2017 UVM-CPS Orchard Monitoring Project

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UNIVERSITY OF VERMONT

122ND ANNUAL VTFGA & UVM APPLE PROGRAM ANNUAL MEETING
FEBRUARY 15, 2018

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Formal Sampling Statewide, 2017

- Ten orchard sites
  - Addison (4)
  - Chittenden (3,including UVM)
  - Grand Isle (1)
  - Orange (1)
  - Washington (1)

- Four scouts
  - Terry Bradshaw (UVM)
  - Jessica Foster (UVM)
  - Sarah Kingsley-Richards (UVM)
  - Eric Boire (CPS)

Pest and Trap Summary, 2017

- 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!
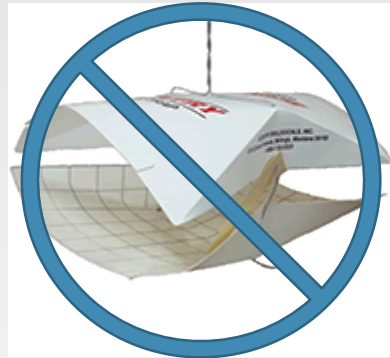
Other Traps

- White Sticky Traps: TPB,EAS,SJS
  - Visual
  - Put out after copper/oil
  - Might have been too small for TPB, EAS

- 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

Figure 7.1.3 – Mite Sampling Chart
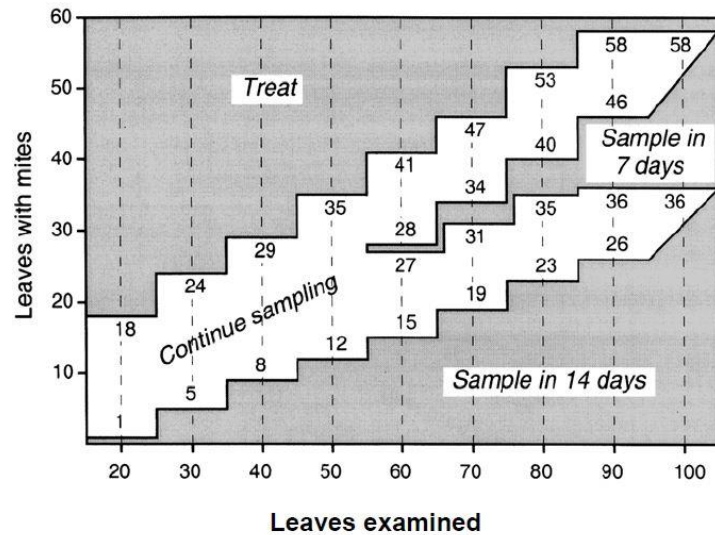Threshold = 2.5 mites/leaf
(June 1 - 30)

Figure 7.1.4 - Mite Sampling Chart
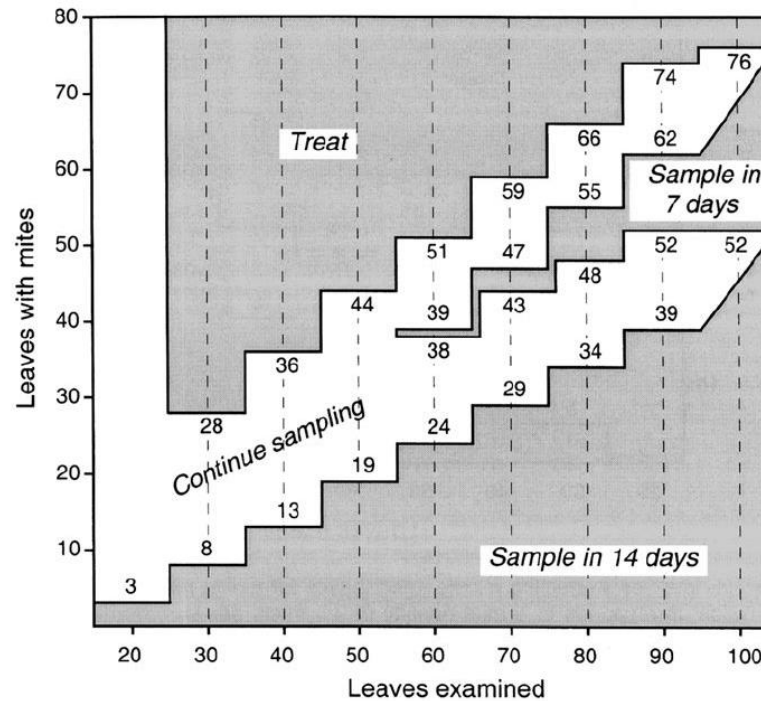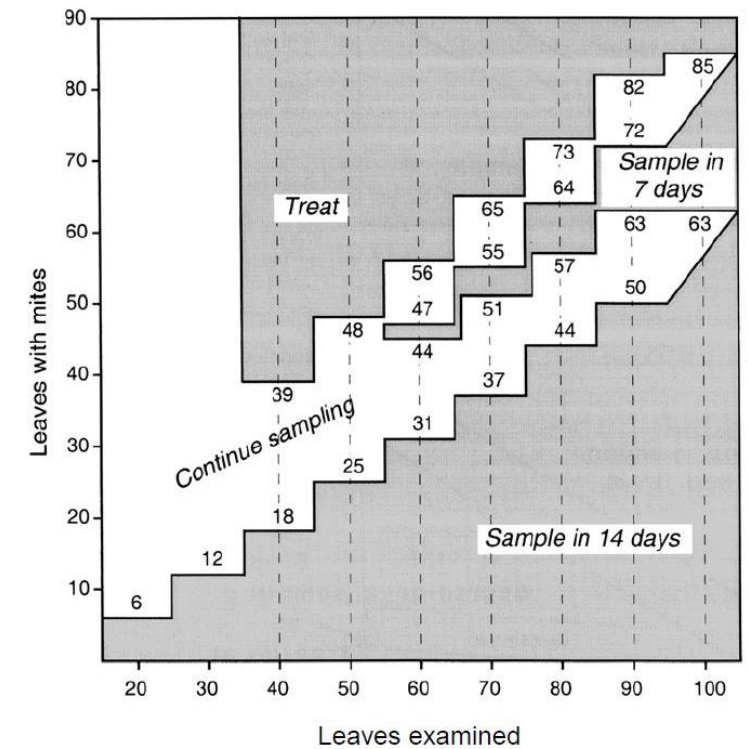Threshold = 5.0 mites/leaf
(July 1 - 31)

Figure 7.1.5 - Mite Sampling Chart
Threshold = 7.5 Mites/Leaf
(August 1 - 15)

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

	week of:	16-Apr	23-Apr	30-Apr	7-May	14-May	21-May	28-May	4-Jun	11-Jun	18-Jun	25-Jun	2-Jul	9-Jul	16-Jul	23-Jul	30-Jul	6-Aug	13-Aug
	Assesment date:																		
	McIntosh phenology																		
	TPB trap 1																		
	TPB trap 2																		
	TPB trap 3																		
	TPB trap 4																		
	TPB avg																		
	EAS trap 1																		
	EAS trap 2																		
	EAS trap 3																		
	EAS trap 4																		
	EAS avg																		
	OFM																		
	RBLR																		
	CM ph																		
	CM da																		
	LAW																		
	TABM																		
	OBLR																		
	Dogwood																		
	SJ scale																		
	AMF trap 1																		
	AMF trap 2																		
	AMF trap 3																		
	AMF trap 4																		
	AMF avg																		
Fruitlets (5x10)	PC																		
	TPB																		
	EAS																		
	CM																		
	LR																		
Foliage	Mites																		
	STLM																		
	# leaves																		

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	week of:	16-Apr	23-Apr	30-Apr	7-May	14-May	21-May	28-May	4-Jun	11-Jun	18-Jun	25-Jun	2-Jul	9-Jul	16-Jul	23-Jul	30-Jul	6-Aug	13-Aug
	Assesment date:	4/20	4/27	5/3	5/11	5/17	5/24	5/31	6/8	6/15	6/21	6/29	7/6	7/13	7/20	7/27	8/3	8/10	8/16
	McIntosh phenology	1/4 GT	1/2 GT	EP	P	B	PF	FS	-	-	-	-	-	-	-	-	-	-	-
SE	TPB trap 1	x	0	0	0	0	0	0											
SW	TPB trap 2	x	1	0	0	0	0	0											
NW	TPB trap 3	x	0	1	0	0	0	0											
NE	TPB trap 4	x	0	0	0	0	0	0											
	TPB avg		0.25	0.25	0	0	0	0											
SE	EAS trap 1	x	0	0	0	0	0	0	-	-									
SW	EAS trap 2	x	0	0	0	0	0	0	-	-									
NW	EAS trap 3	x	0	0	0	0	0	0	-	-									
NE	EAS trap 4	x	0	0	0	0	0	0	-	-									
	EAS avg		0	0	0	0	0	0											
	OFM			x	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RBLR			x	20	66	78	22	15	6	0	0	7	22	3	2	44	11	9
	CM ph			x	0	0	0	0	1	14	7	16	26	33	6	1	1	2	6
	CM da			x	na	na	na	na	1 x*	1	10	3	3	1	12	6	1	2	3
	LAW			x	0	0	0	24	41	25	5	5	2	1	4	0	20	11	9
	TABM			x	0	0	0	0	0	4	3	10	11	2	1	1	0	0	0
	OBLR			x	0	0	0	0	0	7	15	15	2	8	3	1	0	2	3
	Dogwood			x	0	0	0	0	0	0	1	7	15	36	75	87	75	47	31
	SJ scale		x	na	na	na	na	15	-	-	-	-	-	-	-	-	-	-	-
SE	AMF trap 1										x	0	3	4	11	10	41	61	49
SW	AMF trap 2										x	0	0	0	3	7	10	25	24
NW	AMF trap 3										x	0	0	3	4	14	10	22	16
NE	AMF trap 4										x	0	0	1	4	17	24	27	16
	AMF avg											0	0.75	2	5.5	12	21.25	33.75	26.25
Fruitlets	PC							na	1	0	0	2							
(5x10)	TPB							na	1	3	3	4							
	EAS							na	0	0	0	0							
	CM							na	0	0	0	1							
	LR							na	0	1	0	0							
Foliage	Mites								0	0	0	0	0	0	1	0	0	2	0
	STLM								0	0	3	2	3	2	0	0	0	0	0
	# leaves								20	20	20	20	20	20	20	20	20	20	20

Statewide Average Trap Captures

Legend:
- TPB
- EAS
- OFM
- RBLR
- CMph
- CMda
- LAW
- TABM
- OBLR
- Dogwood
- SJS
- AMF
- FruitletPC
- FruitletTPB
- FruitletEAS
- FruitletCM
- FruitletLR
- Foliage Mites per leaf
- Foliage STLM per leaf

105
30-Apr

76
21-May
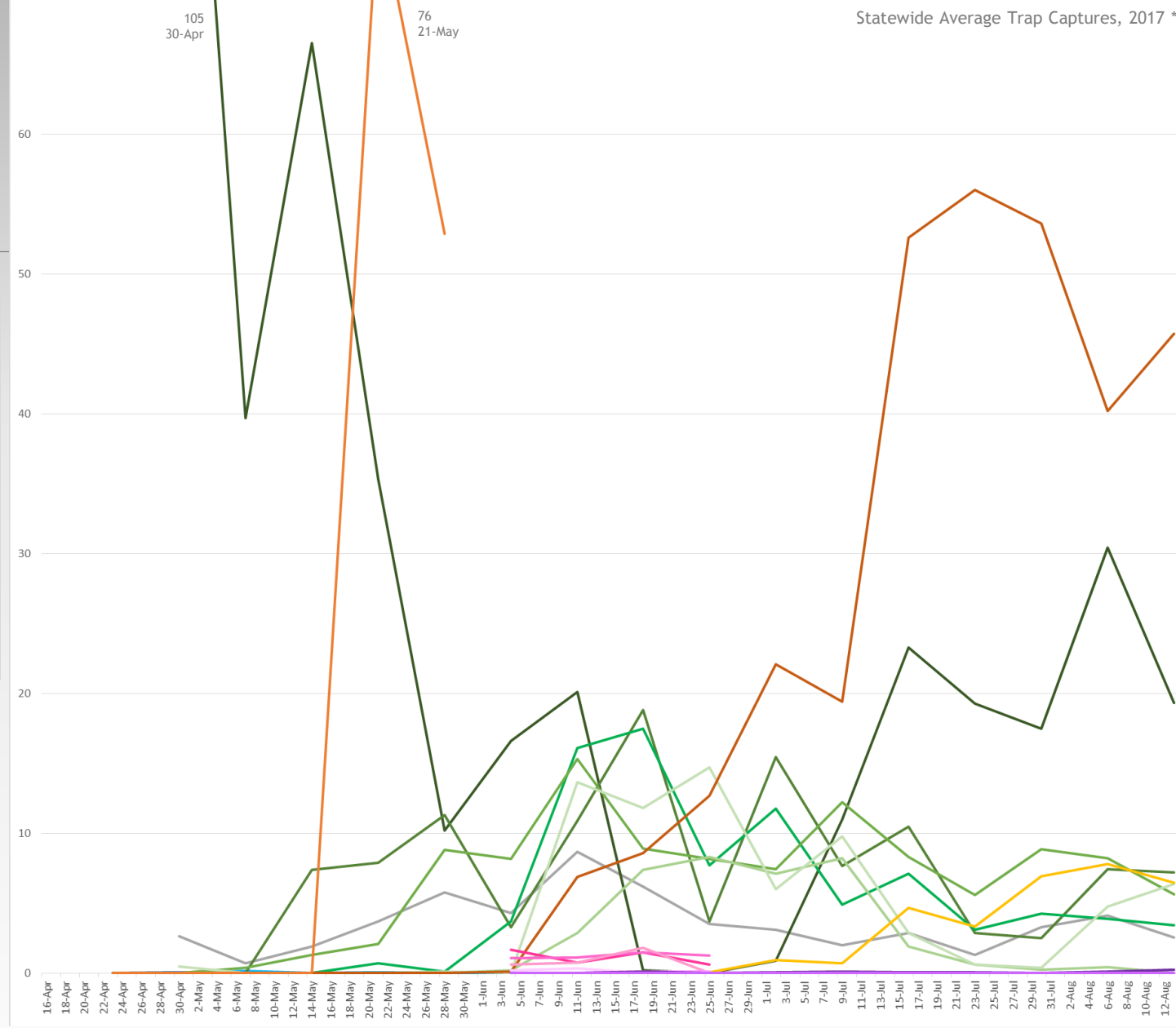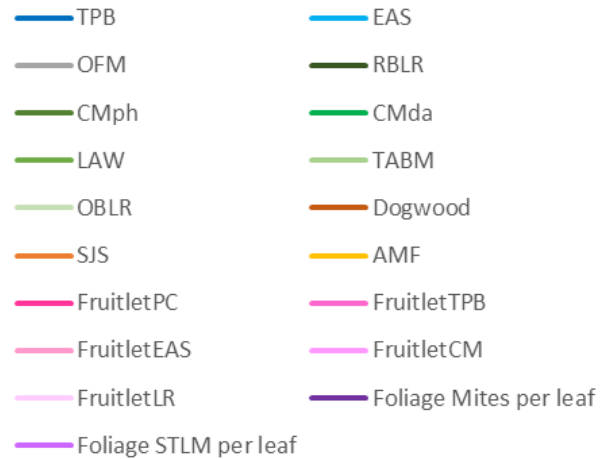
* TPB, EAS, AMF average of average

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Statewide Average Trap Captures

Redbanded Leafroller

- Ridiculously high numbers
  - Two population peaks
  - No threshold

- Necessary?

- Peak trap captures
  - Addison early May
  - Chittenden 2 weeks later
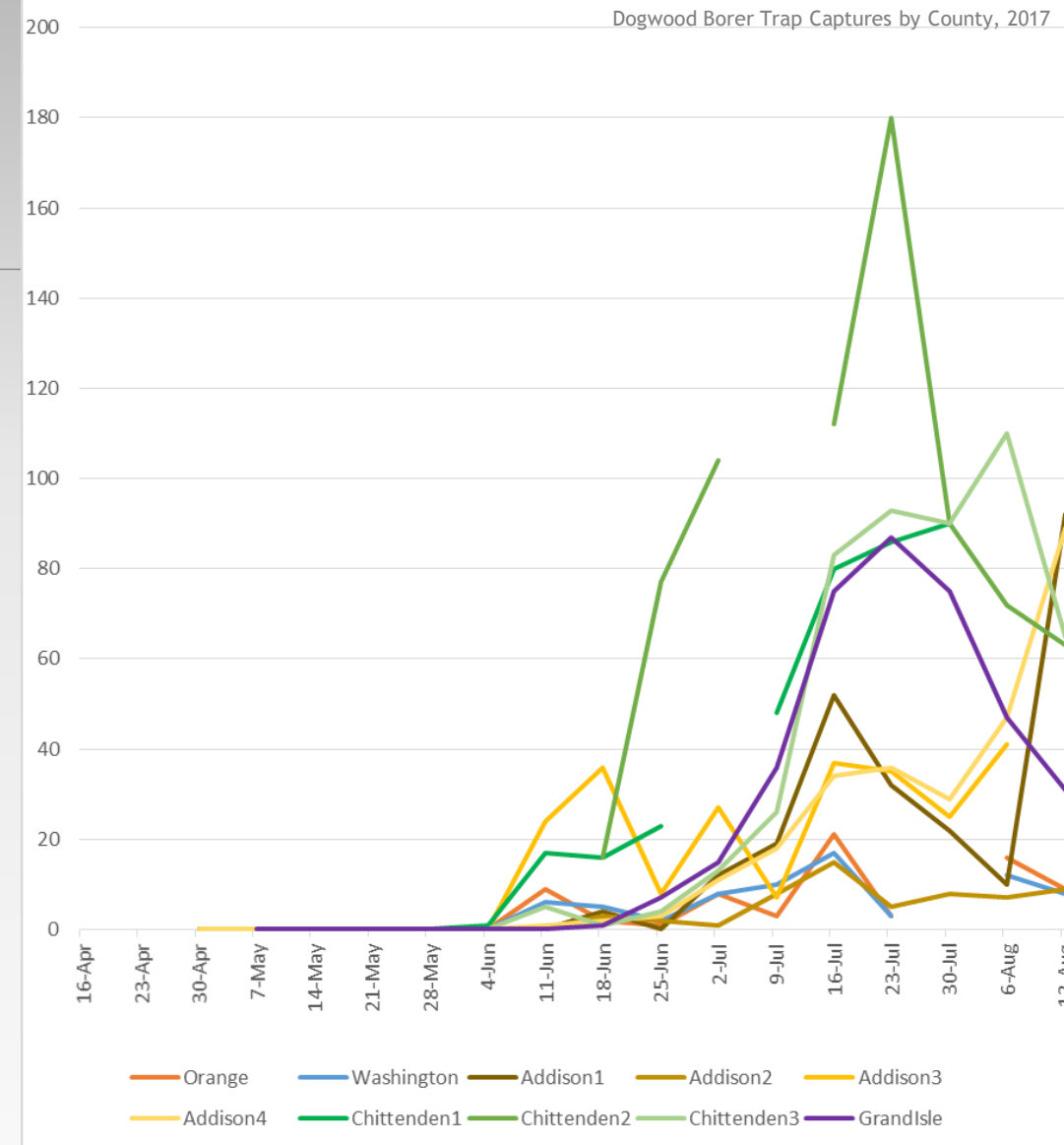 - Grand Isle 3 weeks later
  - Central 6 weeks later

126!
5/11/17

Count half and double =110

Redbanded Leafroller Trap Captures by County, 2017

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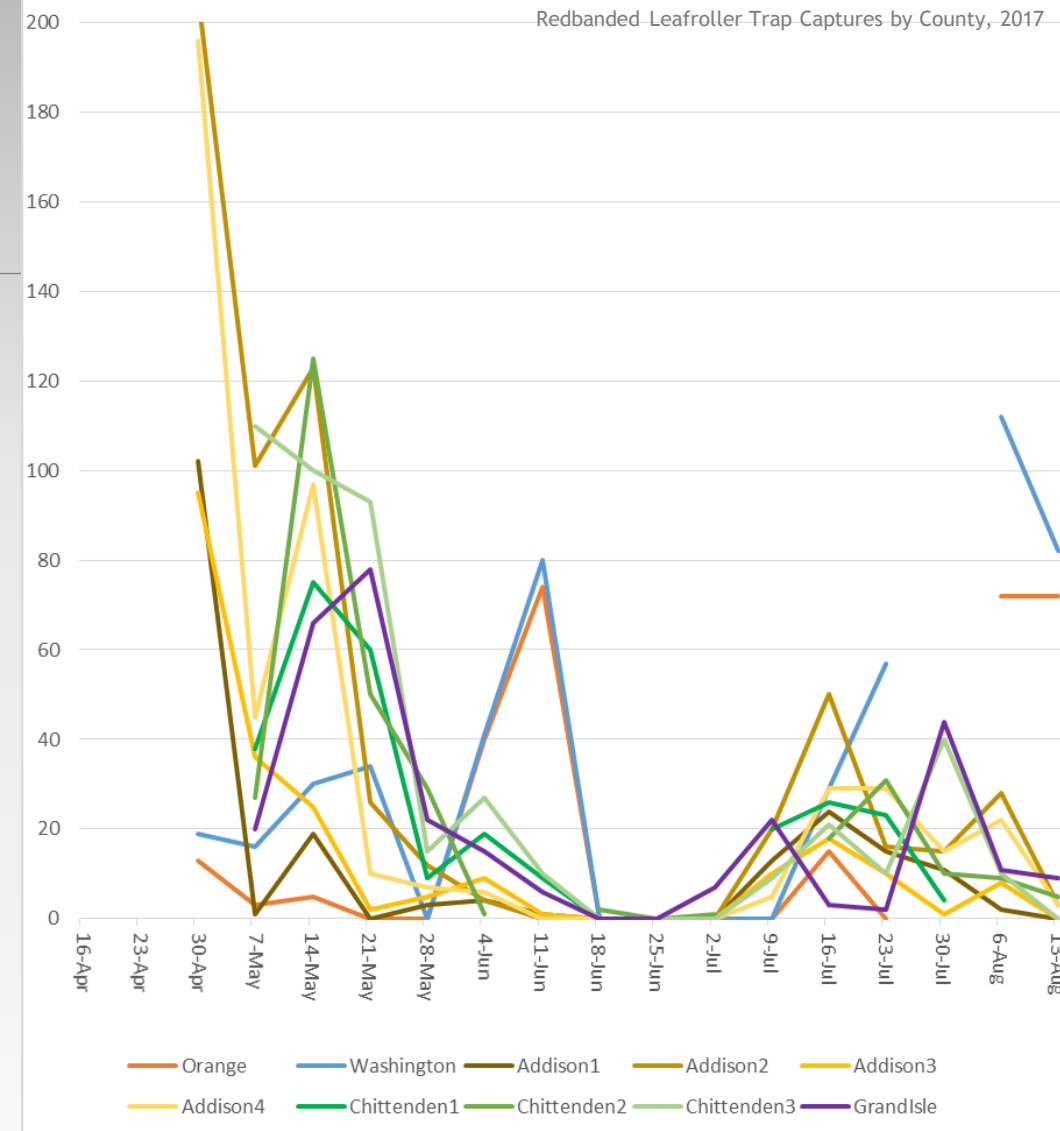
Dogwood Borer

- First time trapping
  - Big, messy
  - No threshold

- Necessary?

- Dramatic trap captures
  - Chittenden/Grand Isle very high
 - Addison high; beginning to peak late season
  - Central much lower

Dogwood Borer Trap Captures by County, 2017

Legend: Orange, Washington, Addison1, Addison2, Addison3, Addison4, Chittenden1, Chittenden2, Chittenden3, GrandIsle

San Jose Scale

- First time trapping
  - Collected all at once
  - Required microscope to count
  - Numbers varied widely by farm

Addison 1	120
Addison 2	0
Addison 3	4
Addison 4	260
*Chittenden 1	230
Chittenden 2	20
Chittenden 3	4
Grand Isle	15
Orange	0
Washington	0

28-May
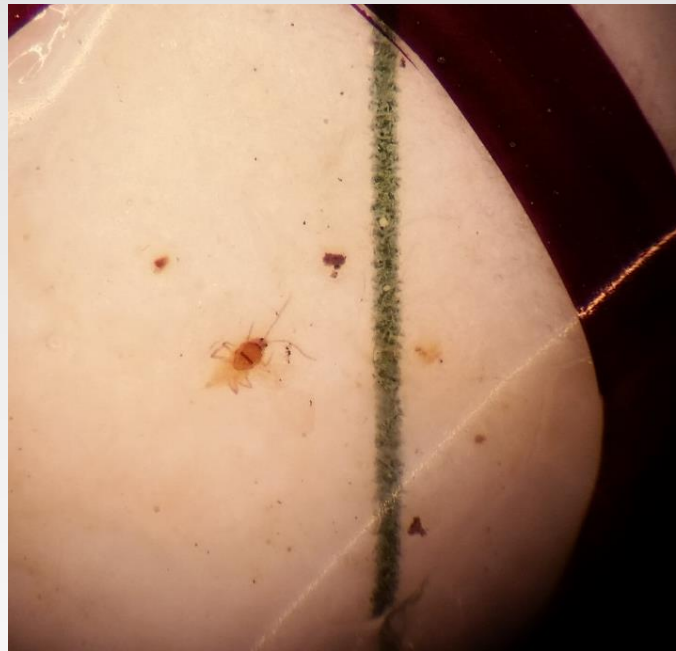
San Jose Scale

- Traps Not Practical
  - Require microscope to count
  - Sloppy biofix date
    - collect traps, transport, delay

- NEWA degree day models
  - Biofix estimates (still sloppy)

- Crawler activity observation
  - Tape, sticky, laborious
  - Still need microscope

- Fruit assessment
  - Dormant oil in spring

Pest Status	Pest Management
Predicted first catch of SJS adults from the overwintering generation is expected after approximately 200-350 degree days (base 50F) have accumulated.	Pheromone traps should be in place in time to record the first adult male flight.

| Pest Status	Pest Management
First generation crawler emergence is predicted to occur approximately 260-360 DD (base 50F) after biofix, or 500 DD after March 1. Prepare to start monitoring for the crawlers or, if SJS was a serious problem last season, begin treatment.	Apply 2 sprays, against the first and peak (7-10 days later) activity of crawlers of the 1st generation. If monitoring, suggested action threshold is 1-2 crawlers/trap (sticky tape trap around limb). Pesticide information

Pest Status	Pest Management
Nymphs secrete new scale covers and develop into adults.	Pheromone traps should be in place in time to record the second adult male flight.

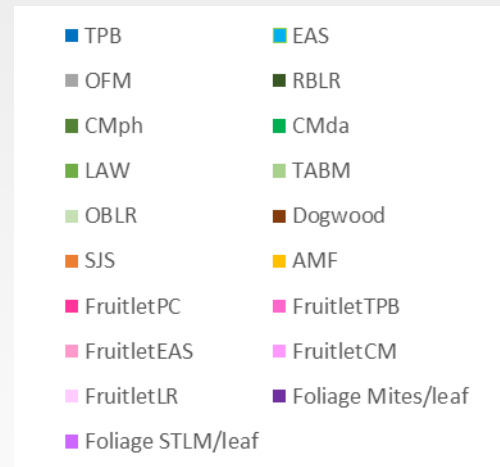| Pest Status	Pest Management
First catch of SJS 2nd generation adults usually occurs sometime around mid-July.	Note date of first capture of 2nd generation adults, to obtain biofix for predicting 2nd generation crawler emergence.

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"

- We put out the wrong lure at first
  - Used DA alone until June 4

- No notable difference
  - Slightly higher numbers for pheromone only
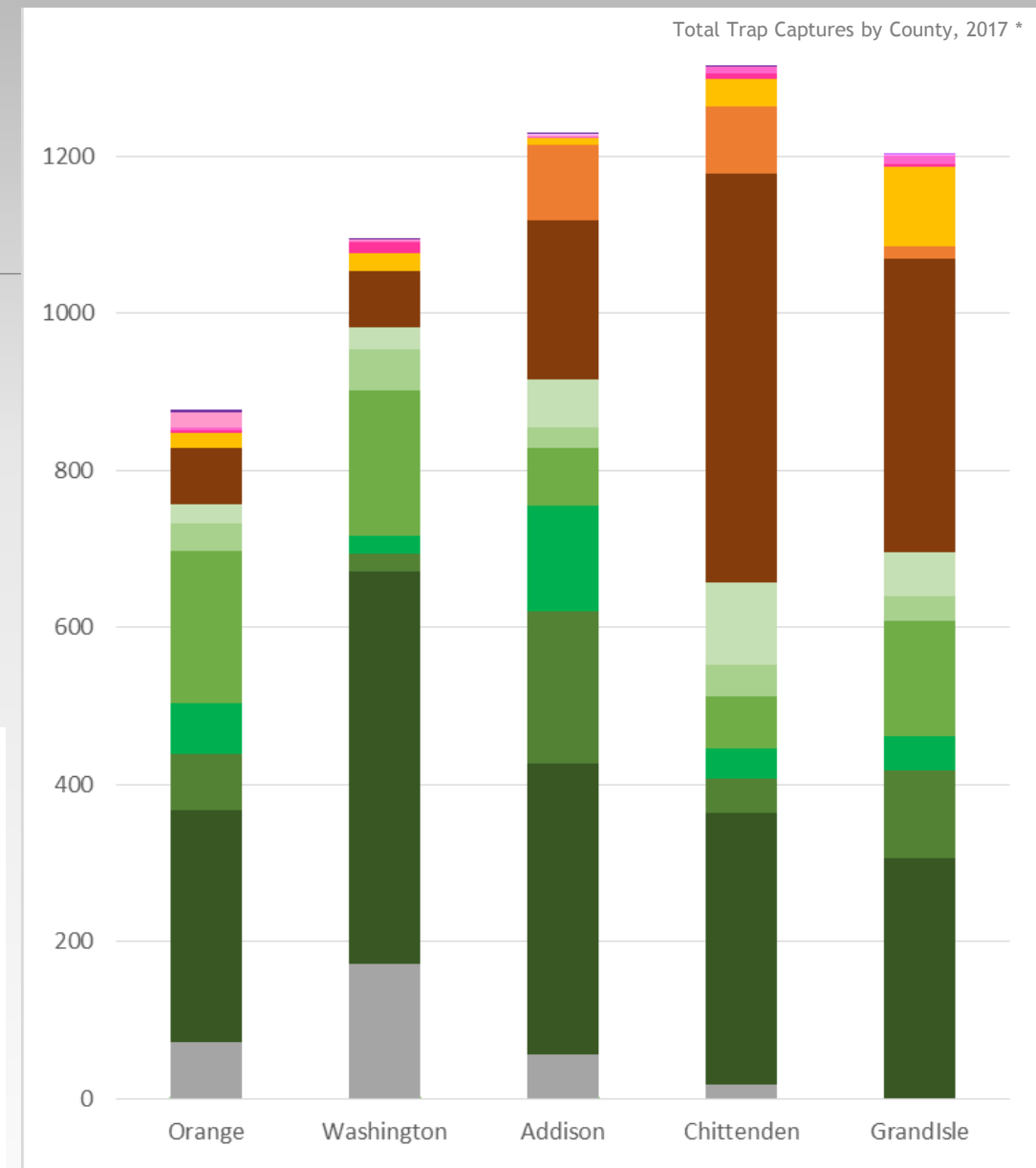 - Zero trap captures at UVM so unable to say if effective in mating disruption orchards

Statewide Average Trap Captures, 2017

Total Codling Moth Trap Captures by County, 2017
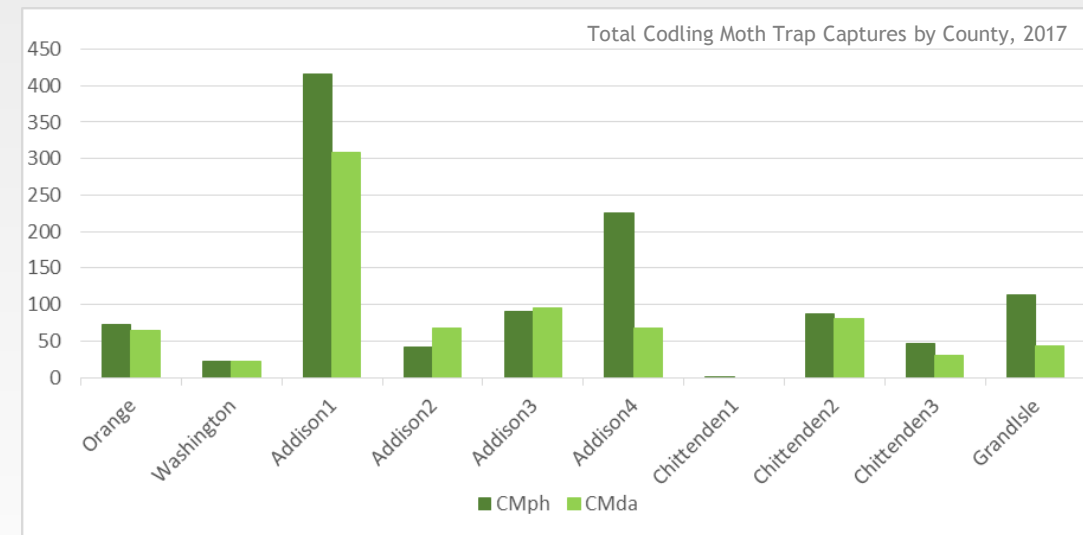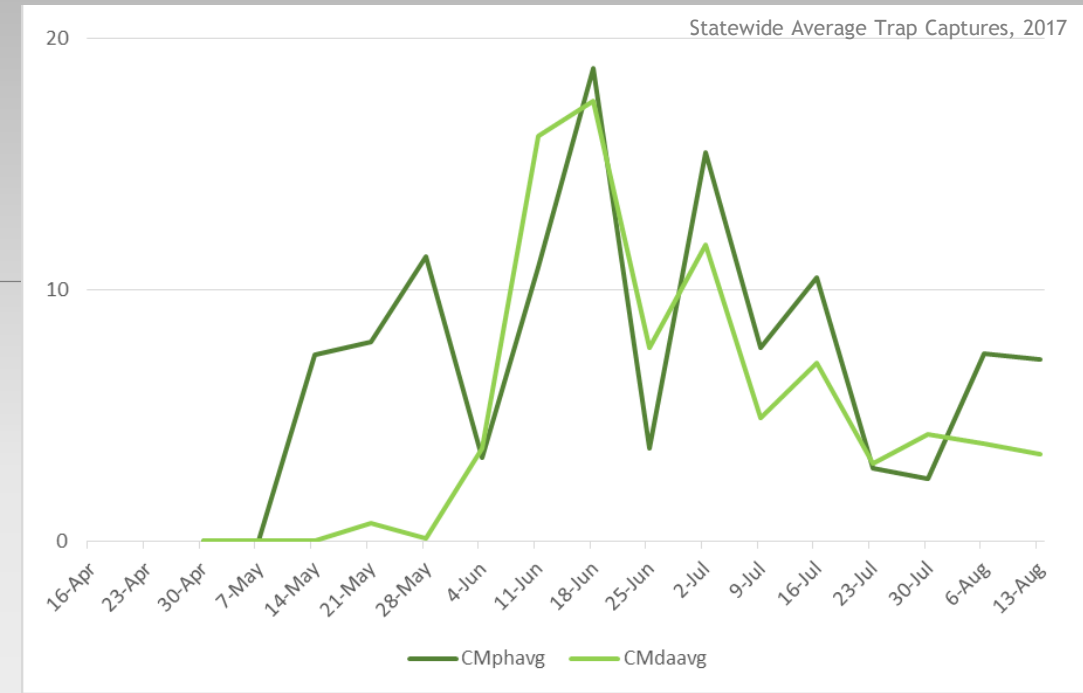
Total Trap Captures over Season by County

- Chittenden highest overall
  - SJS (+Addison), Dogwood (+Grand Isle, Addison)

- Washington highest total Leps
  - Including OFM

- Orange notable Fruitlet EAS
  - ~1/3 fruit

- Grand Isle notable AMF
  - Abandoned orchards

Total Trap Captures by County, 2017 *

Legend:
- TPB
- EAS
- OFM
- RBLR
- CMph
- CMda
- LAW
- TABM
- OBLR
- Dogwood
- SJS
- AMF
- FruitletPC
- FruitletTPB
- FruitletEAS
- FruitletCM
- FruitletLR
- Foliage Mites/leaf
- Foliage STLM/leaf

* TPB, EAS, AMF average

* Addison and Chittenden average

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First Trap Capture or Observation

First Trap Capture or Observation by County, 2017

- Counties with pest in the first week found
  - Out of 17 traps/observations
    - No CMda, SJS (delayed measurement)

- As expected, now with data!
  - Addison → Chittenden → Grand Isle → Central
    - 40% of traps or observations first in Addison (if in Addison at all) at least a week before anywhere else (EAS, OFM, LAW, AMF, FruitletCM, FruitletLR)
    - 20% of traps or observations first in Addison/Chittenden (if in either at all) at least a week before anywhere else (CMph, TABM, FruitletEAS)
    - Mites observed first in Orange/Washington at least a week before anywhere else

- 1-3 week spread
  - Likely dependent on when during week measured
    - OFM, CMph, LAW (3 week); EAS, Dogwood (2 week)

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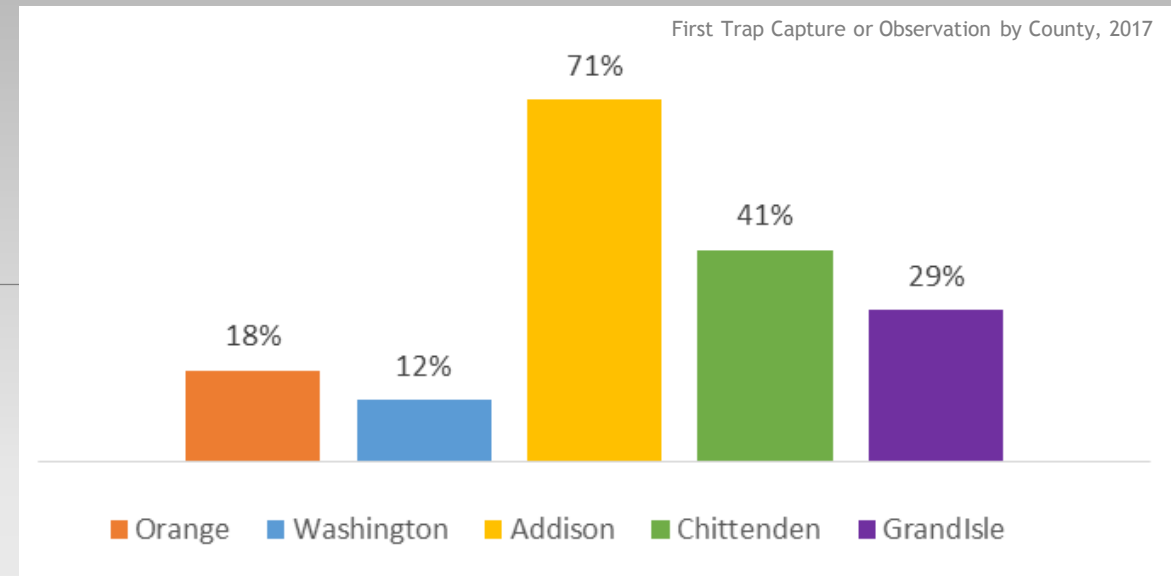
Next Phase

- Three 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

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Thank you

- UVM Apple Program
- Crop Production Services, Addison, VT
- Vermont Agriculture Experiment Station
- USDA NIFA CPPM #VTN29202
- UVM Agricultural Risk Management and Crop Insurance Education Program *RM17RMETS524005*