2018 UVM-CPS Orchard Monitoring Project

SARAH KINGSLEY-RICHARDS
UNIVERSITY OF VERMONT

123RD ANNUAL VTFGA & UVM APPLE PROGRAM ANNUAL MEETING
FEBRUARY 14, 2019
Formal Sampling Statewide, 2018

- Twelve orchard sites
  - Addison (4)
  - Bennington (2) *new*
  - Chittenden (3, including UVM)
  - Grand Isle (1)
  - Orange (1)
  - Washington (1)

- Five scouts
  - Terry Bradshaw (UVM)
  - Jessica Foster (UVM)
  - Sarah Kingsley-Richards (UVM)
  - Eric Boire (Nutrien)
  - Intern (Nutrien)
Pest and Trap Summary, 2018

• Early Season (visual)
  • TPB = Tarnished Plant Bug
  • EAS = European Apple Sawfly

• Fruitlets (sampling, observation)
  • PC = Plum Curculio
  • TPB = Tarnished Plant Bug
  • EAS = European Apple Sawfly
  • CM = Codling Moth
  • LR = Leafrollers

• Foliage (sampling, observation)
  • Mites (European Red, Twospotted Spider)
  • STLM = Spotted Tentiform Leafminer

• Delta Traps (pheromone)
  • OFM = Oriental Fruit Moth
  • RBLR = Redbanded Leafroller
  • CMph = Codling Moth (pheromone)
  • Cmda = Codling Moth (kairomone = “DA”, plant-derived)
  • LAW = Lesser Appleworm
  • TABM = Tufted Apple Bud Moth
  • OBLR = Obliquebanded Leafroller
  • Dogwood Borer

• Other Traps
  • SJS = San Jose Scale (pheromone)
  • AMF = Apple Maggot Fly (visual+scent bait)
Large Plastic Delta Traps

• NOT the Delta 1x Trap
• MUCH easier than Wing Traps!
Other Traps

• White Sticky Traps: TPB, EAS, SJS
  • Visual
  • Put out after copper/oil
  • Full-size traps = increased captures

• Apple Maggot Traps
  • Visual + Scent bait
  • Plastic traps are ok
    • Use staples to close then attach wire BEFORE sticky
    • Trick to attach wire
Mite Sampling

• DO NOT count mites! Count number of leaves with mites

• Chart corresponds to mite density of:
  • 2.5 mites per leaf from June 1 until June 30th
  • 5.0 mites per leaf from July 1 until July 31st
  • 7.5 mites per leaf from August 1 until August 15th
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2017 vs 2018

2017
- Traps set mid-April
  - week of 4/16
- 18 weeks of trapping
  - through week of 8/13

2018
- Traps set late-April
  - week of 4/29
- 17 weeks of trapping
  - through week of 8/19
- Total trap captures
  - higher for Orange
  - same for Chittenden
  - lower for others
Statewide Average Trap Captures

Statewide Average Trap Captures, 2018

* TPB, EAS, AMF average of average

* Foliage Mites per leaf

* TPB, EAS, AMF average of average
Statewide Average Trap Captures

*TPB, EAS, AMF average of average*
Redbanded Leafroller

- Ridiculously high numbers
  - Two population peaks
  - No threshold

- Necessary?

- Peak trap captures
  - All counties May 13
    - One Chittenden site, One Bennington site 1 week later than others
  - Second peak more drawn out over time
    - Orange, Washington, Bennington 3-4 weeks later

- 162! 5/13/18

2017 trap photo = 126 captures

Redbanded Leafroller Trap Captures by County, 2018
Apple Maggot Fly

- Unexpectedly high
  - Threshold 5/trap

83! in single trap
8/16/18

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Apple Maggot Fly

• Chittenden peaked first
  → Addison/Grand Isle
  → Orange/Bennington

• Still high at end of season
  • One Chittenden site still above threshold four weeks after regular scouting ended
Apple Maggot Fly

• Very little damage seen at packout!
  • Small sample (25 fruit)

• Either / Or
  • Treatments did their job
    • Prevented oviposition
    • Prevented development of eggs
  • Fruit colored up late due to heat/drought
    • Not attractive to flies
Dogwood Borer

• Second year trapping
  • Big, messy
  • No threshold

• Necessary?

• Lower trap captures
  • Chittenden, Bennington one peak
  • Orange, Washington, Addison two peaks
  • Grand Isle site = no captures → mating disruption
Codling Moth

• Pheromone = males

• “DA” = males and females
  • Actually a pheromone + DA lure (CM-DA Combo)
    • DA doesn’t work on its own (CM DA)
  • Used in mating disruption orchards
    • kairomone is a plant-derived “scent”

• No notable difference
  • Slightly higher numbers for pheromone only
  • Both lures worked equally well in mating disruption orchards (?)

• Unknown syrphid fly on CMda traps
Total Trap Captures over Season by County

- Orange highest overall, then Chittenden
  - Also highest Leps, AMF
- Chittenden and Addison highest DWB
  - Grand Isle zero DWB (mating disruption)
- Bennington low AMF
First Trap Capture or Observation

- Counties with pest in the first week found
  - Out of 18 traps/observations

- As expected, now with data!
  - Addison → Chittenden → Bennington → Central → Grand Isle
    - 20% of traps or observations first in Addison (if in Addison at all) at least a week before anywhere else (LAW, OBLRAMF, FruitletEAS)
    - 12% of traps or observations first in Chittenden (if in Chittenden at all) at least a week before anywhere else (EAS, RBLR)
    - TABM first in Bennington before anywhere else

- 1-3 week spread
  - Likely dependent on when during week measured
    - OFM, CM, LAW, OBLR, DWB (2 week); EAS (3 week)

- Mites 5 week spread; late in Chittenden/Grand Isle; no Bennington data
Scouting Evaluation

- Participating growers benefited from scouting
  - Used in pest management decision making (100%)
  - Reduced or delayed sprays (100%)
  - Had a net economic benefit (better yield quality/quantity) and/or reduce risks (88%)

  “(With) up to date scouting results I have confidence in my spray timing.”

  “Scouting allowed us to be more precise in our spray applications and reduce our use of pesticides.”

  “I am not sure of the amount of money saved, however, it was significant.”
Most important scouting results

(often/highly useful)

- Codling moth (100%)
- Apple maggot fly (100%)
- European apple sawfly (88%)
- Dogwood borer (88%)
- Plum curculio (86%)
- Mites (86%)
- Obliquebanded leafroller (75%)

Most pesticide applications
- Apple maggot fly (100% made applications, 63% made 3 applications)
- European apple sawfly (88% made applications, 50% made 2 applications)
- Codling moth (88% made applications, 75% made 2 applications)
- Plum curculio (86% made applications, 57% made 2-3 applications)
- Mites (oil) (75% made 1 application)

- Oriental fruit moth (71%)
- Redbanded leafroller (57%)
- Tarnished plant bug (50%)
- Lesser appleworm (14%)
- Tufted apple bud moth (14%)

Note: no diseases scouted
Most familiar scouting protocols
(comfortable/very comfortable)

- Apple maggot fly (88%)
- Apple scab (88%)
- Codling moth (75%)
- Mites (75%)
- Fire blight (75%)

Need work
- Obliquebanded leafroller*
- San Jose scale*
- Plum curculio
- Dogwood borer*
- Tarnished plant bug
- European apple sawfly*

*At least one not at all comfortable with scouting
Information needed to improve scouting

• Insects
  • Which traps/lures to select (PC, (CM))
  • How to place traps (PC, DWB)
  • Monitoring schedules ((EAS))
  • Pest identification (TPB, EAS, PC, SJS, DWB, Mites, etc.)
  • What to do with scouting results (DWB, SJS)

• Diseases
  • How to assess (na)
  • Monitoring schedules (Apple scab, Fire blight)
  • Pest identification (none)
  • What to do with scouting results (Fire blight)
Resources for setting up a scouting program
(useful/highly useful)

• Weekly postings via email or blogs of scouting activities in area orchards (86%)
• On-farm training in deploying a scouting program at my orchard (83%)
• A paid IPM consultant to perform a scouting program at my orchard (71%)
• Explanations of best scouting practices at winter meetings (71%)
• Online resources on best scouting practices (57%)
• Online training in deploying a scouting program (38%)
• On-farm training in deploying a scouting program at an orchard near me (33%)

• 86% use NEWA at least once a week in making management decisions
  • Apple scab, Fire blight (88%)
  • Weather data (temp, rain, leaf wetness, etc.) (88%)
  • Growing degree day calculation (86%)
  • Codling moth (75%)
Next Phase

• Two more years of Extension IPM funding
  • Continued UVM scouting (6 sites)
    → Grower training → **Grower scouting**
  • Online data logging system

• Develop trapping recommendations tailored to VT
  • Analysis of statewide data
  • Streamline essential traps/timing (by county?)
  • Pair with threshold recommendations
Thank you

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• Nutrien Ag Solutions, Addison, VT
• Vermont Agriculture Experiment Station
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