What is Integrated Pest Management (IPM)?

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Managing pests to promote sustainability and reduce risks to:

• Environment – water, air, landscape, non-targets organisms.
• Economics – farm business, crop yield, crop quality.
• Human health – our food, farmworkers, neighbors.

Integrated Pest Management or IPM means
Defining IPM

IPM is a pest control strategy that uses an array of complementary methods: natural predators and parasites, pest-resistant varieties, cultural practices, biological controls, various physical techniques, and pesticides.

It is an approach to managing the pests of apples that aims to significantly reduce or eliminate the use of pesticides.

   e.g. planting apple scab resistant varieties can eliminate the need for scab sprays and is an essential component of organic apple production in the Northeast.
The six steps of IPM

1. **Pest identification** ...or... *What is causing the problem?*
2. **Pest biology** ...or... *What is its life cycle?*
3. **Monitoring** ...or... *How much is in the orchard?*
4. **Thresholds** ...or... *Will that number cause economic injury?*
5. **Control** ...or... *How do I protect my crop?*
6. **Evaluation** ...or... *Did the methods I use solve the problem?*
The six tactics for management

1. **Cultural** – pruning to open the canopy for faster drying.
2. **Physical** – hail netting to prevent wounding and crop loss.
3. **Genetic** – varieties less susceptible to fire blight.
4. **Biological** – parasitoids, predators, or microbials that kill pests.
5. **Chemical** – pesticides, nutrients, growth regulators.
6. **Regulatory** – quarantines and certification programs.
Hierarchy of IPM Tactics

- **CHEMICAL**
  - Toxicity: High
  - Intervention: increasing
  - Examples: pesticides = herbicides, fungicides, insecticides, fumigants

- **BIOLOGICAL**
  - Toxicity: Low
  - Prevention
  - Intervention: increasing
  - Examples: predators, parasitoids, microbials
cultivation, mulch, high tunnel, netting, fences
crop rotation, cover crops, sanitation, resistant varieties, pruning, nutrition, soil factors

- **PHYSICAL**
  - Toxicity: Low
  - Prevention

- **CULTURAL, GENETIC & REGULATORY**
  - Toxicity: Low
  - Prevention
<table>
<thead>
<tr>
<th>Arthropods</th>
<th>In time, by season</th>
<th>In space, across field</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>• Constant threat</td>
<td>• Localized</td>
</tr>
<tr>
<td>Diseases</td>
<td>• Sporadic</td>
<td>• General</td>
</tr>
<tr>
<td>Weeds</td>
<td>• Rare</td>
<td>• Associated or linked</td>
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<tr>
<td>Wildlife</td>
<td></td>
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</tbody>
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<table>
<thead>
<tr>
<th>Others not covered in this workshop</th>
<th>In time, crop life span</th>
<th>In space, on plant</th>
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<tbody>
<tr>
<td></td>
<td>• Preplant</td>
<td>• Phenology</td>
</tr>
<tr>
<td></td>
<td>• Establishment</td>
<td>• Plant part affected</td>
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<td>• Bearing years</td>
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Tools of IPM

Scouting & monitoring
• Clipboard & records
• Hand lens, optivisor
• Traps, sticky cards
• White plates
• Trowel, knife, etc
• Bags, vials, etc
• Camera, phone

Records & reports
• Field maps
• Planting records
• Scouting results
• Spray records
• Harvest records
Tools of IPM

Knowledge

• Accurate pest ID
• Reference books
• Fact sheets - nysipm.cornell.edu
• Cornell Fruit Resources - fruit.cornell.edu
• Cornell Pest Management Guidelines
• NEWA - newa.cornell.edu