



Strawberry Agritech 2026 May 5th



Host Plant Resistance, Ultrasound, and Biopesticides as Tools for Strawberry Pest Management



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Chilli Thrips

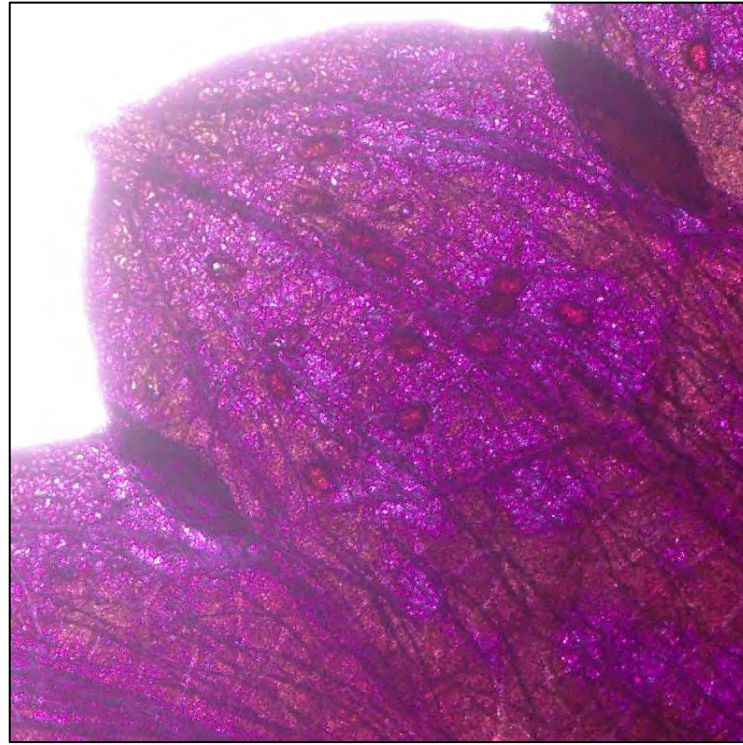
Key Thrips: Chilli Thrips

- *Scirtothrips dorsalis* (Hood)
- Invasive and phytophagous (Kumar et al. 2013).
- Six life stages



Chilli Thrips

- Can complete development between **9.7 °C – 33 °C**
(**49.5 °F – 91.4 °F**)
- Doesn't develop below **-4 °C (24.8 °F)**
- Favored by dry conditions ([LINK](#))
- Feed on wild plant hosts in June-Aug ([LINK](#))



Chilli thrips eggs. Image: Lovely Adhikary, UF/IFAS GCREC

Severe infestation



Bronzing and cracking of fruits



Chastity Perry



Lovely Adhikary

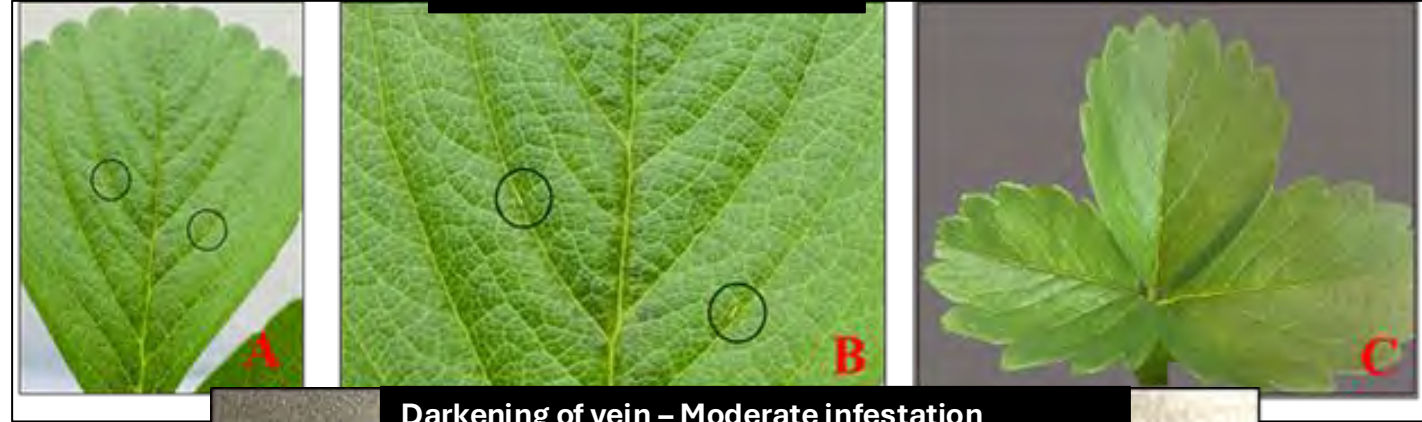


Diem
Nguyen

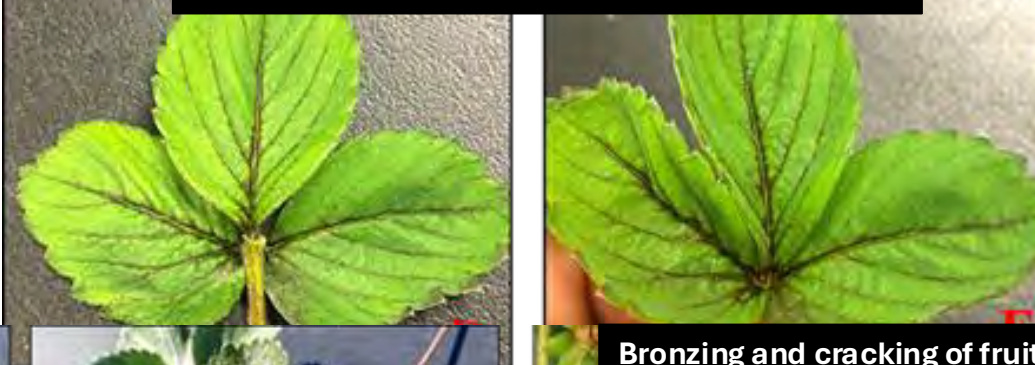
Chilli Thrips

- Infest plants early in the season.
- Heavy feeding causes necrosis of leaf veins and petioles.
- Feeding damage causes bronzing and cracking of fruits.
- Yield loss.
- Rapid insecticide resistance development. [Link](#)

Initial leaf symptoms



Darkening of vein – Moderate infestation



Severe infestation

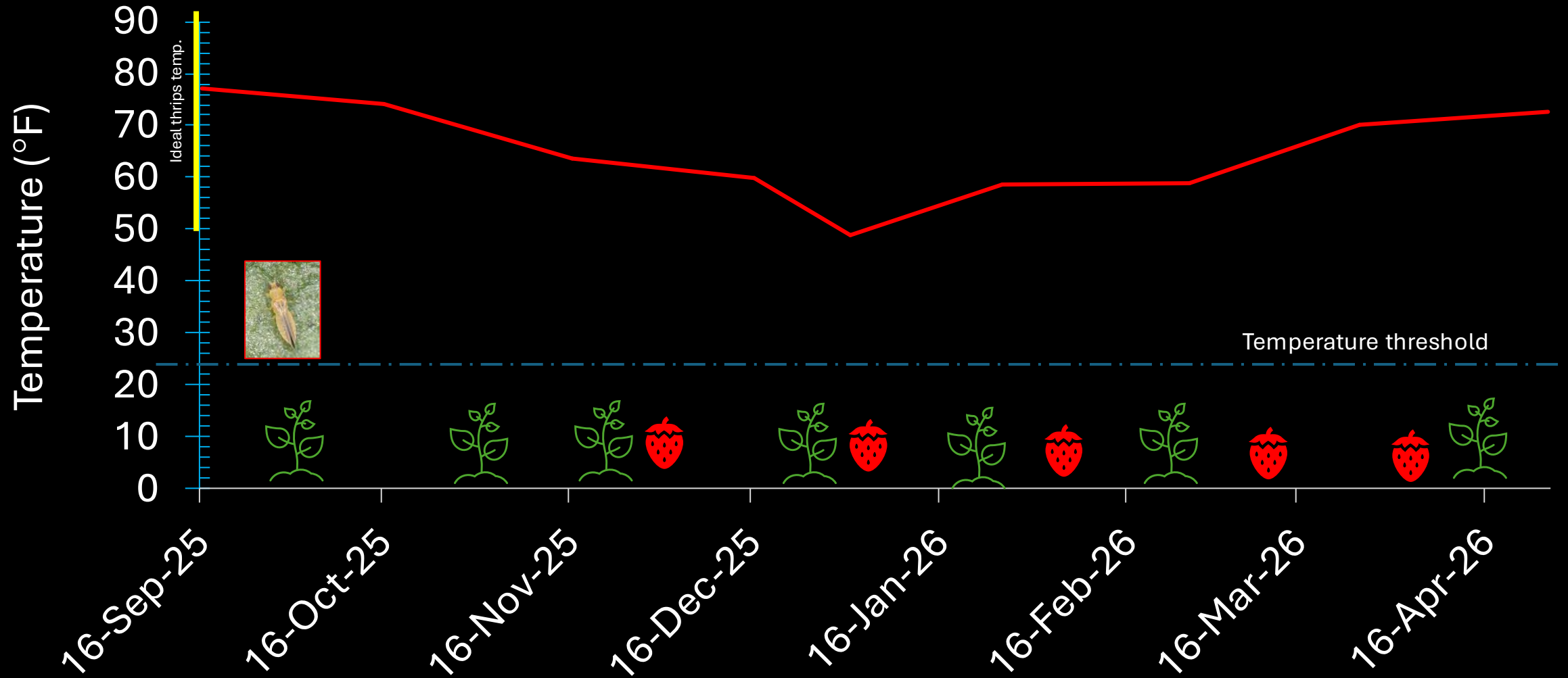


Bronzing and cracking of fruits



Chilli Thrips in FL

2025-2026 Weather Data Source: UF/IFAS FAWN at GCREC, Balm Station



Biological & Chemical Control of Thrips

Apta (Grp. 21A)

Exirel (Grp. 28)

Timectin (Grp. 6)

Rimon (Grp. 15; IGR)

Radiant (Grp. 5)

**Sefina Inscalis
(Grp. 9D)**

Knack (Grp. 7C; IGR)

Assail (Grp. 4A)

Sivanto Prime (Grp. 4D)

Remember to use a non-ionic
surfactant (0.25 % v/v), 50-100 GPA.
Use the 1-2 week residual activity
period.

OMRI

Entrust (Grp. 5)

BoteGHA Optima

(EPF: *Beauveria bassiana*)

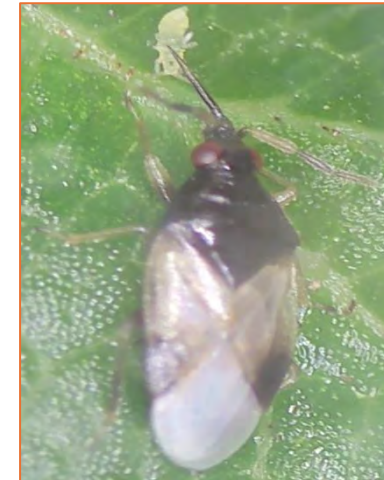
Captiva Prime (Botanical:
Capsicum + garlic + canola)

Pyganic (Grp. 3A)
(Botanical: pyrethrin)

Aza-Direct (Botanical: neem)



Predatory mite, *Amblyseius swirskii*, *Neoseiulus californicus*



Minute pirate
bug, *Orius* spp.

Twospotted Spider Mite Damage on Strawberry

- *Tetranychus urticae* Koch
(Trombidiformes: Tetranychidae).
- Cause leaf stippling.
- Strawberry fruit yield loss by 10-25%.
- Resistance to several miticides.



Trifoliate covered in webbing



Adult *T. urticae* and eggs

Twospotted Spider Mite Damage on Strawberry

Mycotrol ESO
(*Beauveria*
bassiana strain
GHA) **OMRI**

PyGanic EC 5.0
(IRAC Grp. 3A)
OMRI

Agri-Mek (IRAC
Grp. 6)

Nealta (IRAC
Grp. 25)



Predatory mite as biological control agent.
Video credit: Allan Busuulwa, GCREC, UF/IFAS.

Magister SC
(IRAC Grp. 21)
APPLY ONCE ONLY; REI-7d,
PHI 12H, Not during bloom
(<https://www.cdms.net/ldat/ldCD5027.pdf>)

Onager Optek
(IRAC Grp. 10A)
APPLY ONCE ONLY; REI-3d,
PHI 12H
(<https://www.cdms.net/ldat/ldDE1034.pdf>)

Pamera Seed Bug

Neopamera bilobata Say (Hemiptera: Rhyparochromidae)



Pamera Seed Bug

Neopamera bilobata Say (Hemiptera: Rhyparochromidae)



- Native to Florida.
- Adults and nymphs are actively feeding stages.
- Feeding injuries on young fruit make the fruits unmarketable.

[Talton et al. 2020.](#)

[DOI: 10.3390/insects11120843.](https://doi.org/10.3390/insects11120843)

IPM of Strawberry Pests

- Host Plant Resistance (HPR)
- Ultrasound – Physical Control
- Biopesticides



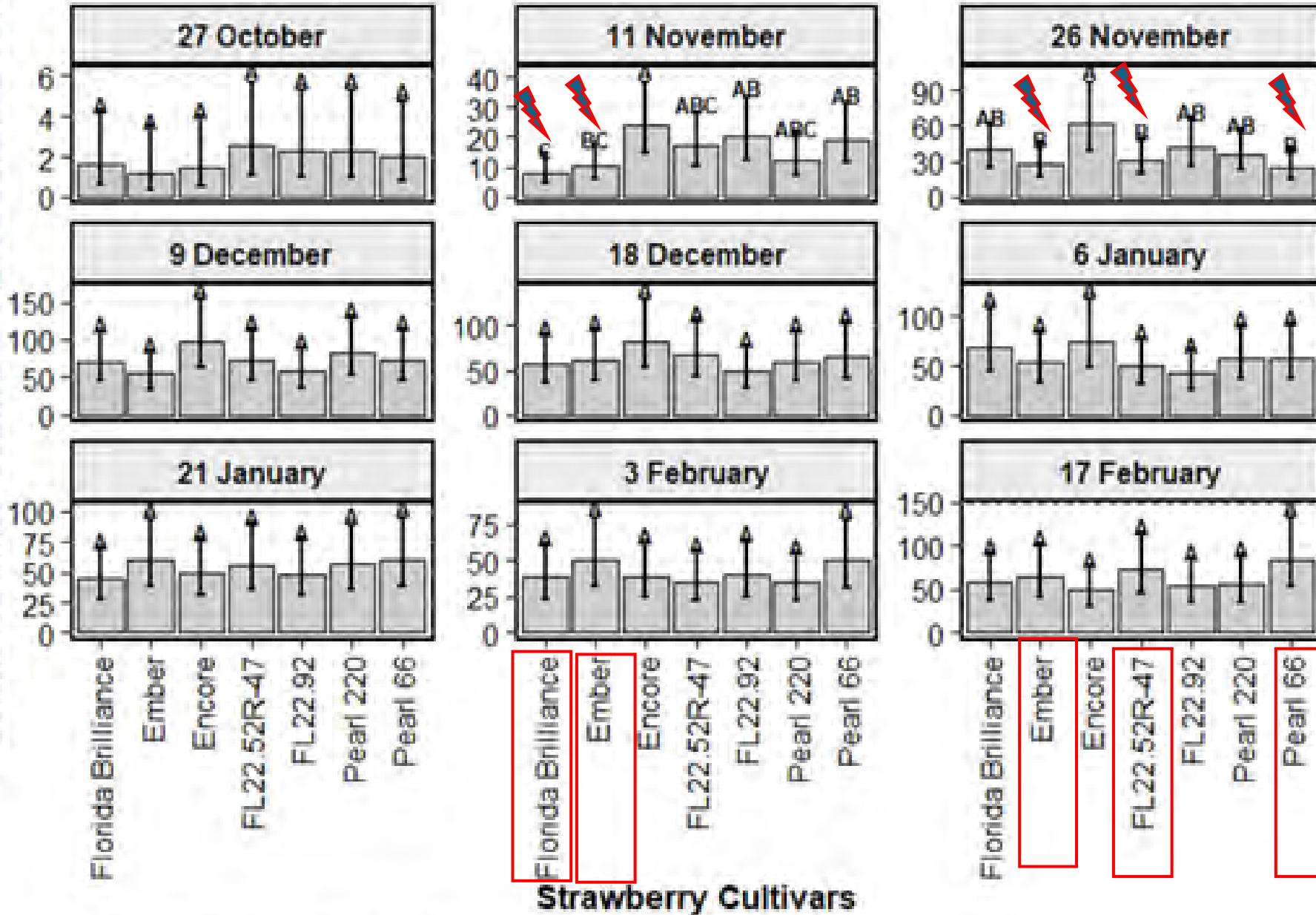
IPM of Strawberry Pests

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HPR for Chilli Thrips Management

Estimated thrips count per eight trifoliate $\pm 95\%$



Letters indicate Tukey-adjusted pairwise differences ($\alpha = 0.05$)



Lovely Adhikary



Diem Nguyen

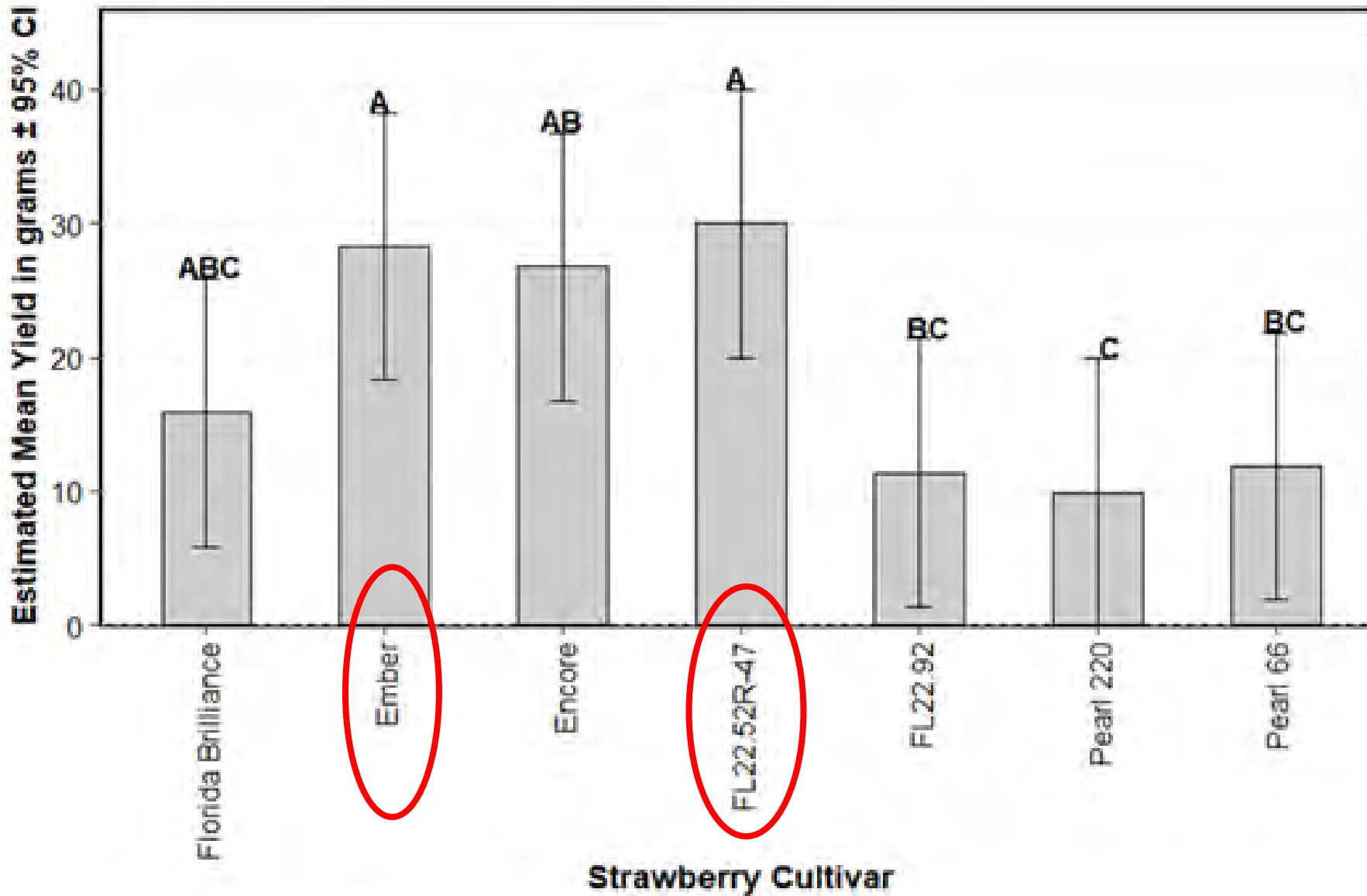


Soumava Basu



Dr. Vance Whitaker

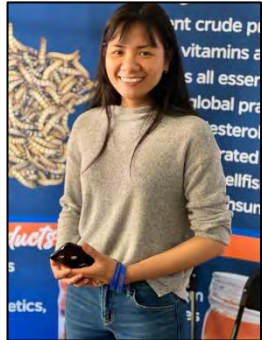
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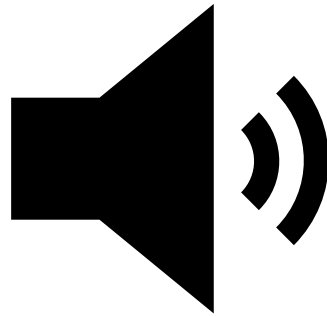
IPM of Strawberry Pests

- Host Plant Resistance (HPR)
- **Ultrasound – Physical Control**
- Biopesticides



Ultrasound for Thrips & Spider Mite IPM

- Mole crickets, cabbage loopers, mosquitoes, lacewings, praying mantises, impacted by sound waves of 20 – 80 kHz frequency.
- Impact on chilli thrips and spider mites unknown.
- Human hearing range of sound = 20 Hz to 20 kHz



Neuroscience. Purves D, Augustine GJ, Fitzpatrick D, et al., editors.

Sunderland (MA): [Sinauer Associates](#); 2001.

<https://www.ncbi.nlm.nih.gov/books/NBK10924/>

Ultrasound for Thrips & Spider Mite IPM



Allan Busuulwa



Chastity Perry



Diem Nguyen

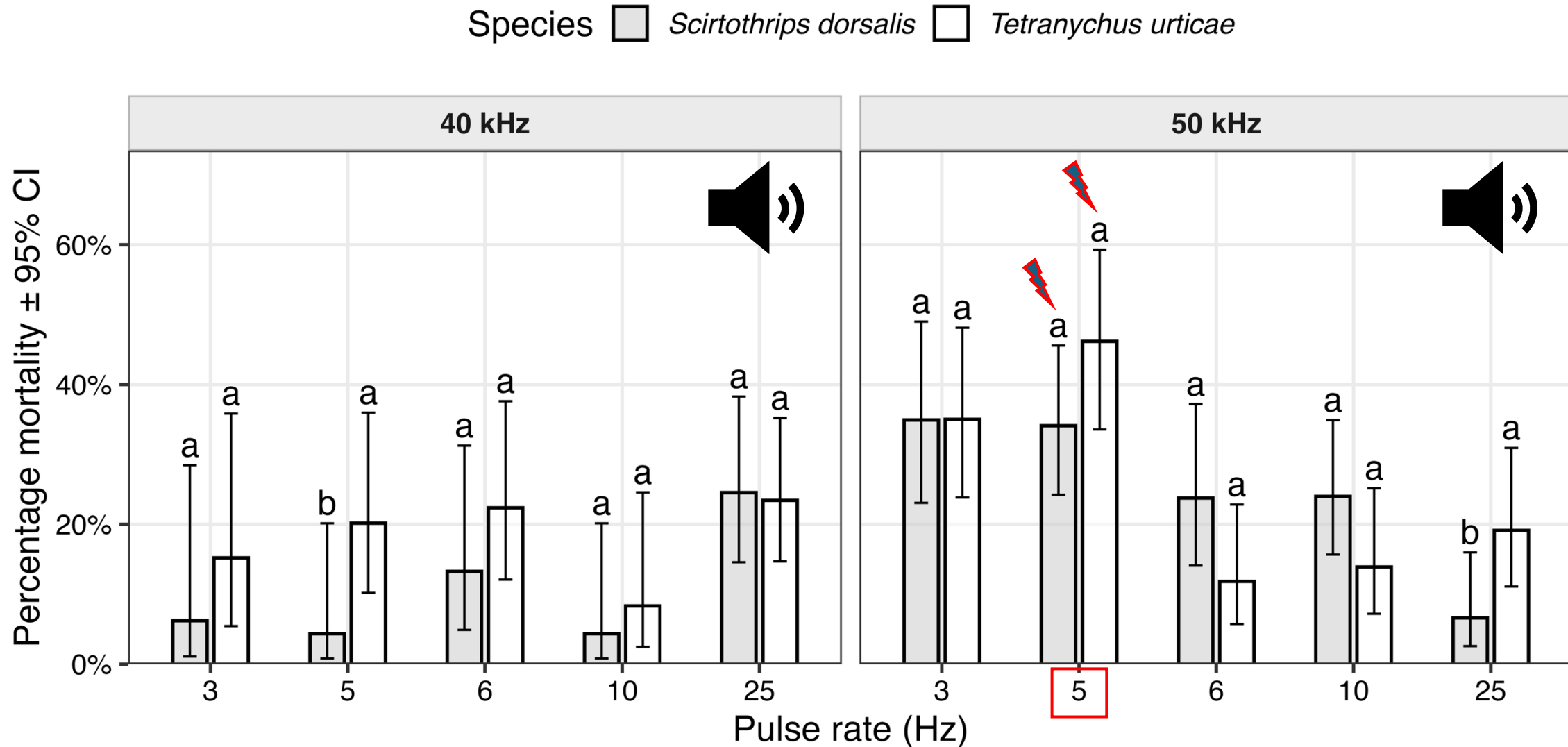


Sara Paz



Cristhian Maldonado R.

Ultrasound for Thrips & Spider Mite IPM

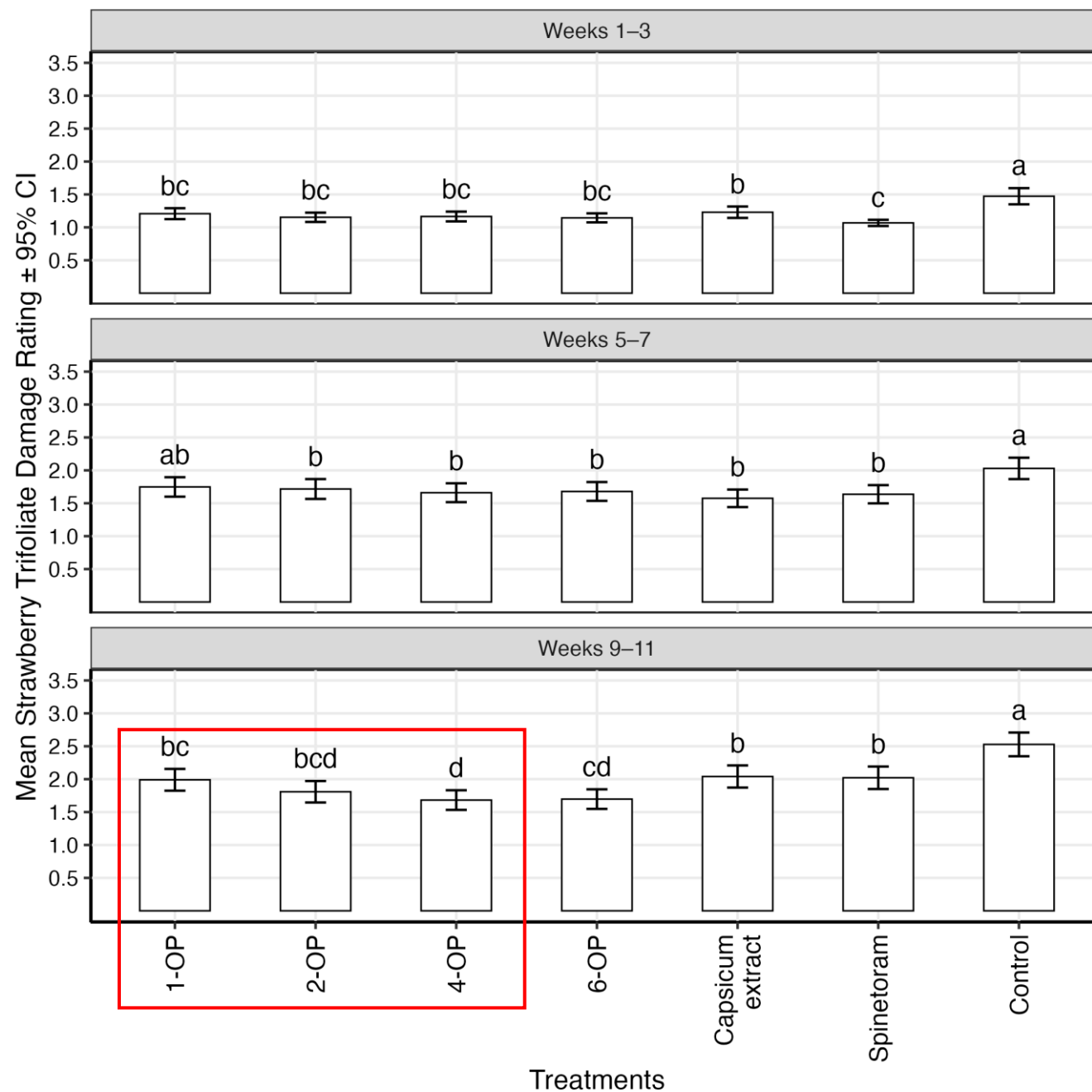


IPM of Strawberry Pests

- Host Plant Resistance (HPR)
- Ultrasound – Physical Control
- **Biopesticides**



Ornamental Peppers for Chilli Thrips



Allan Busuulwa, PhD Student, Lahiri Lab, GCREC

Pamera Seed Bug

Neopamera bilobata Say (Hemiptera: Rhyparochromidae)

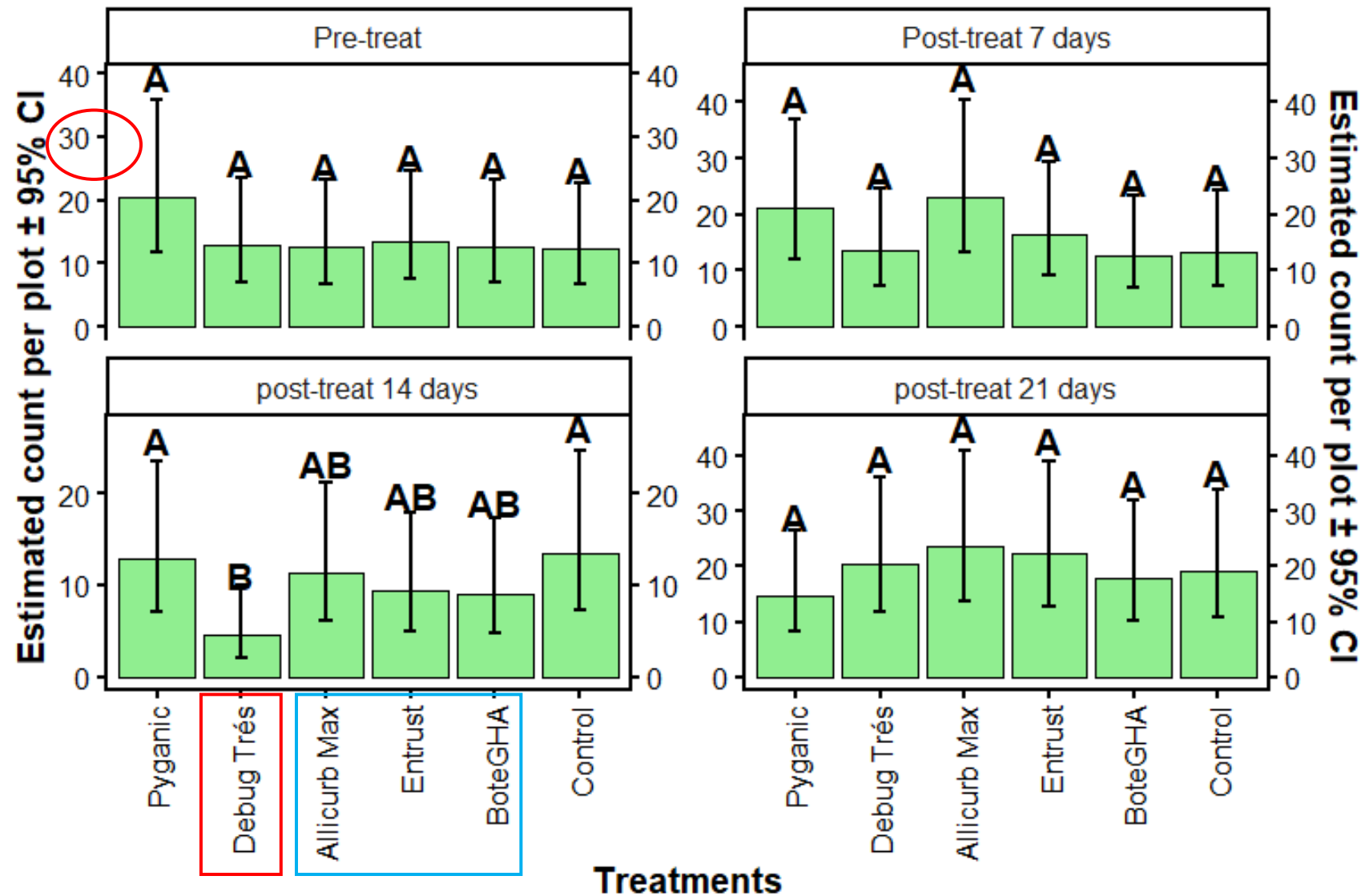
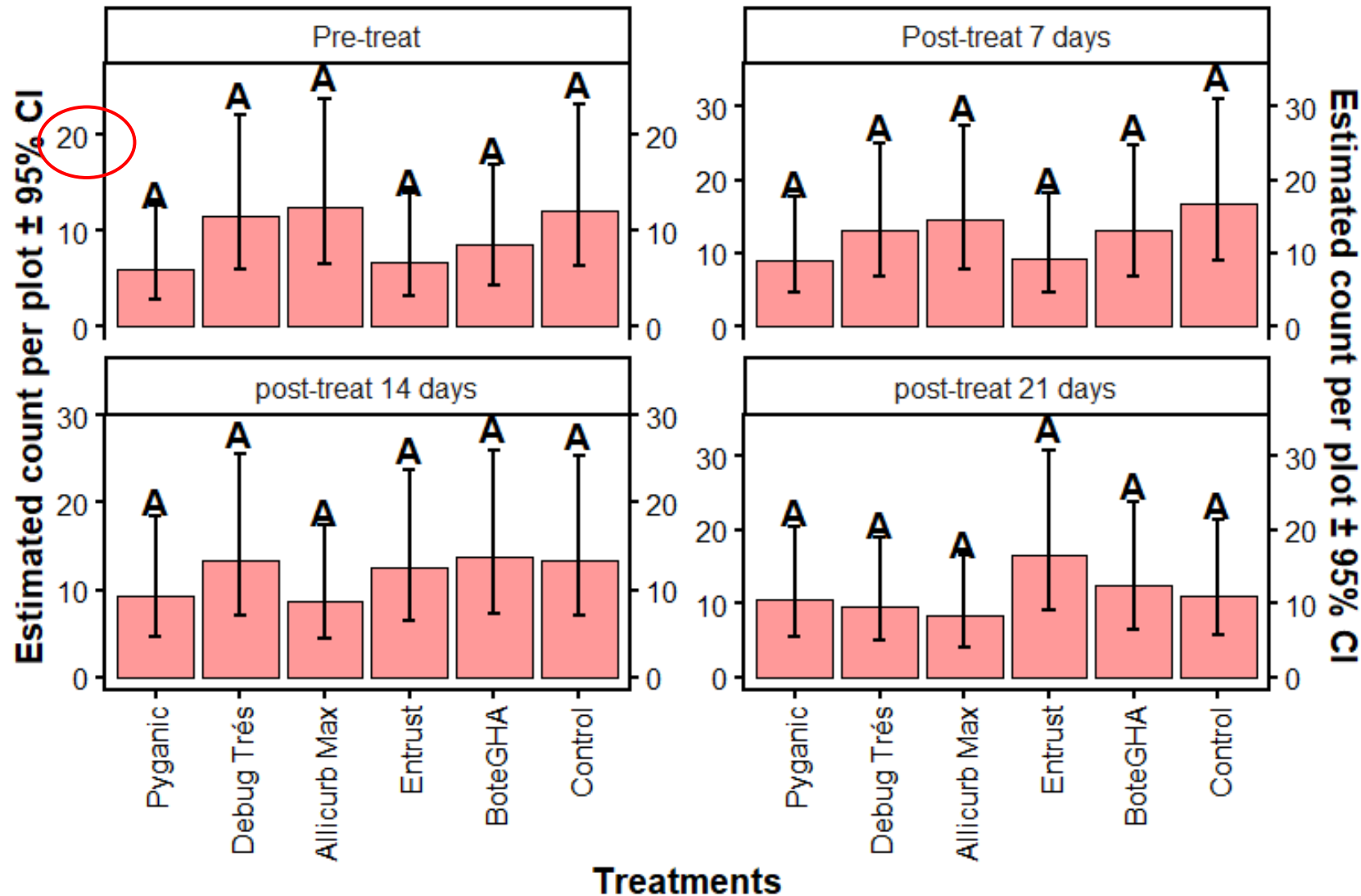


Figure 1:
Pamera seed
bug counts
(adult &
nymph) per
Florida
Brilliance
plots.

1) Pyganic (pyrethrin), 2) Debug Trés (neem oil), 3) Allicurb Max (castor + garlic oil), 4) Entrust (spinosad), 6) BoteGHA (*Beauveria bassiana* strain GHA),

Pamera Seed Bug

Neopamera bilobata Say (Hemiptera: Rhyparochromidae)



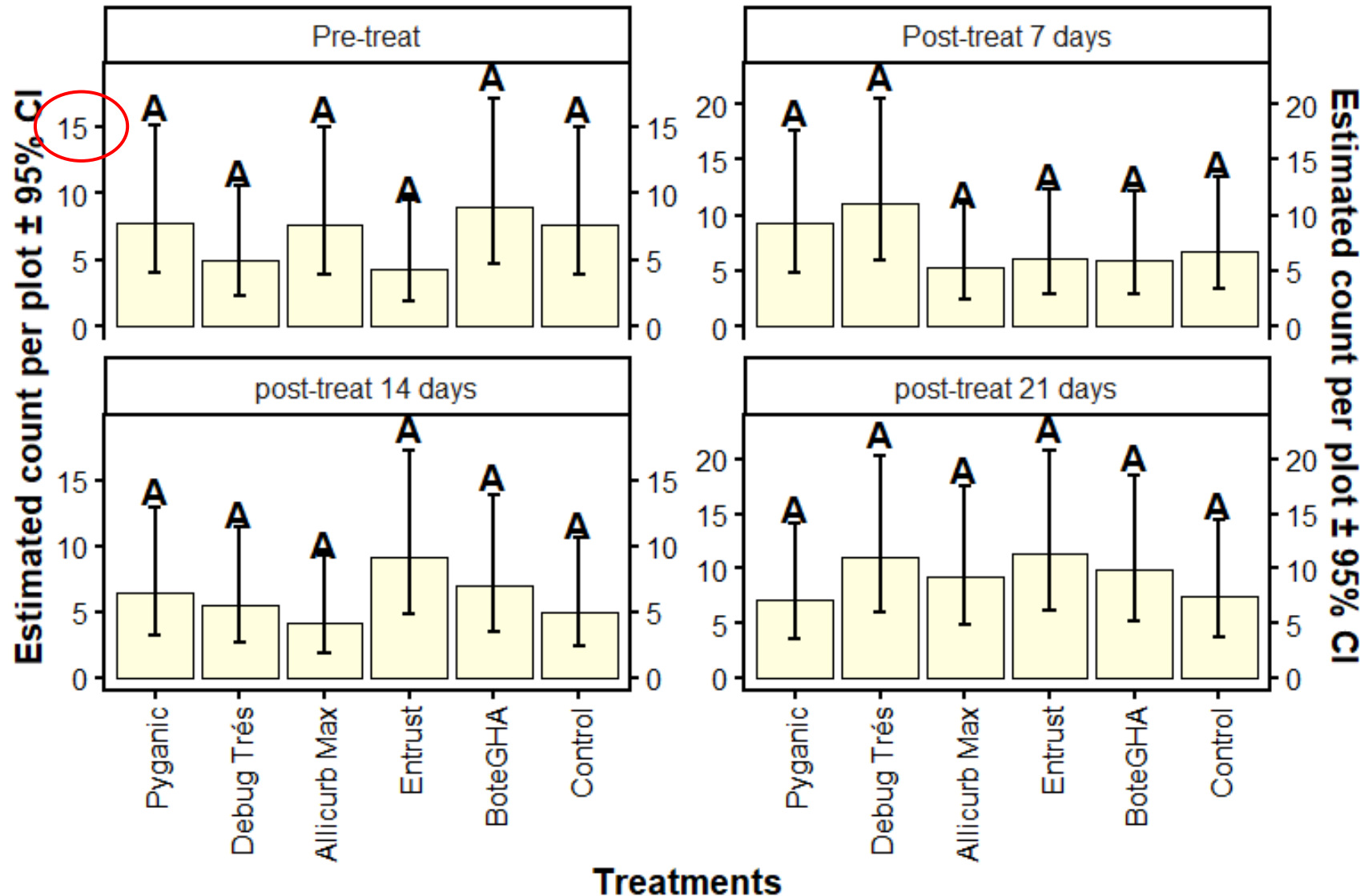
Letters indicate Tukey-adjusted pairwise differences ($\alpha = 0.05$)

Figure 1:
Pamera seed
bug counts
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Encore plots.

1) Pyganic (pyrethrin), 2) Debug Trés (neem oil), 3) Allicurb Max (castor + garlic oil), 4) Entrust (spinosad), 6) BoteGHA (*Beauveria bassiana* strain GHA),

Pamera Seed Bug

Neopamera bilobata Say (Hemiptera: Rhyparochromidae)

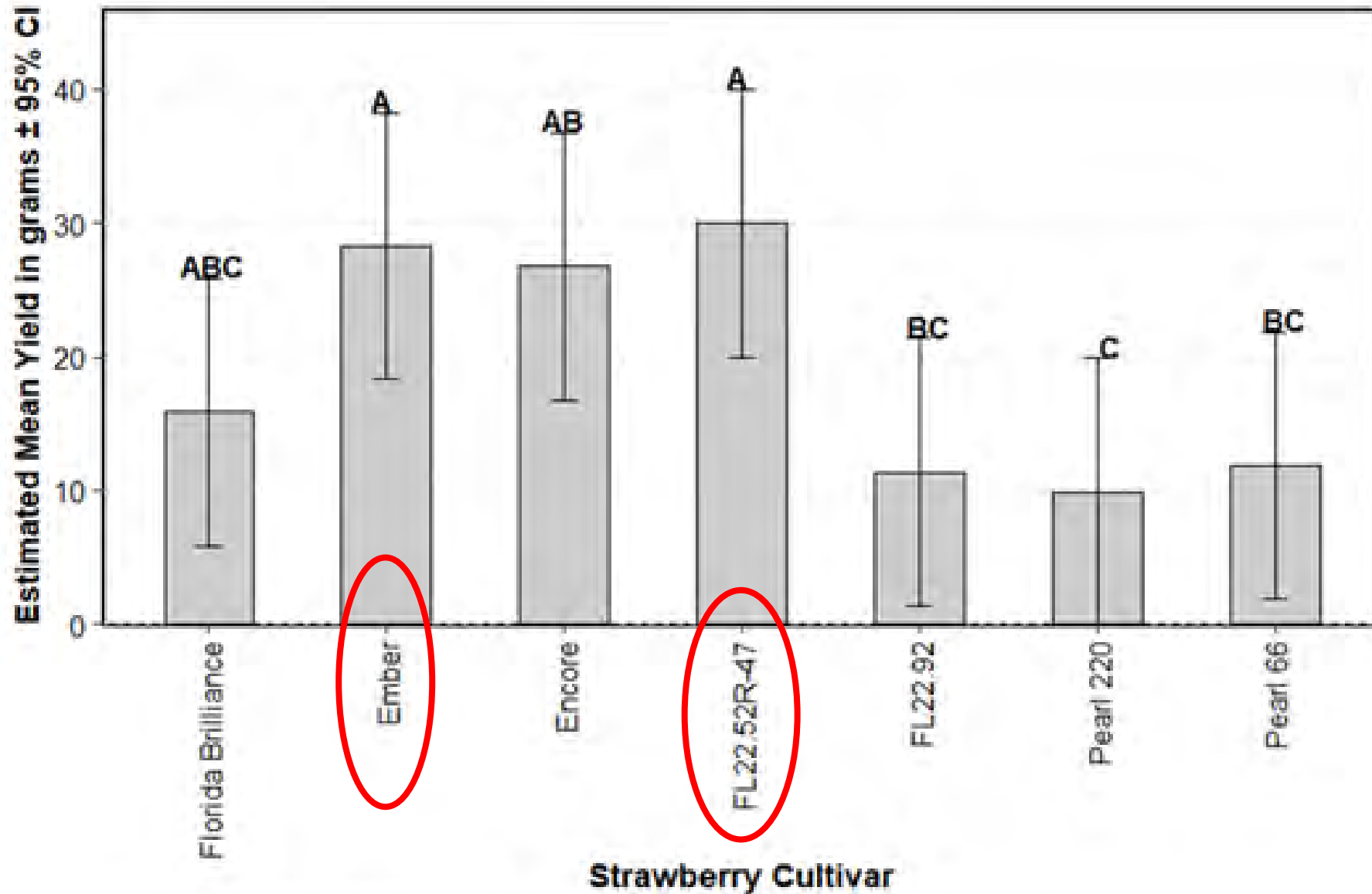


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Figure 1:
Pamera seed
bug counts
(adult &
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Ember plots.

1) Pyganic (pyrethrin), 2) Debug Trés (neem oil), 3) Allicurb Max (castor + garlic oil), 4) Entrust (spinosad), 6) BoteGHA (*Beauveria bassiana* strain GHA),

HPR for Chilli Thrips Management

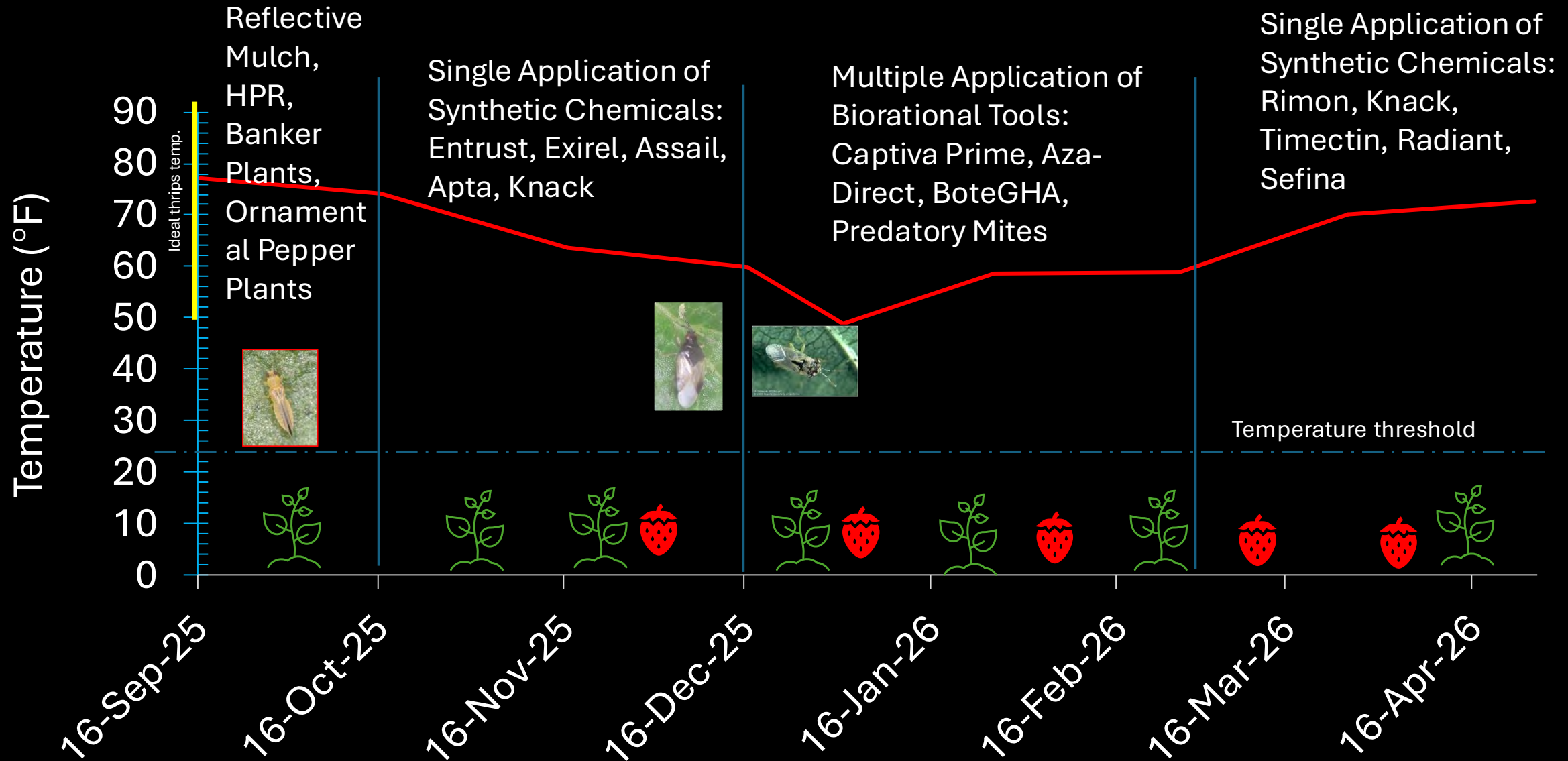


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Chilli Thrips in FL

2025-2026 Weather Data Source: UF/IFAS FAWN at GCREC, Balm Station



IPM Adoption Survey – 10 mins

Why?

- IPM Cost Benefit Analysis
- Pesticide Registration Issues



Strawberry Entomology Lab Members



USDA-NIFA-Hatch Project No. FLA-
GCR-005888 & FLA-GCR-006546



Specialty Crop Block Grant Program



Gagandeep Kaur



Marissa Cassaway



Babu Panthi



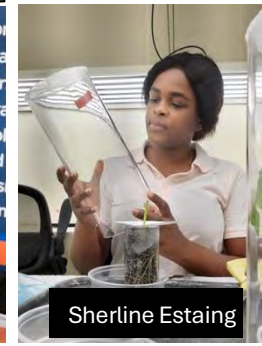
Midhula Gireesh



Armand Yambisa



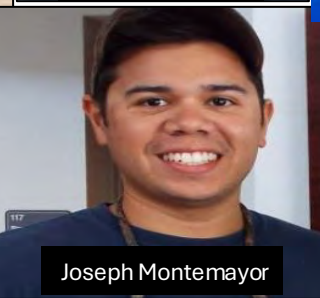
Diem Nguyen



Sherline Estaing



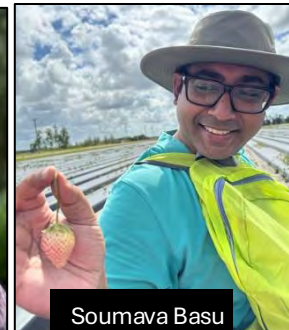
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