.
- Biological control least environmentally disruptive
- Examples:
  - Phorid fly for fire ant reduction
  - Lady beetles for aphid control
  - Bt for caterpillar control





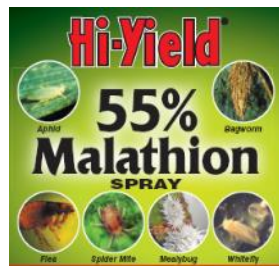
# Step 4

## Control Measures - Chemical

- Last control measure considered when developing an IPM program
- Being last **does not** imply that pesticides aren't an important component of an IPM control program



**IMAGE**  
70 DG herbicide



# Chemical Control



- Pesticide use may be the first control strategy if there is a need to significantly reduce or eliminate a pest population
- Many choices
- Use them wisely!
- Read and Follow Label Directions

# Step 4

## Control Measures - Regulatory

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- Don't allow the pest to become established  
(Don't import your problem)
- Particularly important for exotic pests
- Exotic pests have No natural enemies.
- Federal and state agencies can & often do place quarantines on certain exotic pests to prevent their spread into other areas of the state or country

—Examples:

- Red imported fire ant
- Gypsy moth
- Emerald ash borer
- Sudden oak death
- Invasive Plants



# IPM Step 5 - Evaluation of Effectiveness

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- Final step is evaluation
- Follow-up monitoring





# Why Monitor?

- Determine effectiveness
- Identify new or overlooked pest problems
- Enhance pest management effectiveness
- Reapply or revise
- Accurate records





# Choose plants wisely!

- With new plants appearing yearly on the market, there has not been ample research on level of invasiveness.
- Monitor your plants growth and contain if needed.

# Need Help?

- **Contact your local County Extension Agent first**
- **Extension Specialists:**
  - John Hopkins - Extension Urban Entomologist
  - Janet Carson - Extension Horticulturist
  - John Boyd - Extension Weed Specialist
  - Sherrie Smith - Plant Disease Clinic

# QUESTIONS?

