Implementing an Orchard Monitoring Program

JESSICA FOSTER, UNIVERSITY OF VERMONT
Workshop Agenda

• Introduction
• Scouting Presentation
• Orchard Scouting Walk-IPM Blocks
• Mating Disruption Hanging- Orchard 4.
• Questions
What is Scouting?

scout·ing ˈskoudiNG/
noun: Scouting
1. the action of gathering information about enemy forces or an area.
2. the characteristic activity and occupation of a Boy Scout or Girl Scout
What is Scouting?

scout·ing
ˈskoudiNG/
noun: Scouting

1. the action of gathering information about enemy forces or an area.
2. the characteristic activity and occupation of a Boy Scout or Girl Scout
Enemy Forces?

Insects
Diseases
Weeds
Other Orchard Issues
Why do we scout?

To gather information about the status of the orchard so timely decisions can be made and actions taken.
Why do we scout?

To gather information about the status of the orchard so timely decisions can be made and actions taken.
How do we scout?

- Trap Inspection
- Fruit & Foliage Assessments

How Often?

- Weekly

Leaf Assessment: STLM Mine

Fruit Damage: European Saw Fly

Delta Trap
White Visual Traps
European Saw Fly
Tarnish Plant Bug
Delta Traps

Trap Placement - 6-7 feet above ground. (Head Height)

Pest Specific Lures
Red Sphere Sticky Trap

Visual or Baited Trap Covered in tanglefoot. Baited with essence of apple. Used to catch Apple Maggot Fly (AMF).
Scale of Scouting

- 10 Acres Blocks
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How much time will scouting take?

- 20-30 Minutes / 10 Acres
When does scouting start? Who exactly are we looking for?
How much time will scouting take?
• 20 - 30 Minutes/ 10 Acres

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<tr>
<th>Silver Tip</th>
<th>Tight Cluster</th>
<th>Early Pink</th>
<th>Late Pink</th>
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<tbody>
<tr>
<td>STLM- Spotted Tentiform Leaf Miner</td>
<td>Set Red Visual Traps</td>
<td>Check traps weekly for thresholds</td>
<td>Continue Monitoring</td>
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<tr>
<td>TPB- Tarnished Plant Bug</td>
<td>Set White Sticky Traps</td>
<td>Check traps weekly for thresholds</td>
<td>Continue Monitoring</td>
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<tr>
<td>EAS- European Apple Sawfly</td>
<td>Set White Sticky Traps</td>
<td>Check traps weekly for thresholds</td>
<td>Continue Monitoring</td>
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<th>Bloom</th>
<th>Petal Fall</th>
<th>June</th>
<th>July</th>
<th>August</th>
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<tr>
<td>Pollinators Active</td>
<td>No Insecticides!</td>
<td>Examine leaves for presence of 1st gen. nymphs and adults. Threshold: 25/100 Lvs</td>
<td>Continue Monitoring</td>
<td>Examine leaves for presence of 2nd gen. nymphs and adults. Threshold: 25/100 Lvs</td>
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<td>White Apple and Potato Leafhoppers</td>
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<td>Bee &amp; Bumble Bee</td>
<td>European Red and Two-Spotted Spider Mites</td>
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<td>PC- Plum Curculio</td>
<td>Inspect fruit on early blooming cultivars in perimeter rows for fresh egg-laying scars.</td>
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<td>Threshold: First evidence of damage. Use DD model to determine timing of last spray.</td>
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<td>OBLR- Obliquebanded Leafroller</td>
<td>Hang pheromone traps in orchard. Check daily for first capture. Begin to accumulate DD (base 43F) from first capture.</td>
<td>When 600 DD (base 43F) are reached, examine 10 expanding terminal shoots per tree. Record the number of terminals infested. Use OBLR Sampling Form to determine whether to treat.</td>
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<tr>
<td>CM- Codling Moth</td>
<td>Hang pheromone traps in orchards. Check daily for first trap capture.</td>
<td>1st Generation Calculate DD from first adult catch to time insecticide spray 250-350 DD (base 50F)</td>
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<td>AMF- Apple Maggot Fly</td>
<td>Hang traps during last week in June.</td>
<td>Monitor Weekly For Thresholds</td>
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**Scouting Thresholds**

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<th>STLM</th>
<th>McIntosh: 4/Trap</th>
<th>Late Pink</th>
<th>Petal Fall</th>
<th>July</th>
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<tr>
<td>Non-Mac: 8/Trap</td>
<td>9/Trap</td>
<td>7 Mines/100 Lvs</td>
<td>50 Mines/100 Lvs</td>
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<tr>
<th>TPB</th>
<th>Wholesale: 3/Trap</th>
<th>Late Pink</th>
<th>Petal Fall</th>
<th>July</th>
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<tr>
<td>Retail: 5/Trap</td>
<td>8/Trap</td>
<td>14 Mines/100 Lvs</td>
<td>100 Mines/100 Lvs</td>
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<tr>
<th>EAS</th>
<th>No Pre-Bloom Insecticide: 5/Trap</th>
<th>Blocks with Pre-Bloom Insecticide: 9/Trap</th>
<th>Petal Fall</th>
<th>July</th>
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<tr>
<td>AMF</td>
<td>Non-Baited Spheres: 1/Trap</td>
<td>Baited Spheres: 5/Trap</td>
<td>Petal Fall</td>
<td>July</td>
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**Orchard IPM Resources**

- UVMA Fruit Page: Tree Fruit and Viticulture
  - [http://www.uvma.edu/~fruit](http://www.uvma.edu/~fruit)
- NEWA: Decision support systems for insect and disease models
  - [http://newa.cornell.edu](http://newa.cornell.edu)
- Great Lakes IPM: Trapping Supplies
  - [http://greatlakesipm.com](http://greatlakesipm.com)
- UVM Plant Diagnostic Clinic: Pest and disease identification
  - [https://www.uvm.edu/extension/pdc](https://www.uvm.edu/extension/pdc)
- Cornell IPM Fact Sheets
- Tree Fruit Field Guide
  - [http://netreefruit.org](http://netreefruit.org)
Tarnish Plant Bug (TPB)

• White Visual Traps: 2 traps/10 acres.
• Timing: Silver Tip
• Placement: near the edge of the block, hang traps at about 2’ above ground, on an outer branch.

Tight Cluster Thresholds *Average
- Wholesale: 3/trap
- Retail: 5/ trap

Late Pink Thresholds
- Wholesale: 5/ trap
- Retail: / 8 trap
European Apple Sawfly (EAS)

- White Visual Traps: 2 traps/10 acres.
- Timing: Early Pink
- Placement: Orchard edges, south side of the tree, outside branches at 5-6 feet above ground

Threshold: *Averages
No Pre-Bloom Insecticide: 5/trap
Blocks receiving Pre-bloom Insecticide: 9/trap
Plum Curculio

Visual inspection of 10 fruit per tree.

Late Bloom- begin to inspect fruit on early-blooming cultivars in perimeter rows for fresh egg-laying scars
Codling Moth (CM)

- Delta Trap: 1 trap/5 Acres, Larger Orchards Blocks- 5 traps, corners and middle.
- Timing: Bloom
- Placement: 6-7 feet above ground level.

Traps should be checked daily until first capture, then weekly.

Petal Fall: For 1st generation CM, Calculate DD from first adult catch to time of insecticide spray in block where CM is a problem: 250-350 DD base 50F.

July: For 2nd Gen CM, Calculate DD from first adult catch to time insecticide sprays in blocks where CM are a problem: 1260-1370 DD, base 50F
Obliquebanded Leafroller (OBLR)

- Delta Trap
- Timing: Petal Fall
- Placement: 6-7 feet above ground level.

Traps should be checked daily until first capture. Begin to accumulate DD base 43F.

June: When 600 DD base 43F are reached examine 10 expanded terminal shoots per tree from as wide and are of the block as possible. Record number of terminals infested.

Use Cornell Sampling Form to determine whether or not to treat.
Apple Maggot Fly (AMF)

- Traps are sticky red spheres baited with volatile essence of apple lures. 4 traps/10 Acres
- Timing: Hang last week in June in early cultivar blocks, rest in July.
- Placement: 5-6 feet above ground

Inspect weekly. Insecticide should be sprayed when an average of 5 AM / trap are caught in a week.

Thresholds:
- Non Baited Spheres: 2/trap
- Baited Spheres: 5/ trap
Two Spotted Spider and European Red Mites

Leaf Inspection - Starting at Petal Fall - Middle Aged Leaves

Mite Sampling Chart
Threshold June: 2.5 mites/leaf

Two Spotted Spider Mite
European Red Mite
NEWA

18 stations in Vermont
  Six airports
  Twelve on-farm stations

Nationwide (East)
  25 states
  Over 500 stations

newa.cornell.edu
NEWA: Apple Models

- Six insect models
  - Codling moth
  - Plum curculio
  - Obliquebanded leafroller
  - Oriental fruit moth
  - Apple maggot
  - San Jose scale

- Three disease models
  - Apple scab
  - Fire blight
  - Sooty Blotch and Fly Speck

- Multiple horticultural models
  - Carbohydrate thinning, evapotranspiration, irrigation, frost risk, degree days

- Archived weather data
Mating Disruption
Priorities.

Redbaned Leaf Roller - no thresholds established
Dogwood Borer - no thresholds established
San Jose Scale - Microscopic

Redbanded Leaf Roller
Dogwood Borer
San Jose Scale Trap
White Traps
Delta Traps
AMF Traps
Leaf/Fruitlet

UVM Horticulture Research Center, South Burlington, VT - 4 Acres
Summary

Scout your orchard at least once a week to be aware of what is going to catch problems as they develop.

Monitor weather/environmental conditions for degree day calculations, disease models, etc., and to determine optimal conditions for spraying to optimize coverage and minimize drift.
Thank you

- UVM Apple Program
- Nutrien Ag Solutions, Addison, VT
- Vermont Agriculture Experiment Station
- USDA NIFA CPPM #2017-70006-27143/1013802
- UVM Agricultural Risk Management and Crop Insurance Education Program
  RM18RMETS524C022

USDA and the University of Vermont are equal opportunity providers and employers. The UVM Fruit Program is funded in partnership by USDA, Risk Management Agency, under award number RM18RMETS524C022. This work is supported by Crop Protection and Pest Management Program [grant no. 2017-70006-27143/1013802] from the USDA National Institute of Food and Agriculture, and by the Vermont Agency of Agriculture, Food and Markets via the USDA Specialty Crops Block Grants Program. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.
White Apple and Potato Leafhoppers

Examine the underside of randomly selected leaves during the period from petal fall through first cover.

Petal Fall-June: examine leaves for presence of 1st gen.
Nymphs and Adults Threshold: 25/100 Leaves

August: examine leaves for presence of 2nd gen.
Nymphs and Adults Threshold: 25/100 Leaves
Spotted Tentiform Leafminer (STLM)

- Trap: Red trunk visual sticky traps
- Timing: Silver Tip
- Placement: South side of tree trunks. Minimum of 4 traps per 10 acre block

Tight Cluster:
- MacIntosh: 4/trap
- Non-Macs: 8/trap

Late Pink:
- MacIntosh: 9/ trap
- Non-Mac: 21/trap

Petal Fall: Check sap mines in leaves
- Macs: 7 mines/100 leaves
- Non-Macs: 14 mines/100 leaves

July
- Macs: 50 Mines/100 leaves
- Non-Macs: 100 Mines/100 leaves