

WA-SIR:

Update on the Sterile Codling Moth Release Project in Washington



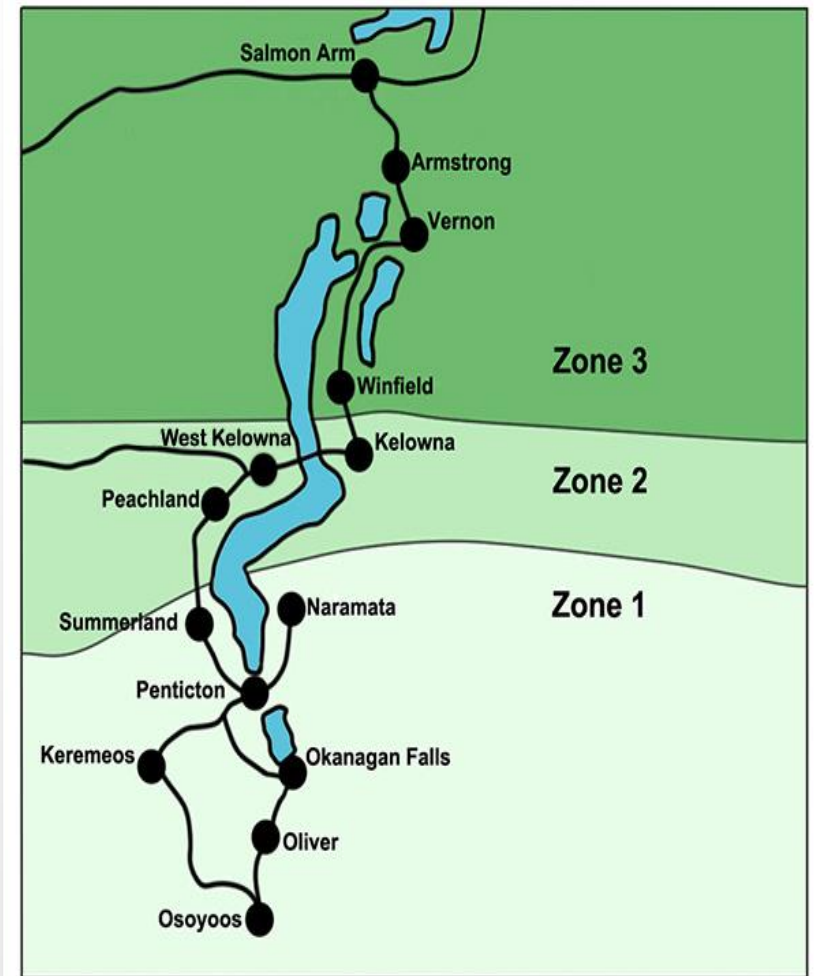
Washington State Tree Fruit Association Annual Meeting
5 December 2018
Yakima Convention Center, Yakima, WA

Elizabeth H. Beers, Dave Crowder, Tobin Northfield
Tree Fruit Research & Extension Center
1100 N. Western Ave.
Wenatchee, Washington



Brief History of SIR, with emphasis on CM

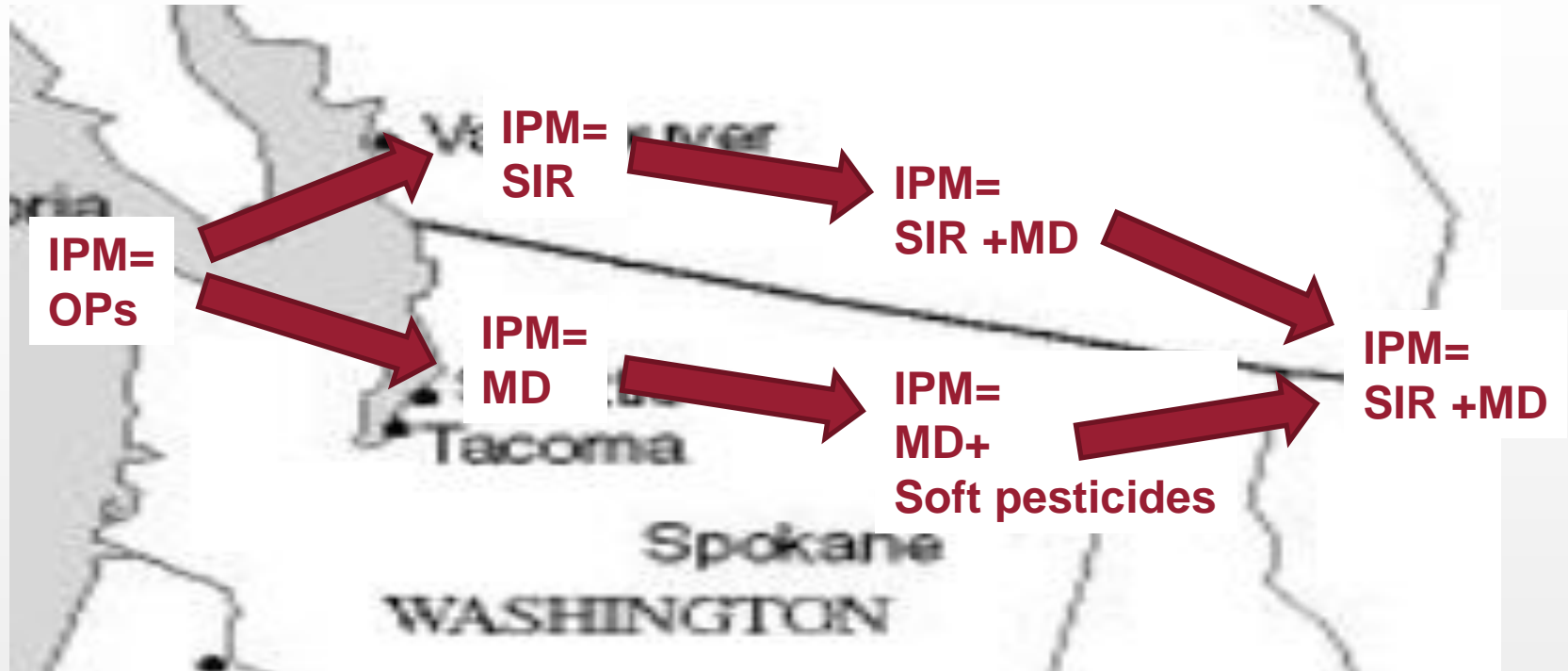
- SIR popularized by Knipling in the 1950s
- Large US projects implemented (screwworm, pink bollworm)
- Goal was eradication in a region
- SIR for codling moth explored in the 1960-1970s in PNW (BC, WA)
- Canadian SIR program on-line in the early 1990s (still ongoing)



Graphic courtesy of OK-SIR



Codling moth control across borders: Convergent Evolution?



- CM control philosophy diverged in late 1980s
- BC embraced the SIR approach, got it funded
- WA embraced the MD approach, got it implemented
- BC integrated MD as part of program ca. 2000
- WA – headed in same direction?



The Big Picture

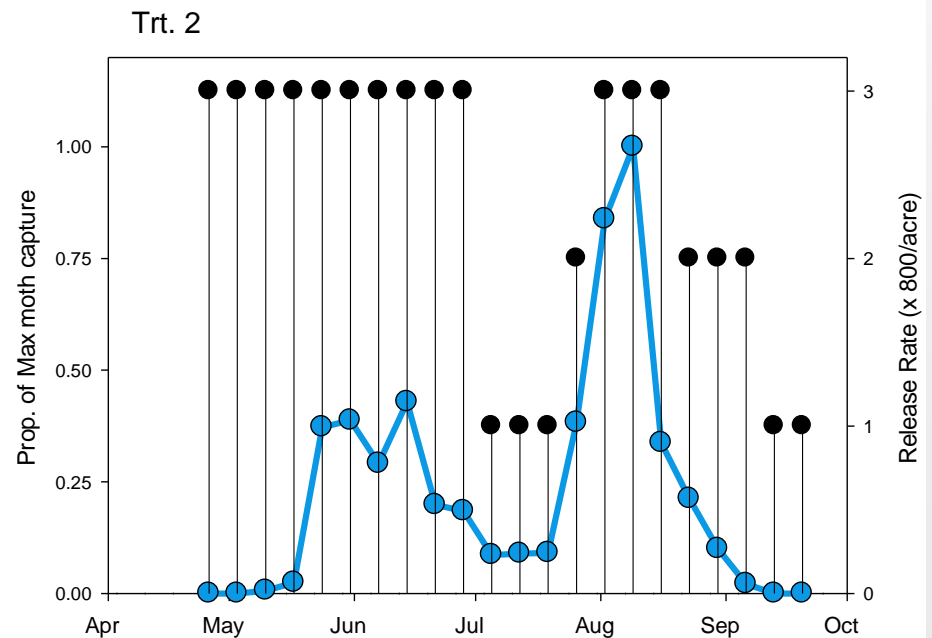
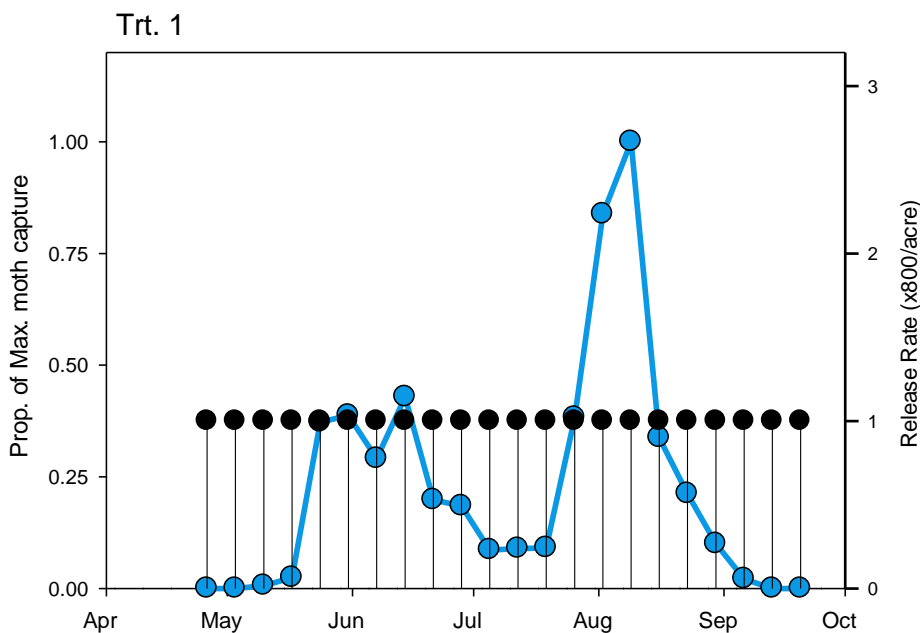
- SIR works as currently defined/deployed
- Large scale, compulsory buy-in
- Can it work on a smaller scale (and, what are the limits?)
- Can it work in a business model?
- Can we capture new efficiencies, exploit new technology?
- Does it work as an IPM tool vs an eradication technique?





Pilot Project: Release Rate of Moths: fixed vs variable

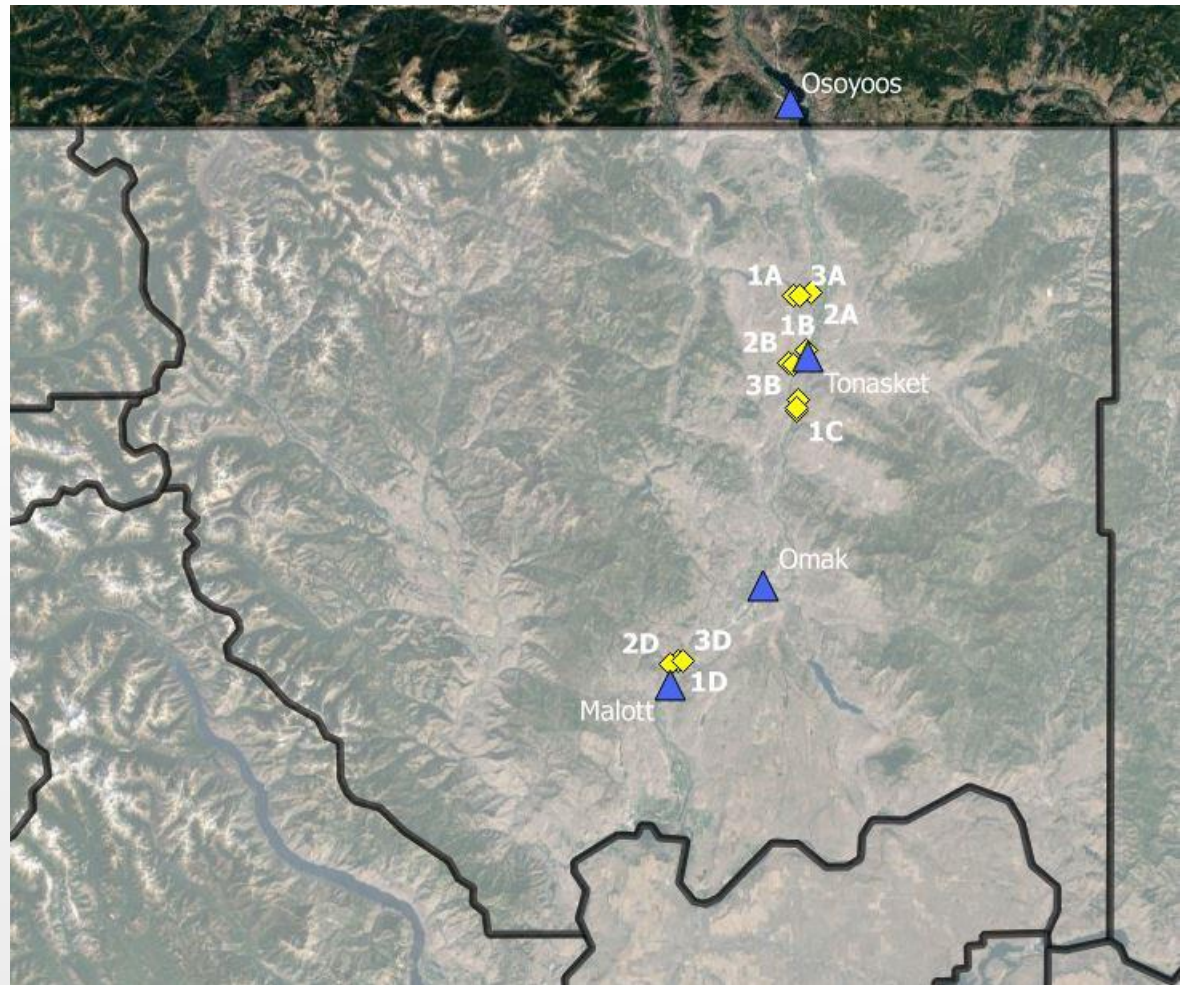
1. Std. CM program + std. rate of SIR (800 sterile moths/acre/week)
2. Std. CM program + gradated rate of SIR
(base rate increased to 2x and 3x rate as CM activity increases)
3. Std. CM program + insecticides





Plots

- Organic apple, Okanogan County (close to Canadian facility)
- Target: 8 acres/plot (limited by sterile moth availability)
- All plots received full organic program, grower applied
- 3 treatments, 4 groups
- Plots separated by ¼ mile
- Tonasket to Malott
- Moth release weekly April-September (22 weeks)
- **All Moth Releases Made by Drone (M3 Consulting)**





Sterile Moth Release, April-September

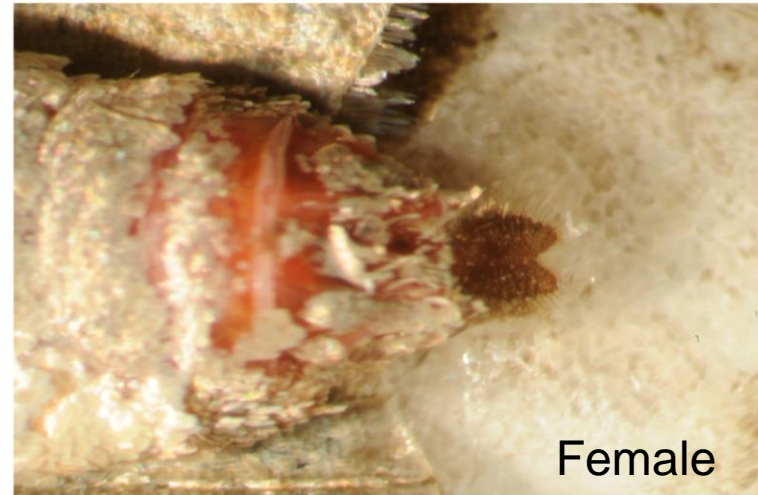
WA-SIR Project Presents:

The background of the slide is a black field with a dense pattern of thin, white, radiating lines that create a sense of depth and movement, resembling a starburst or a tunnel effect.

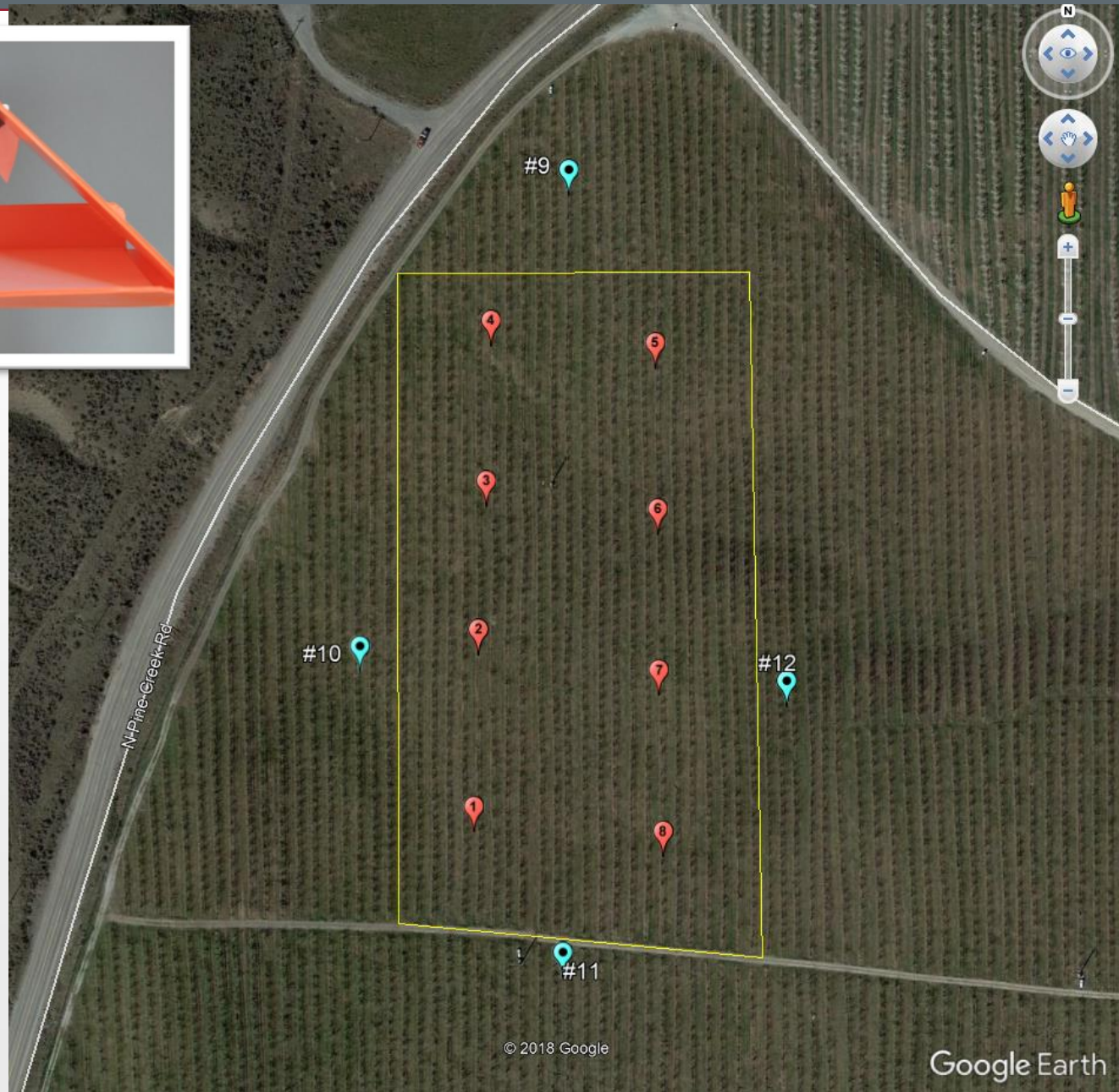


What did we measure?

- CM+DA+AA pheromone traps, checked weekly on Tuesdays, 24 April to 25 September
- Trap bottoms changed and brought back to lab, classed by male/female and wild/sterile
- Fruit damage sampled *in situ* Gen. 1 (1 side, every 3rd row); preharvest by cultivar (2 sides, every row)



Trap Layout – Regular Shape



Trap Layout – Irregular Shape





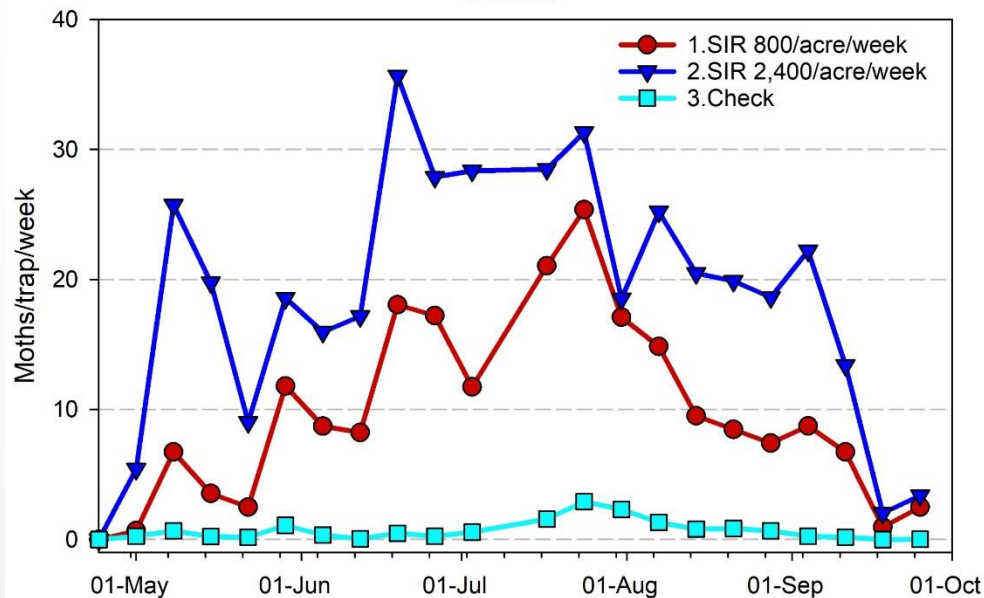
1 trap/acre



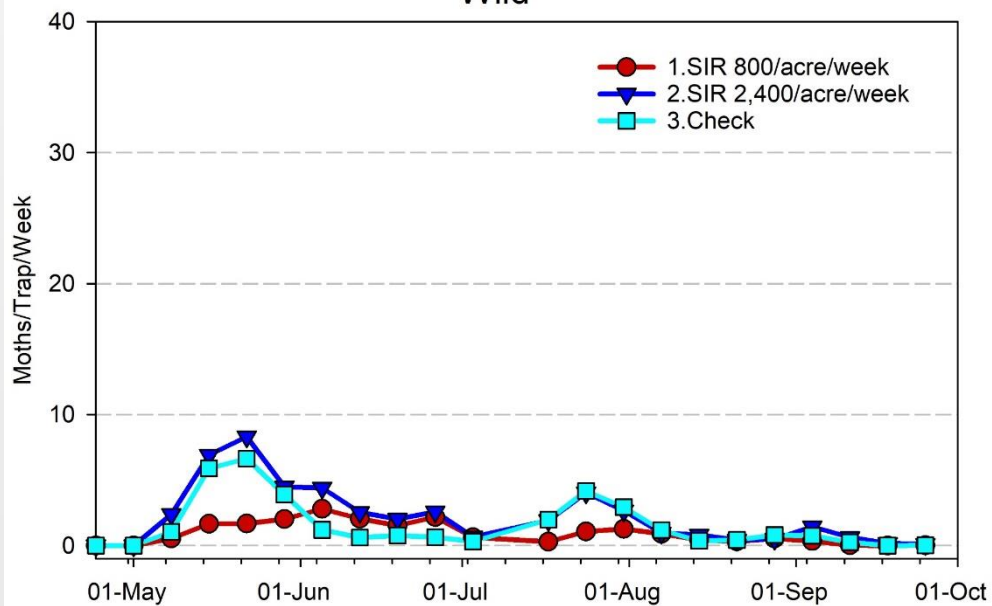


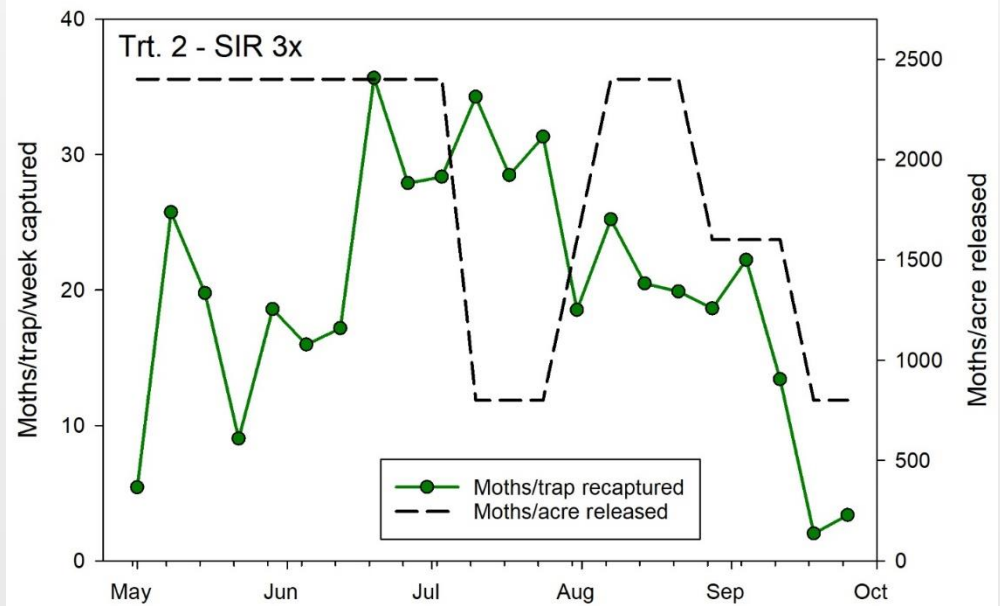
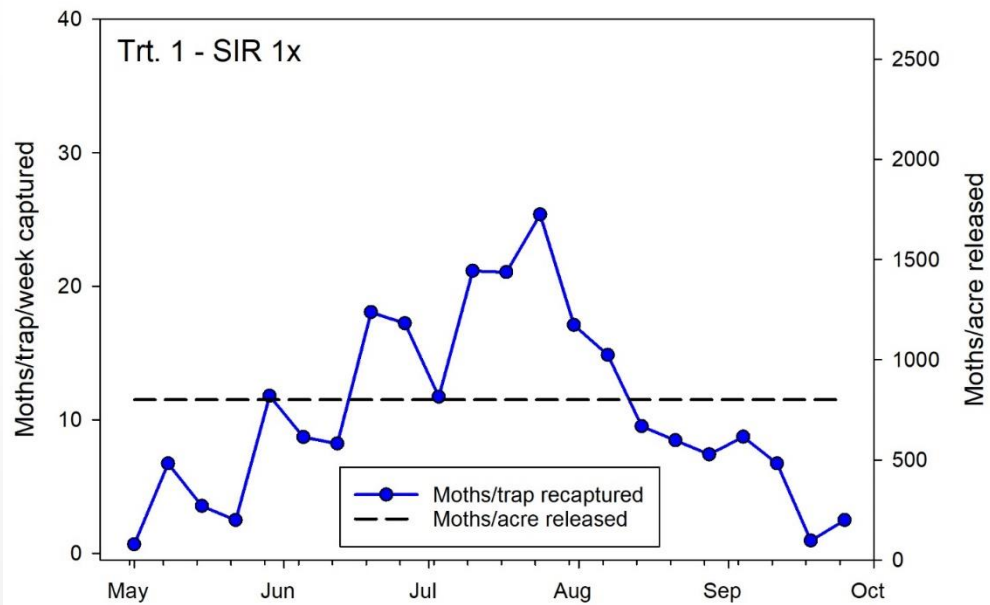
Trap Catches – Sterile vs Wile

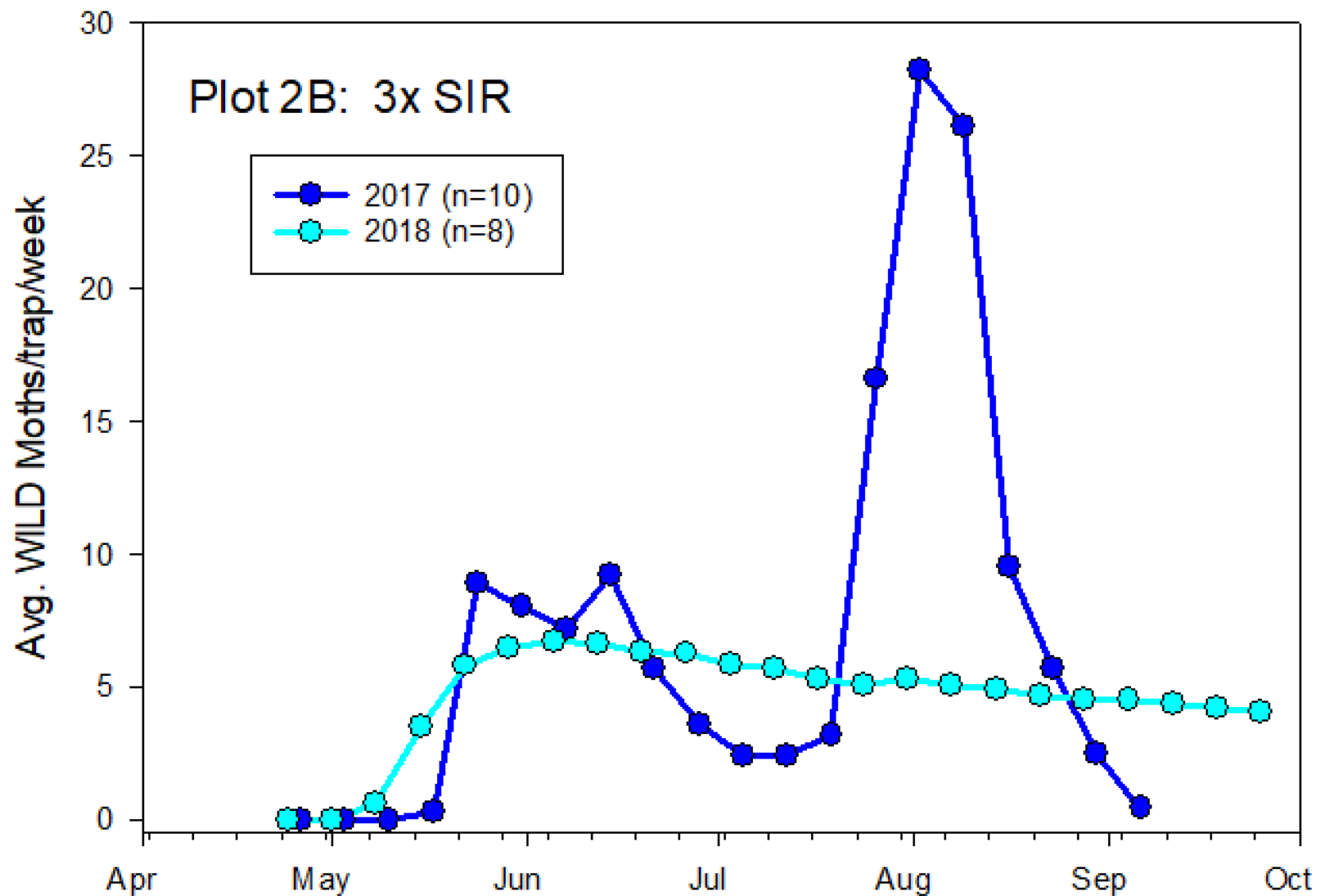
Sterile



Wild









3x SIR rate, 29 May



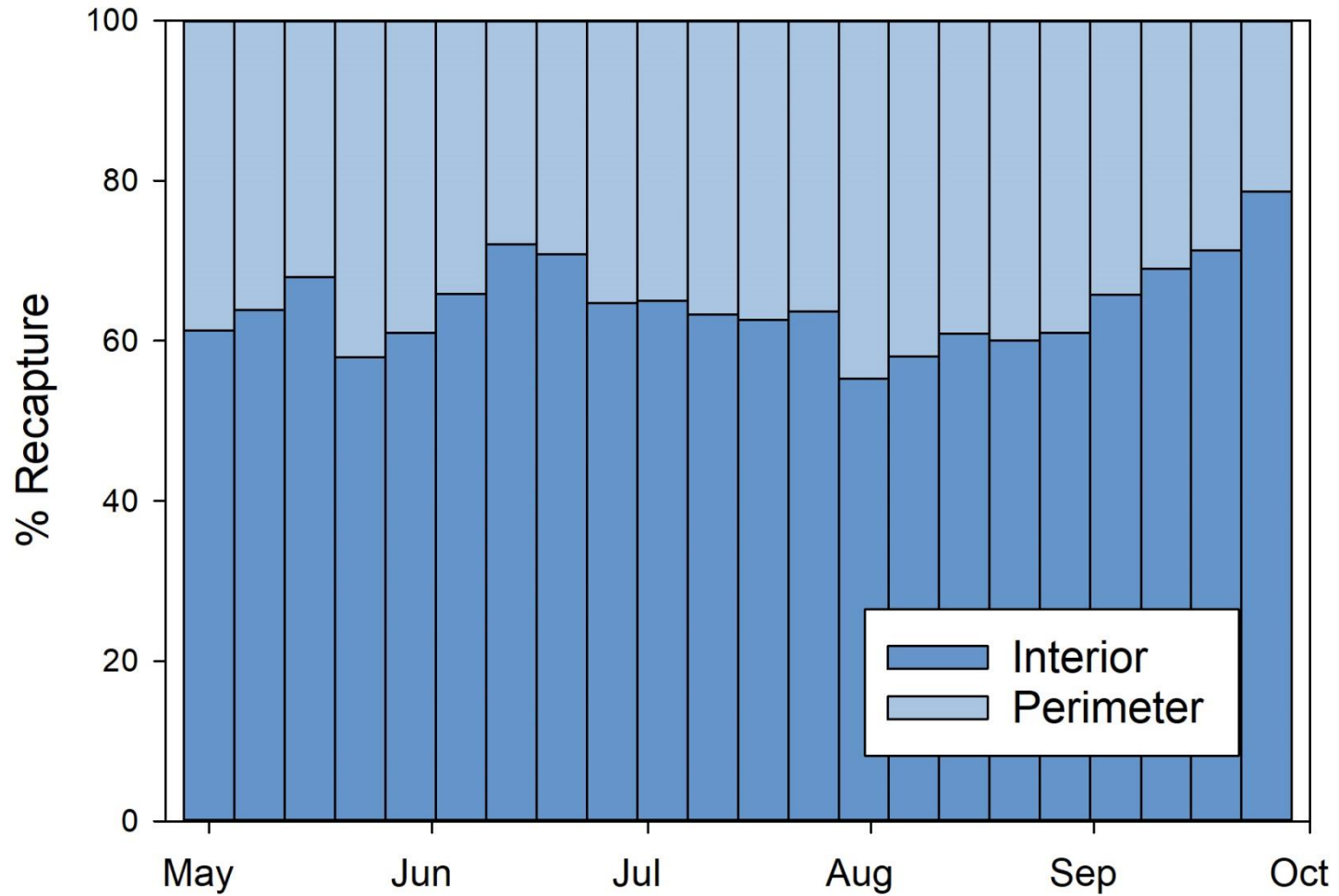


Check Plots, 29 May





Off-target Drift: A small-plot problem



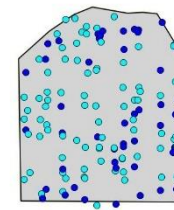
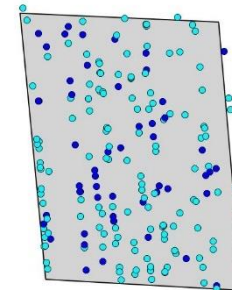
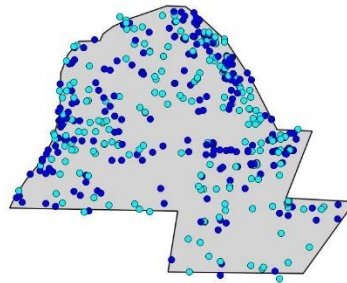
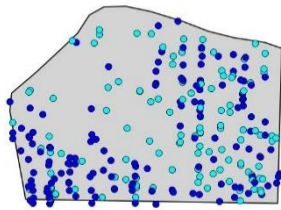
Rep A

Rep B

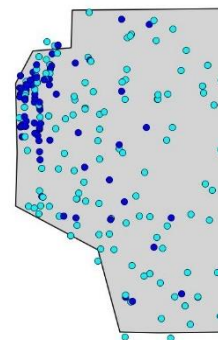
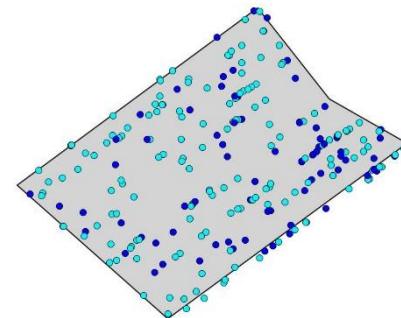
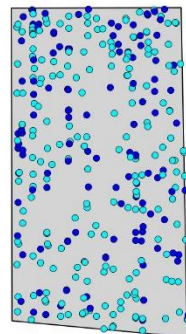
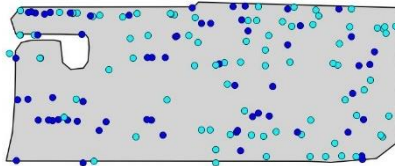
Rep C

Rep D

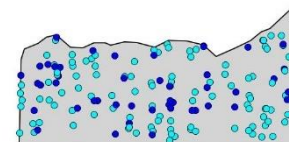
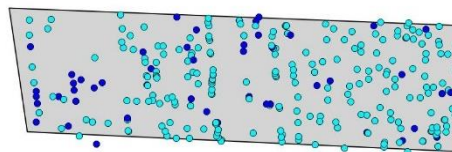
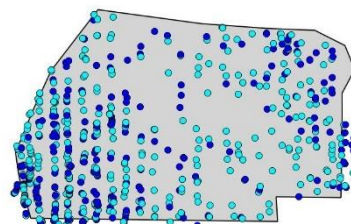
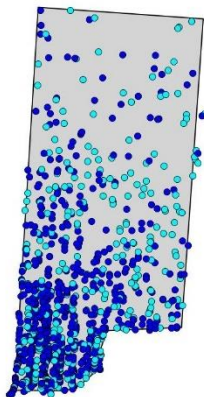
1x SIR



3x SIR

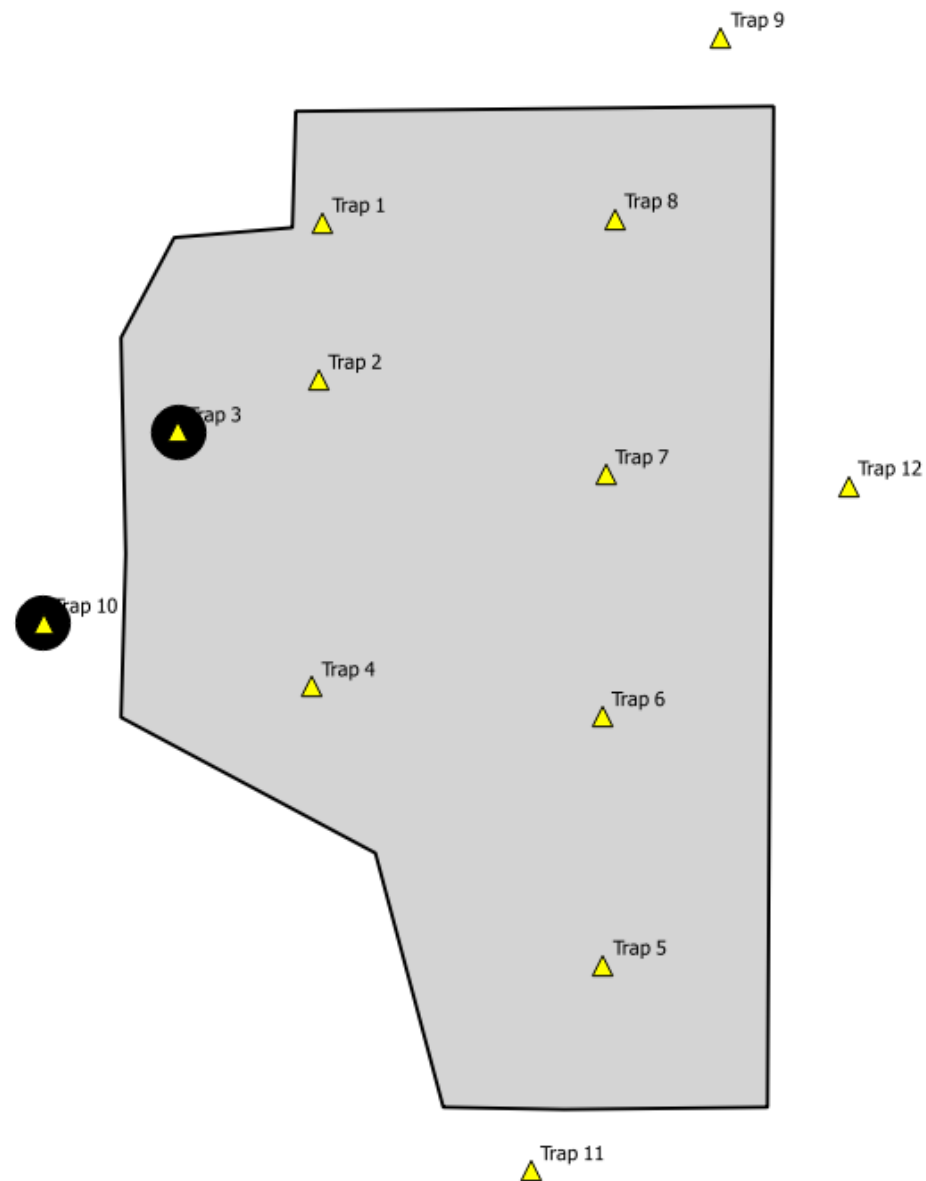
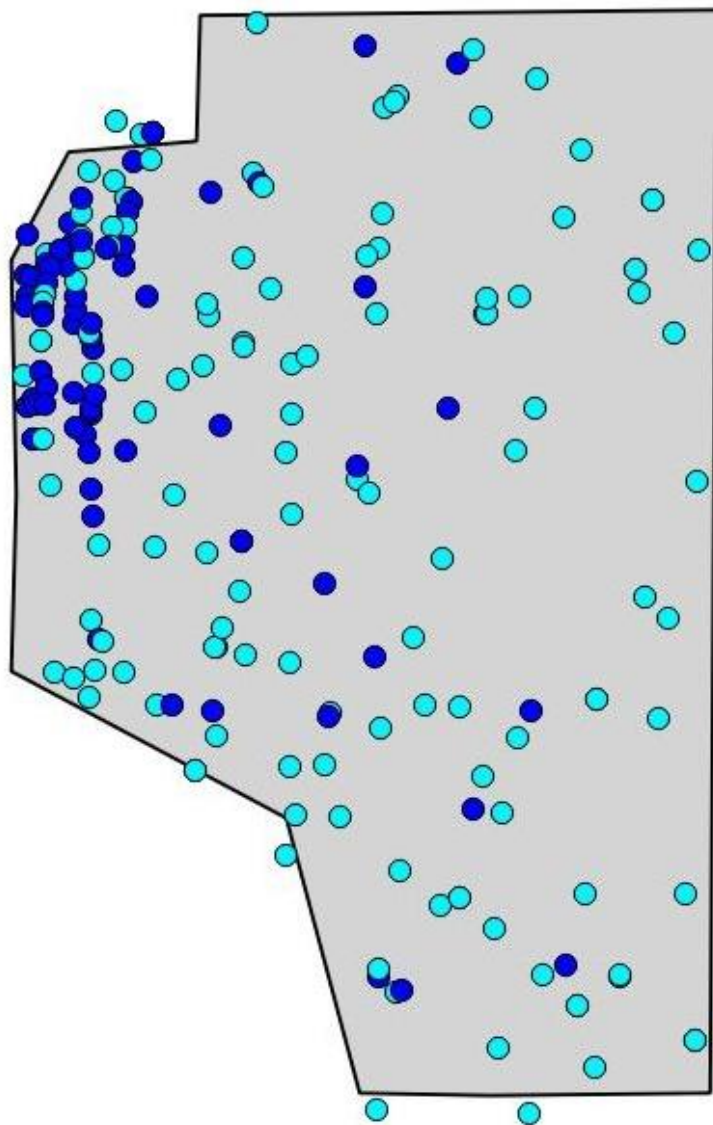


Check



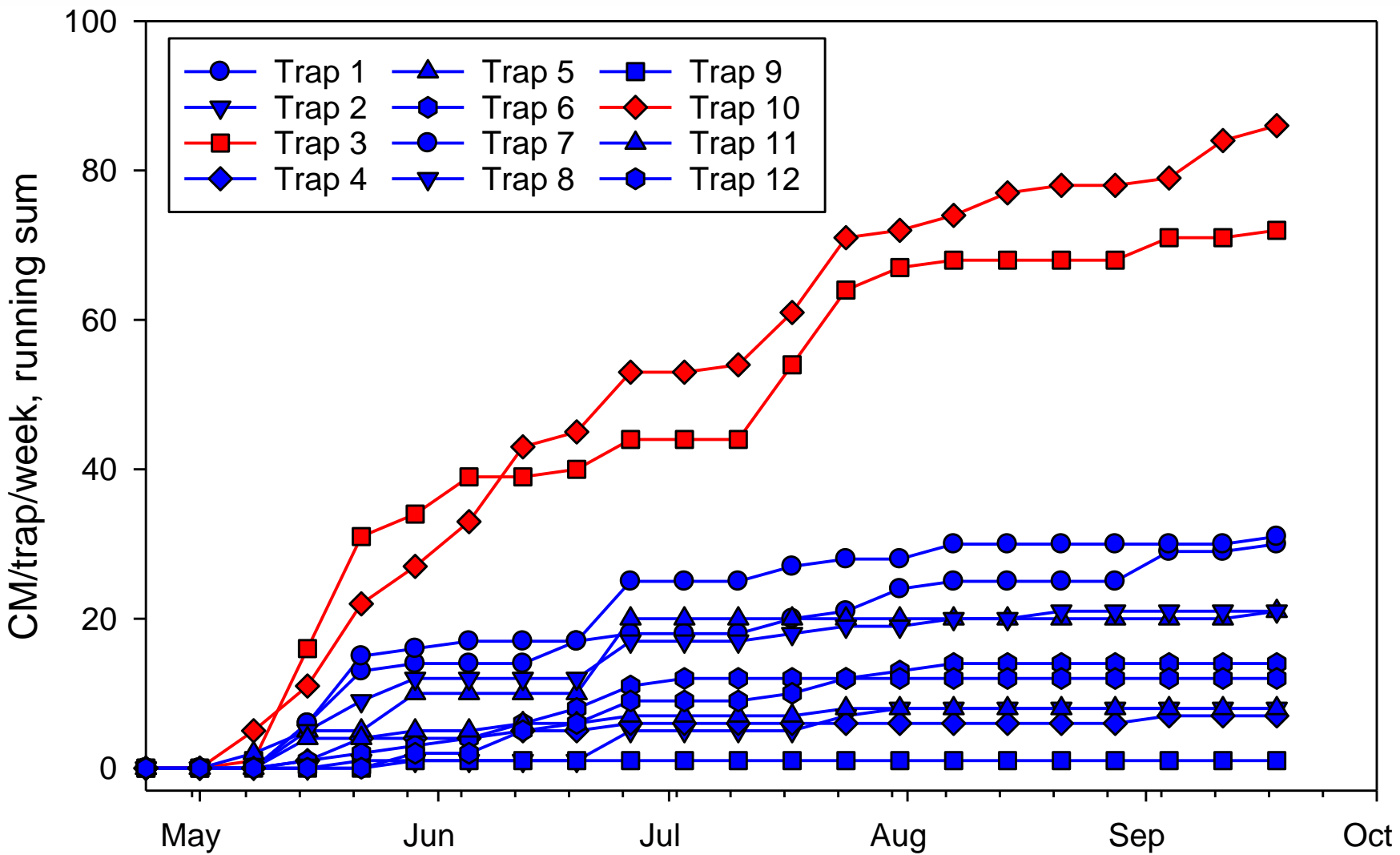


Is there a pattern to CM damage? (do traps predict it?)



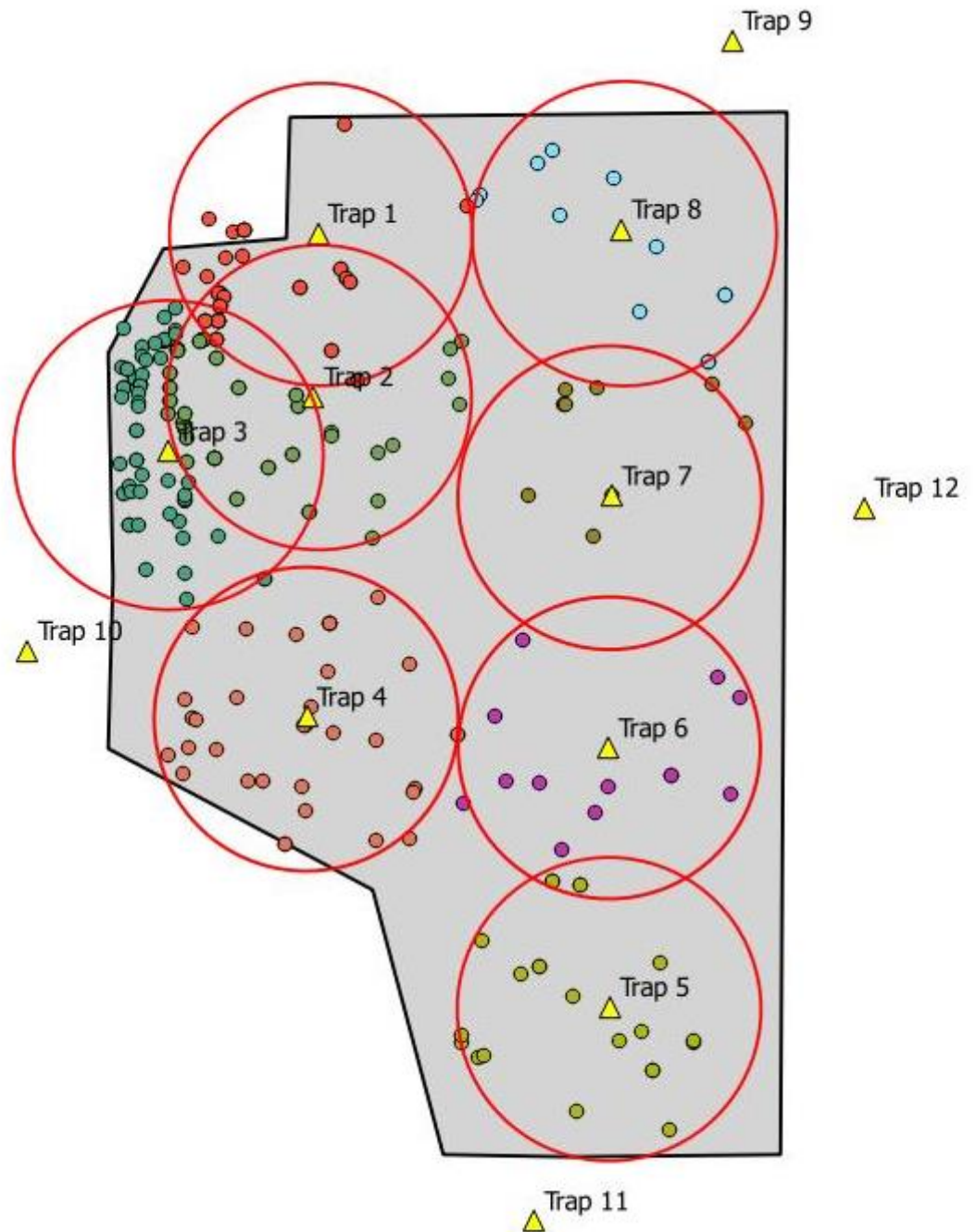


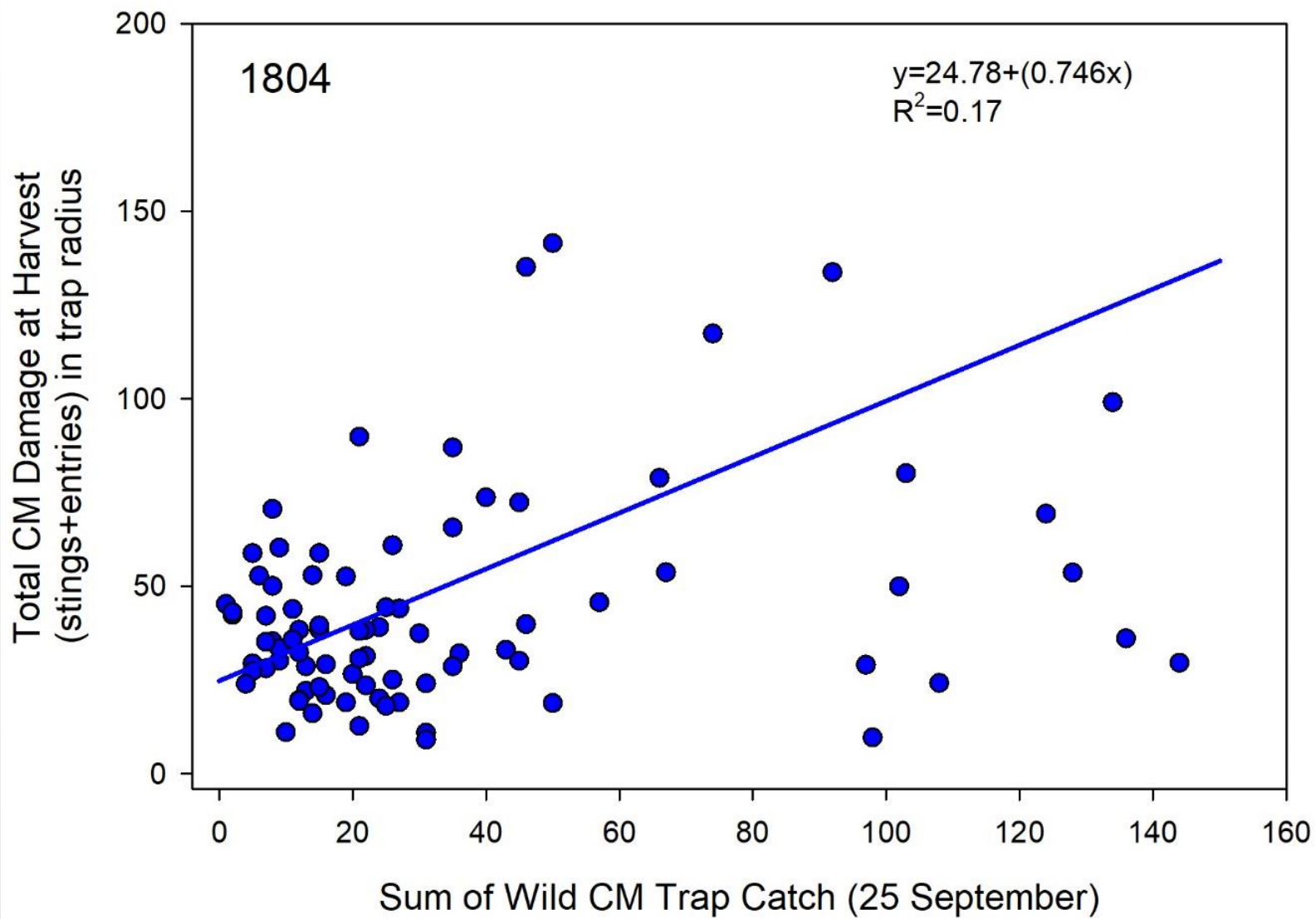
Trap catch over the season

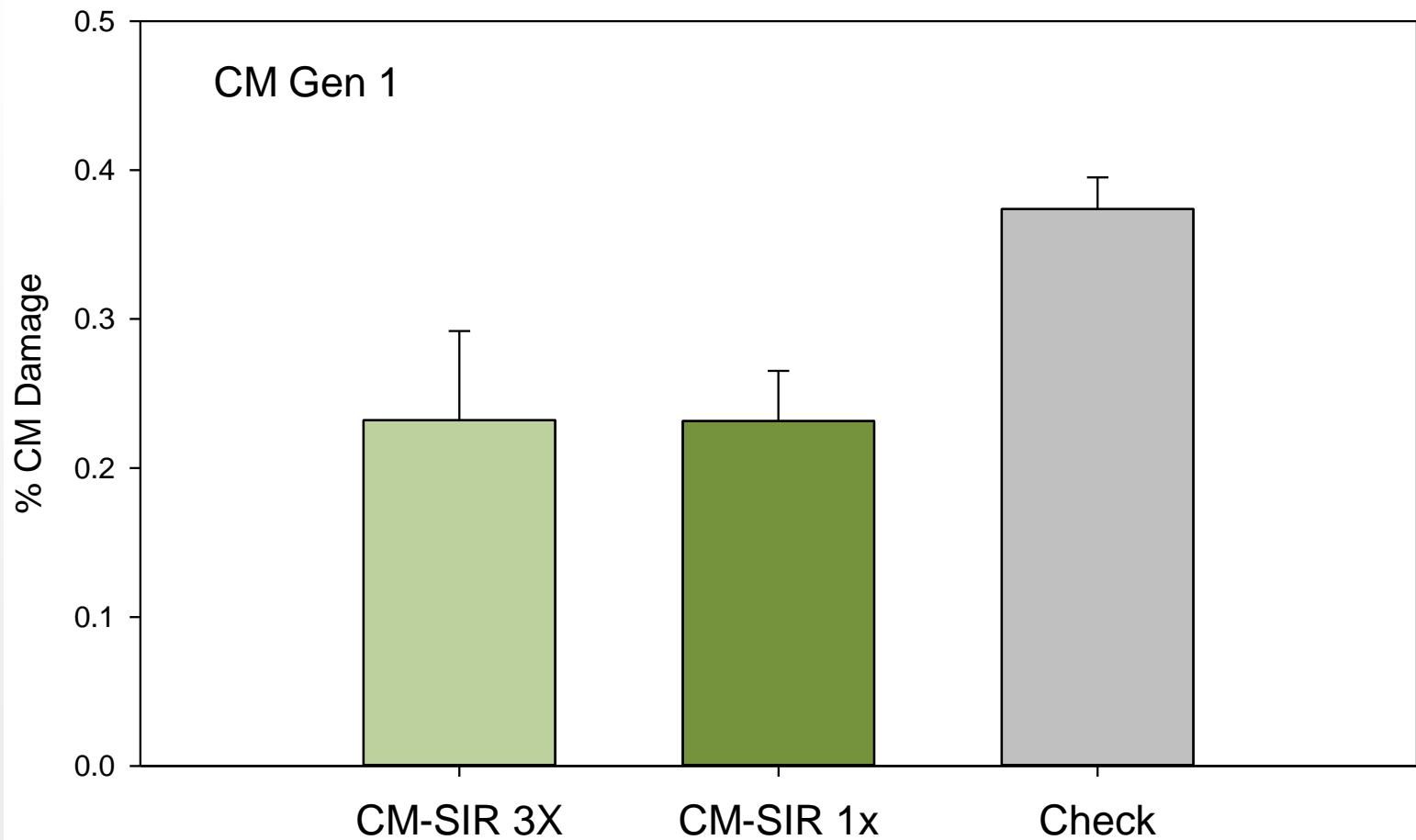




1-acre trap radius

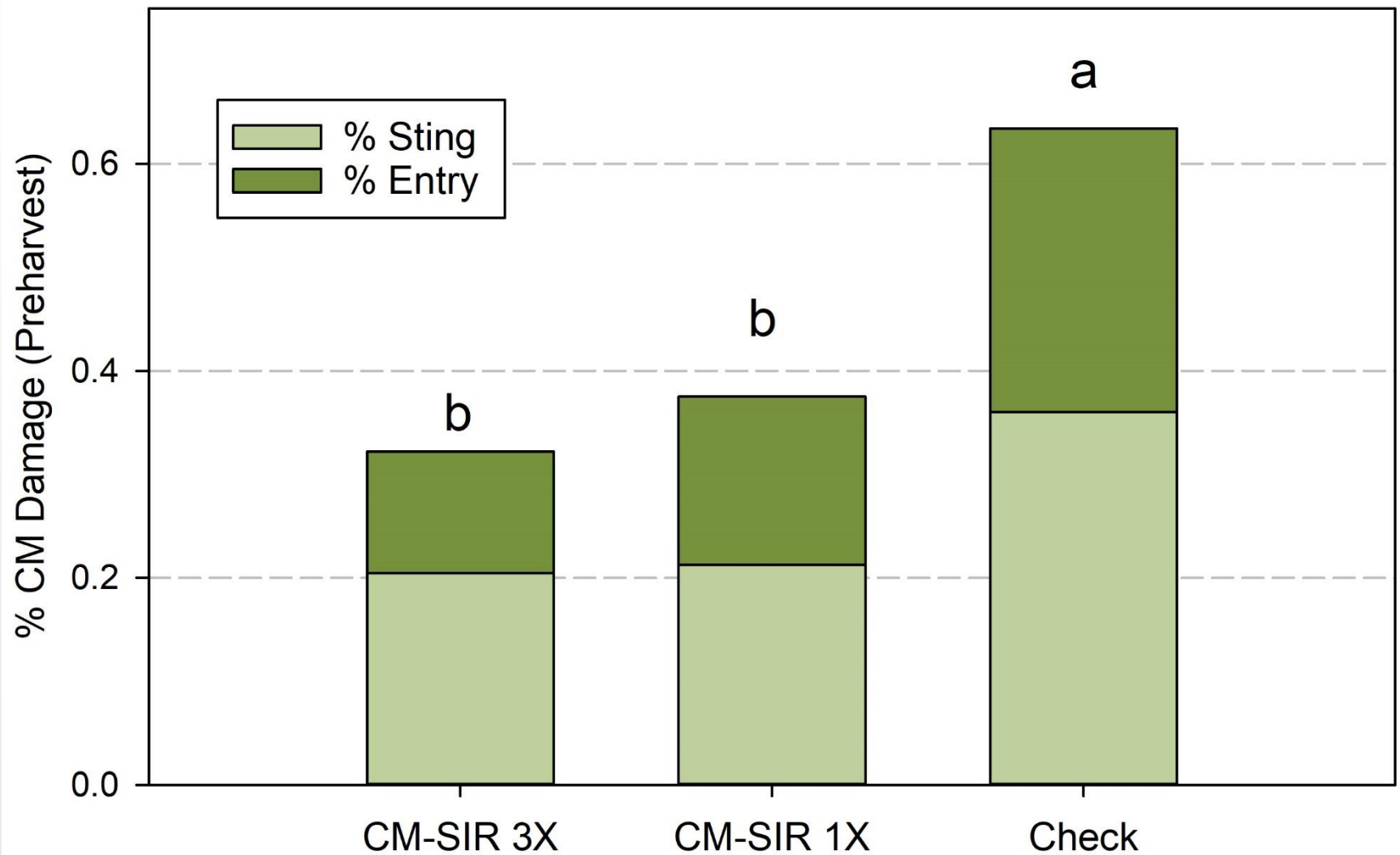








CM Damage - Preharvest





Acknowledgements

✓ Growers and Fieldstaff of Okanogan County

