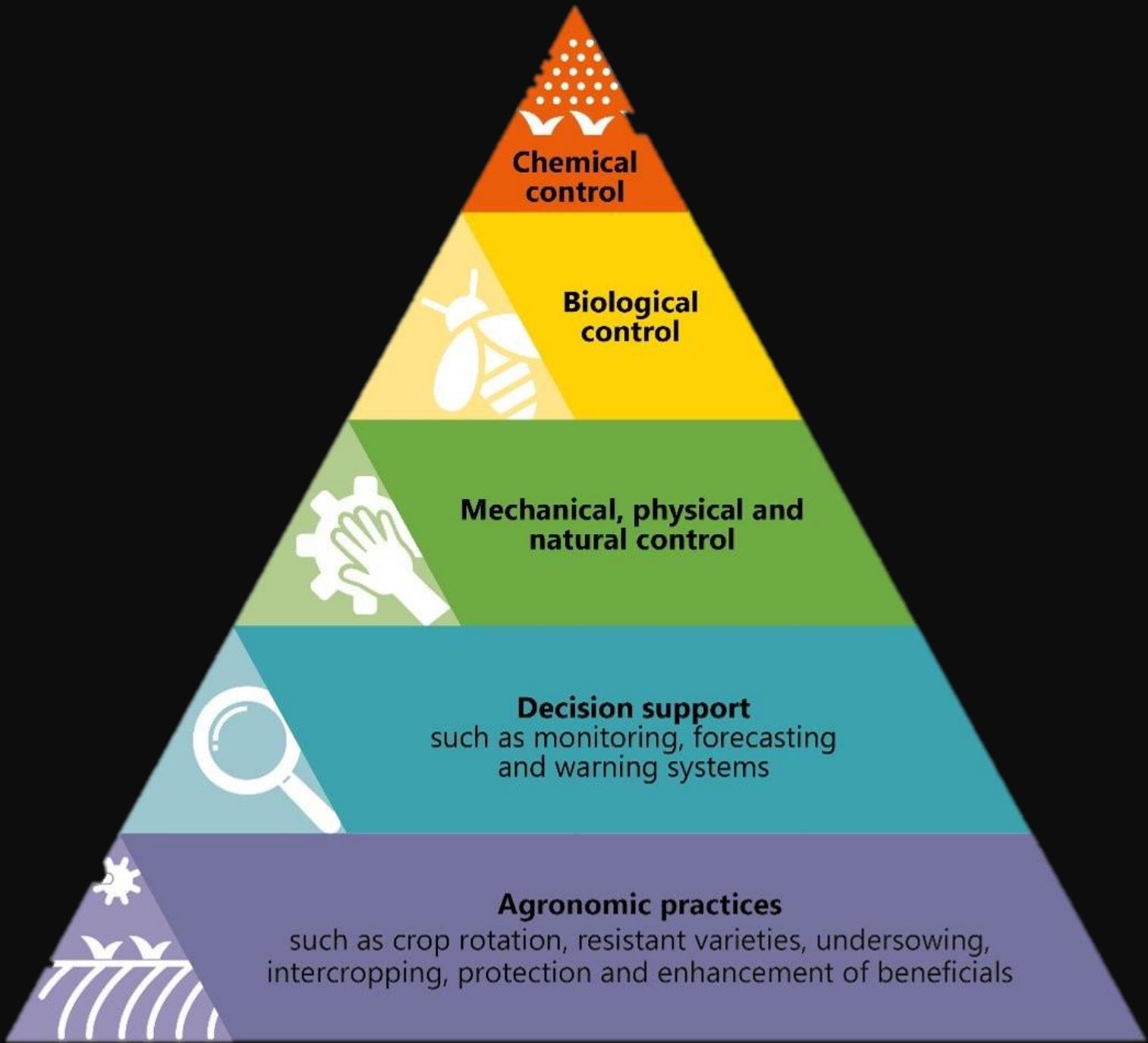


# Invertebrate Management Update

Ian Grettenberger, Luis Espino, Whitney Brim-  
DeForest, Madi Hendrick, Kevin Goding  
UC Davis Entomology & Nematology/  
UC Cooperative Extension

- Tadpole shrimp
- Armyworm
- Rice water weevil
- Rice seed midge





# Rice water weevil



# Tadpole shrimp

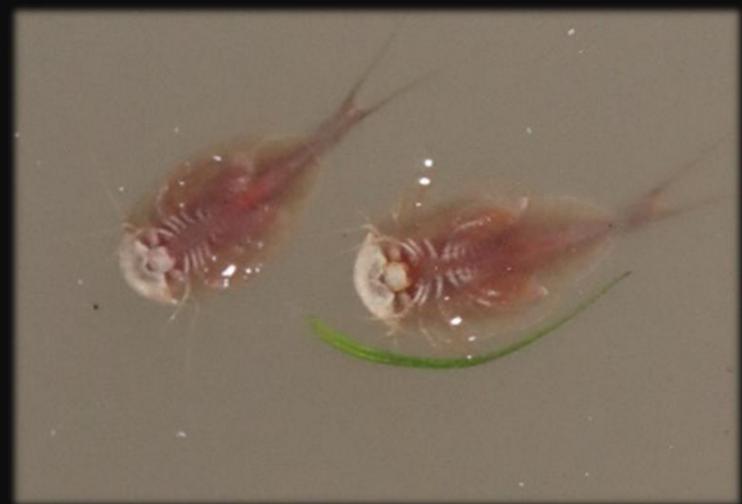
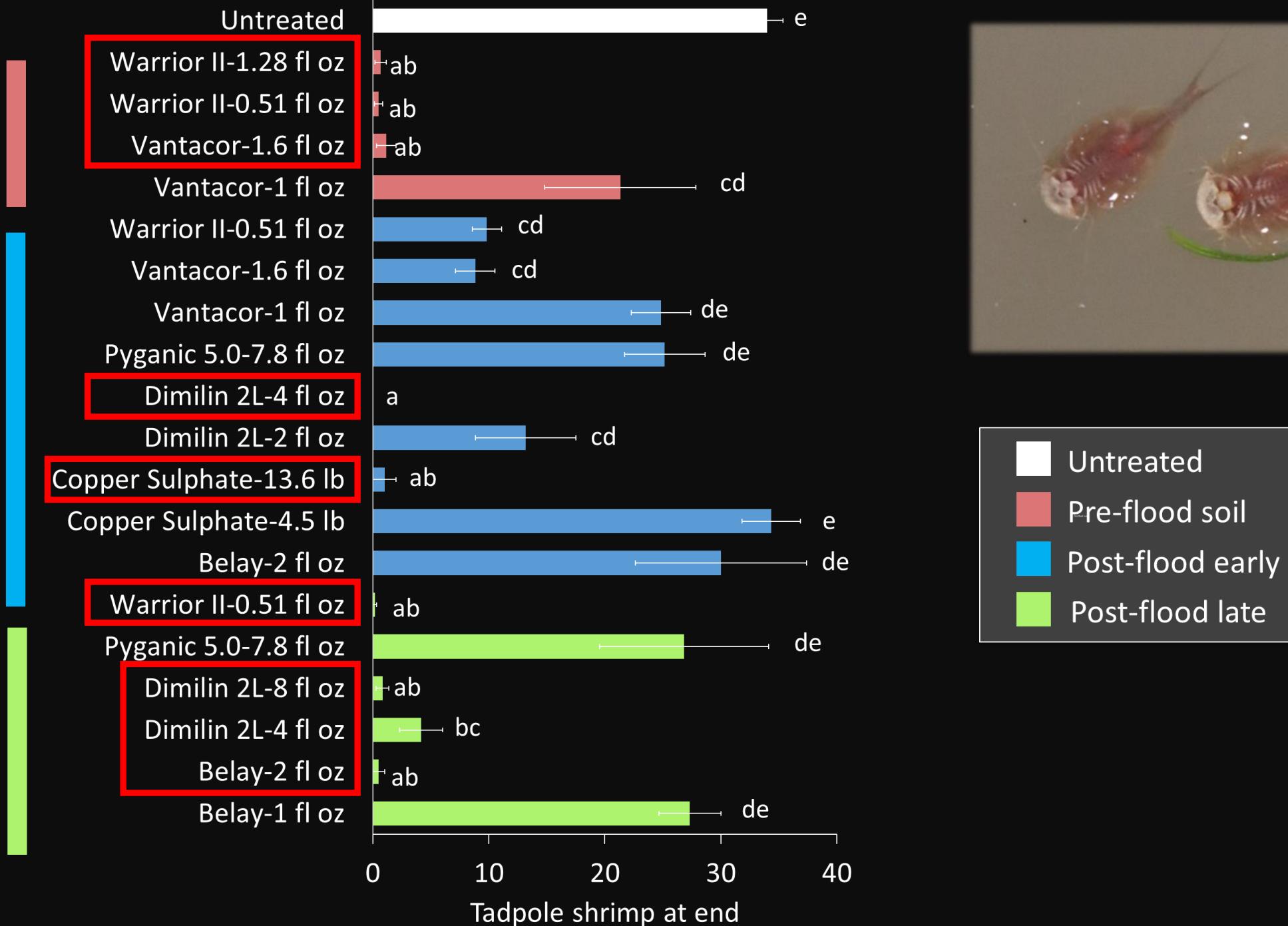


IPM-based  
methods

Insecticide  
resistance

Regulatory  
risk

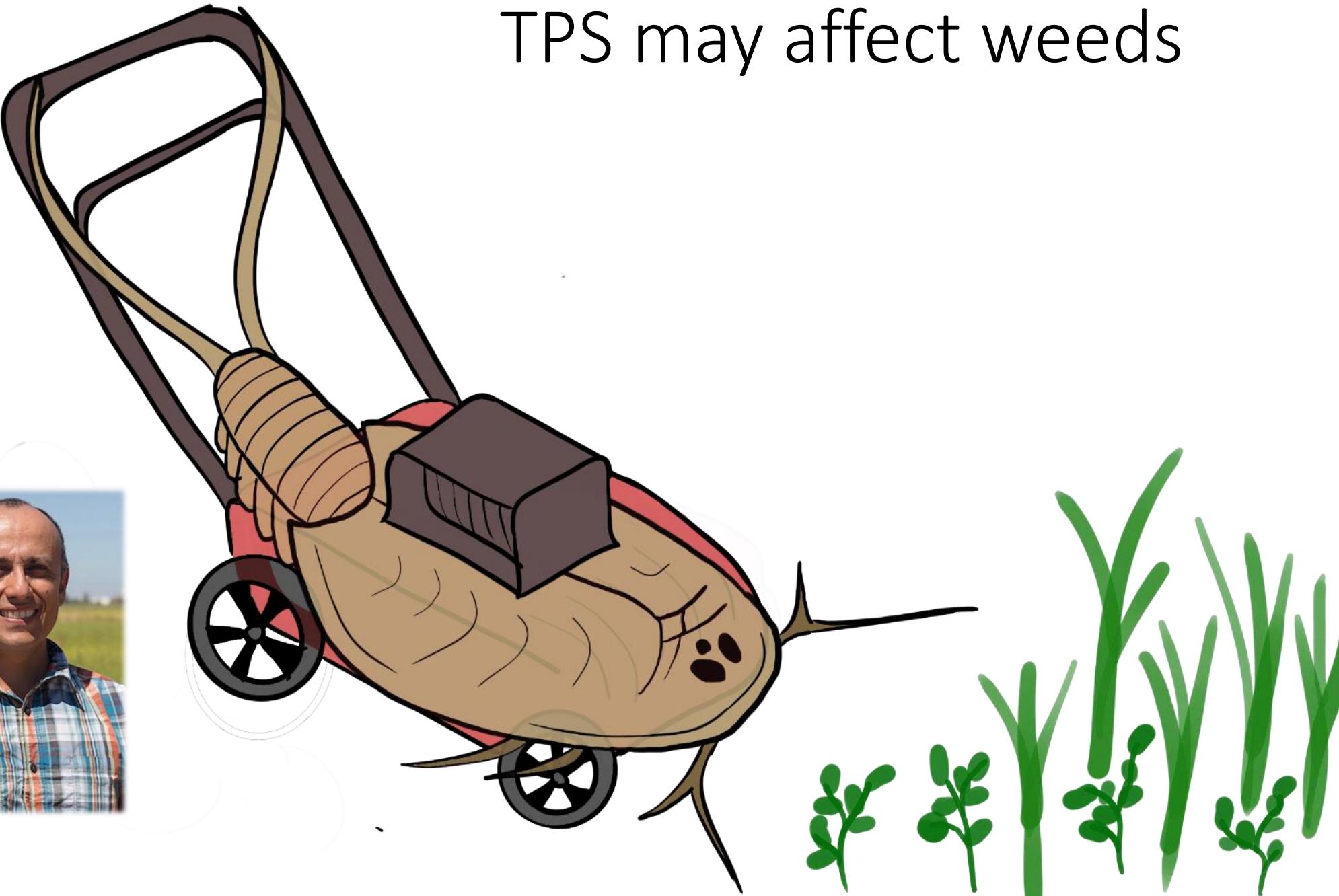
Weed  
mgmt. (?)



# DPR project: update

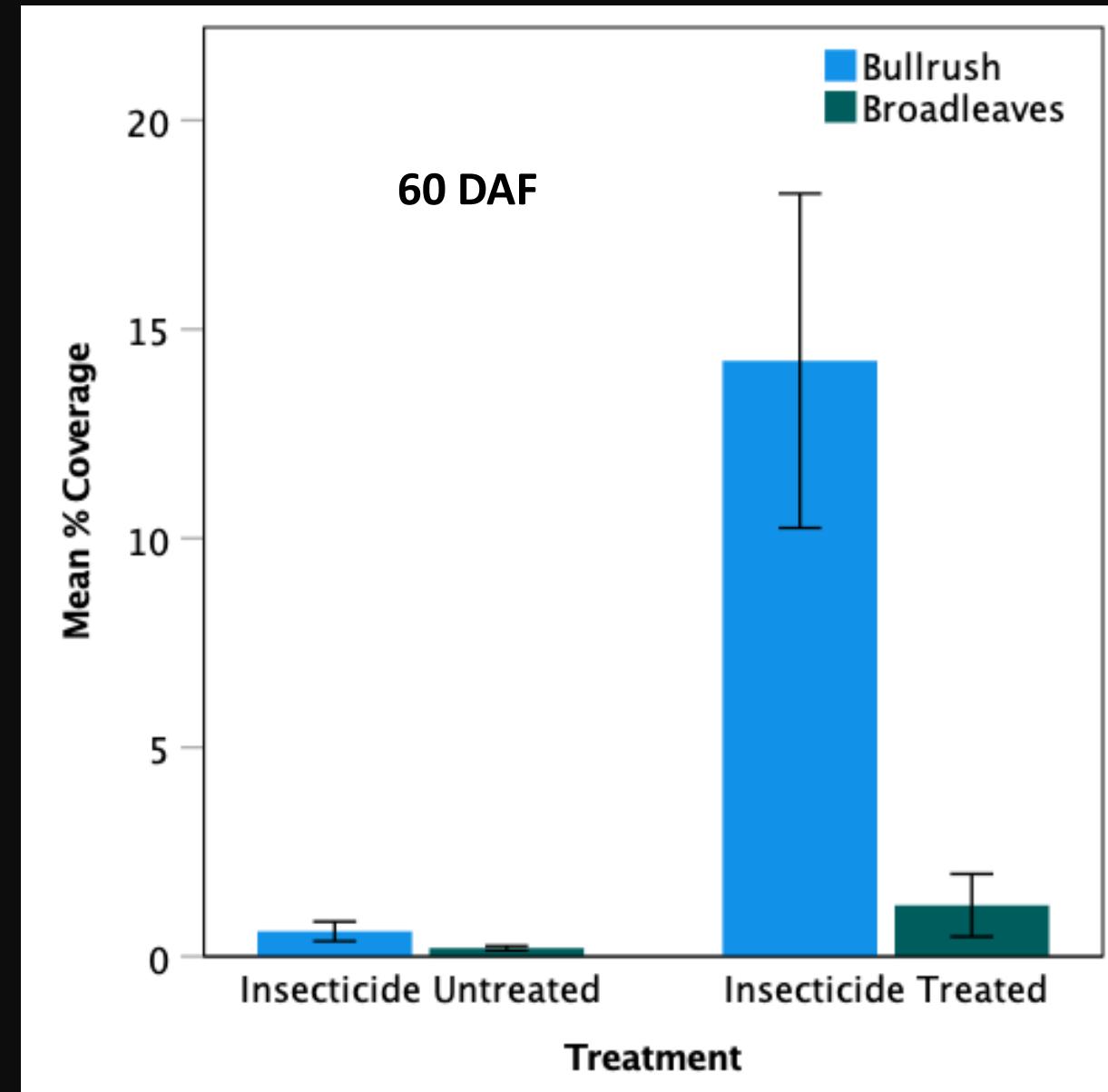
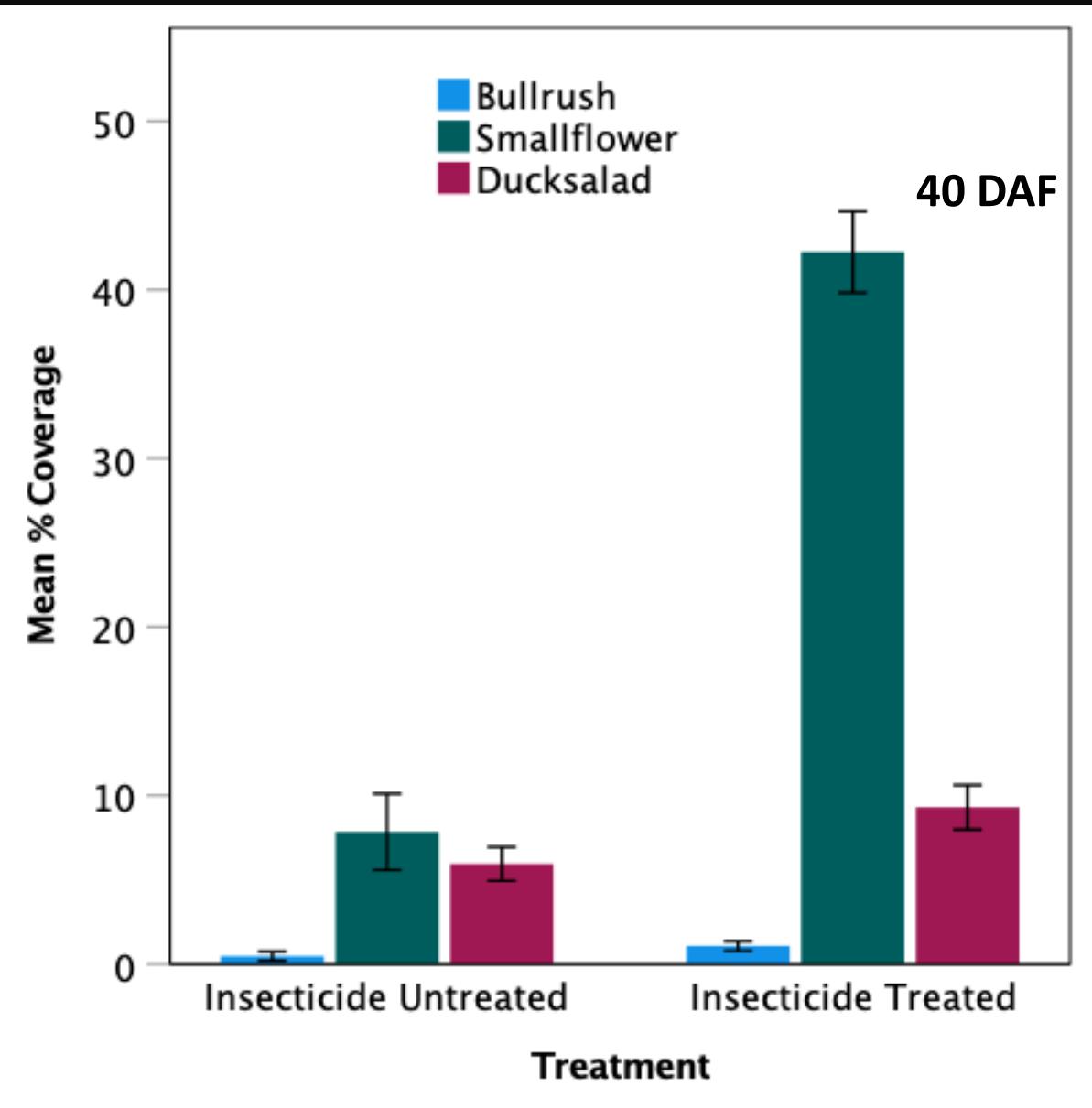
- Biological control
- Weed management – TPS interaction

TPS may affect weeds



# TPS can affect weed coverage

Herbicide applications: Clomazone  
@ 8 DAF; penoxsulam + propanil @ 41 DAF





## No TPS

-Bullrush escaped penoxsulam +  
propanil control

## TPS

-Plots seeded early  
-No bullrush escaped herbicide  
application

# Tadpole shrimp

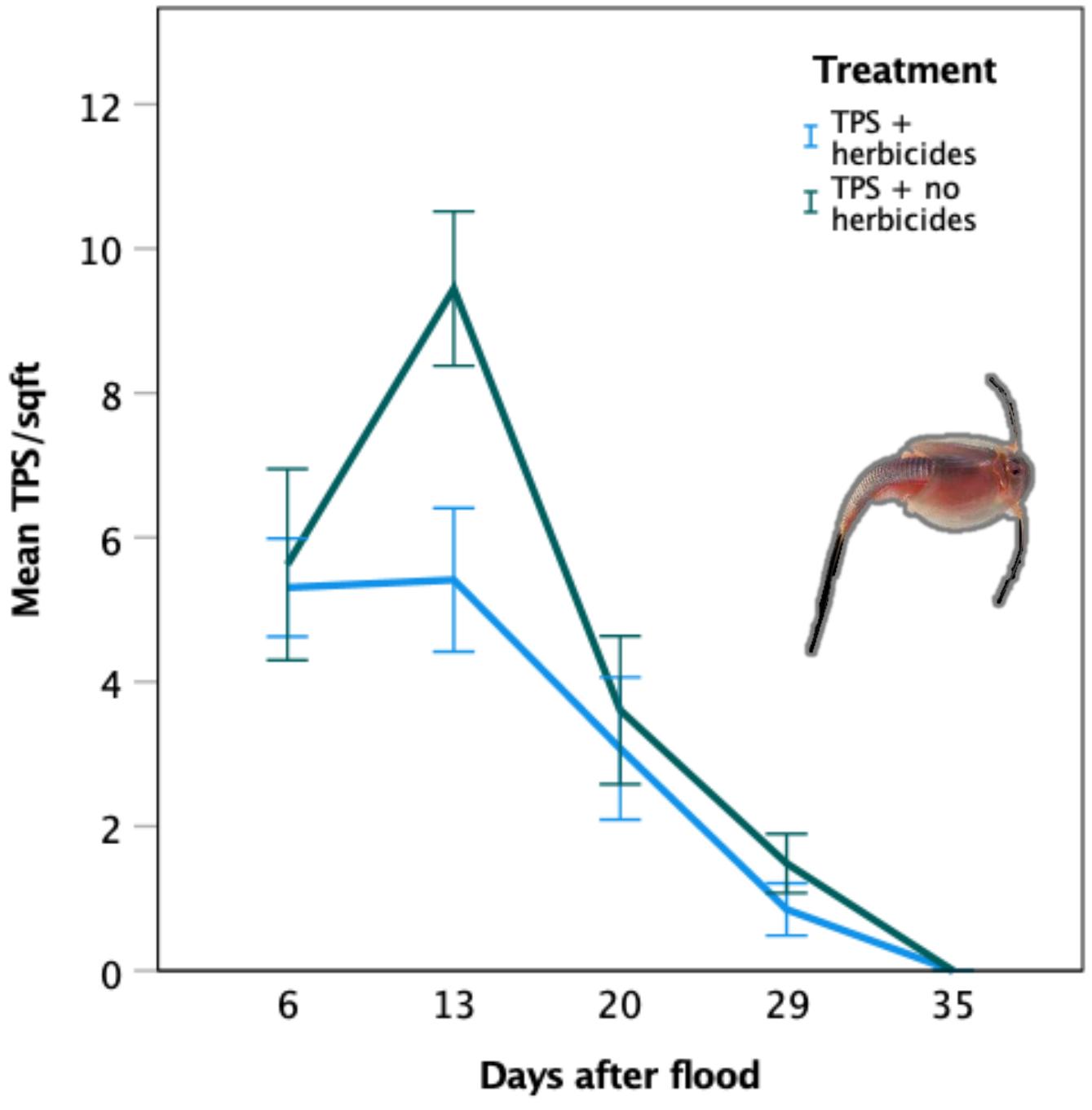
Herbicide	
Tadpole shrimp	No herbicide
Herbicide	No herbicide
No tadpole shrimp	No tadpole shrimp

## Herbicides

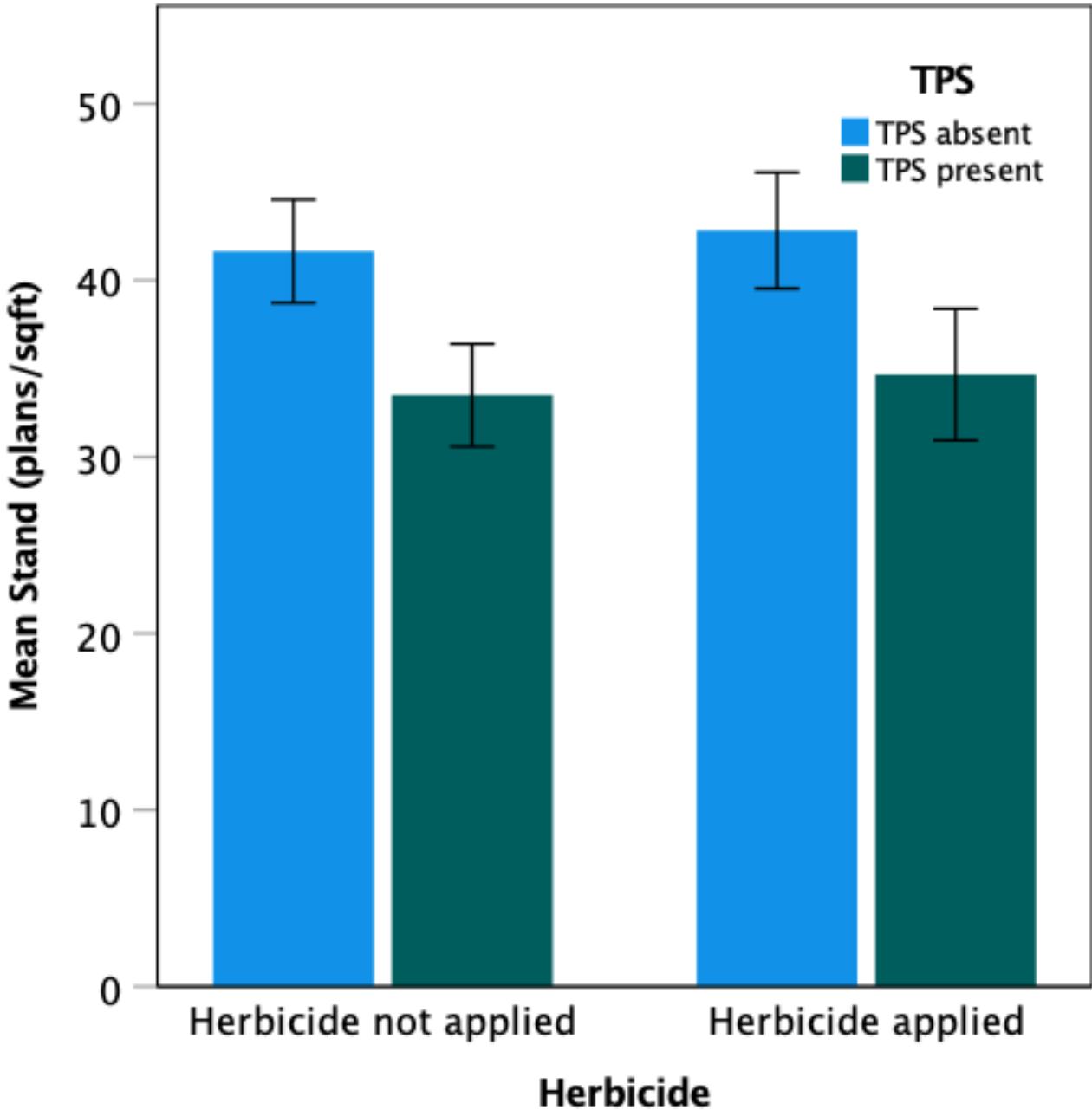
- 5/31-DAS: Clomazone (0.04 lbs/a)
- 6/13: Pre-mix of bezobicyclon and halosulfuron (0.23 and 0.05 lbs/a)
- 7/15: Tankmix of propanil and besulfuron-methyl (6 and 0.04 lbs/a)

## Insecticides

- Lambda-cyhalothrin

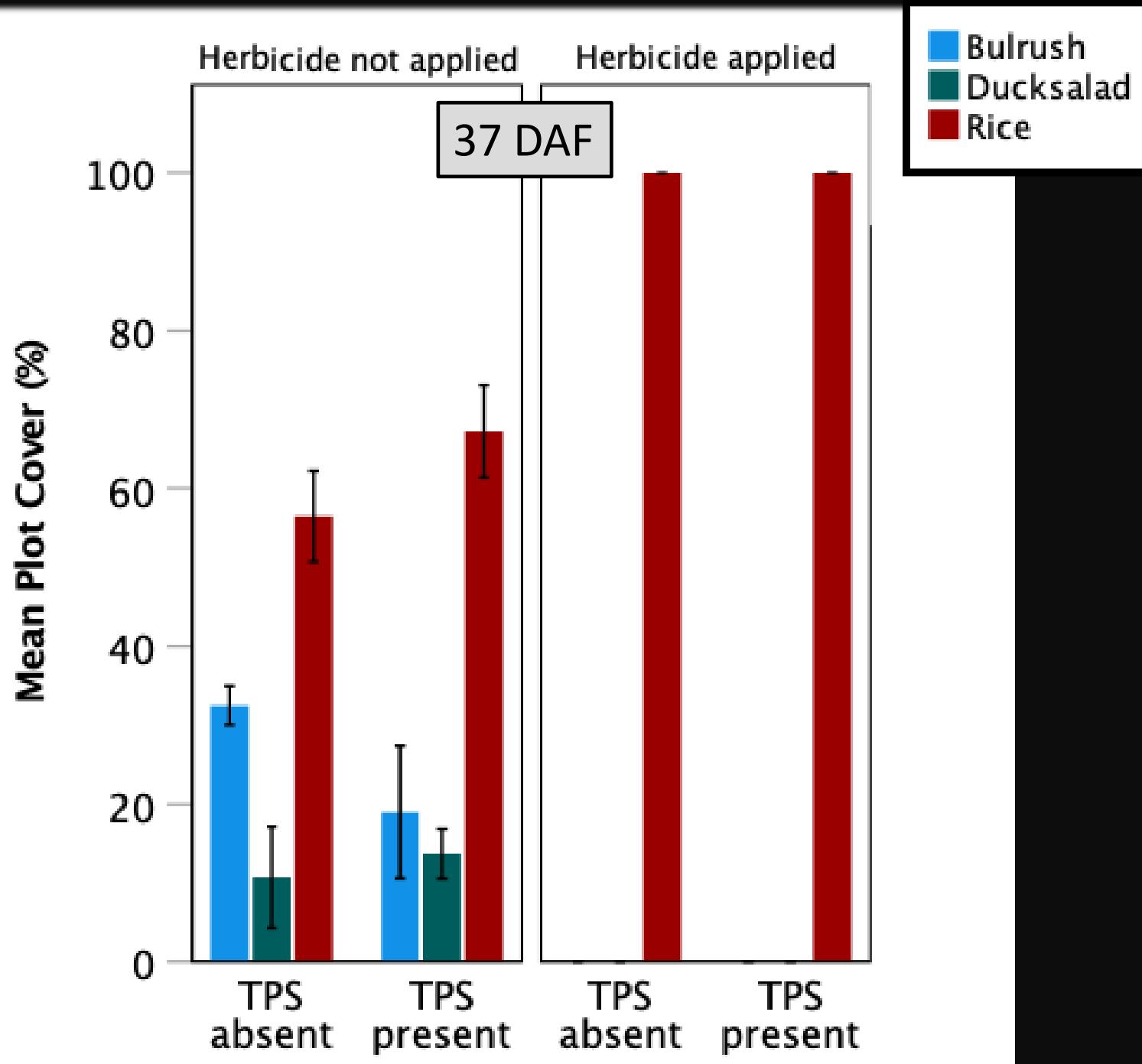


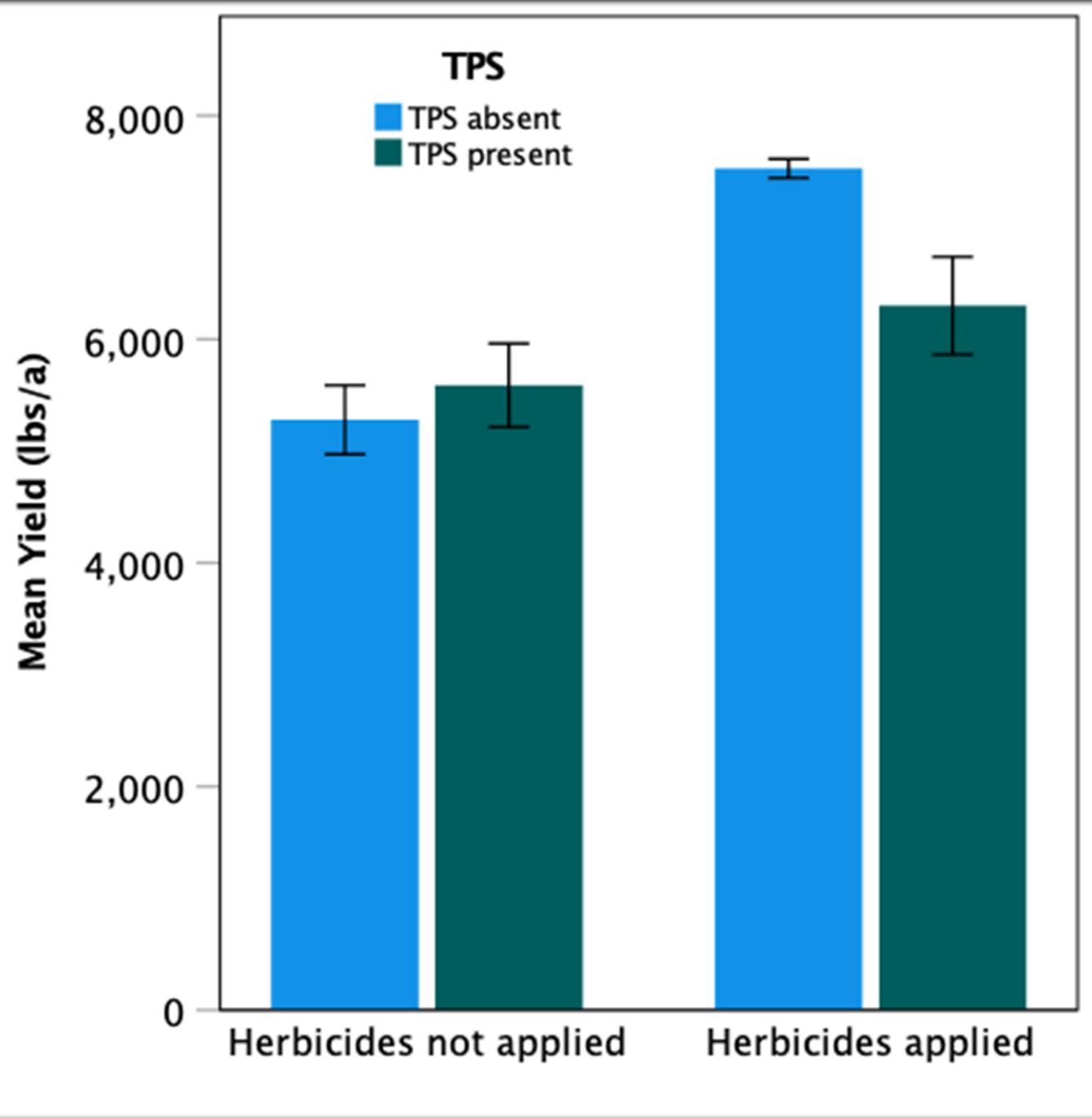
- Slight differences (13 DAT), but otherwise no effect of herbicides on TPS



Plant stand:  
22 days after flood



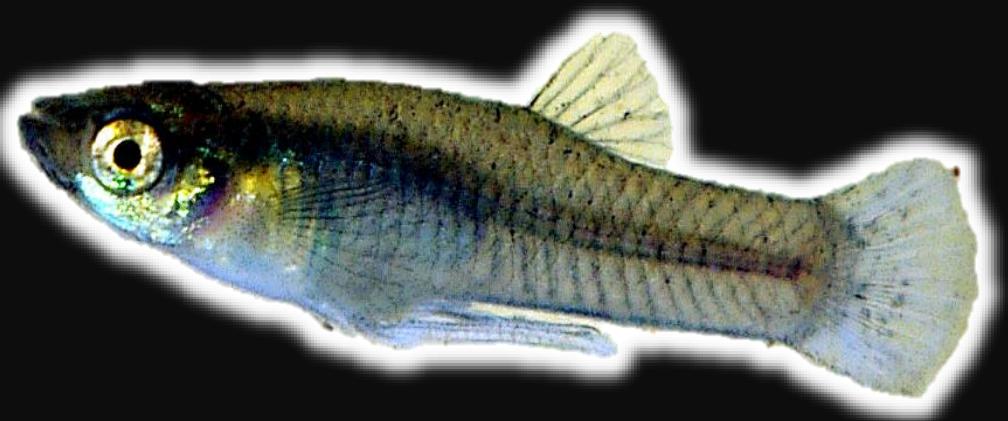




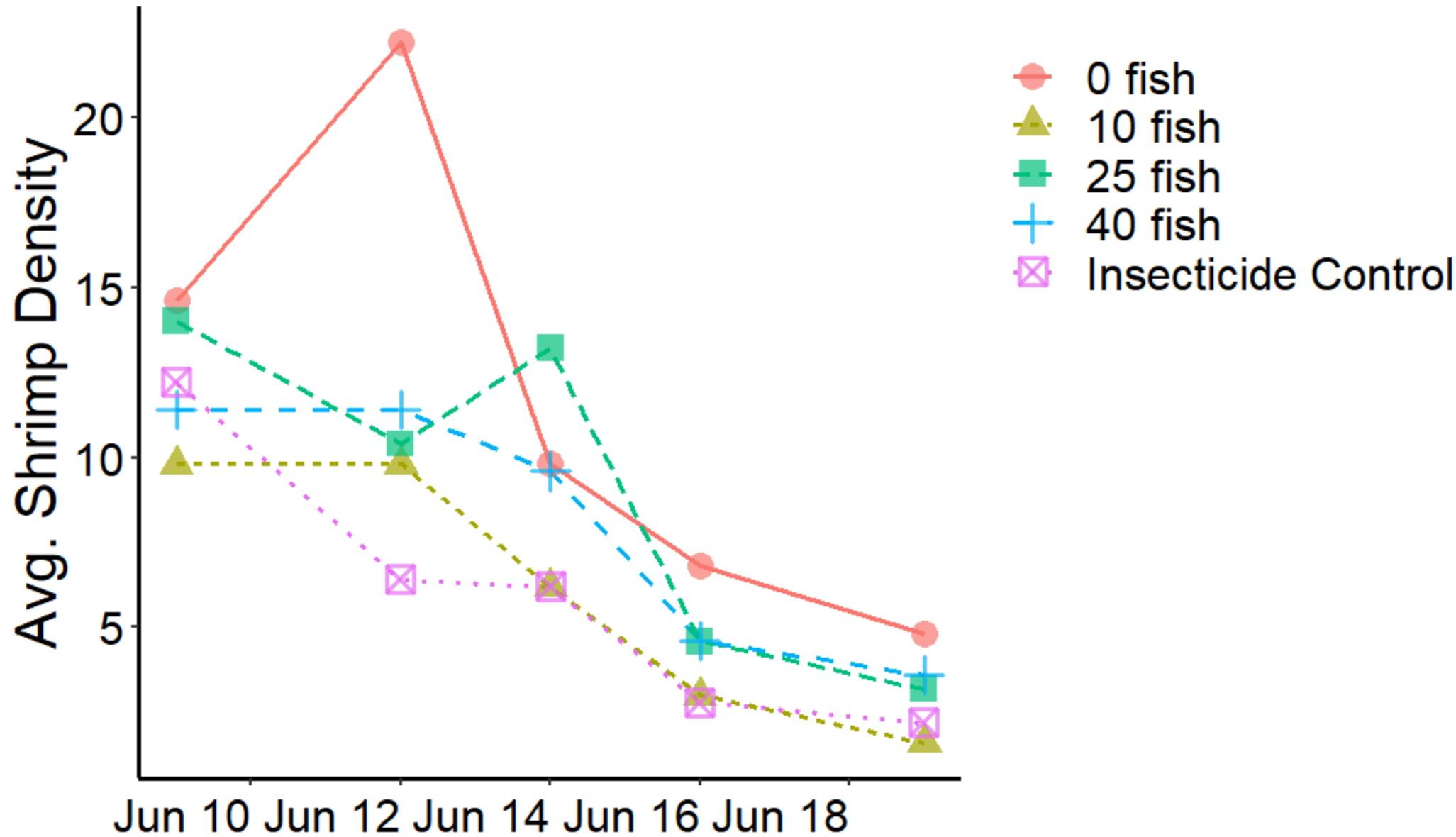
Yield

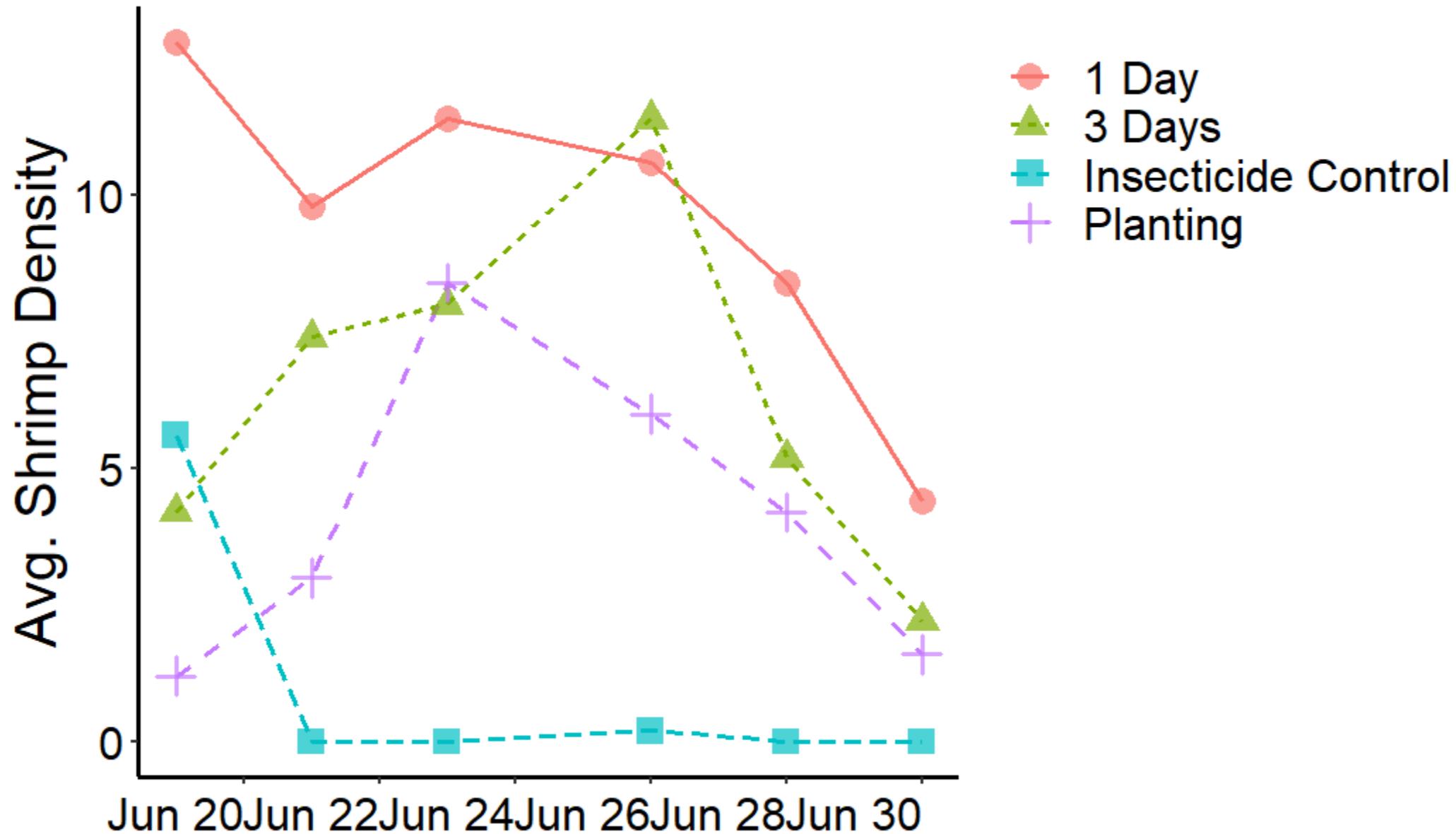






- **Density (of fish)**
  - 5 treatments: Insecticide (diflubenzuron), 0 fish, 10 fish, 25 fish, 40 fish
- **Timing (of application)**
  - 4 treatments: Insecticide control (diflubenzuron), at-planting, 1 day, 3 days
  - 40 fish added to each plot





# Rice seed midge



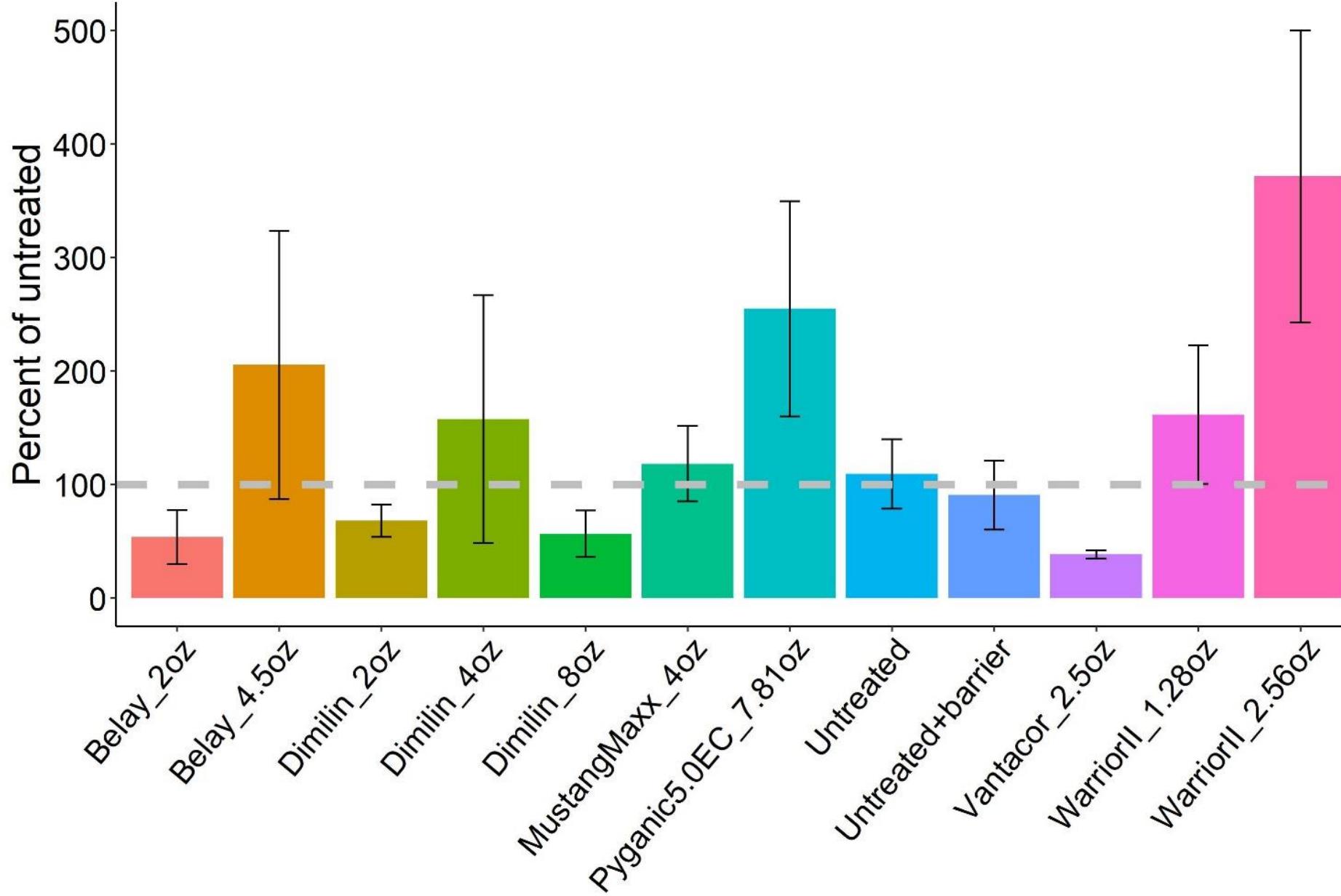
# Insecticide trial: seed midge - 2022

Trt #	Treatment	Rate
1	Belay	2 fl oz
2	Belay	4.5 fl oz
3	Dimilin 2L	2 fl oz
4	Dimilin 2L	4 fl oz
5	Dimilin 2L	8 fl oz
6	Mustang Maxx	4 fl oz
7	Pyganic 5.0 EC	7.81 fl oz
8	Vantacor	2.5 fl oz
9	Warrior II	1.28 fl oz
10	Warrior II	2.56 fl oz
11	Untreated #1	N/A
12	Untreated# 2- barrier	Barrier

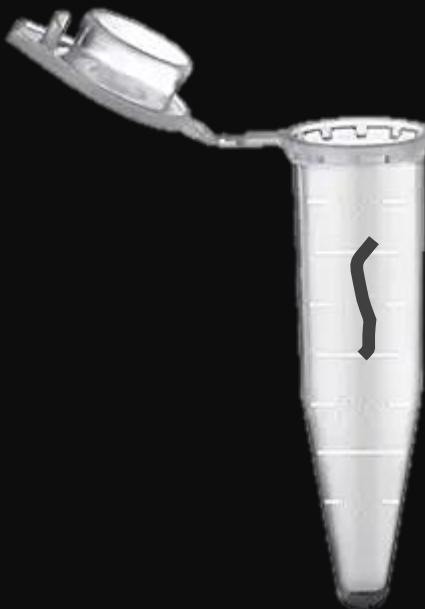


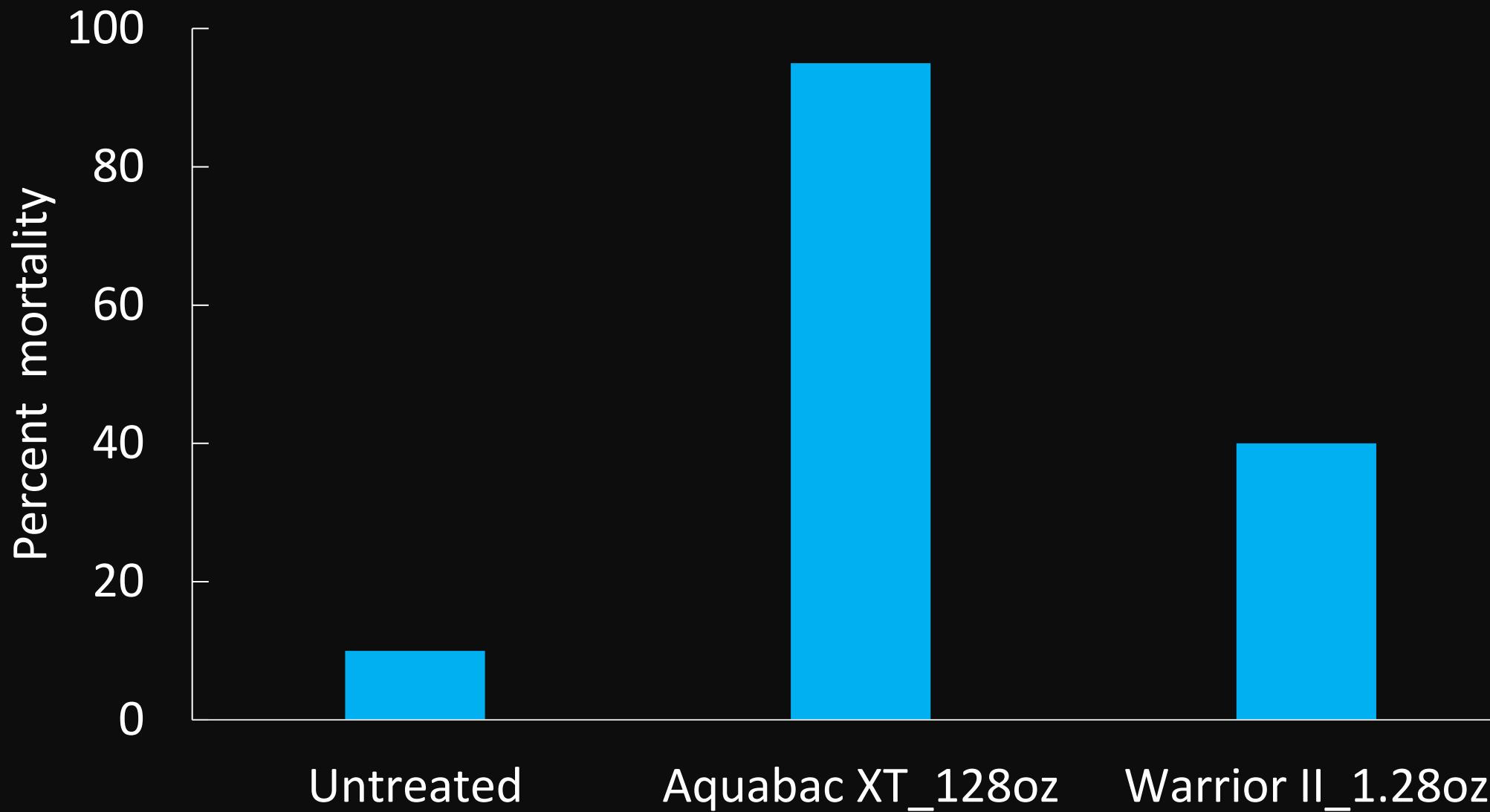


Cnephodes  
metzneri



- 3 treatments
  - Untreated
  - Aquabac Xt
  - Warrior II
- 40 larvae per





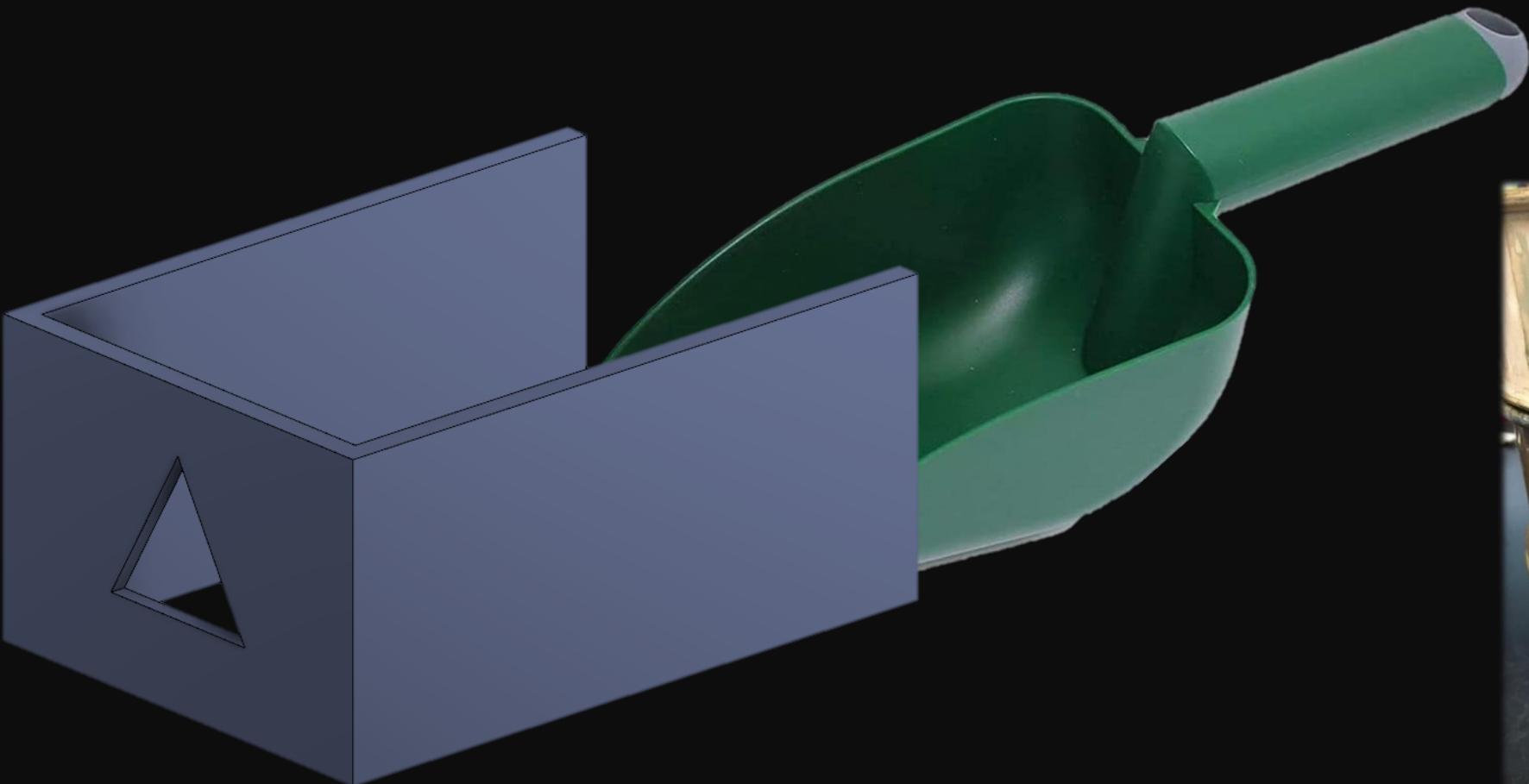
# Insecticide trial: seed midge - 2023

Trt #	Treatment	Active ingredient	Units
1	Untreated -normal		
2	Untreated-remove TPS		
3	Warrior II	Lambda-cyhalothrin	1.28 fl oz
4	Warrior II	Lambda-cyhalothrin	2.56 fl oz
5	Mustang Maxx	Zeta-cypermethrin	4 fl oz
6	Belay	Clothianidin	2 fl oz
7	Belay	Clothianidin	4.5 fl oz
8	Pyganic 5.0 EC	Pyrethrins	7.805 fl oz
9	Pyganic 5.0 EC	Pyrethrins	15.61 fl oz
10	Vantacor	Chlorantraniliprole	1.6 fl oz
11	Vantacor	Chlorantraniliprole	2.5 fl oz
12	Dimilin 2L	Diflubenzuron	4 fl oz
13	Dimilin 2L	Diflubenzuron	8 fl oz
14	Dimilin 2L	Diflubenzuron	16 fl oz
14	Aquabac XT	<i>Bt israelensis</i>	32 fl oz
15	Aquabac XT	<i>Bt israelensis</i>	64 fl oz
16	Aquabac XT	<i>Bt israelensis</i>	128 fl oz



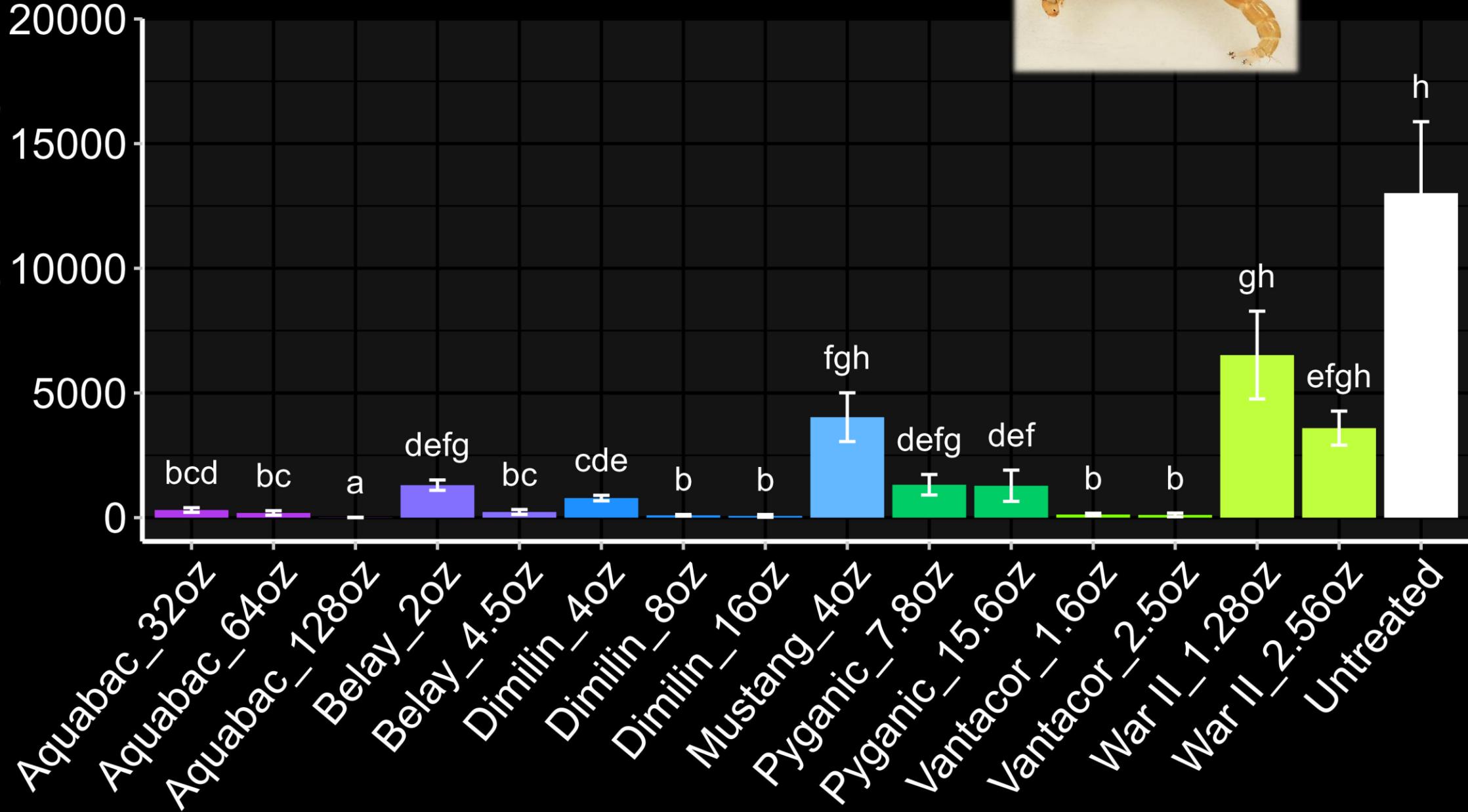


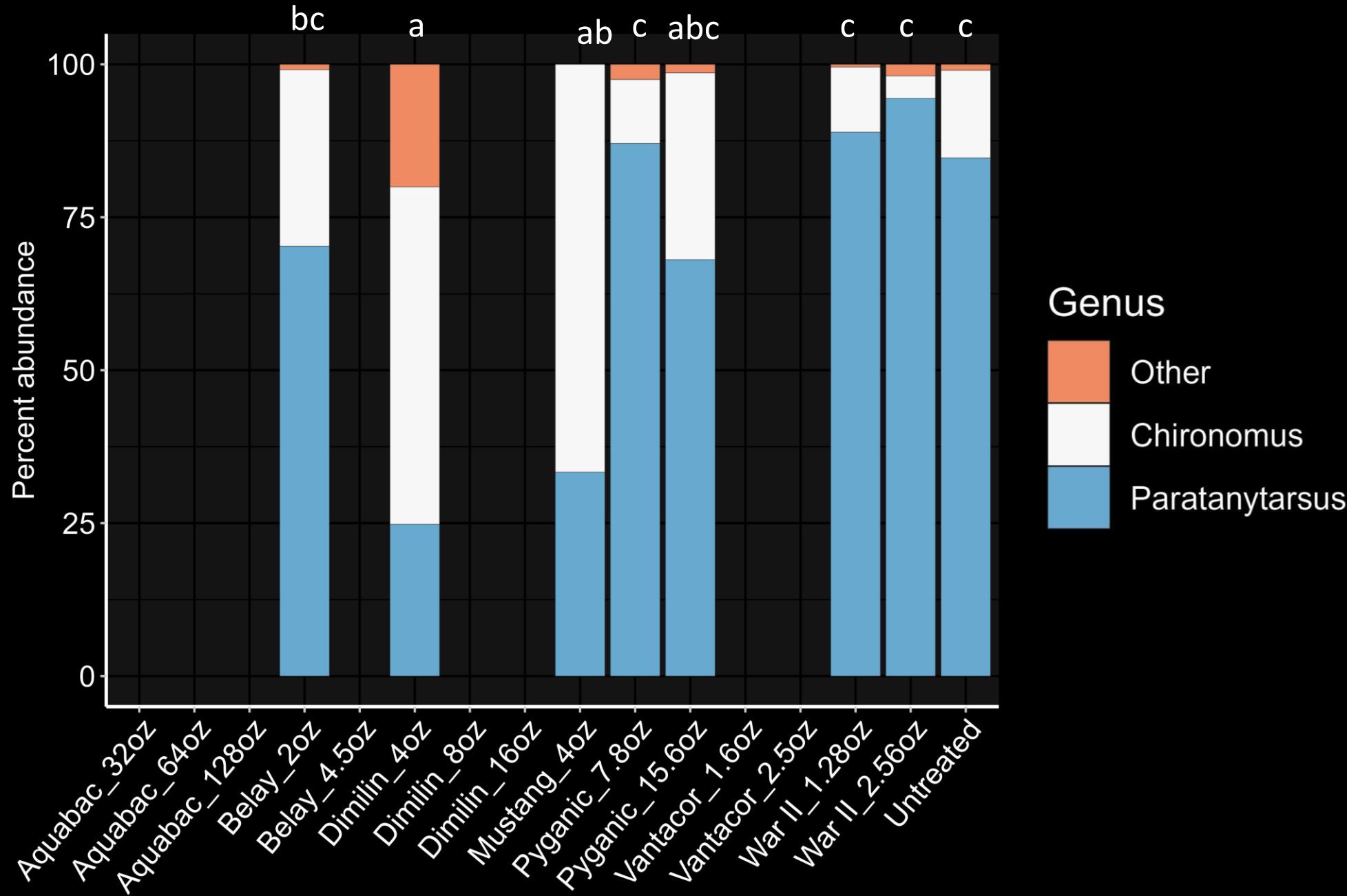


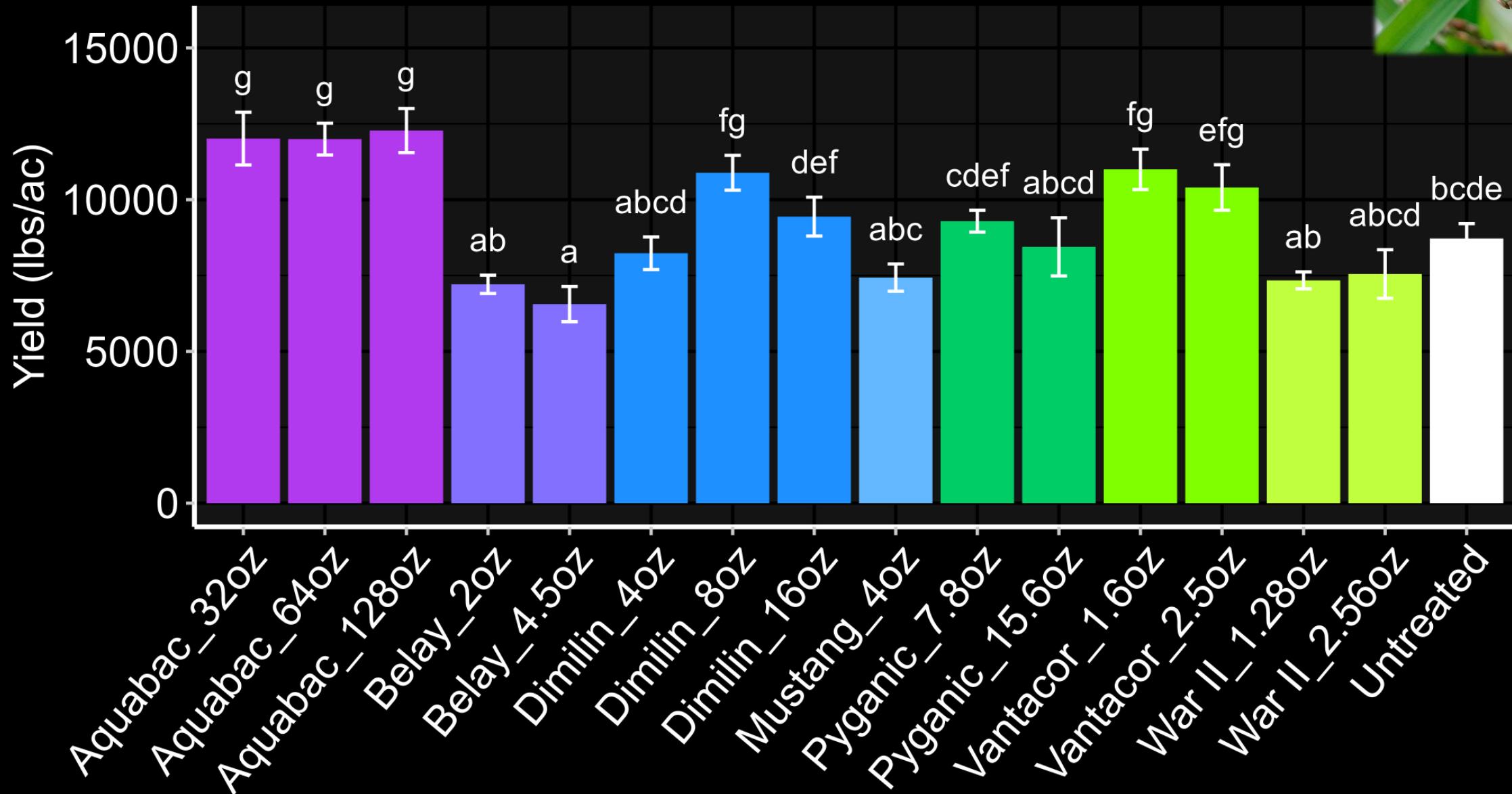


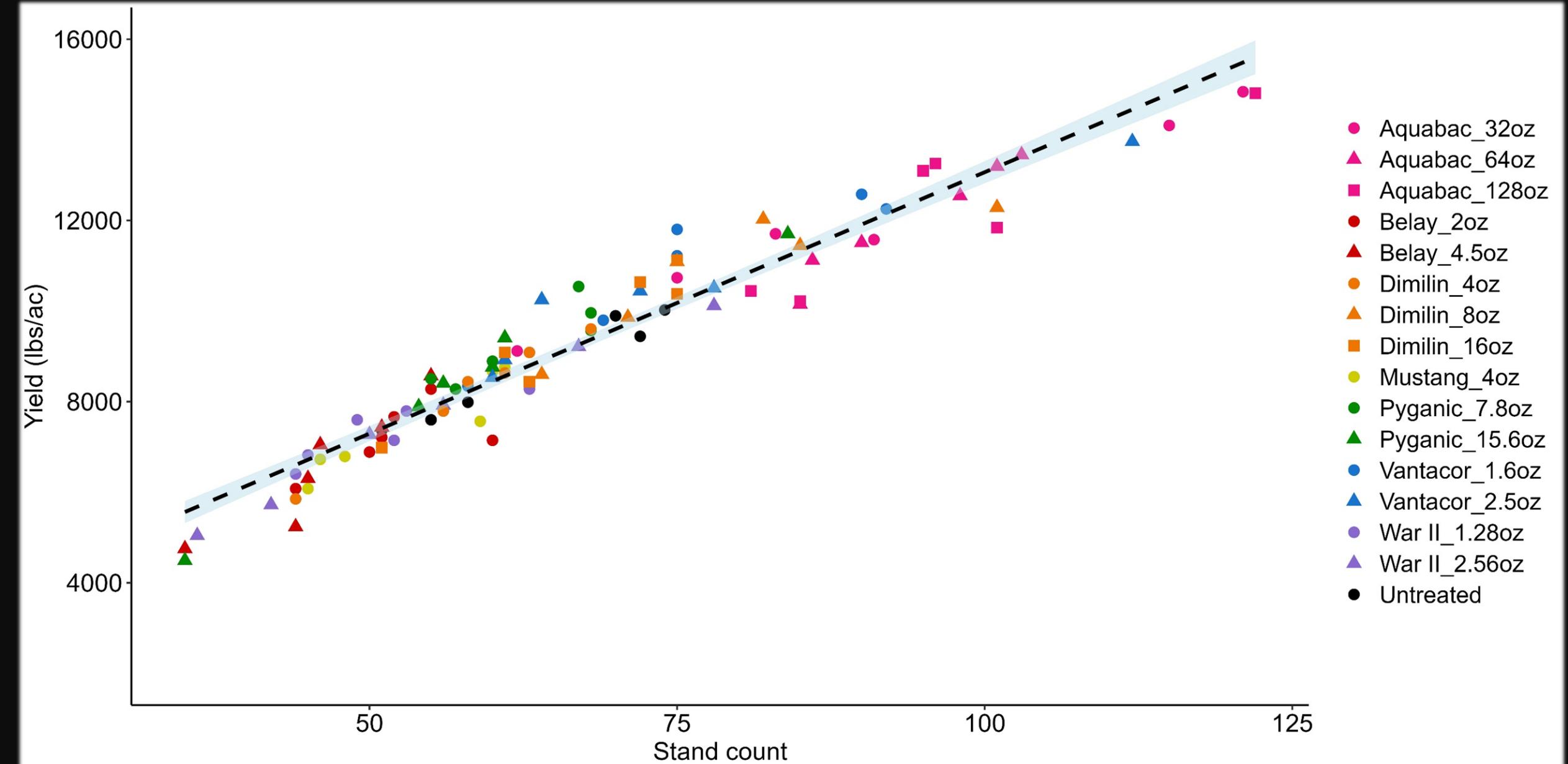


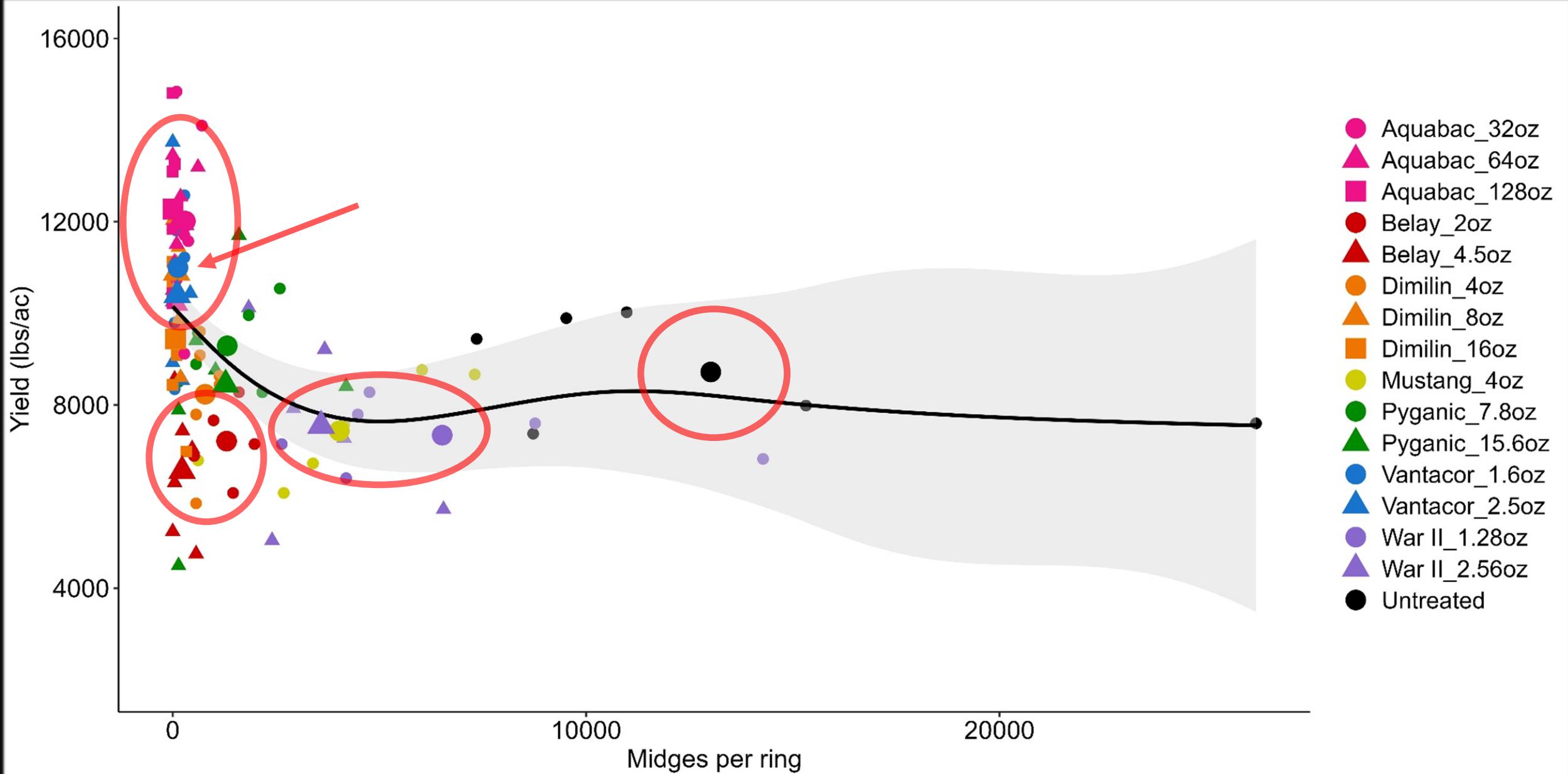
Total midges in ring







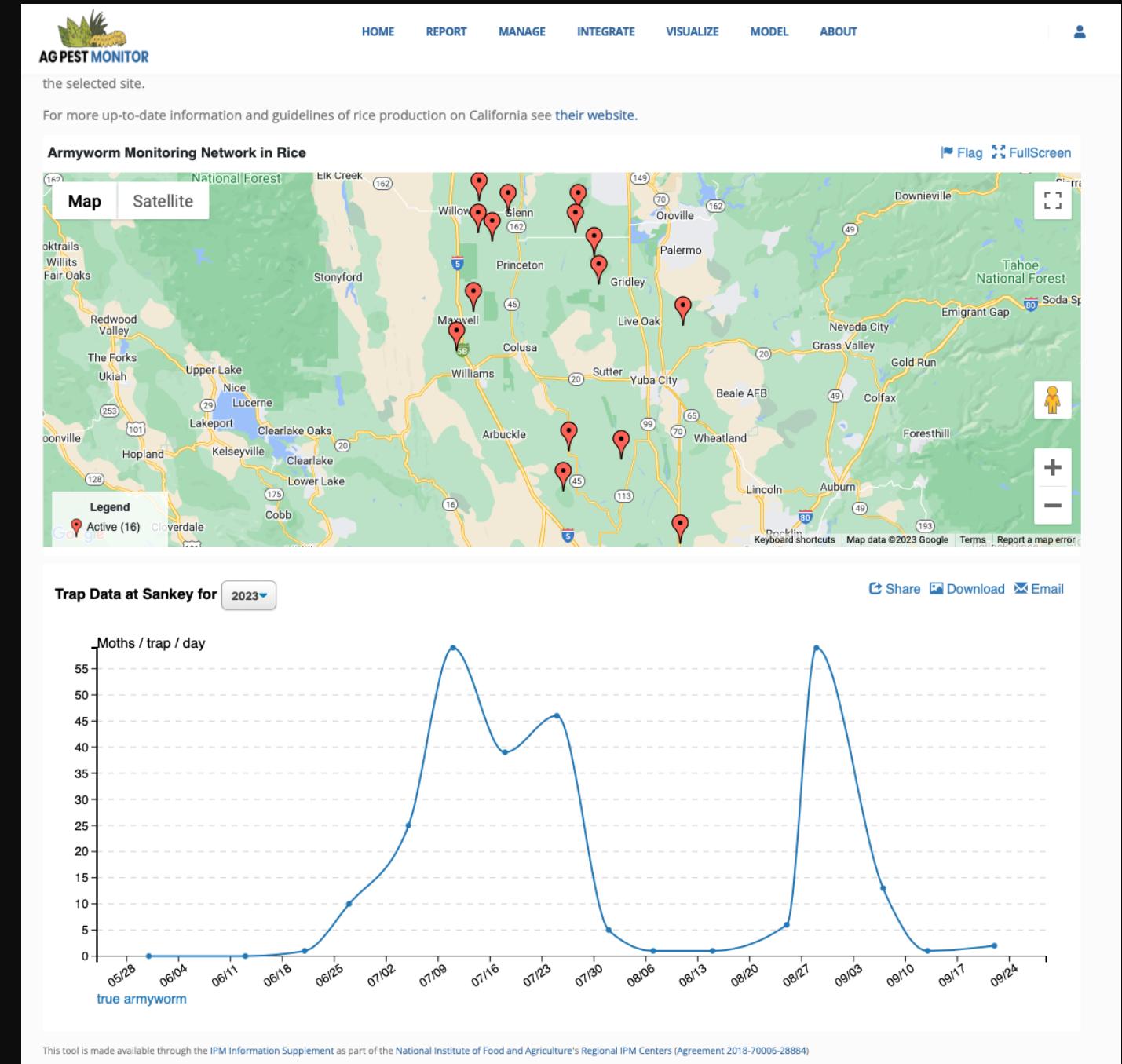


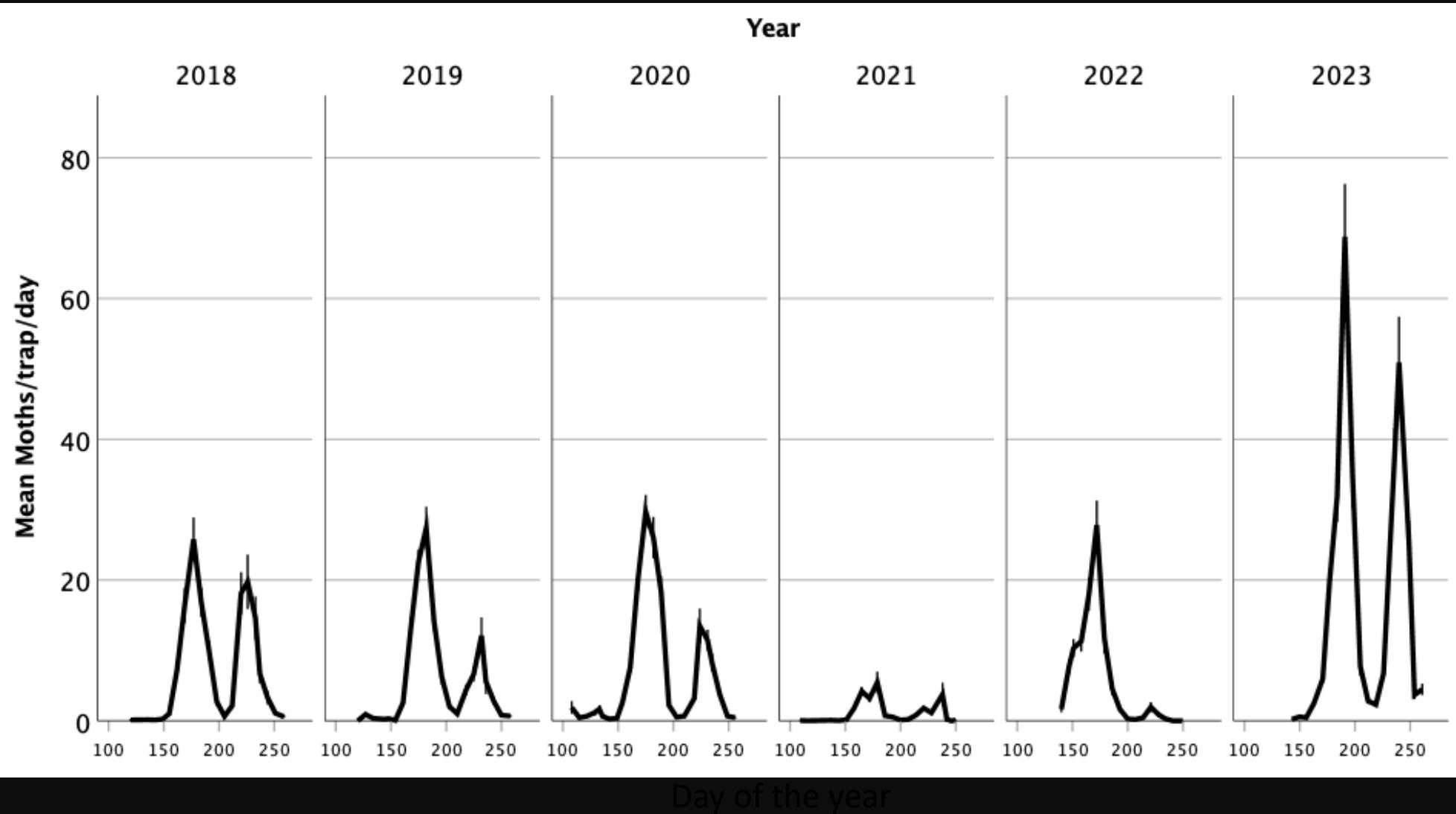


# Armyworms



# Areawide monitoring





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- Rice Experiment Station
- Grettenberger lab undergraduates
- Ray Stogsdill

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Questions?