



Update on Current Research in Novel Codling Moth Control Tactics

Washington State Tree Fruit Association Annual Meeting (Virtual)

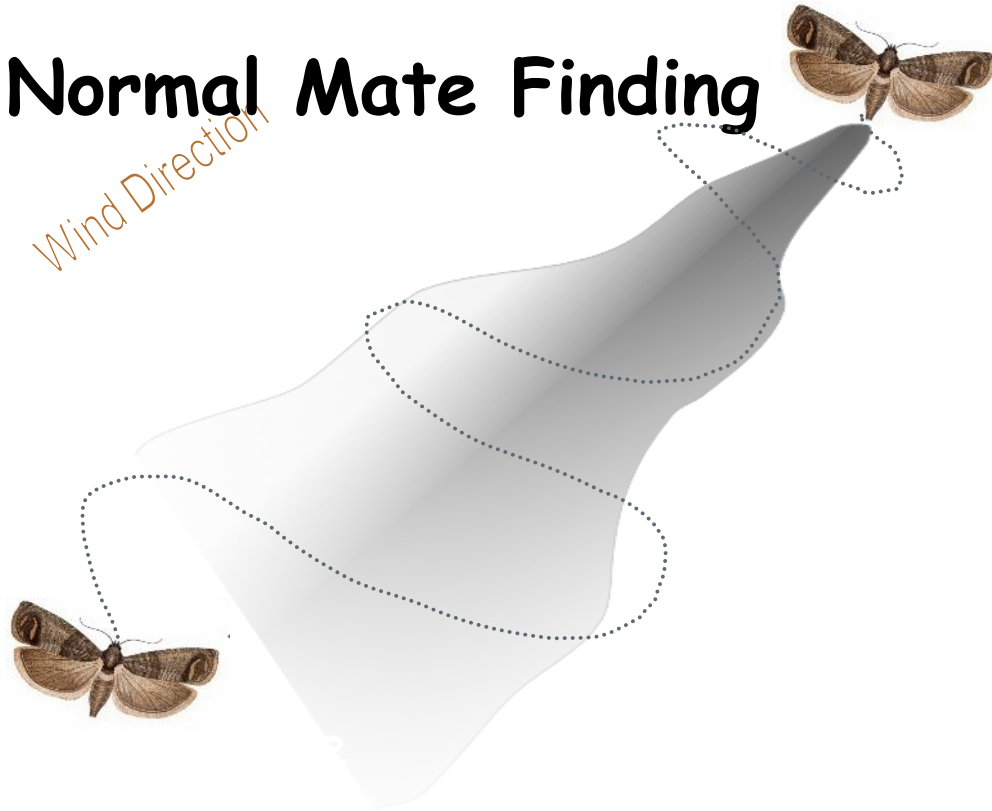
9 December 2020, 10-10:25 am

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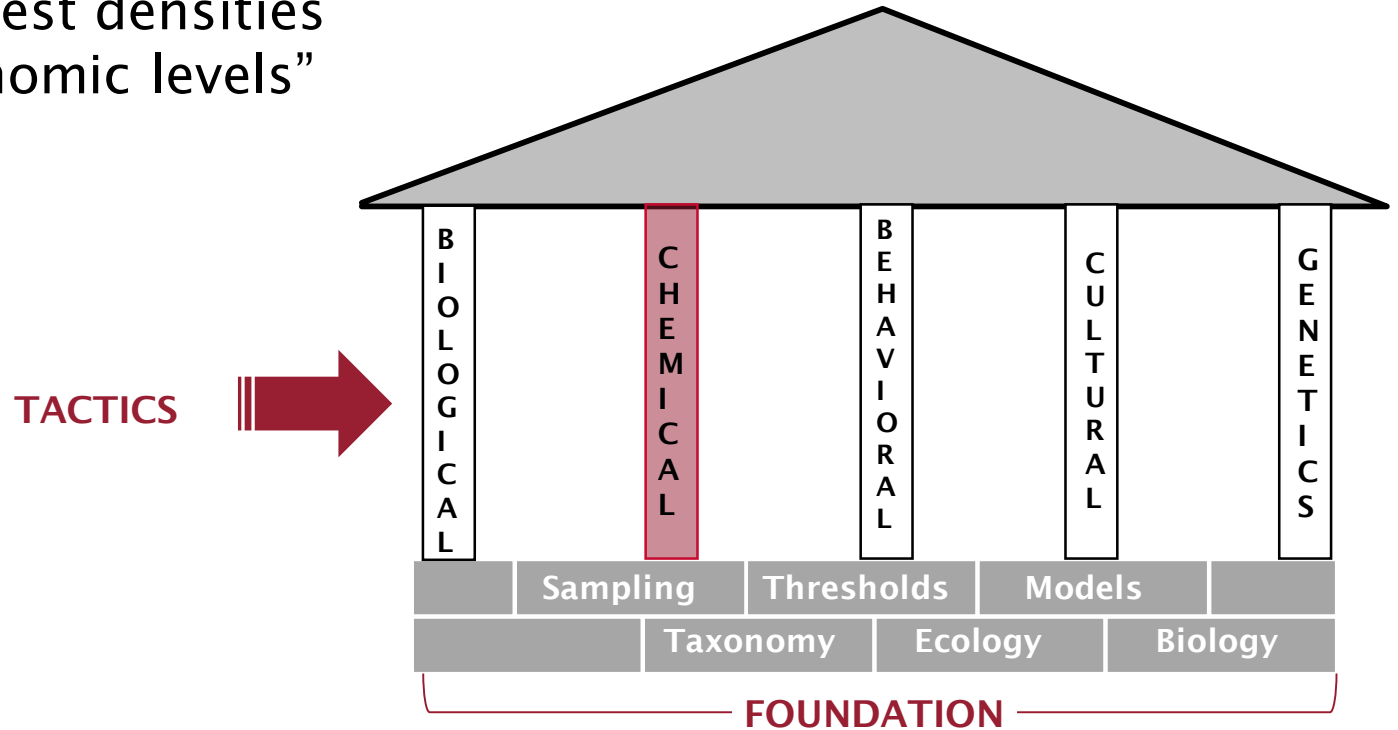
But First: The Basics!

Normal Mate Finding



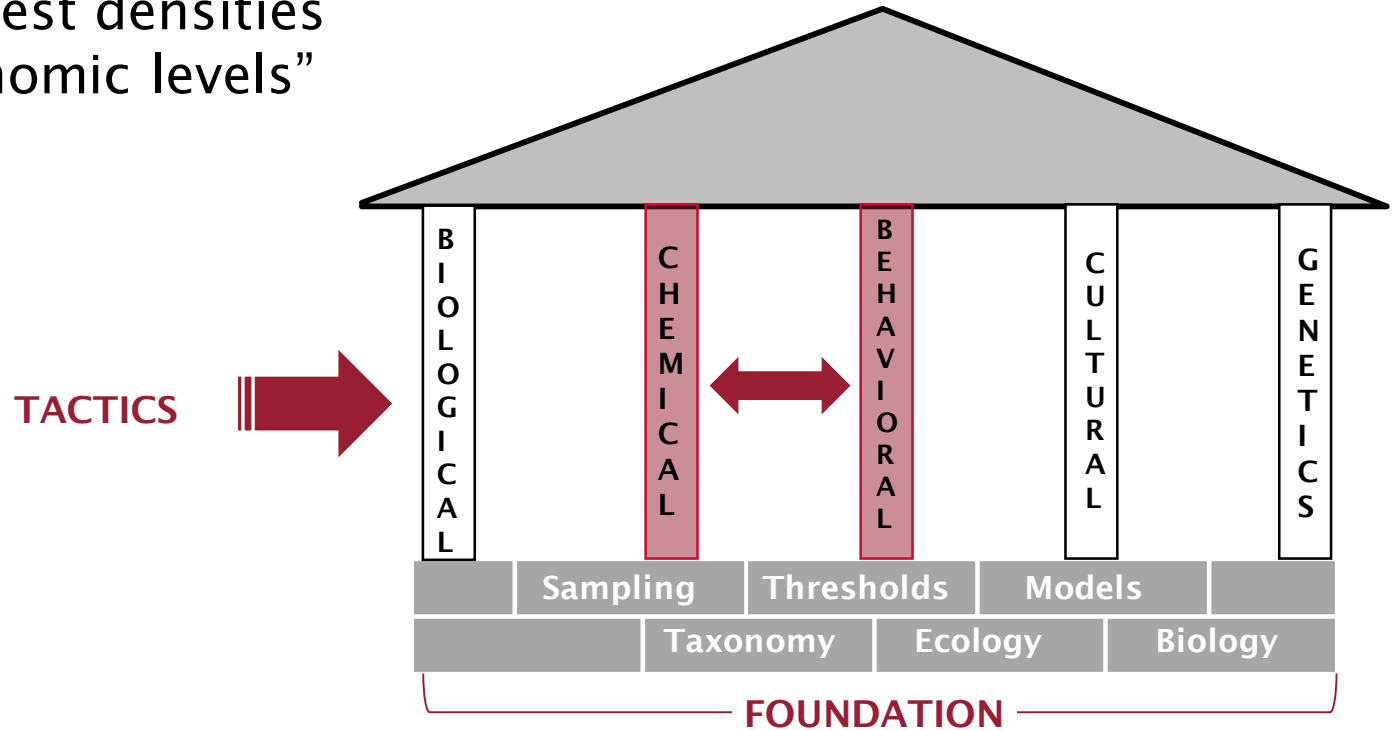
IPM Basics

“The use and integration of multiple tactics to suppress pest densities below economic levels”



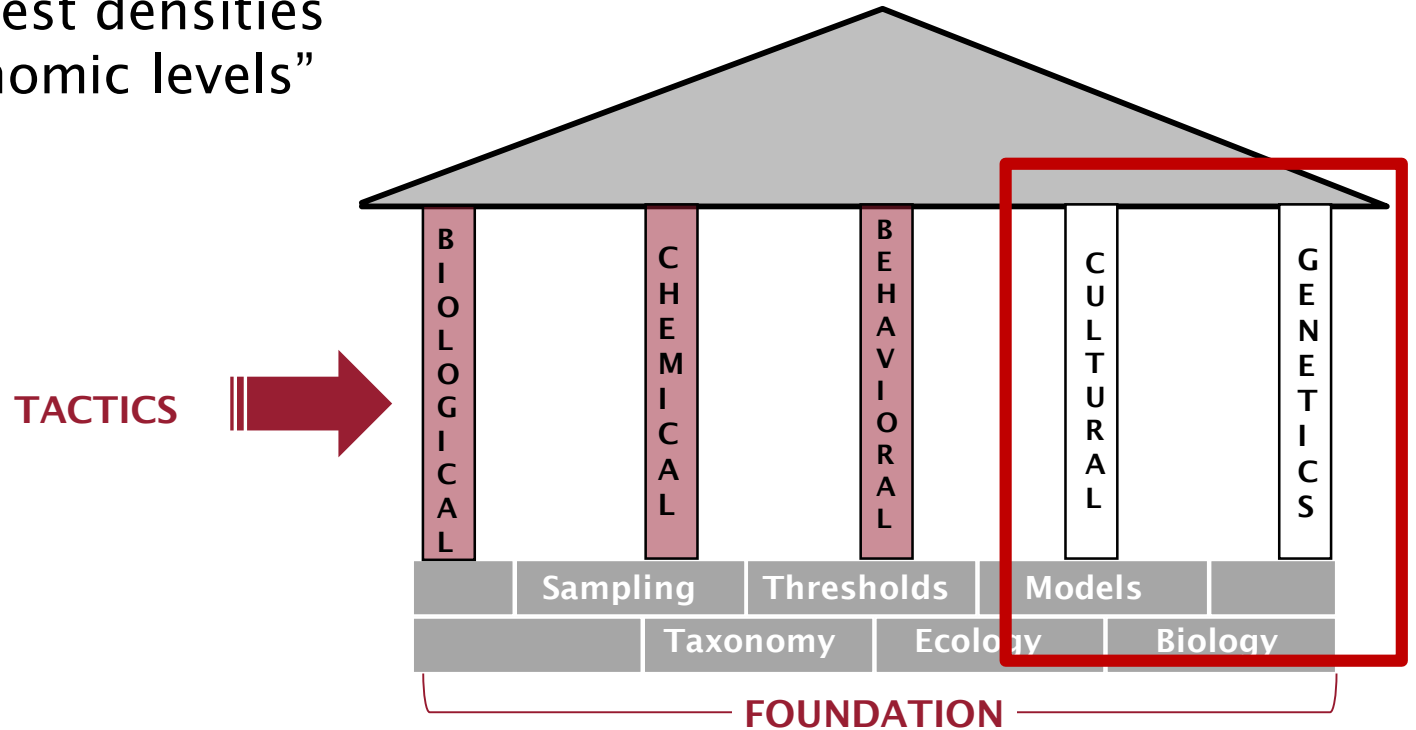
IPM Basics

“The use and integration of multiple tactics to suppress pest densities below economic levels”



IPM Basics

“The use and integration of multiple tactics to suppress pest densities below economic levels”



Cultural Control: Trunk banding/Infested Fruit Removal

Trunk banding:

Treated or not

Corrugated cardboard or cloth

Timing essential!

Fruit removal:

Anytime, but before they leave fruit to pupate

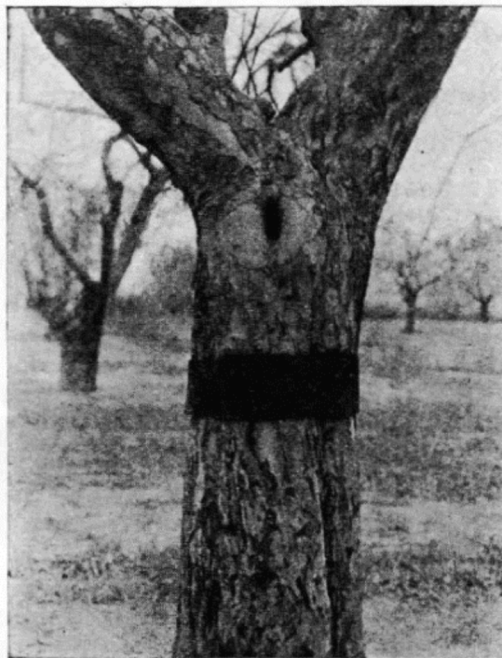
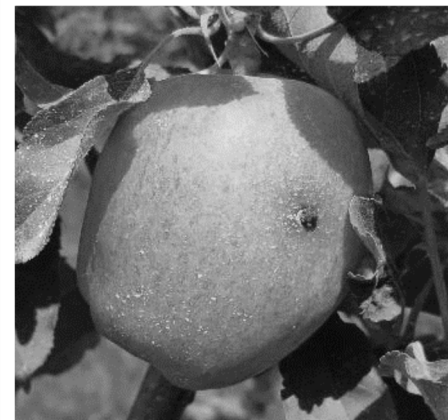


Fig. 3. Tree banded with chemically treated corrugated paper band.



Net Enclosures



- ✓ Minimize heat stress
- ✓ Eliminate overhead cooling
- ✓ Equipment Access
- ✓ Reduces worker exposure to UV and heat stress
- ✓ Excludes vertebrate (birds/deer)
- ✓ Exclude insects

(Kalcsits et al., 2017).

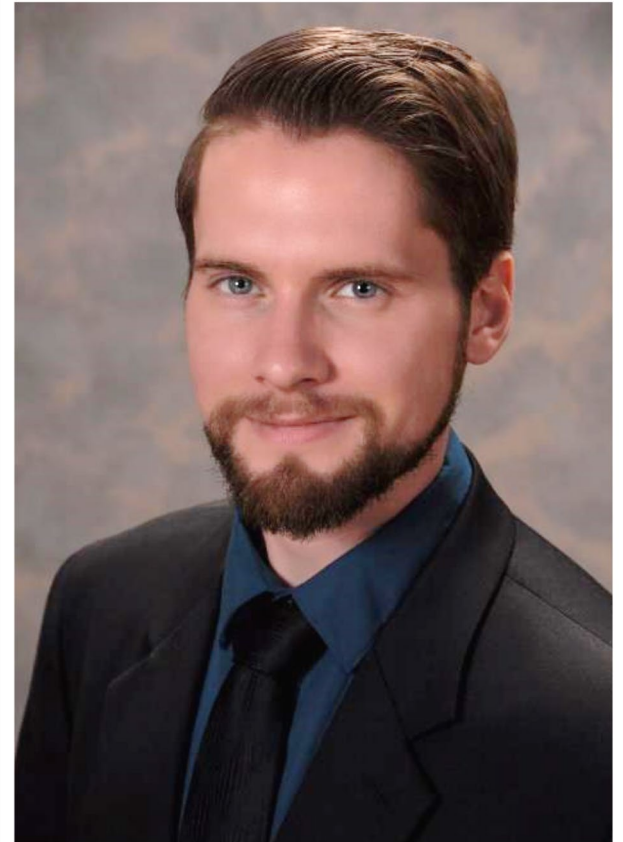
Types of Nets



Net Exclusion Experiments, 2016-2019



Dr. Adrian Marshall



**Net Cage
trials at
WSU Sunrise
Orchard
2015-2019**



Large Cages
4 rows x 12 trees

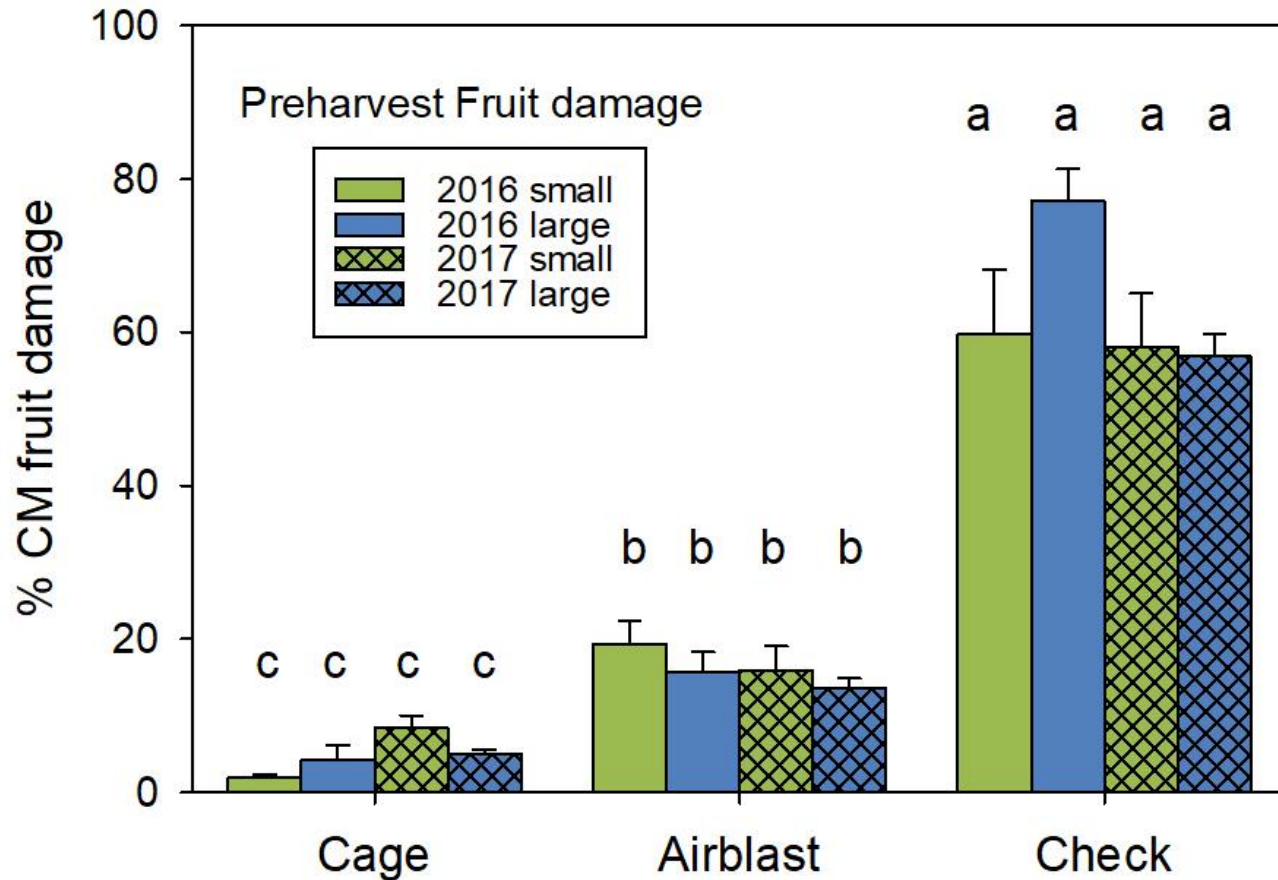
Small Cages
1 rows x 3 trees

Questions about codling moth and nets

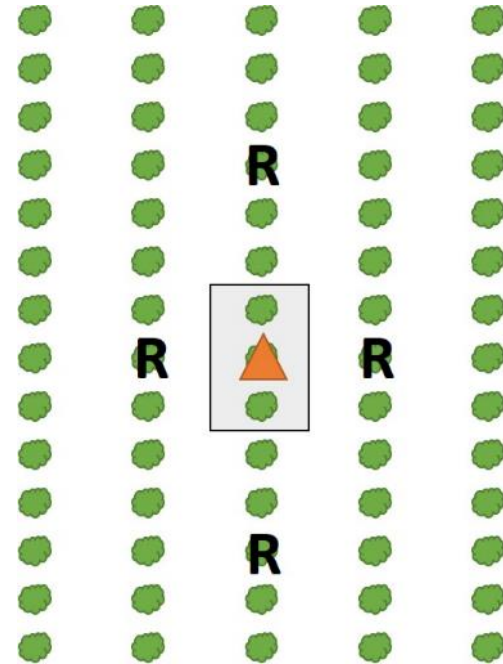
1. Can a full net enclosure keep out wild codling moths?
2. If we release sterile moths inside a net, will they stay there?
3. Is the mechanism physical or behavioral?



Do nets reduce codling moth damage?

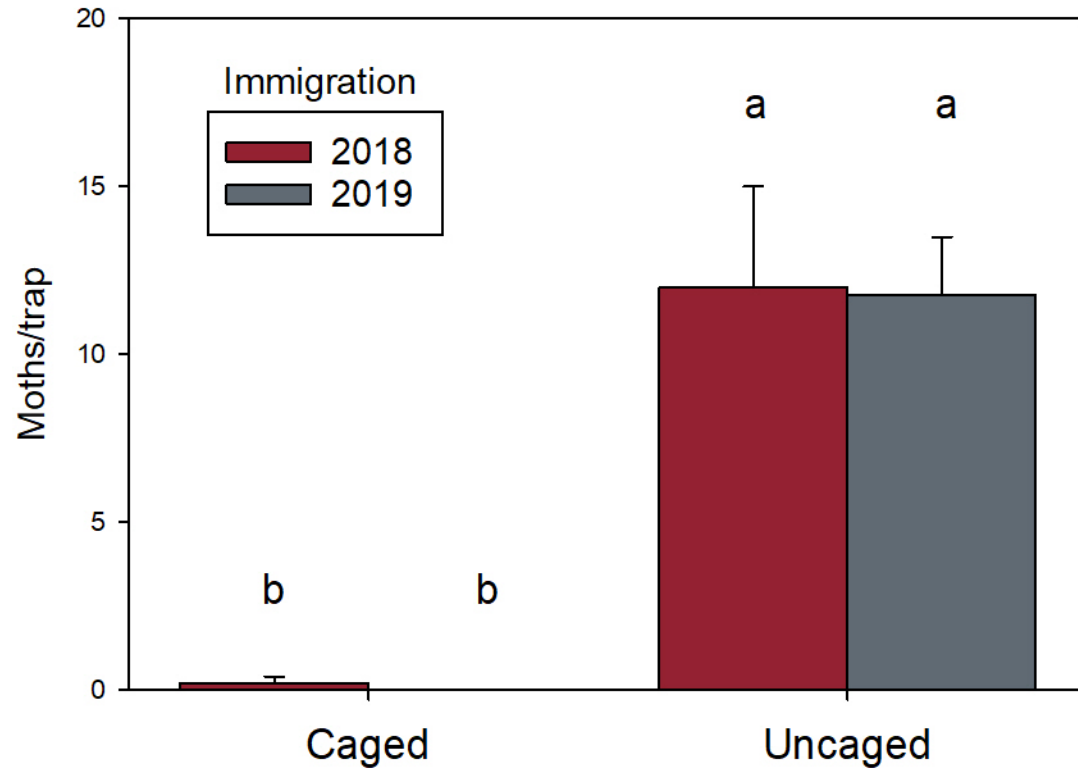


Small cage experiments: do codling moth cross nets?

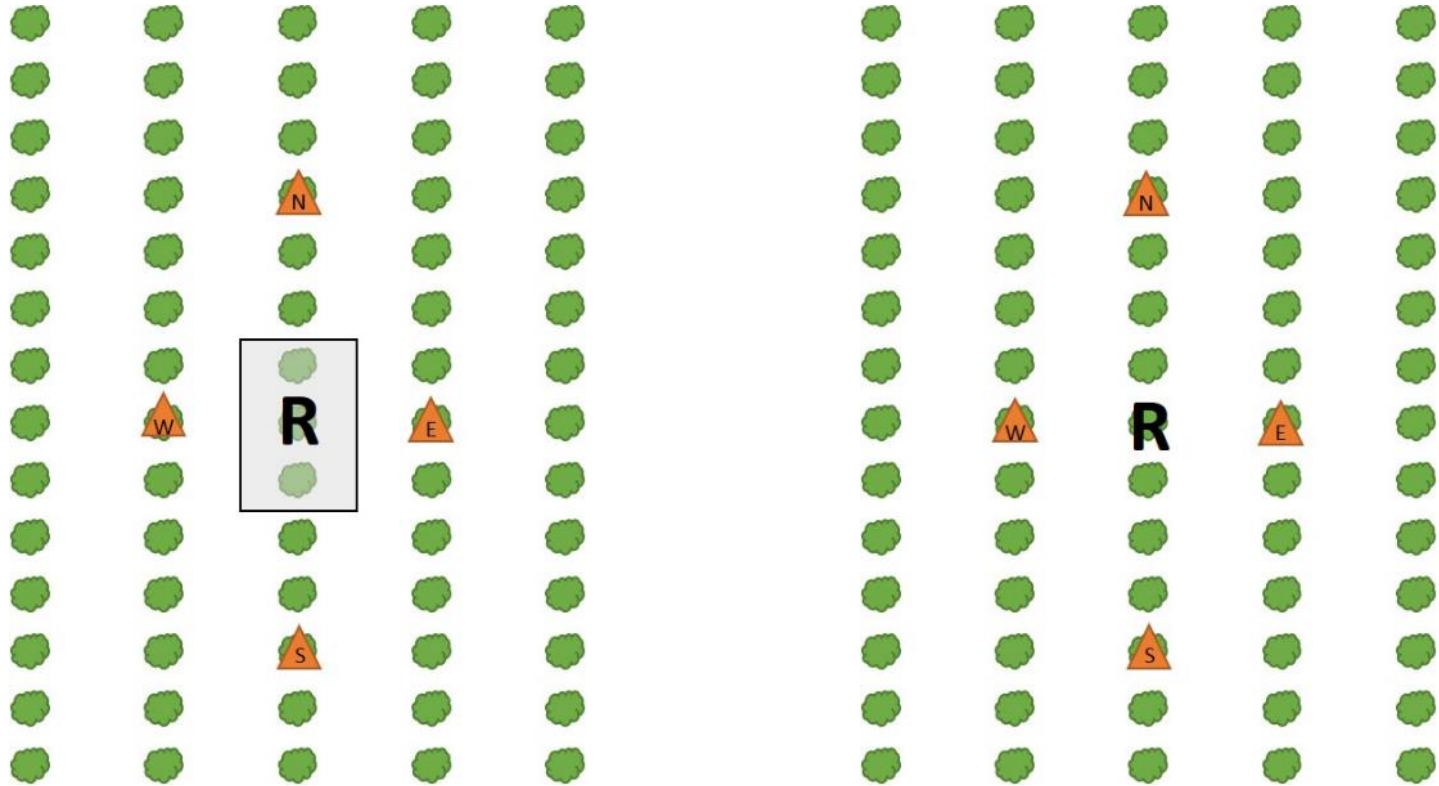


R = Release point

Codling moth immigration: NO, they don't get in!



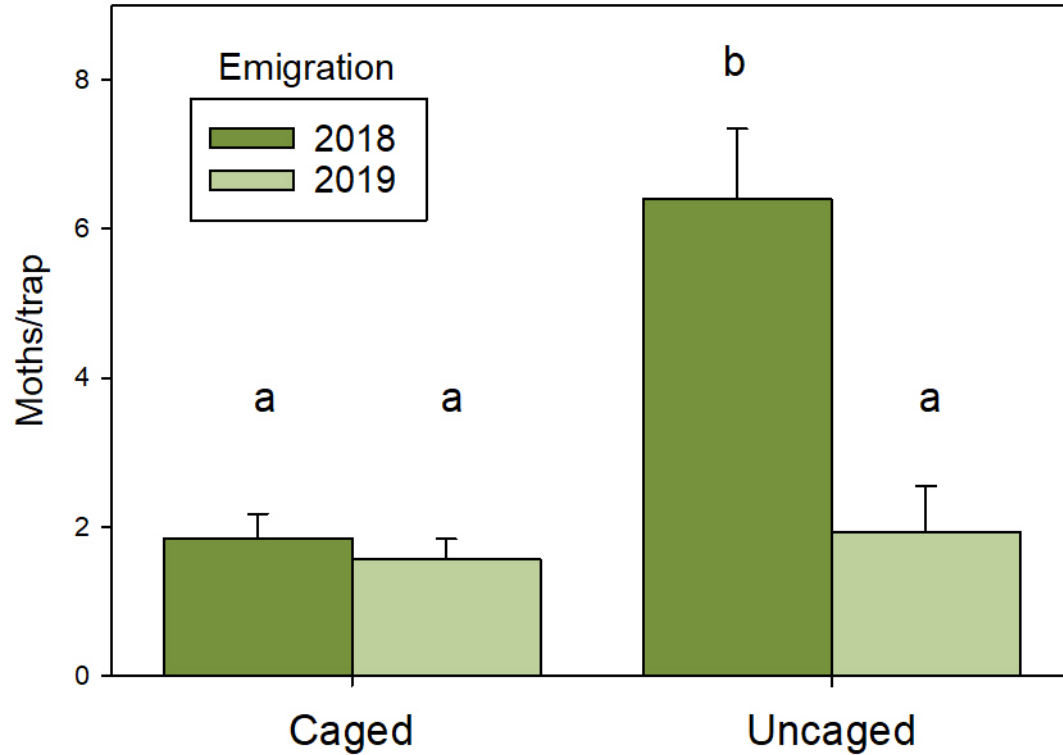
Emigration – can they get out?



Caged

Uncaged

Codling moth emigration: YES, they can get out!



Codling moth nets: Commercial Scale

1. Full cage



2. Overhead





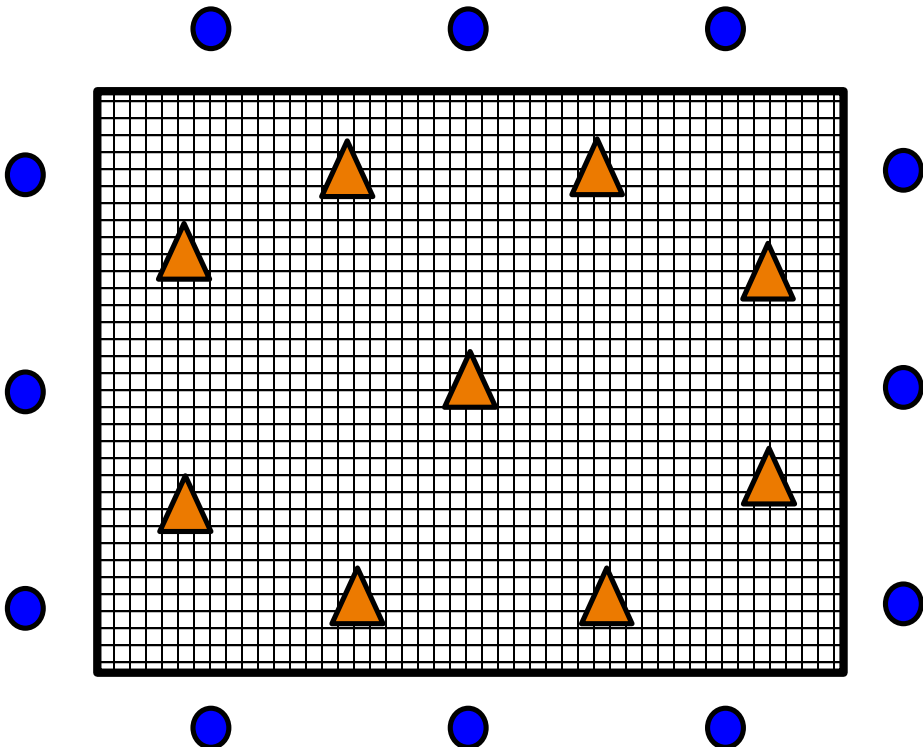
3. No net (check)



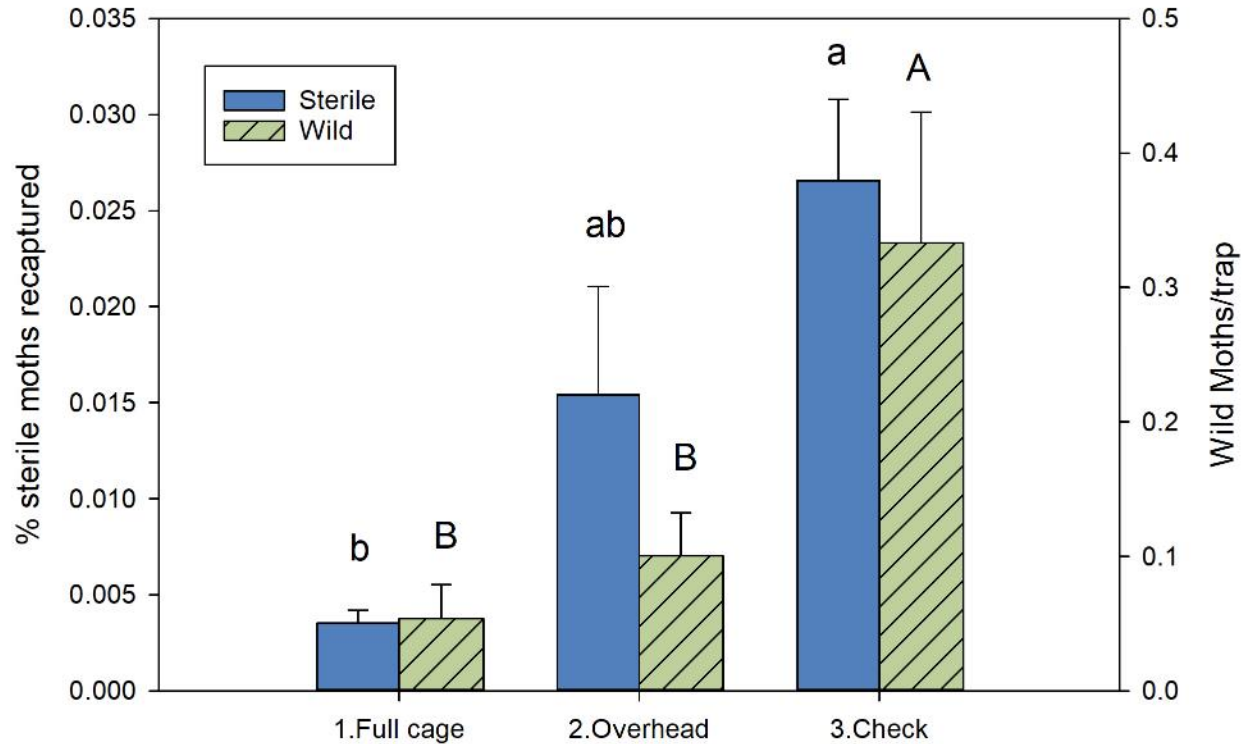


Plot Layout

-  Pheromone trap
-  Release point



Can Codling Moth Cross Nets?



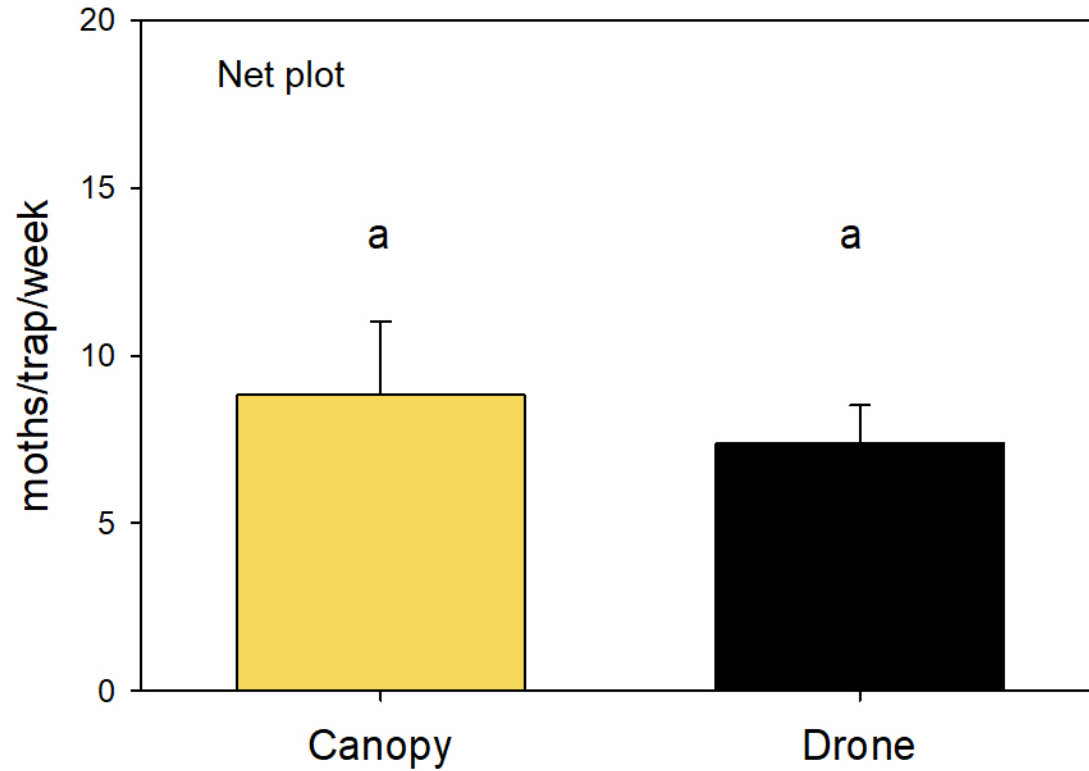
Sterile Moths and Nets



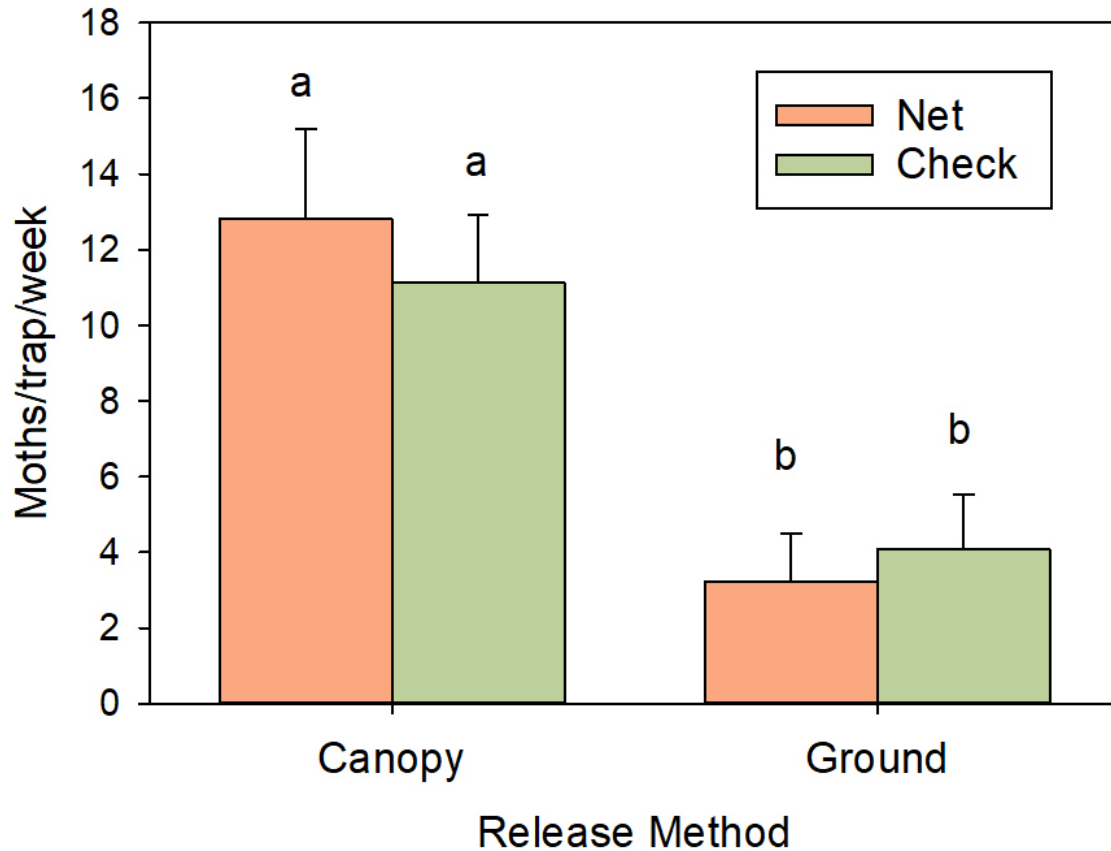
Release by Drone vs Hand under Nets



Netted plot: drone vs hand release (canopy)



Net and Check: Canopy vs Ground Release

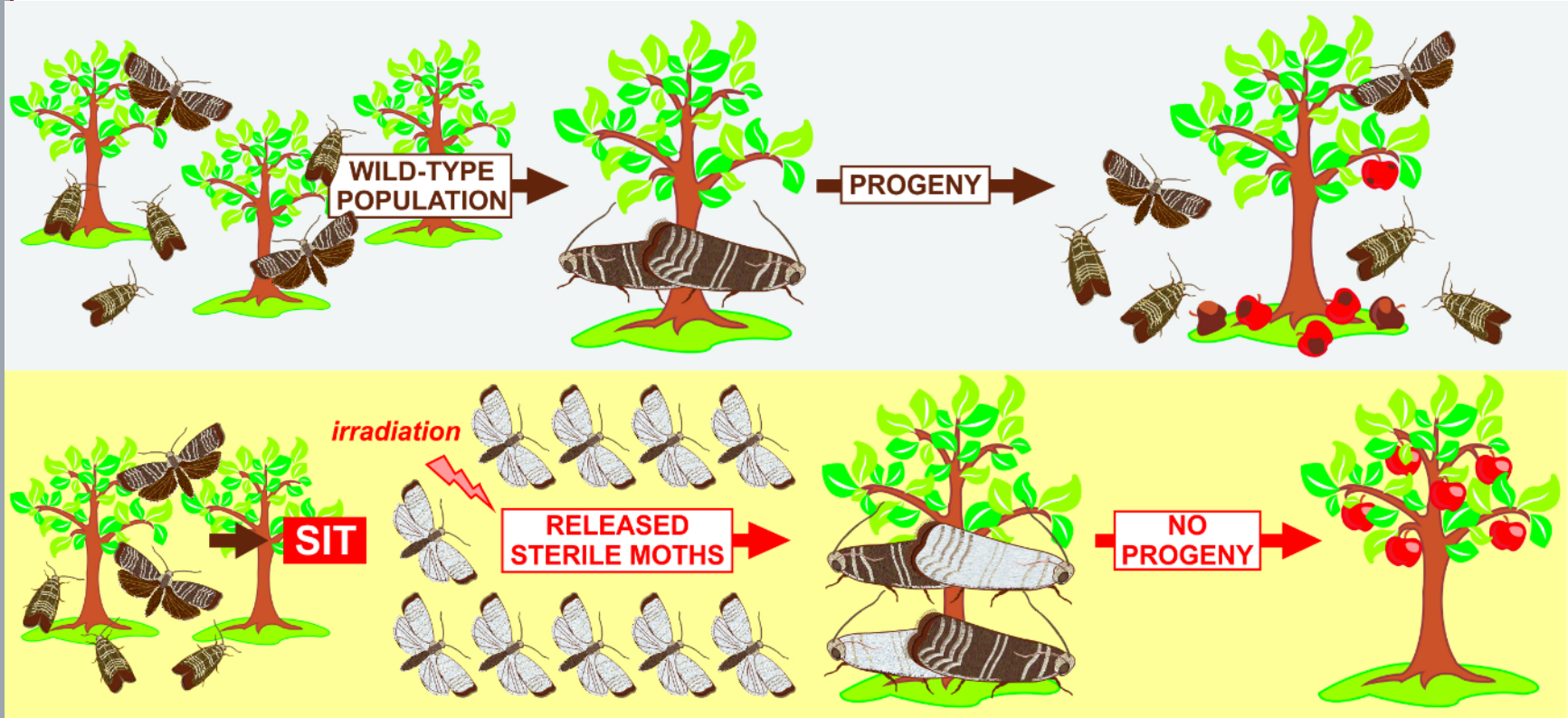


ATV moth release

SIR: It's Raining Moths!

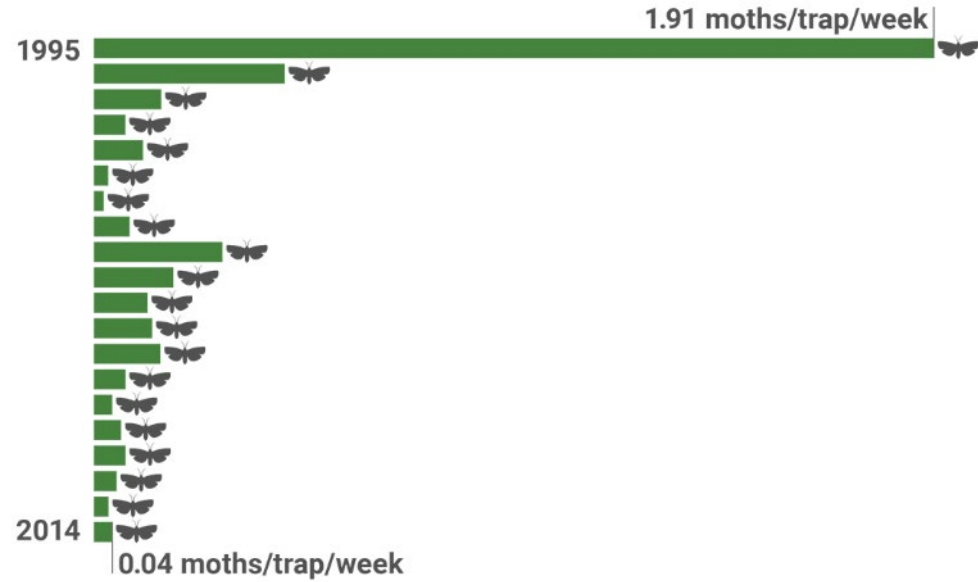


Sterile Insect Technique



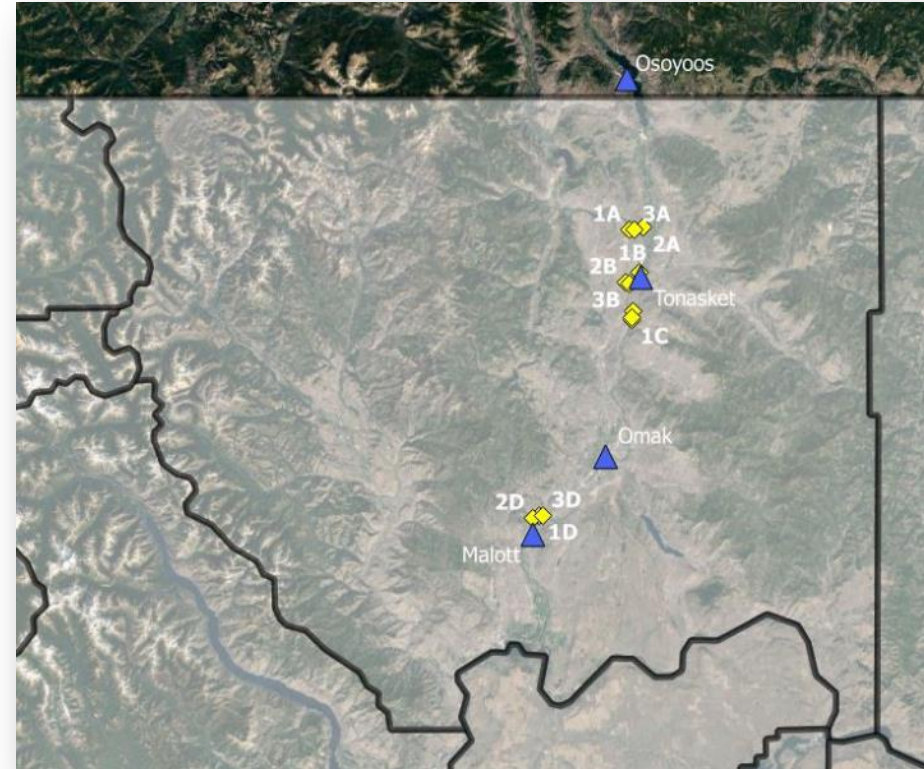
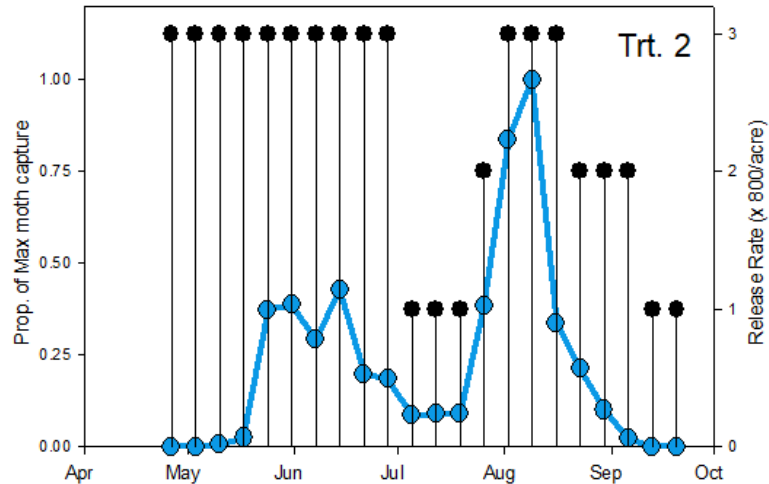
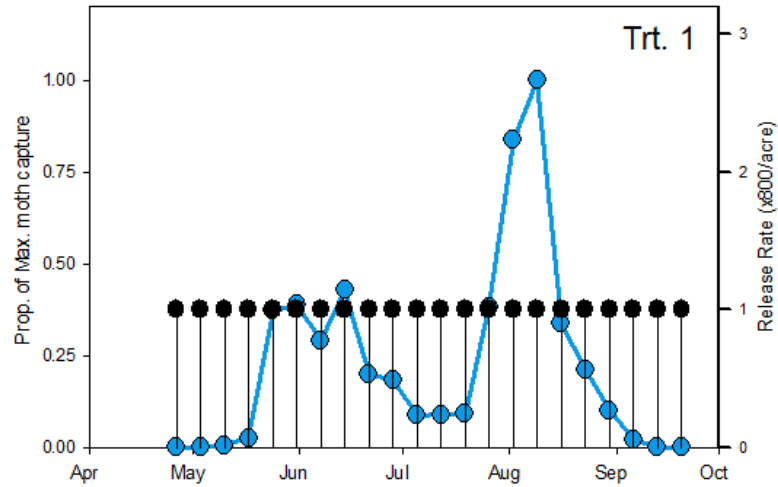
(Marec and Vreysen et al 2019)

OK-SIR: A Success Story



Graphics courtesy of OK-SIR

WA-SIR Pilot Project 2018-2020



WA-SIR Pilot Project: Trapping and monitoring





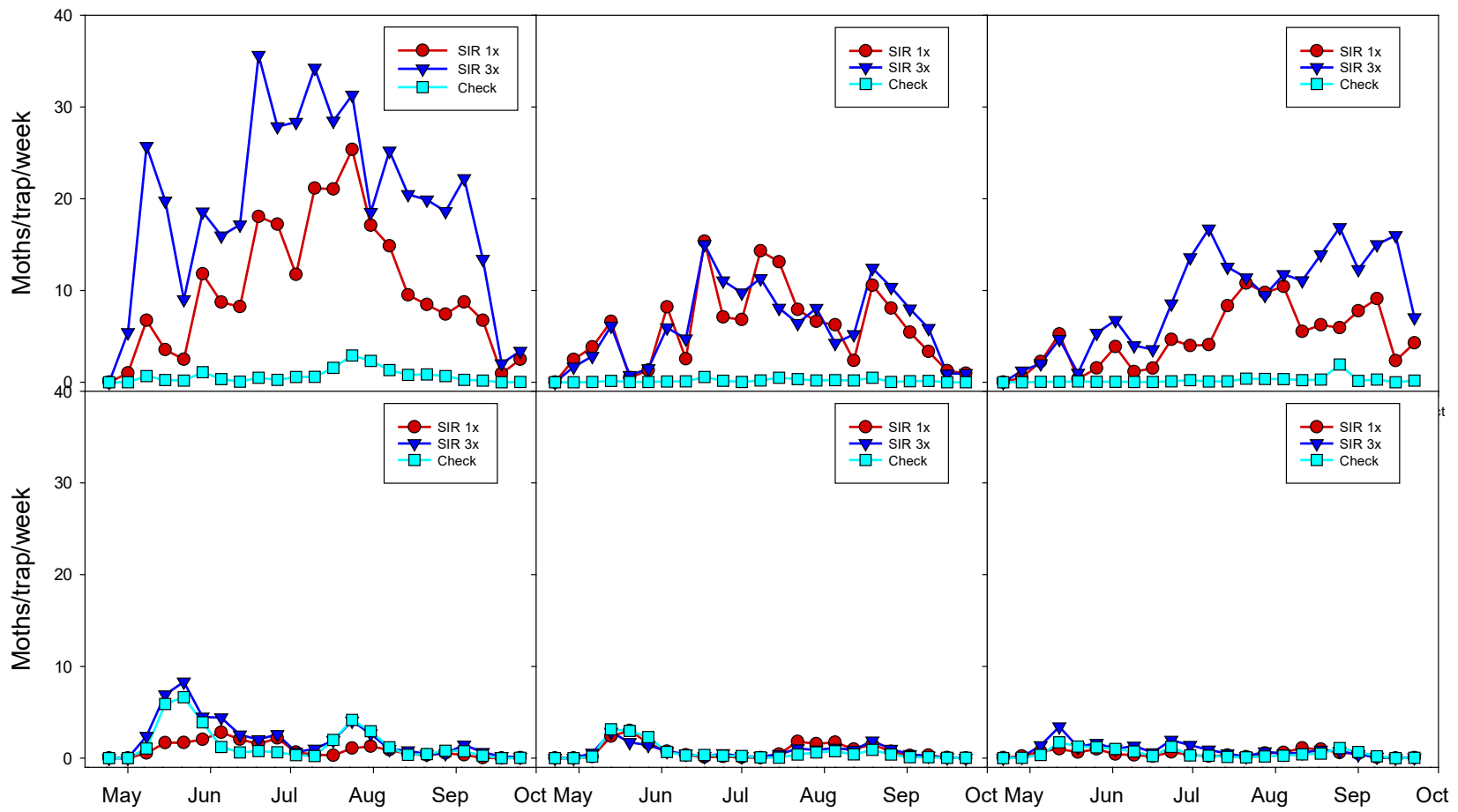
2018

2019

2020

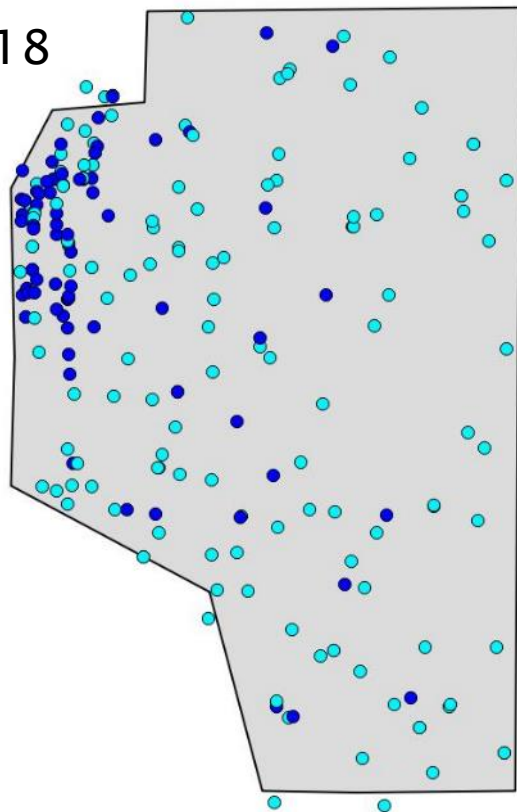
Sterile

Wild

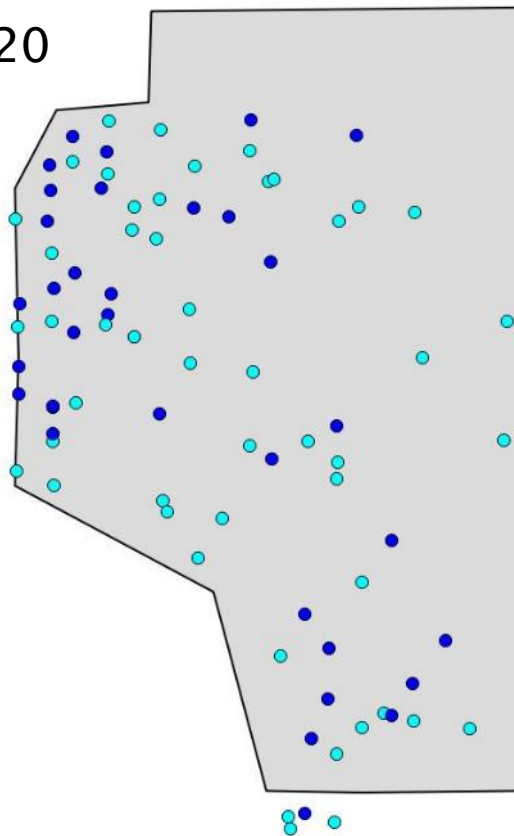


Case History: cleaning up a hot spot

2018

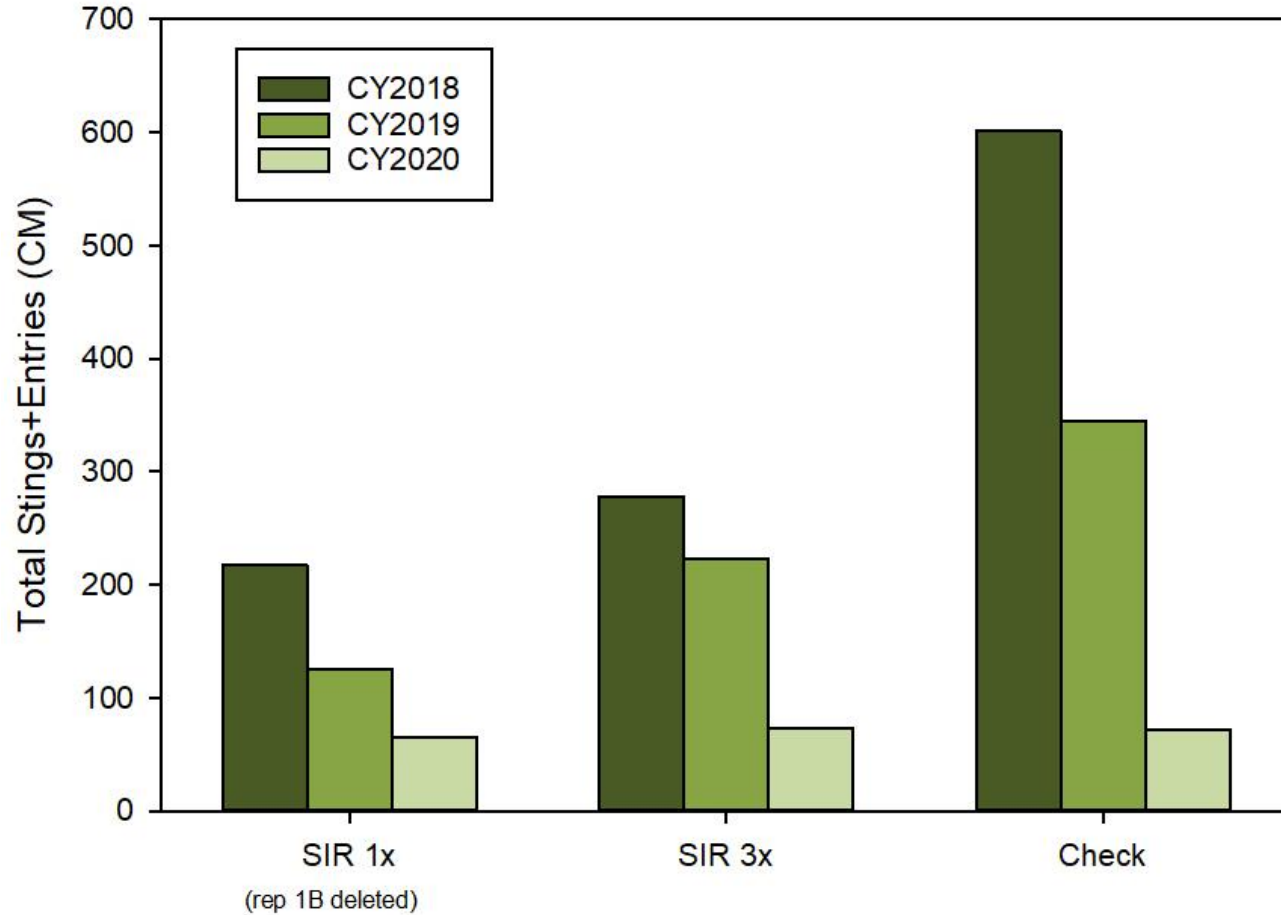


2020



- sting
- entry

Fruit damage trends



Thanks!



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