

Walnut Husk Fly Research Update

Cindy Kron
North Coast IPM Advisor

April 1, 2022



UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

Statewide Integrated
Pest Management Program

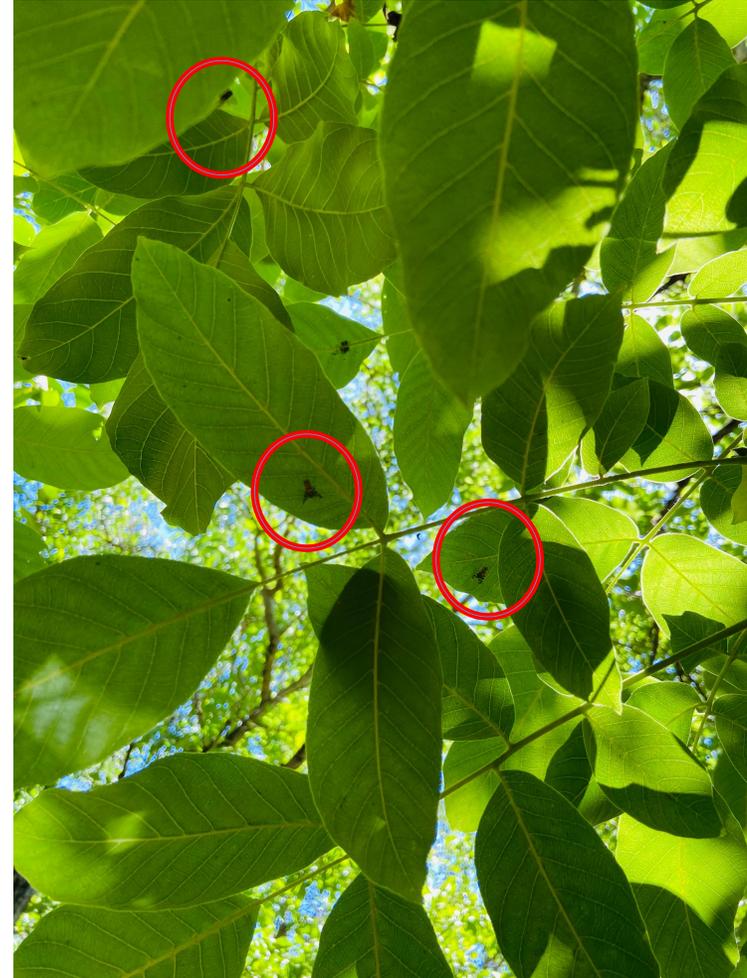
2020 Objectives

1. Familiarize oneself with walnut production, phenology, and seasonal needs with weekly visits throughout the season
2. Monitor for walnut husk fly to determine the seasonal fluctuations of this species in Lake county and associated walnut damage with the goal of gaining a better understanding of this key pest for future research

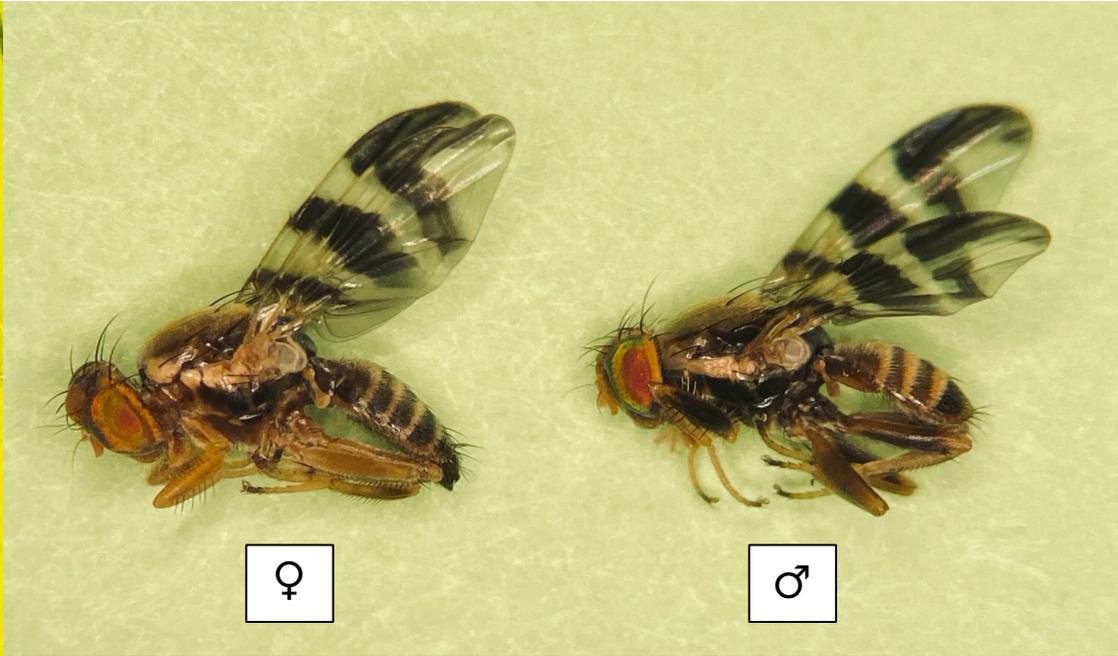
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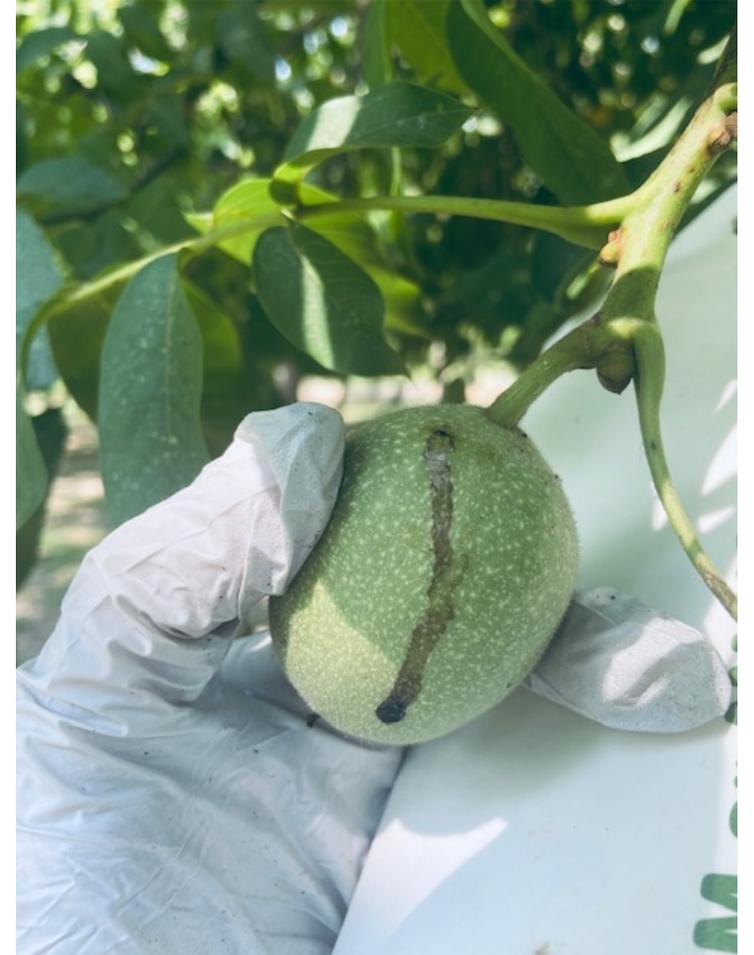
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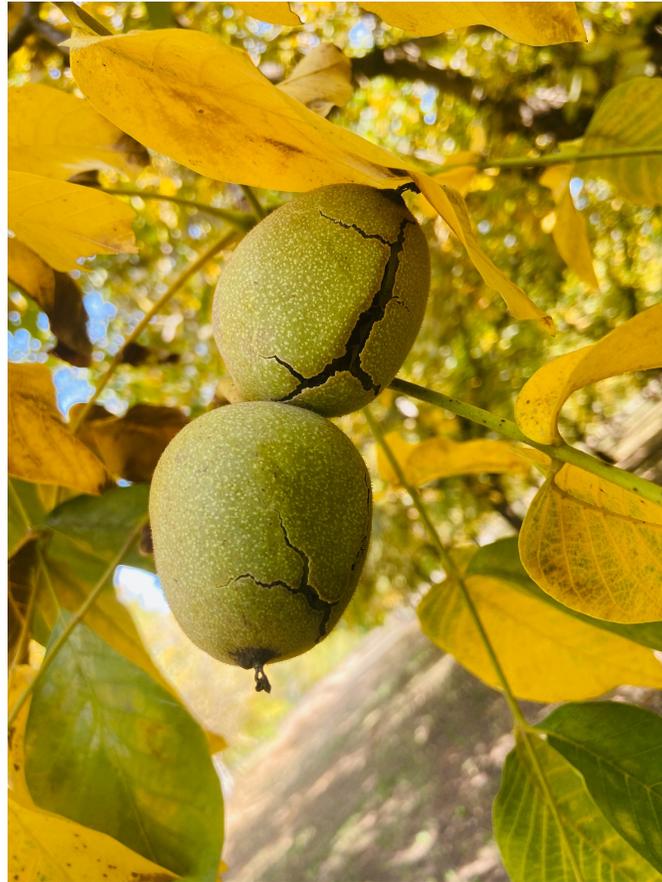
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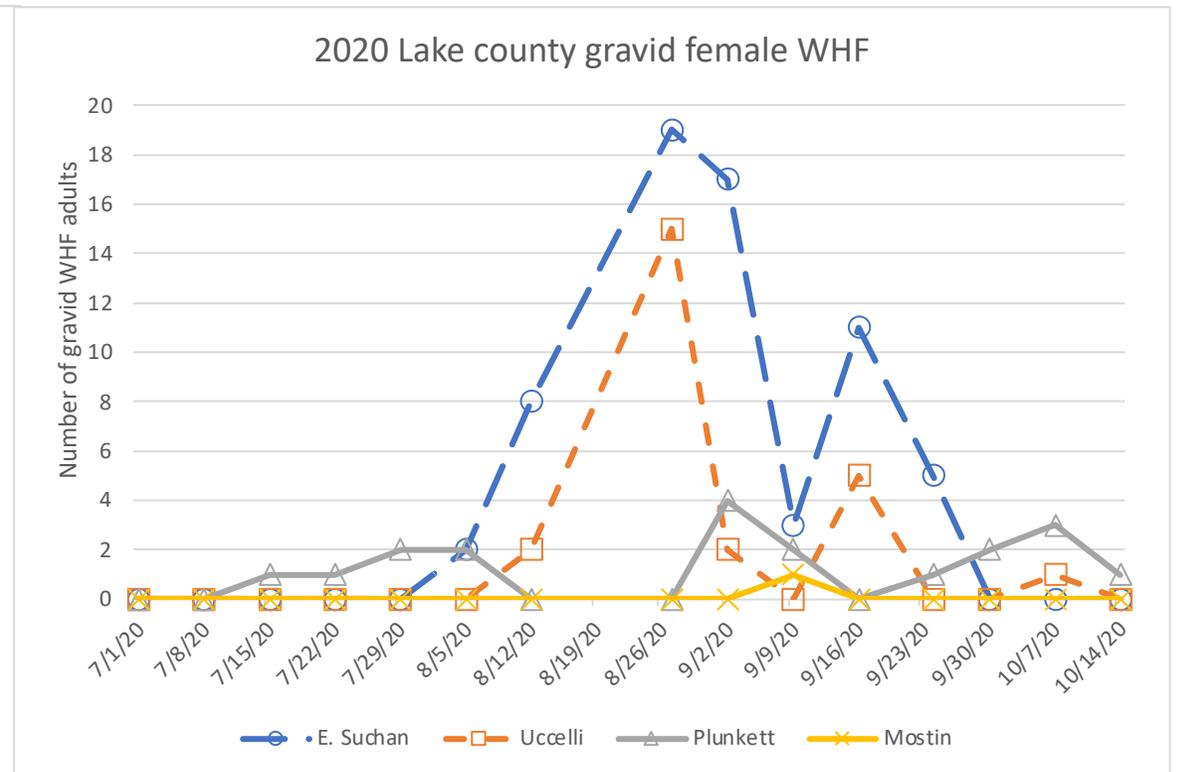
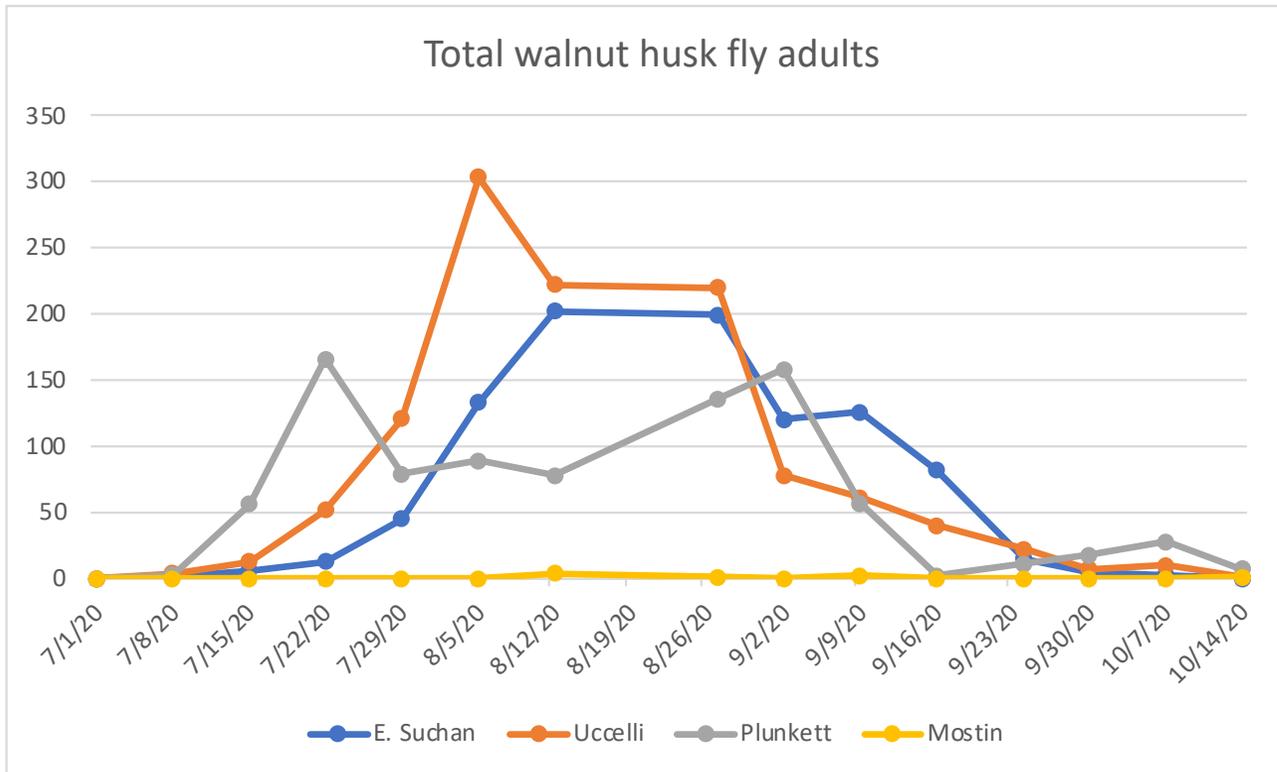
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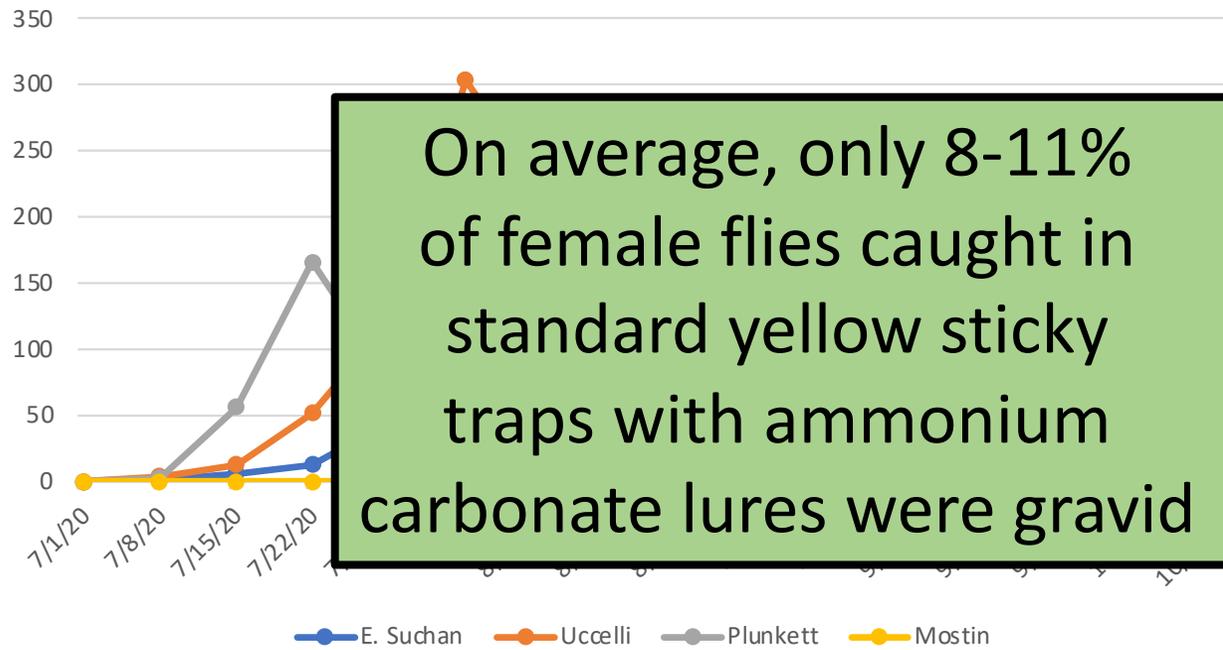


Monitor for walnut husk fly to determine the seasonal fluctuations of this species in Lake county and associated walnut damage with the goal of gaining a better understanding of this key pest for future research



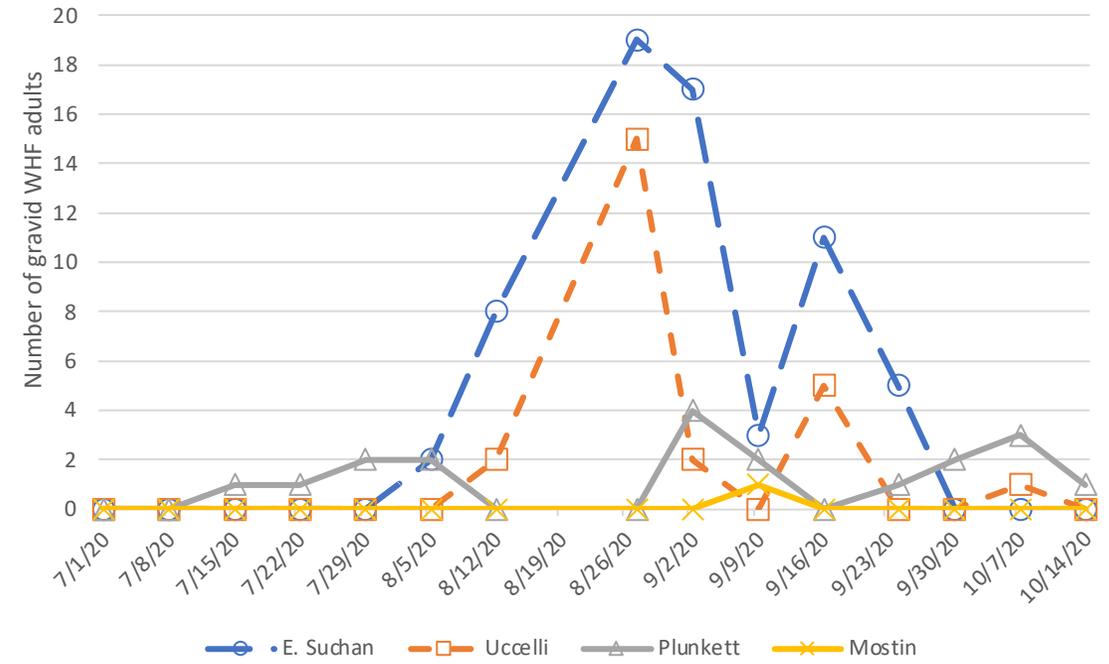
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Total walnut husk fly adults



On average, only 8-11% of female flies caught in standard yellow sticky traps with ammonium carbonate lures were gravid

2020 Lake county gravid female WHF



Monitor for walnut husk fly to determine the seasonal fluctuations of this species in Lake county and associated walnut damage with the goal of gaining a better understanding of this key pest for future research

	Percent estimated WHF damage			
	E. Suchan	Uccelli	Plunkett	Mostin
Trap 1	6.5	12	3	0.5
Trap 2	13.5	23	9.5	0.5
Trap 3	-	-	6	-
Average	10	17.5	6.2	0.5
	<u>2020 WHF trapped per orchard</u>			
	E. Suchan	Uccelli	Plunkett	Mostin
Trap 1	527	675	288	1
Trap 2	423	479	248	7
Trap 3	-	-	452	-
Total	950	1154	988	8
Average	475	577	329	4

2021: Field evaluation of novel adult trap designs and lures for walnut husk fly (*Rhagoletis completa*) in walnuts

Collaborators:

- Spencer Walse, USDA Agricultural Research Service, Parlier
- Jhalendra Rijal, Area IPM Advisor, UC Cooperative Extension, Stanislaus
- Robert Van Steenwyk, University of California, Berkeley
- Houston Wilson, Kearney Agricultural Research and Extension Center, Parlier
- Elizabeth “Betsy” Boyd, California State University, Chico
- Cindy Kron, North Coast IPM Advisor, UC Cooperative Extension, Sonoma



Objective:

Compare novel and conventional trap and lure designs for season-long trap captures of walnut husk fly in commercial walnut orchards.

New Trap & Lure Experiment - 2021



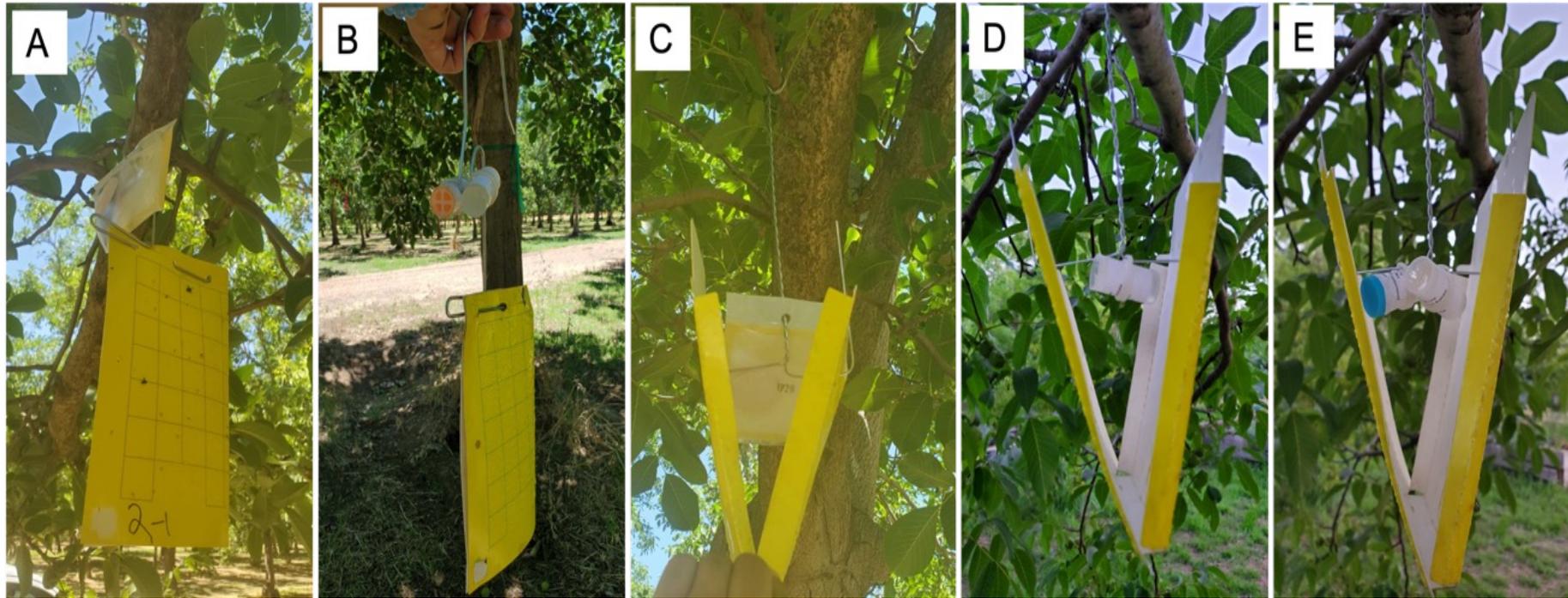
Locations/Researchers

1. Fresno: H. Wilson/S. Walse
2. Stockton: J. Rijal
3. Woodland: R. Van Steenwyk
4. Chico: E. Boyd
5. Lakeport: C. Kron

- 5 locations (one orchard in each location): Fresno, Stockton, Chico, Woodland, Upper Lake
- Replicated 5 times in each location in a Randomized Complete Block Design (RCBD)
- Weekly trap checking from mid-June to mid-September; traps rotated weekly

S. Walse



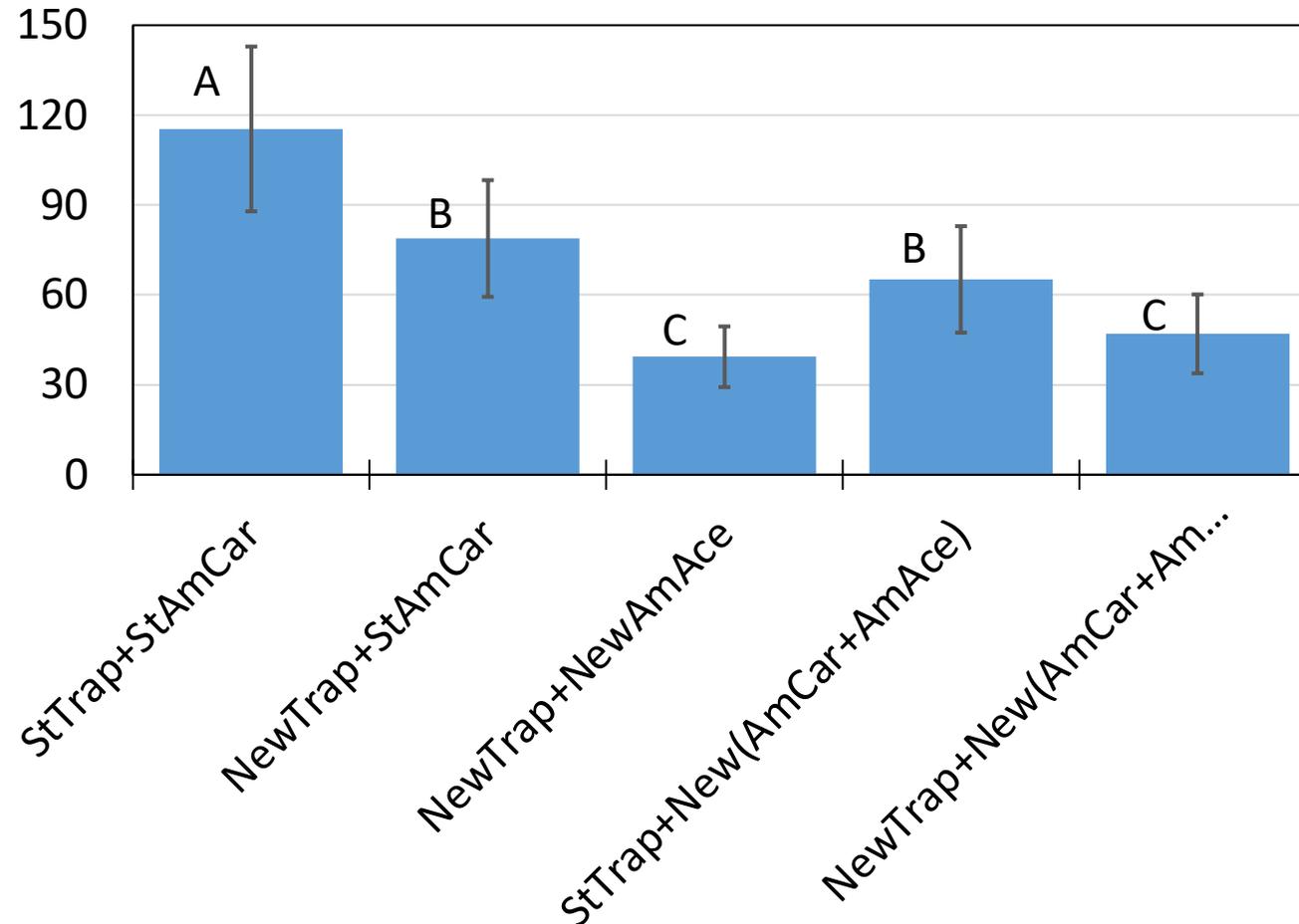


Treatments:

- A. Standard yellow sticky card with standard AmmCarb lure
- B. Standard yellow sticky card with new AmmCarb + AmmAce lure
- E. New V-shaped trap with standard AmmCarb lure
- D. New V-shaped trap new AmmAce lure
- E. New V-shaped trap new AmmCarb + AmmAce lure

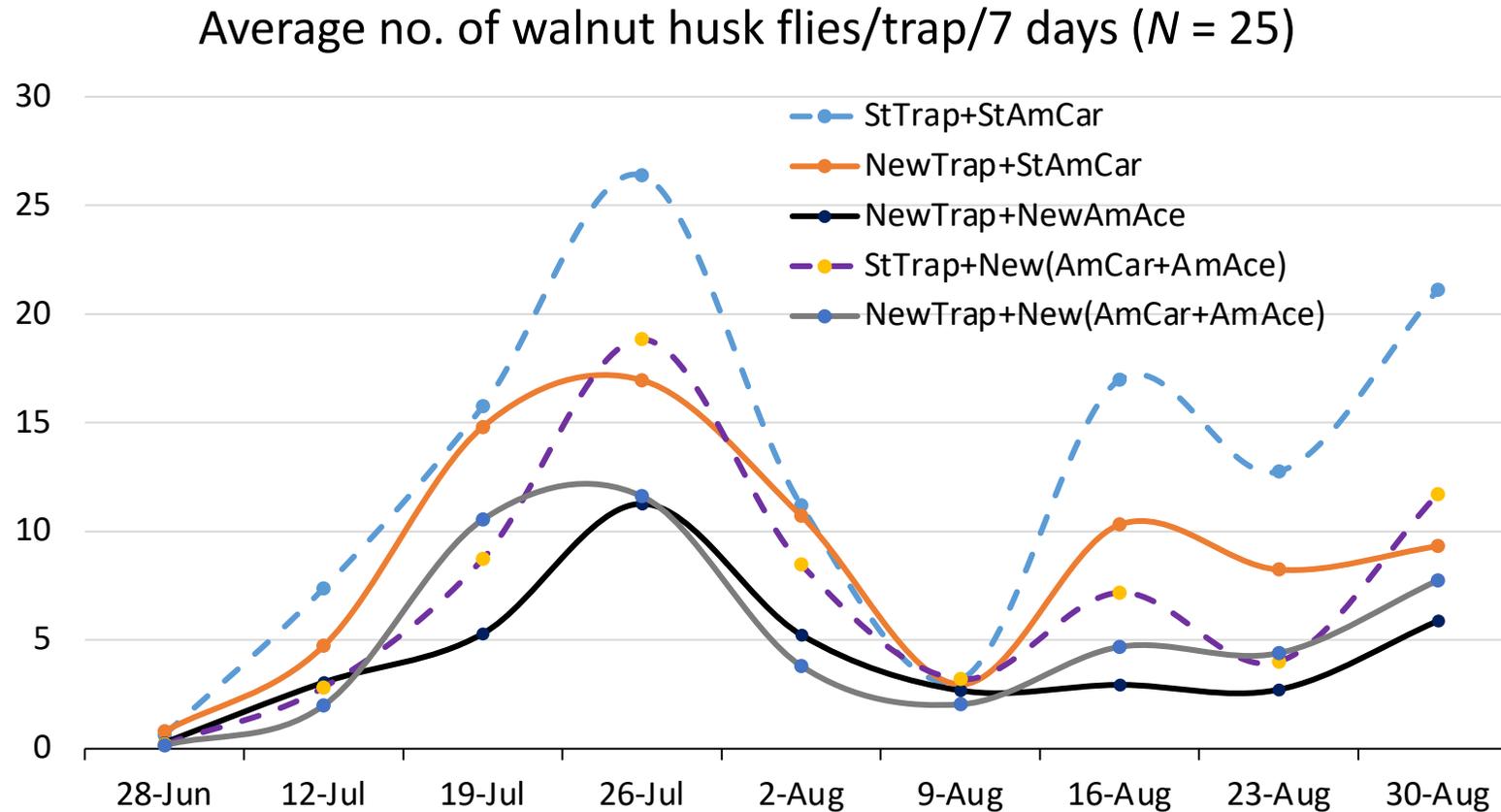
Results: Average WHF caught by trap/lure type

Mean (SE) Total No. of Husk Flies Captured



Generalized Linear Mixed Model with Poisson distribution using treatments as a fixed effect and locations as a random effect

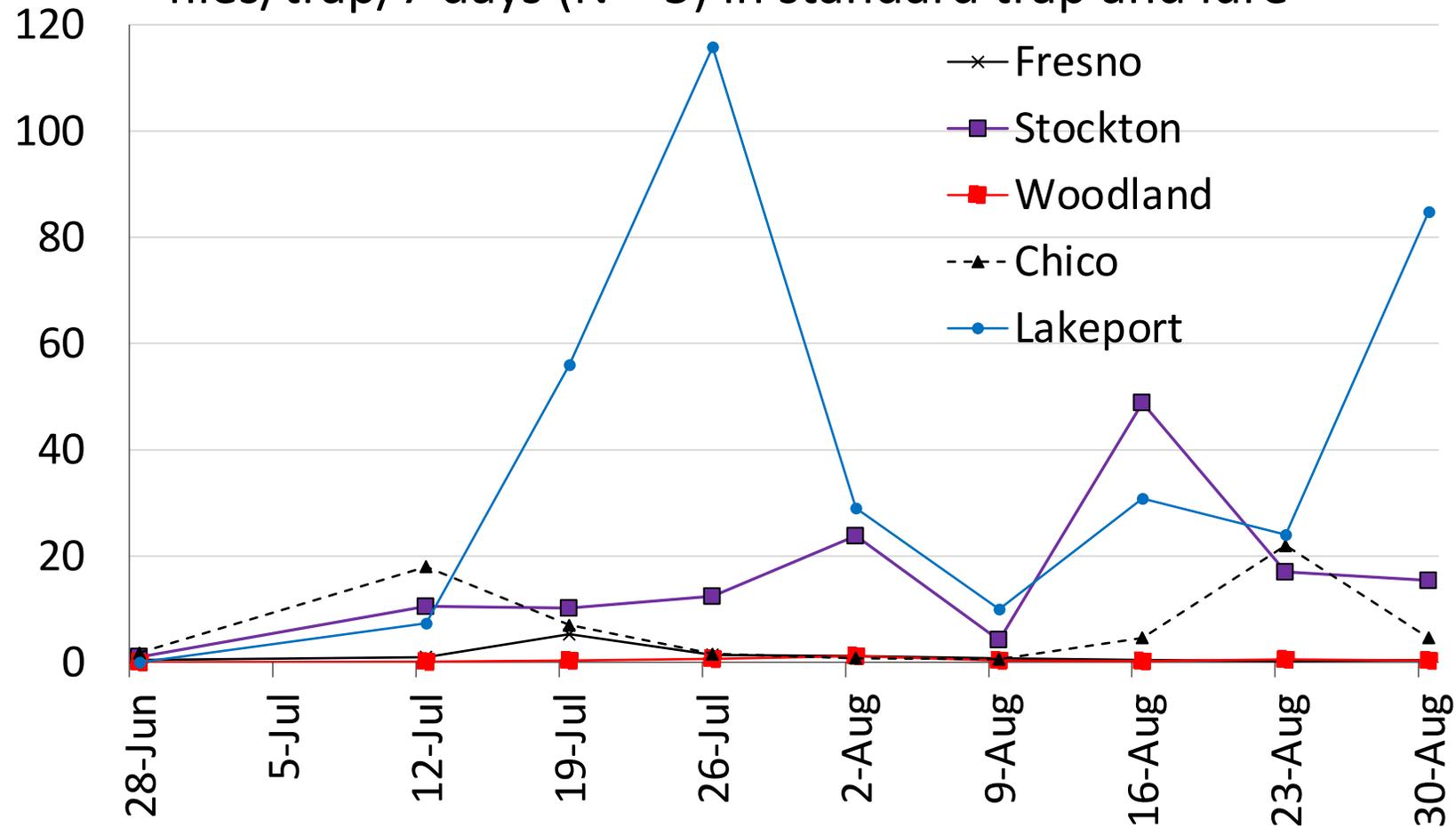
Results: Average WHF caught by Trap/Lure type per 7 days



*Conclusion: Standard trap/lure performed the best

Results: WHF/standard trap/lure/7 days by location

By location: Average number of walnut husk flies/trap/7 days (N = 5) in standard trap and lure



Summary

- Yellow sticky trap with ammonium carbonate lure in a pouch (i.e., the current industry standard trap/lure) performed the best in total walnut husk fly captures among all trap and lure combinations evaluated.
- The new V-shaped trap with either standard ammonium carbonate lure or new gel-based ammonium carbonate + ammonium acetate vial lure was not as effective as the industry-standard trap and lure.
- Ammonium acetate as standalone or combined with ammonium carbonate did not improve the capture of more walnut husk flies.
- Results were consistent across five locations covering major walnut-producing regions - San Joaquin Valley, Sacramento Valley, and the North Coast.





2022 Project Title:

Testing attractiveness of walnut husk fly lures and trap types by gravid walnut husk fly females in Lake County

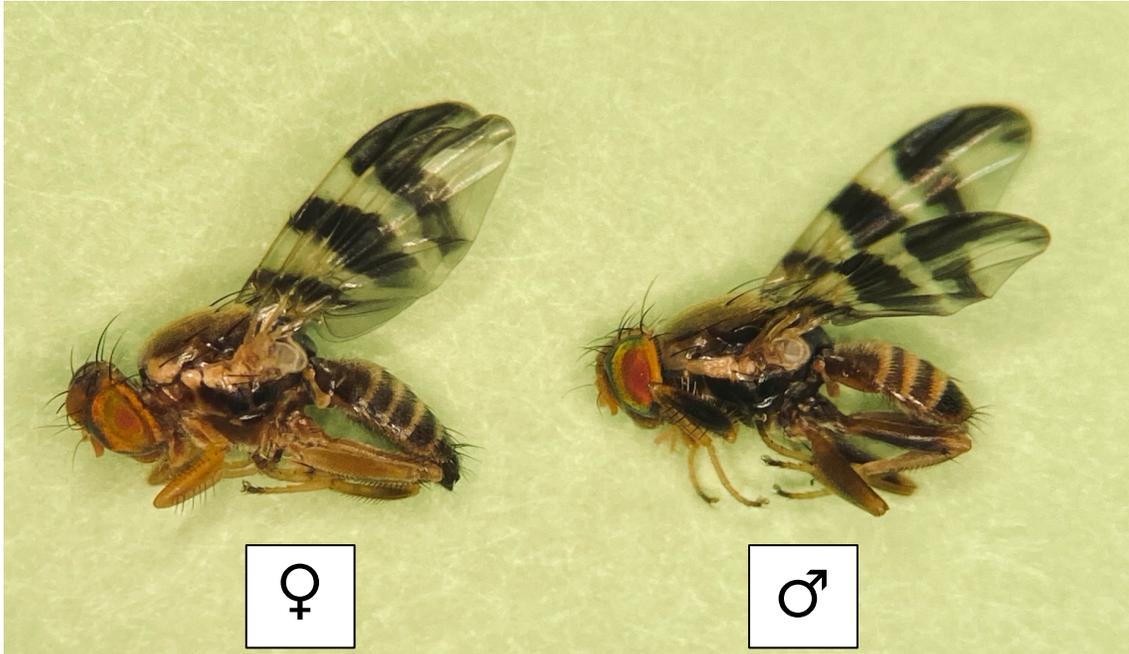
Project leader and affiliation:

- Cindy Kron, UCCE North Coast IPM Advisor

Cooperating personnel and affiliations:

- Bob Van Steenwyk, UCCE Berkeley Extension Specialist
- Rachel Elkins, Recall Non-Faculty Academic Appointee
- Emily Bick, PhD Postdoctoral Fellow, Department of Plant and Environmental Sciences, University of Copenhagen

Research Objectives:



- Repeat trapping conducted in 2020 for a second year of data. This would include 4 orchards (2 in Upper Lake and 2 in Kelseyville) counting male, female, gravid females weekly from June until the end of September.
- Test field performance of different trap shapes, colors and lures for attractiveness by gravid females in comparison to standard yellow traps with ammonium carbonate lures.

California Walnut Board

Thank you for the ongoing support of walnut research in California



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