Grape Root Borer and Vineyard Management

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Who am I?

Image Credit: Russ Ottens, University of Georgia, Bugwood.org

Image Credit: University of Georgia, Bugwood.org

Why IPM (Integrated Pest Management)?

Where is it Damaging my Plant?

H.C. Ellis, University of Georgia, Bugwood.org

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IPM System

REDUCE RISK…..

Pest outbreaks & disease epidemics

Environmental contamination

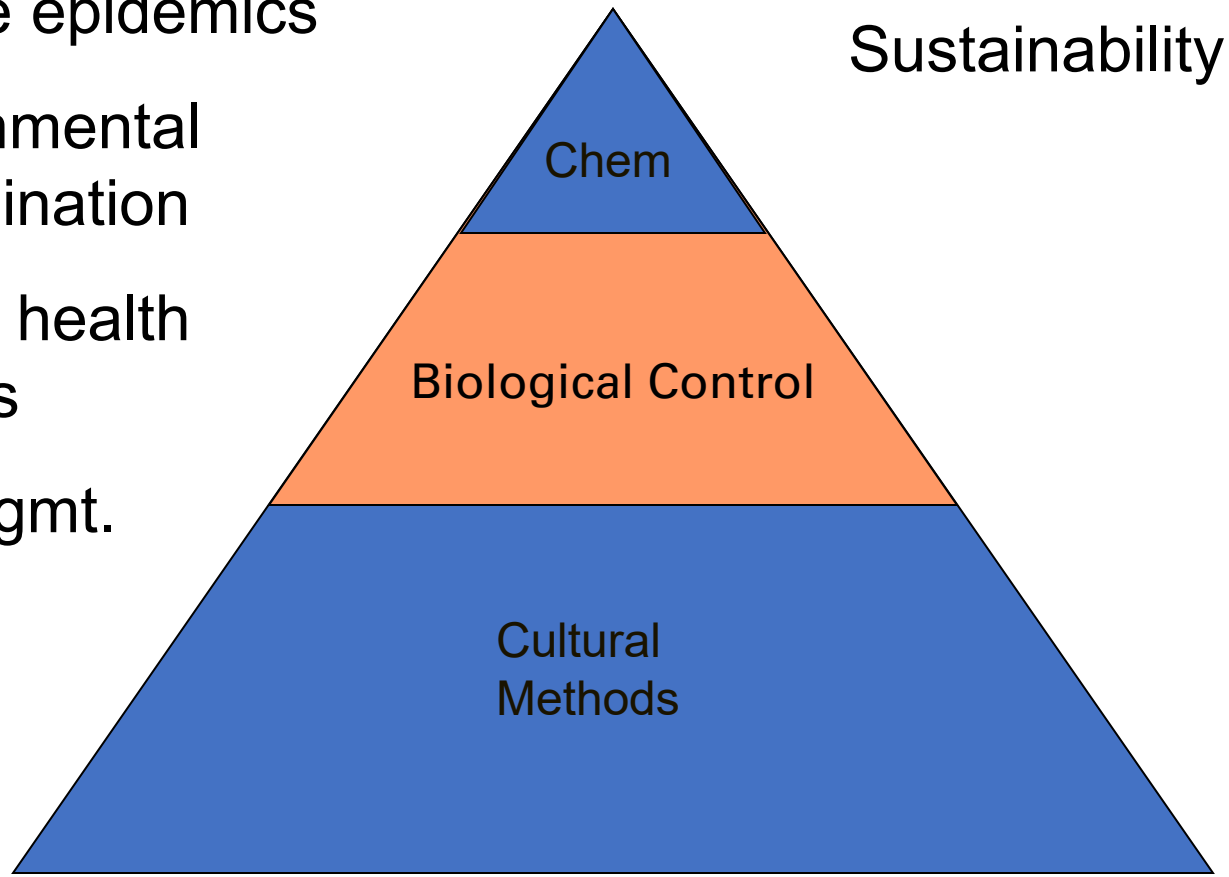
Human health hazards

Pest mgmt. costs

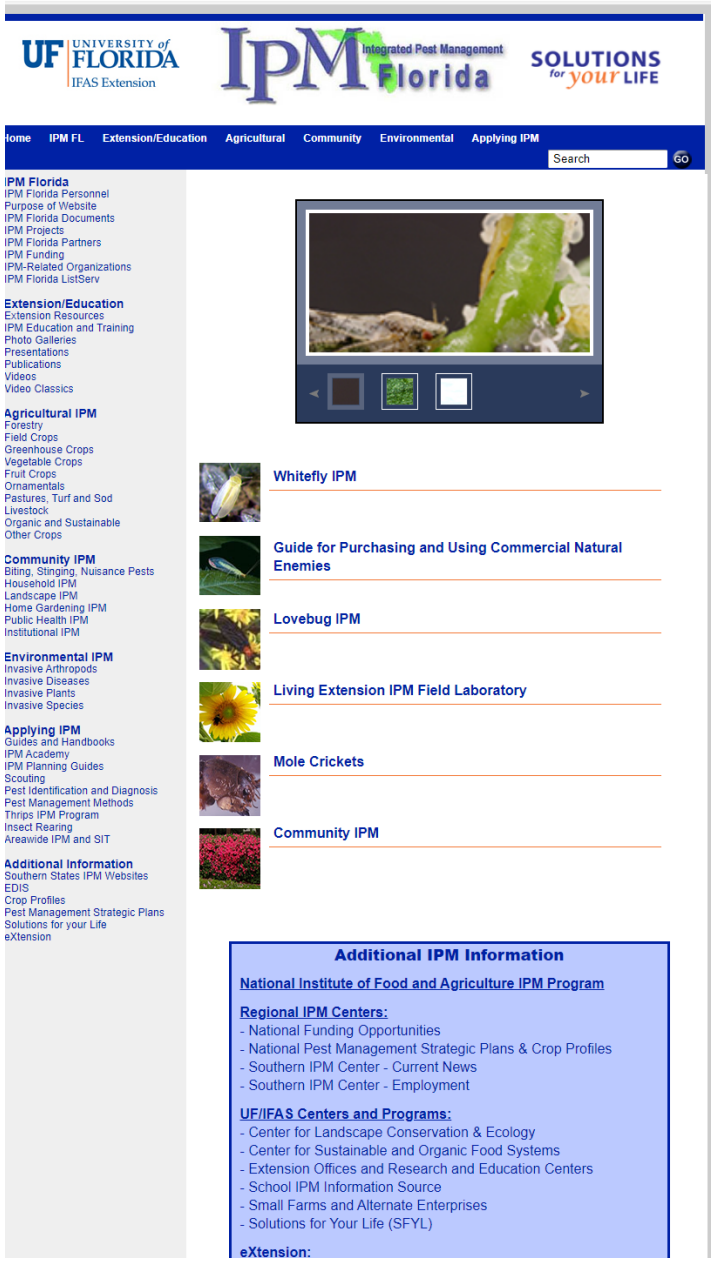
INCREASE…

Reliability

Sustainability



Slide modified from IPM Florida, Dr. Norman Leppla



IPM Resources-
IPM Florida (ufl.edu)

EDIS Publications
Ask IFAS - Powered by EDIS (ufl.edu)

UF/IFAS News
UF/IFAS News - (ufl.edu)

UF/IFAS Pest Alert
UF/IFAS Pest Alert - UF/IFAS Pest Alert (ufl.edu)

UF/IFAS BRE Lab
UF Biosecurity Research & Extension Lab (ufl.edu)

UF/IFAS Small Fruits and Vegetable IPM Lab
Welcome to the Fruit & Vegetable IPM Lab at The University of Florida! (ufl.edu)

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Preparation for grape root borer – 2020

Jun 21, 2020 | Written by Blaauw

We are within a few weeks of the anticipated initial emergence of grape root borer (GRB) adults in North Georgia. If you are planning on implementing mating disruption as a management tactic for GRB and you haven't deployed your pheromone dispensers/ties, now is the time to get those distributed.

If you are unfamiliar with grape root borer (pictured above), GRB is a clearwing moth with larvae that tunnel into the larger roots and crown of grape vines and feed below the soil surface. Symptoms of infested vines include poor growth and fruit set, and potentially complete root girdling and vine death. As such grape root borer is a significantly destructive vineyard pest in southern grape production.

Adult GRB are day flying moths that are reddish brown in color and resemble paper wasps, particularly when flying. The adults generally emerge early July, mate, and then the females lay eggs on the soil surface, leaves, and weeds within eight days emerging. The eggs hatch in approximately two weeks and larvae immediately tunnel into the soil in search of grape roots. The larvae are cylindrical, cream-colored with a brown head, and 1.5 inches long when mature. The larvae spend nearly two years feeding within the roots. During the summer of the second year, larvae will pupate near the soil surface before emerging as adults.

Grape root borer monitoring trap.

Because the adults and the larvae often go unnoticed until the vine begins to decline, management can be a little tricky. Fortunately, GRB adults can be monitored using a simple bucket trap and pheromone (pictured above). Traps and pheromone can be purchased from sites like Great Lakes IPM* and assembly instructions can be found here. The abundance of moths captured on a weekly basis can be used to determine both presence of grape root borer in your vineyard and to determine peak activity periods, which will be used to time management activities.

One preemptive management strategy is weed control. Eliminating weeds around the base of vines reduces the sites for egg laying and improves spray coverage for GRB management.

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Monitoring-Identifying the Problem

Seasonal Distribution of GRB (Grape Root Borer) in Muscadine Grapes on Vine Age and Cultivar

- Improve our understanding of seasonality of GRB
- Understand Vine Age Effects
- Understand Cultivar Effects
- Clayton Bania, MS/DPM student

Methods and Materials

2019 to 2020
Lakeridge Vineyard

Pheromone traps were deployed over 65 acres across the vineyard. Traps were checked weekly from deployment to season end.

2019: 5/28-11/5
2020: 3/24-11/15

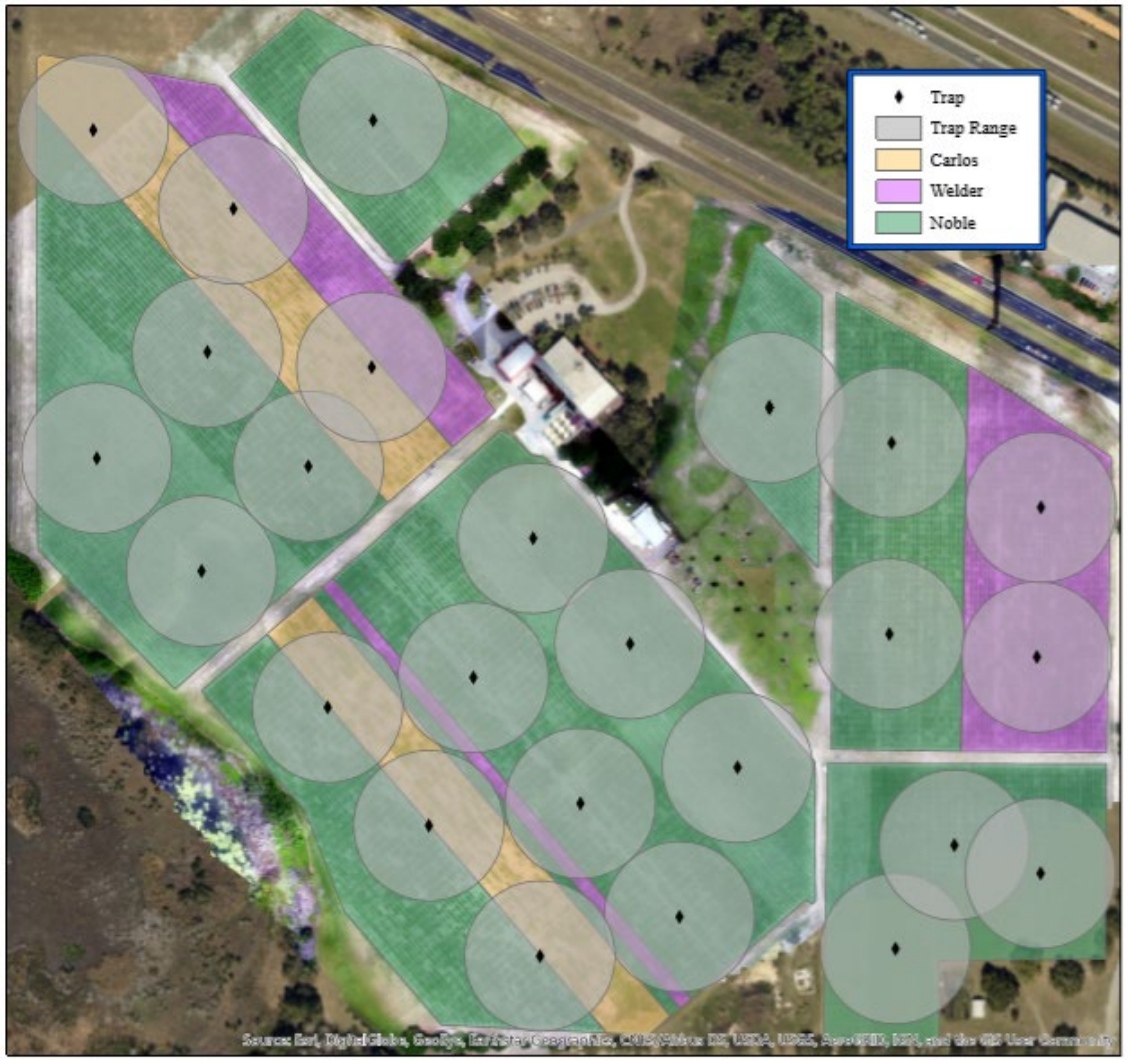
To more accurately define our experiment, the use of GIS software and drone imaging was been used.

2019 Lake Ridge Trap Placement

N

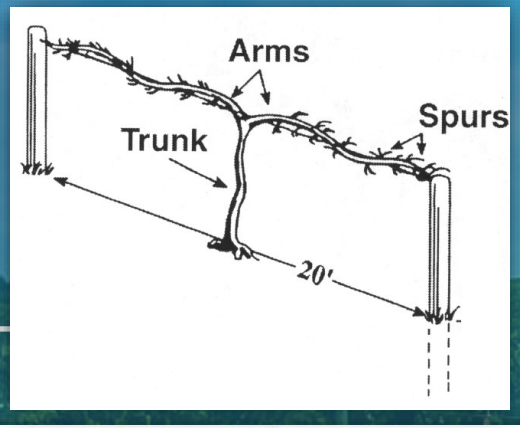
0 0.03 0.05 0.1 0.15 0.2
Miles

2020 Lake Ridge Trap Placement



N

0.05 0.03 0 0.05 0.1 0.15 0.2
Miles



Lures were replaced every 3 weeks.

Insecticide strips were replaced ever 8 weeks.

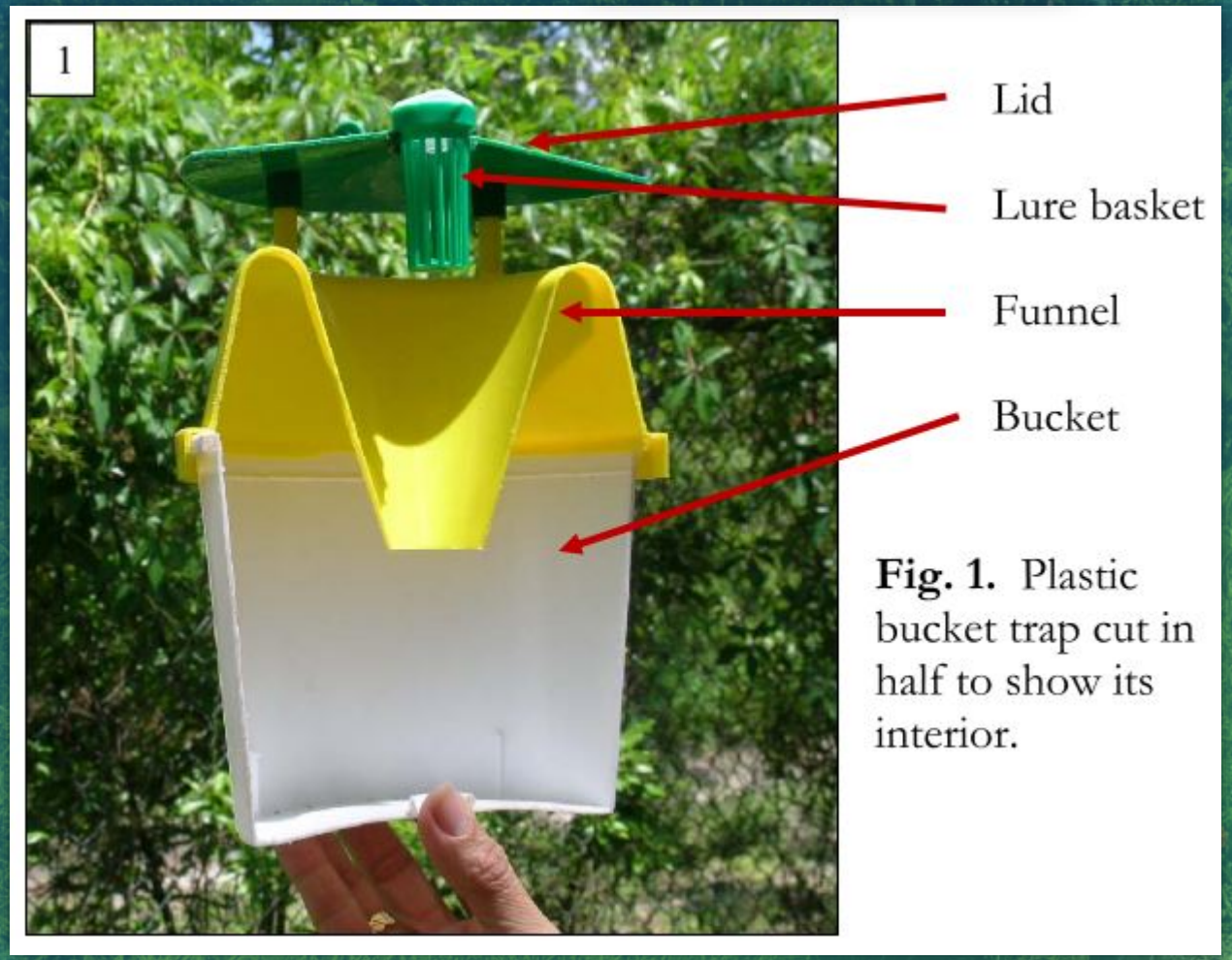
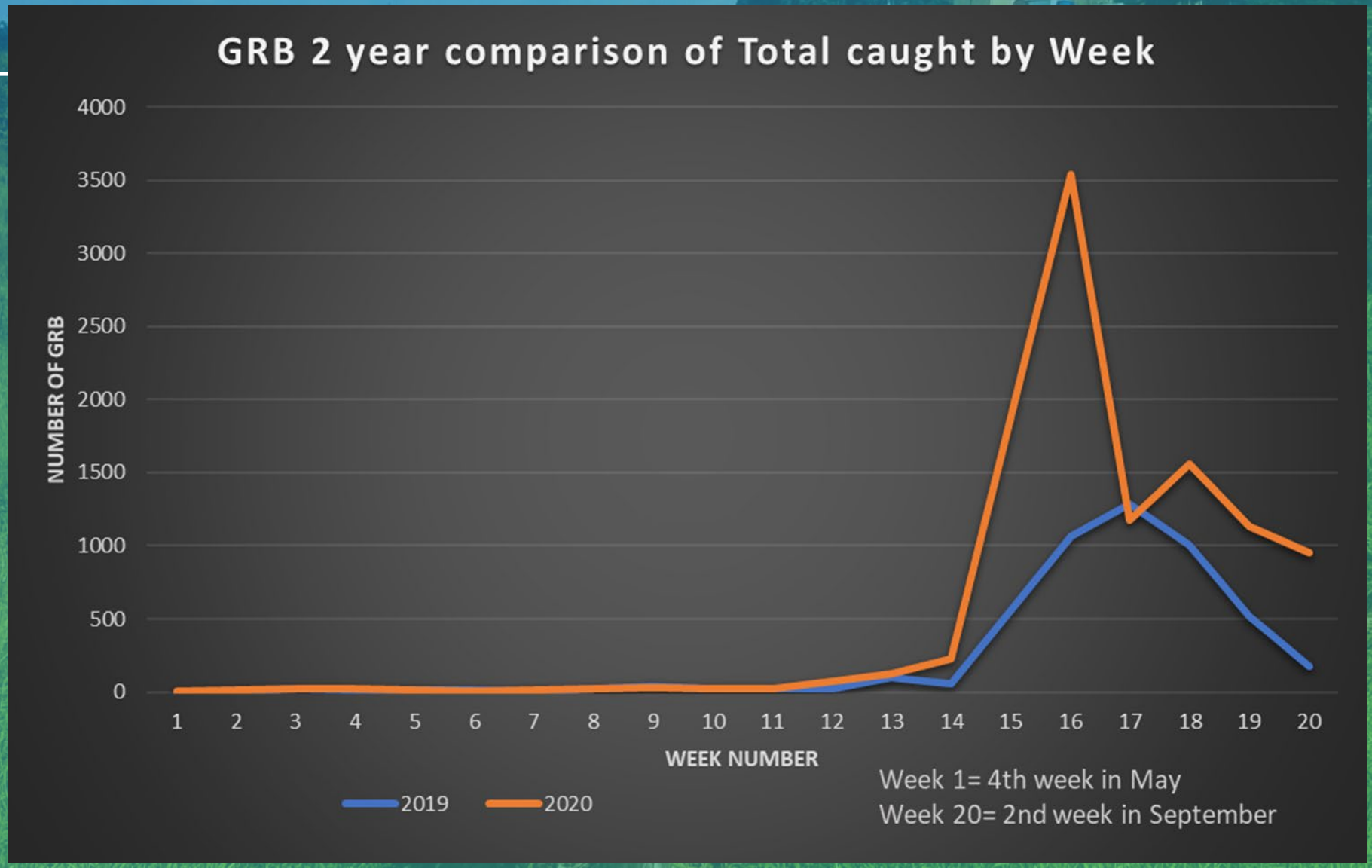
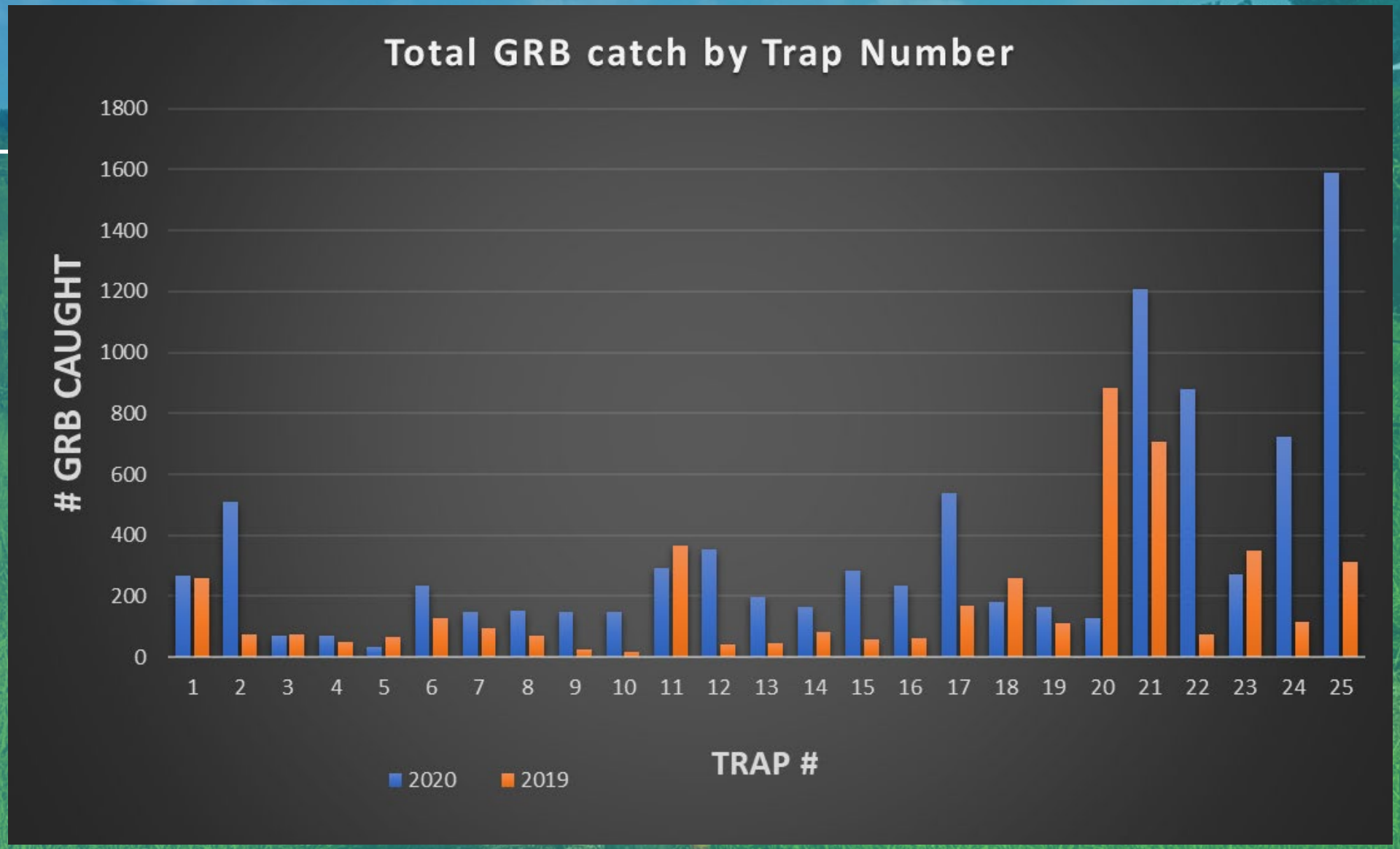


Fig. 1. Plastic bucket trap cut in half to show its interior.

Photo credit: Juliete Brambila USDA APHIS PPQ

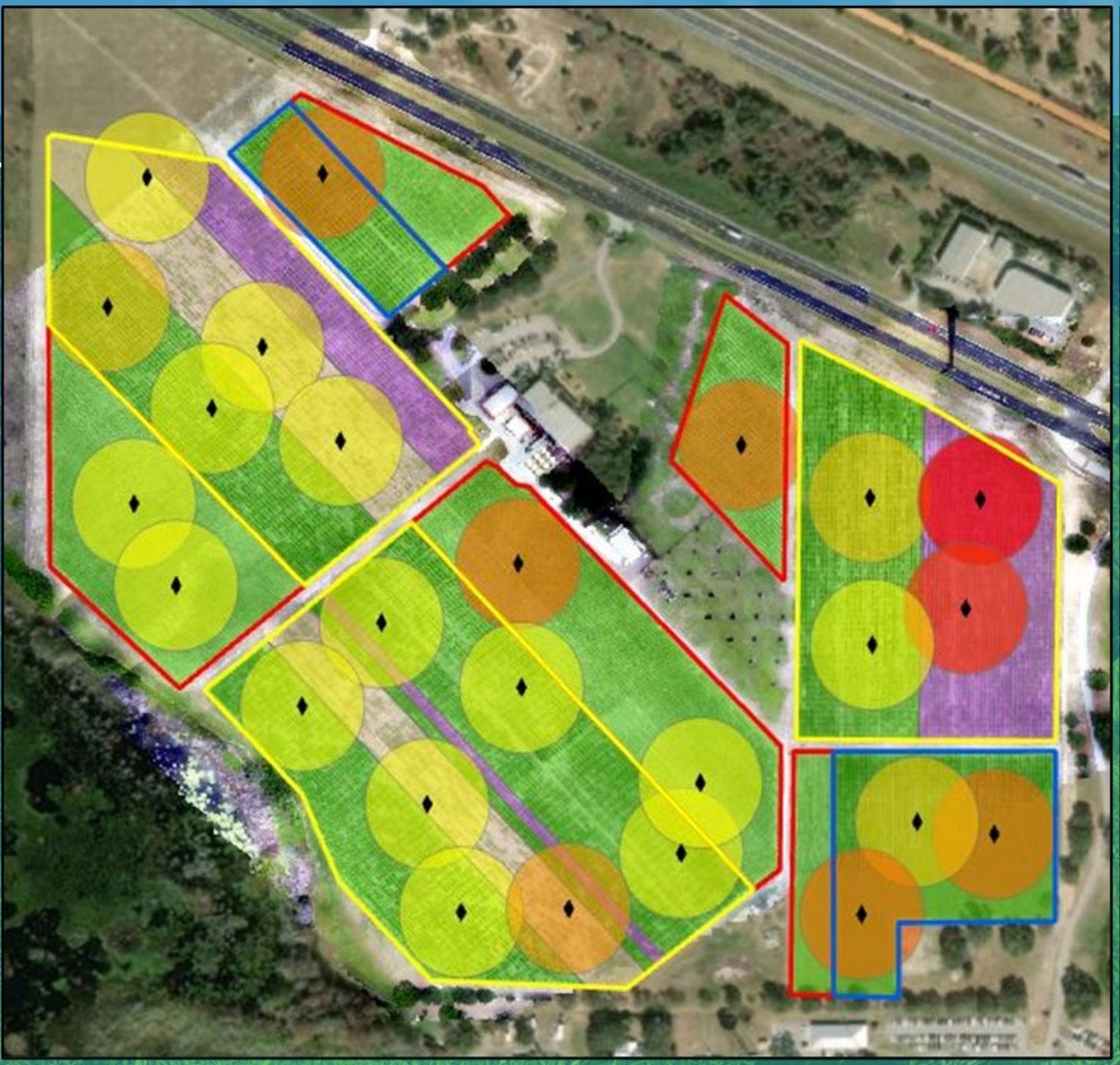
Results and Analysis

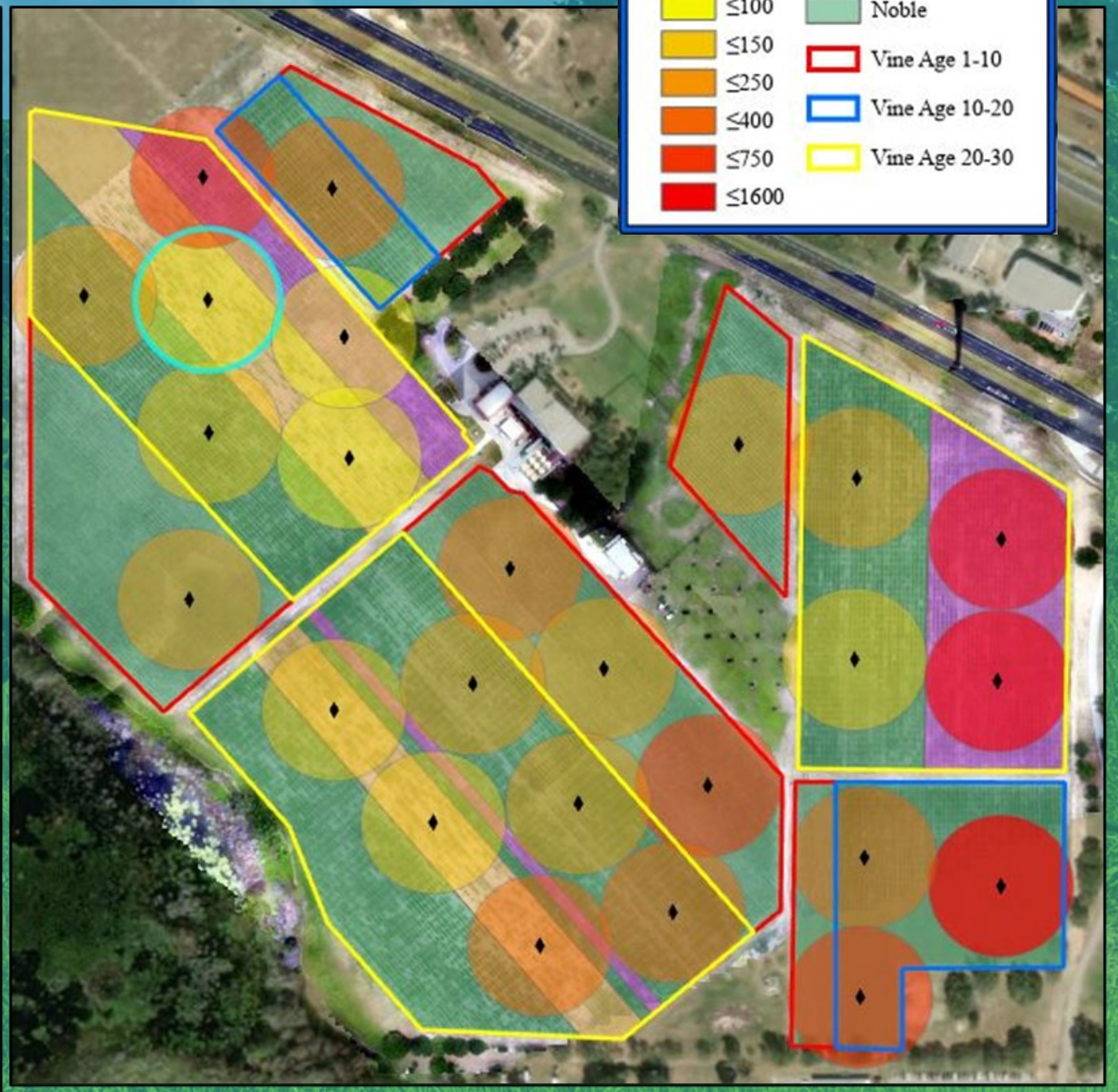


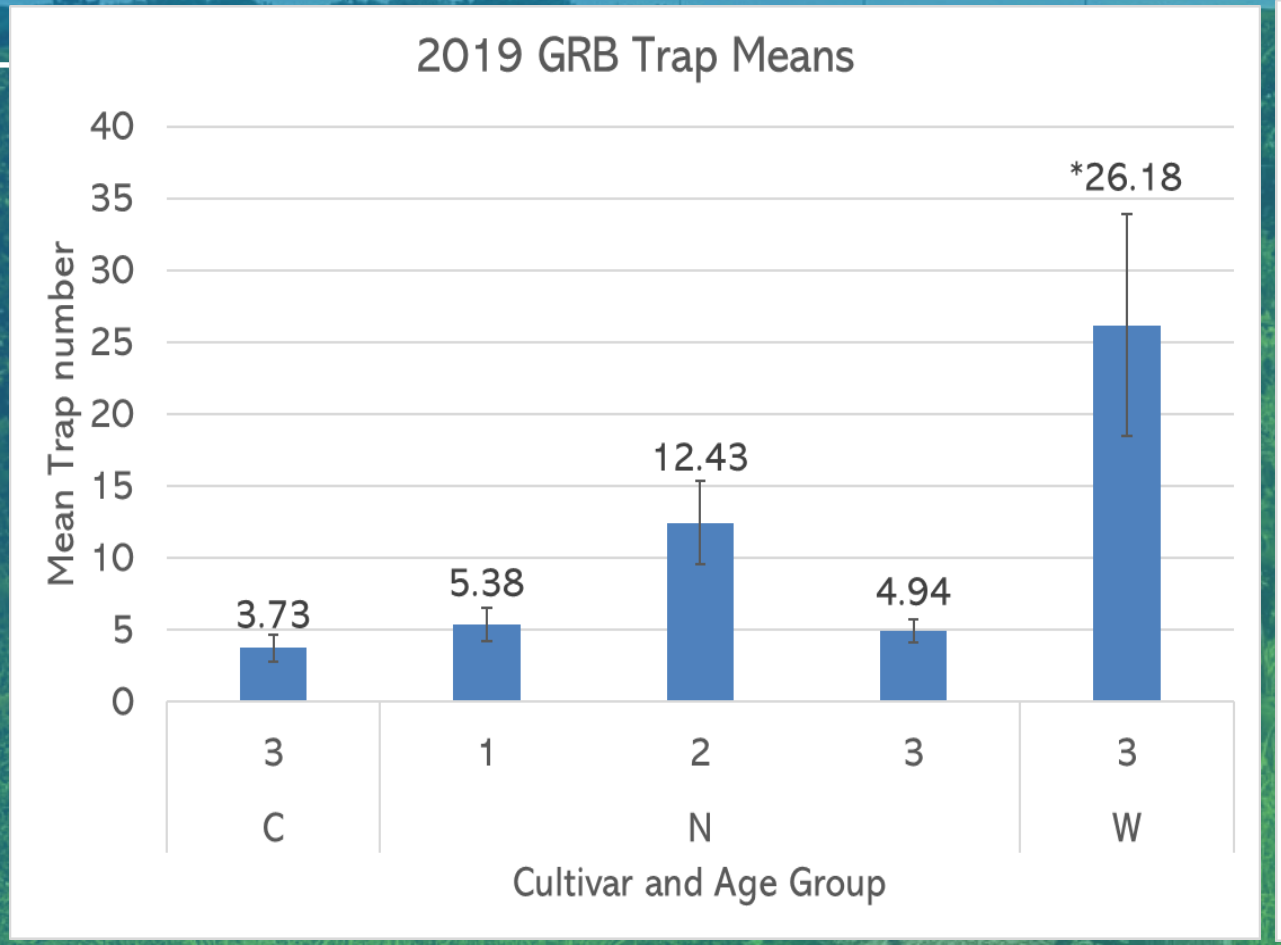

Total GRB catch by Trap Number
GRB CAUGHT
1800
1600
1400
1200
1000
800
600
400
200
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
TRAP #
2020
2019

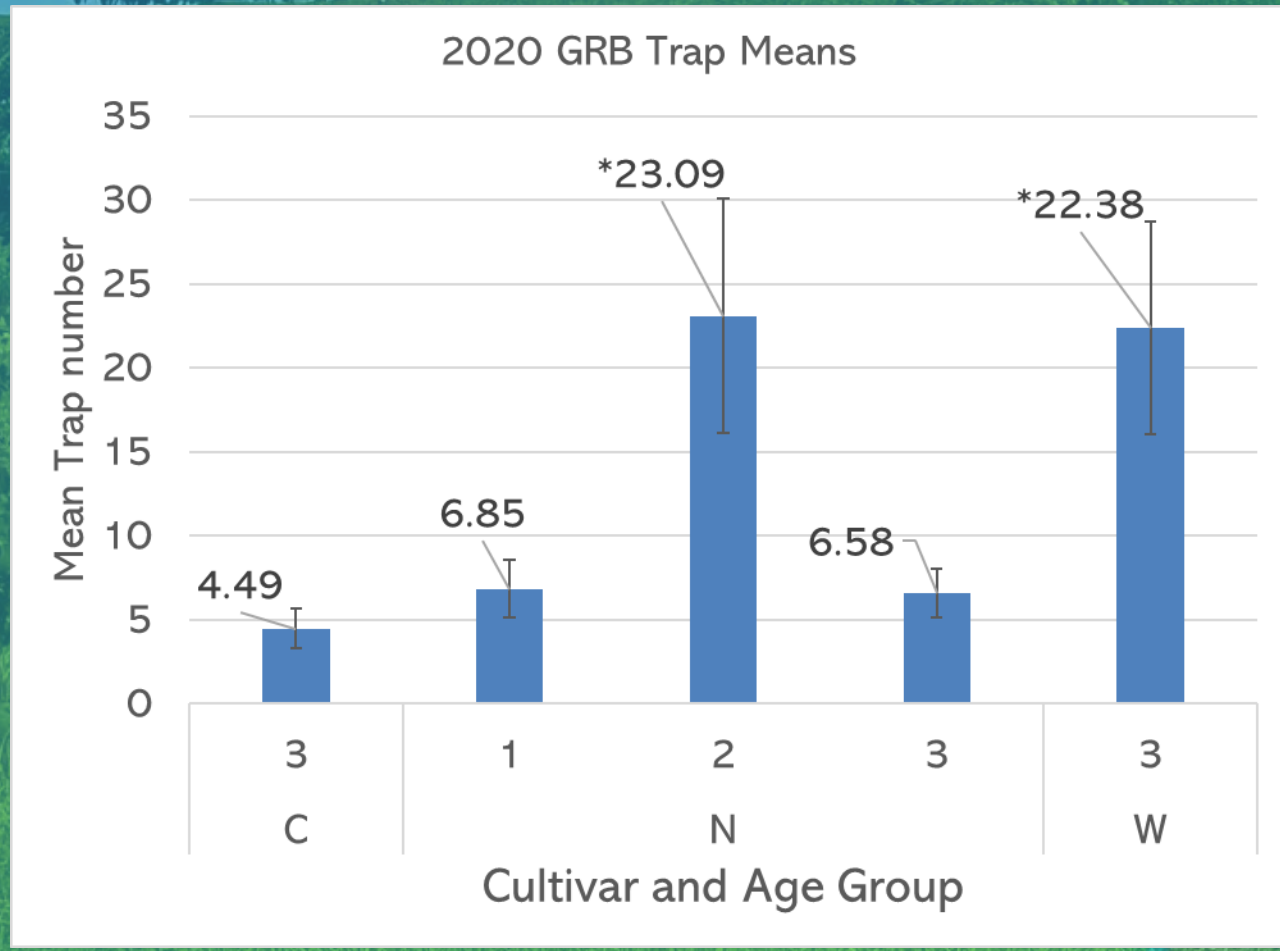
2019 Trap Deployment

2020 Trap Deployment






2019 GRB Trap Means
Mean Trap number
40
35
30
25
20
15
10
5
0
3.73
5.38
12.43
4.94
*26.18
3
1
2
3
3
C
N
W
Cultivar and Age Group


2020 GRB Trap Means
Mean Trap number
35
30
25
20
15
10
5
0
4.49
6.85
*23.09
6.58
*22.38
3
1
2
3
3
C
N
W
Cultivar and Age Group

Recent and Current Studies involving the Grape Root Borer

Mass trapping of Grape Root Borer in a commercial vineyard using pheromone baited bucket traps

Bodies!

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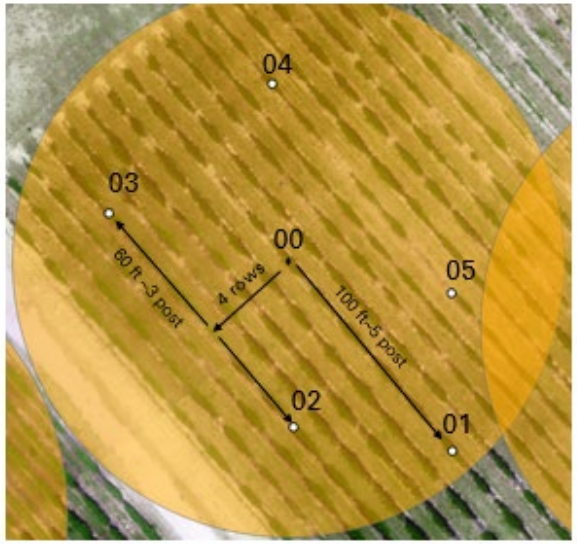
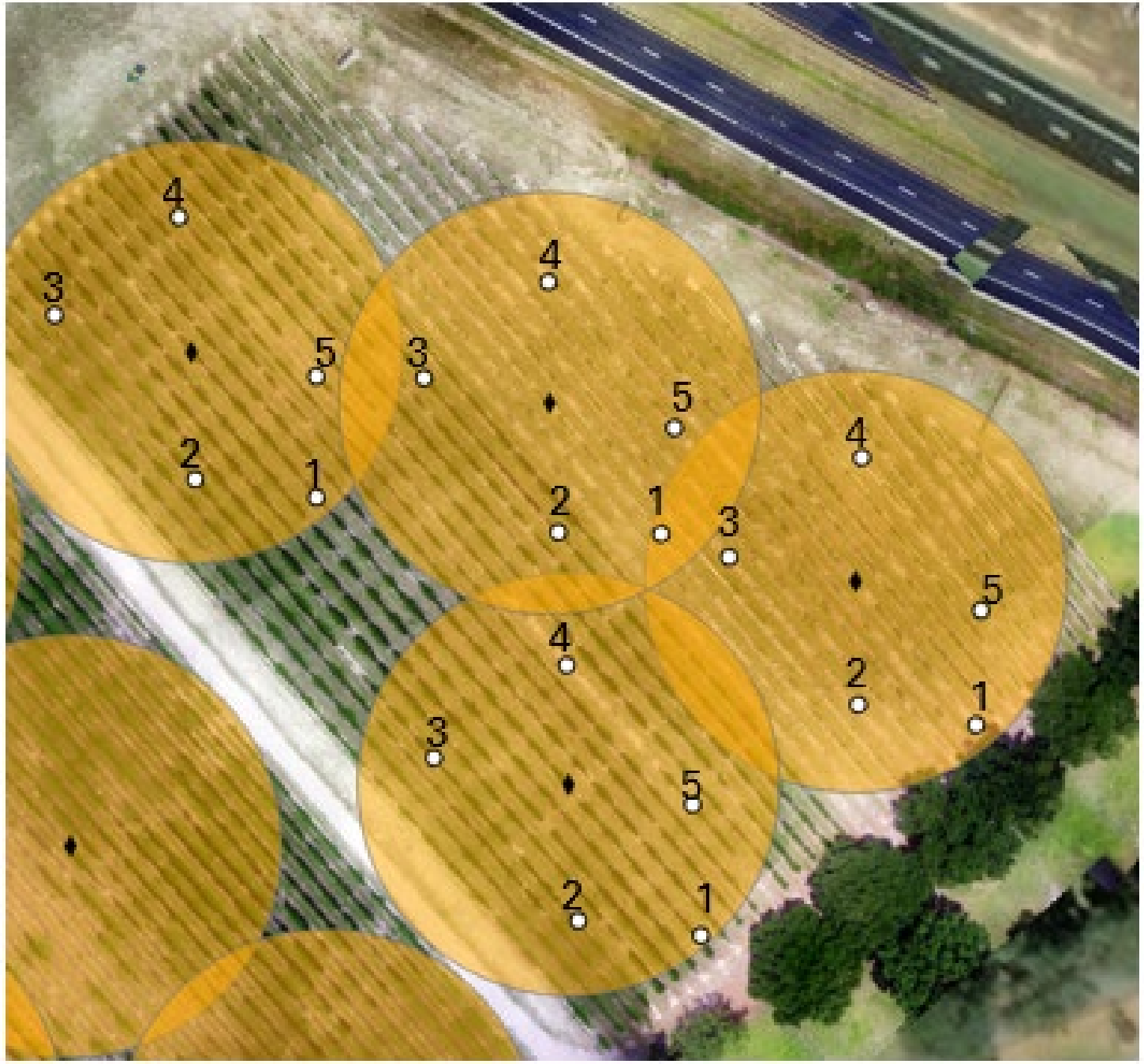
- This study will use 420 traps

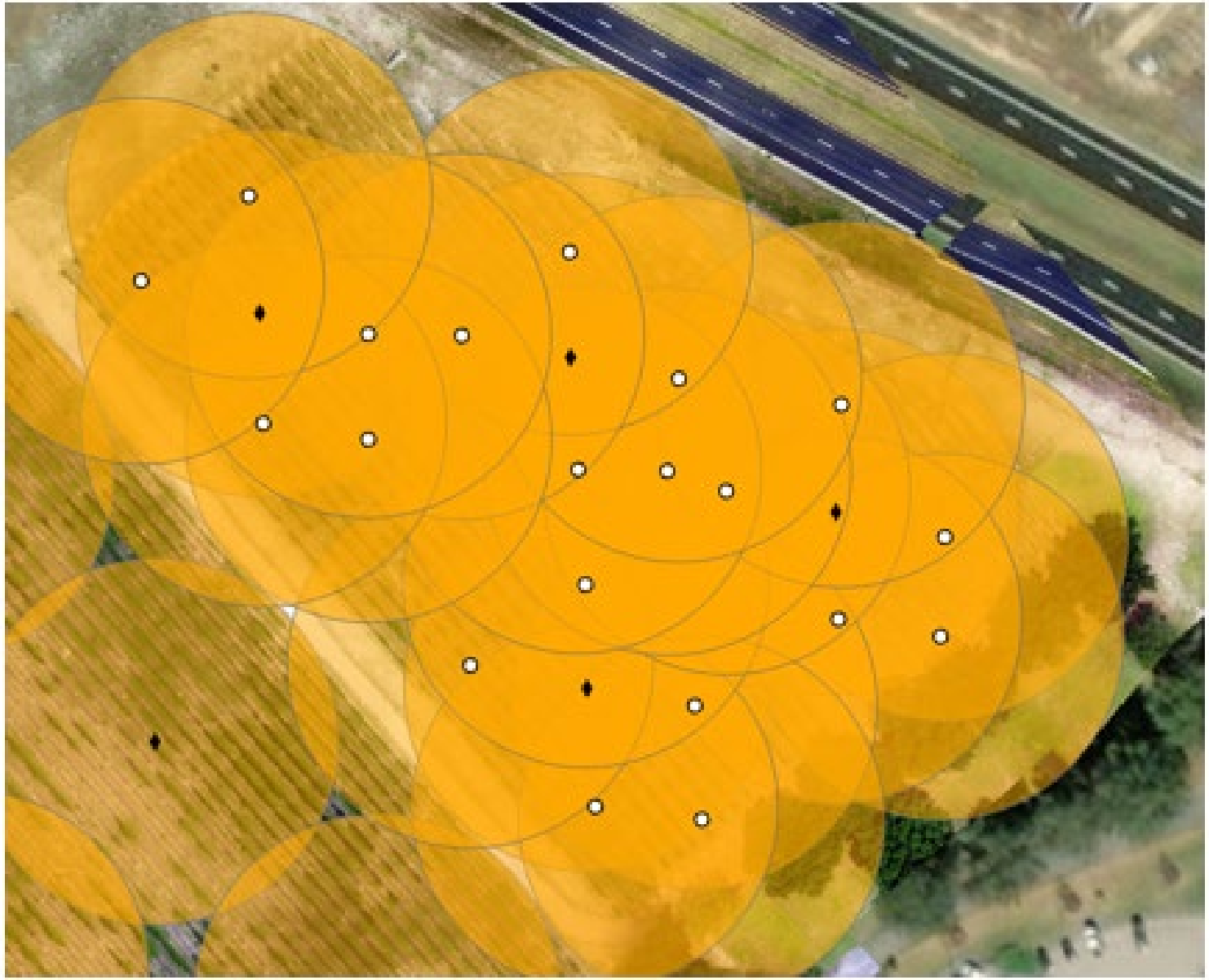
- 70 traps are being monitored for weekly data.
- 8-week deployment
- Insect strips cut into halves and replaced every 8 weeks
- Pheromone lures replaced ever 6-weeks

- **Trap are laid out in 2 stages, the initial 70, followed by 6 sub-traps inside 1 acre area of the original 70 traps.**





A final overlay of all the traps using a 1-acre area range



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Mating Disruption

Image from UGA Extension, and it can be purchased through Helena Chemical
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Pest Management Considerations

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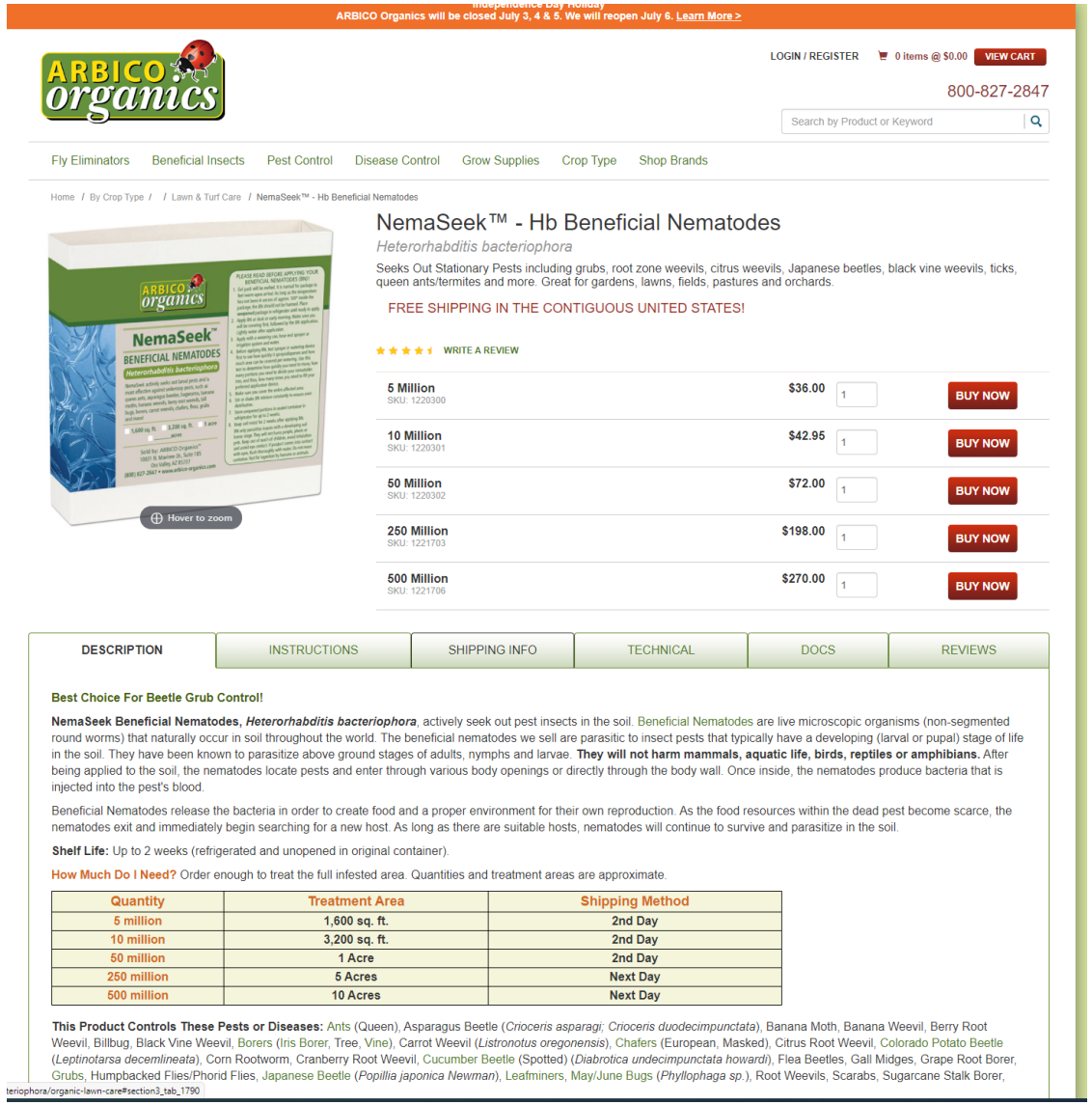
Nematodes?

Image from Arbico Organics

[NemaSeek Beneficial Nematodes - Heterorhabditis bacteriophora (arbico-organics.com)]



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Other Example Efforts in Biological Control

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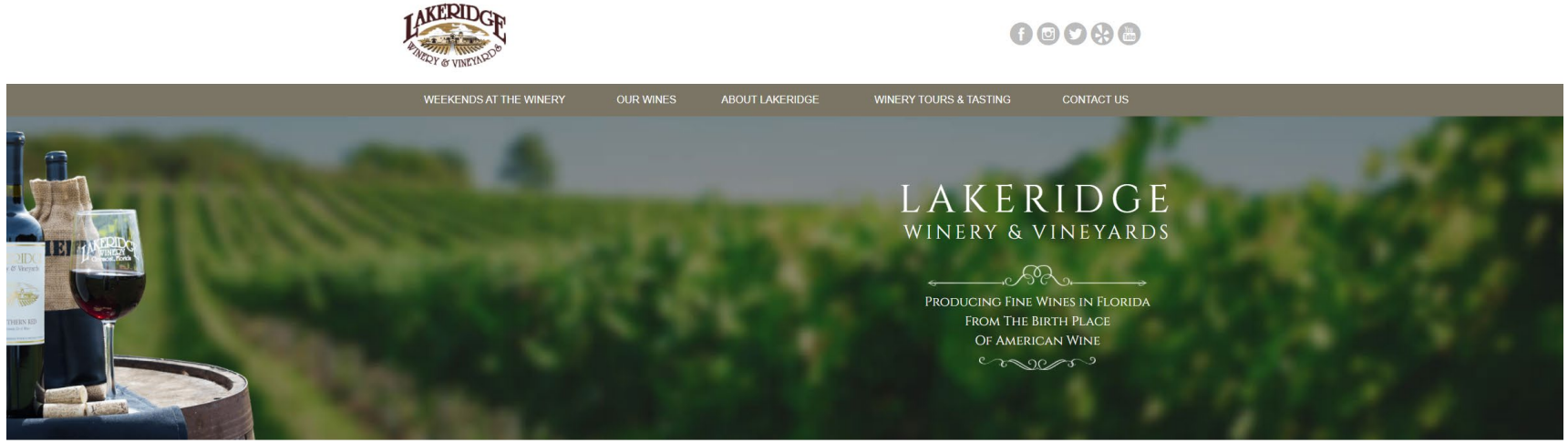
Other Examples in Biological Control

Acknowledgements - Lakeridge Winery



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Questions?

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