2017 UH CTAHR Update

Hawaii Coffee Association Conference

July 21, 2017
(Updated 8/11/17)

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Cooperative Extension

Tropical Plant and Soil Sciences
College of Tropical Agriculture and Human Resources
University of Hawai‘i at Mānoa

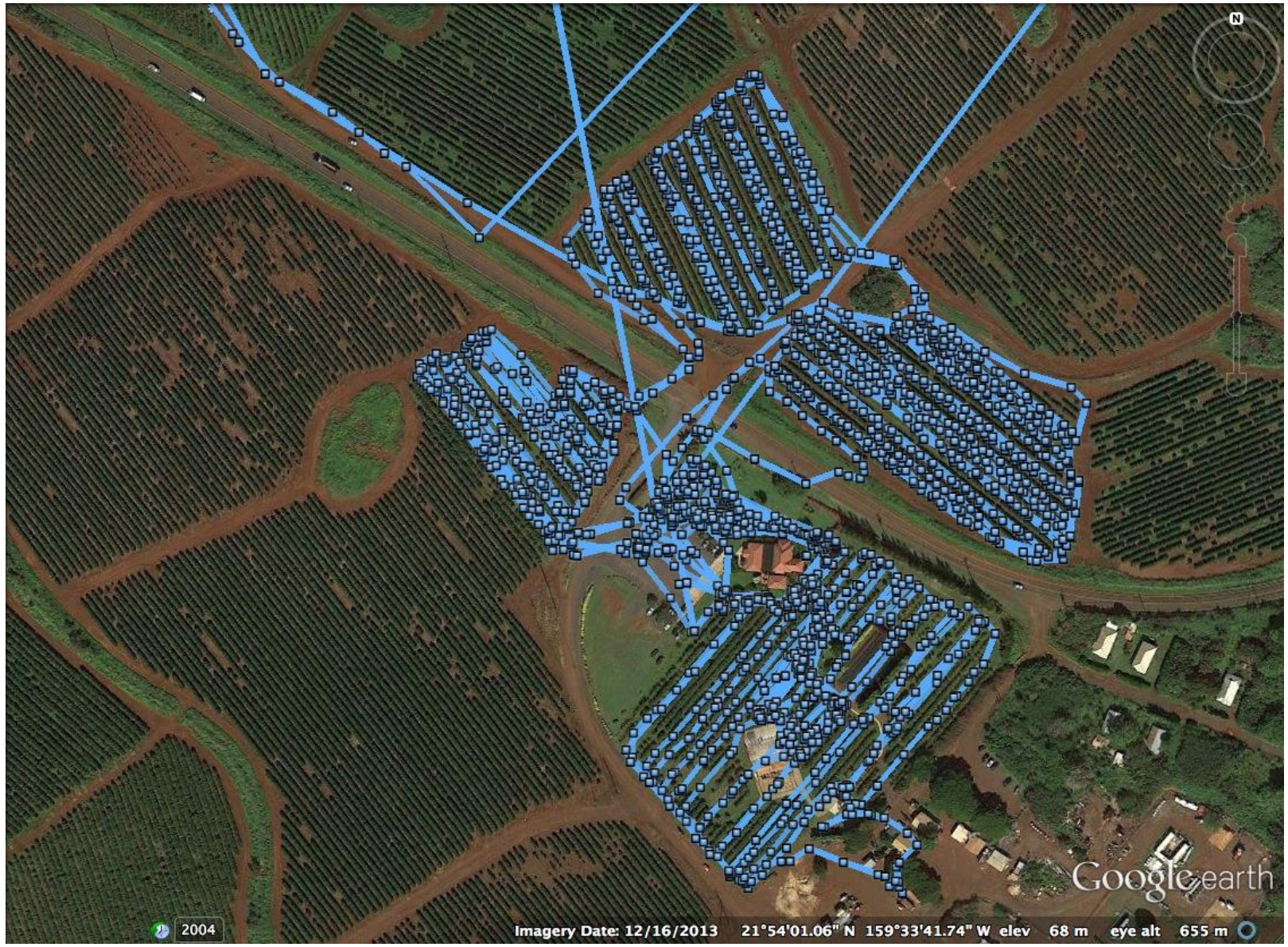
Scouting for CBB on Kauai

Russell Messing
Department of Plant and Environmental Protection Sciences, UH CTAHR

Kauai Agricultural Research Center (Kapa'a)

Moloa'a Bay Coffee (N. Kauai; Moloa'a Bay)

- Technician - Jared Bernard
- Continue to trap and run visual transects for signs of CBB at three locations on Kauai on a weekly basis
- To date, no evidence of CBB on Kauai



‘Alcohol Spray Method’ to Sample Live CBB

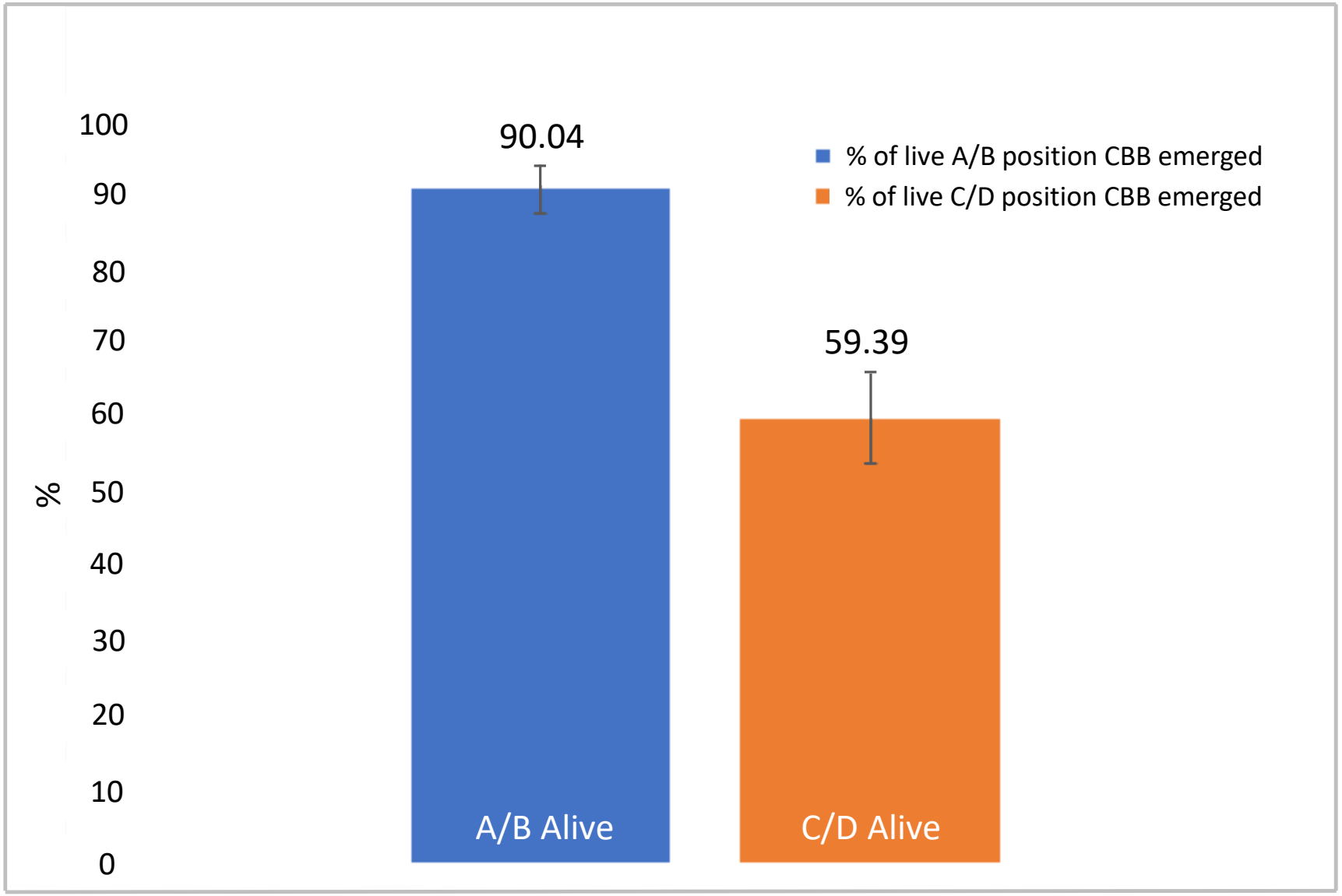
Mark Wright & Ishakh Pulakkatu Thodi

Department of Plant and Environmental Protection Sciences, UH CTAHR

A video was played.

Dissecting green coffee berries to determine the position of CBB can be tedious. As an alternative to this method, a fine spray of alcohol was used to assess the percent of CBB that were alive and targetable using pesticides. To test how reliable this method is, an observational study was conducted in three fields. From each field 5 trees were selected at random and from each tree 20 coffee berries with an entry hole were sprayed with alcohol. After 30 seconds, all the berries from which a live CBB emerged were dissected immediately and CBB position was determined based on the stage of entry hole (A/B or C/D). If no CBB emerged, the berries were carefully dissected to see if the CBB were alive, dead or missing.

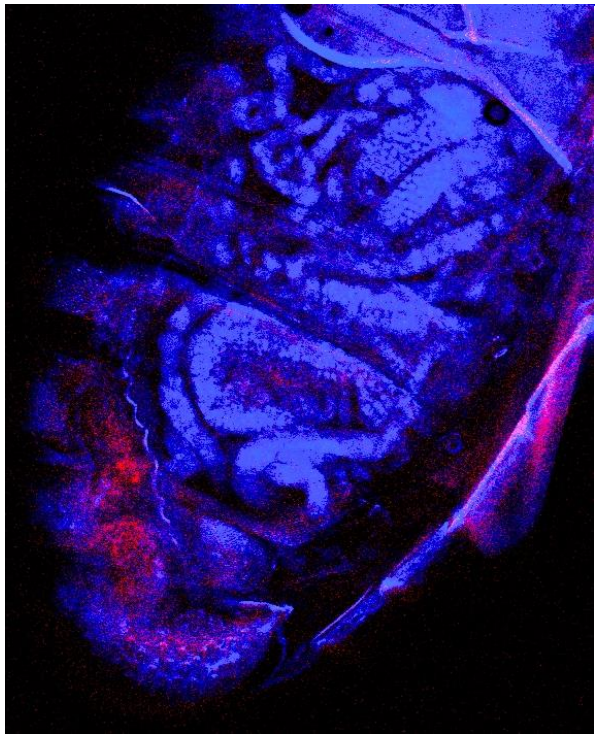
Assessment of CBB population using alcohol spray



About 60% of CBB emerged within 30 seconds of spray.
If the CBB was alive and in A/B position, 90% of them came out soon after the spray. Most CBB emerging from the C/D position were at the early stages of drilling (just reached the bean). So their percentage could vary as the season progress. Alcohol may be used as a tool to estimate live CBB population. This study is ongoing and industry will updated as more data become available.

Graph: Assessment of 300 berries

Coffee Berry Borer Microbial Interactions



Sayaka Aoki
Mark Wright, Gordon Bennett, Russell Messing, Fernando Vega*, and Ania Wieczorek

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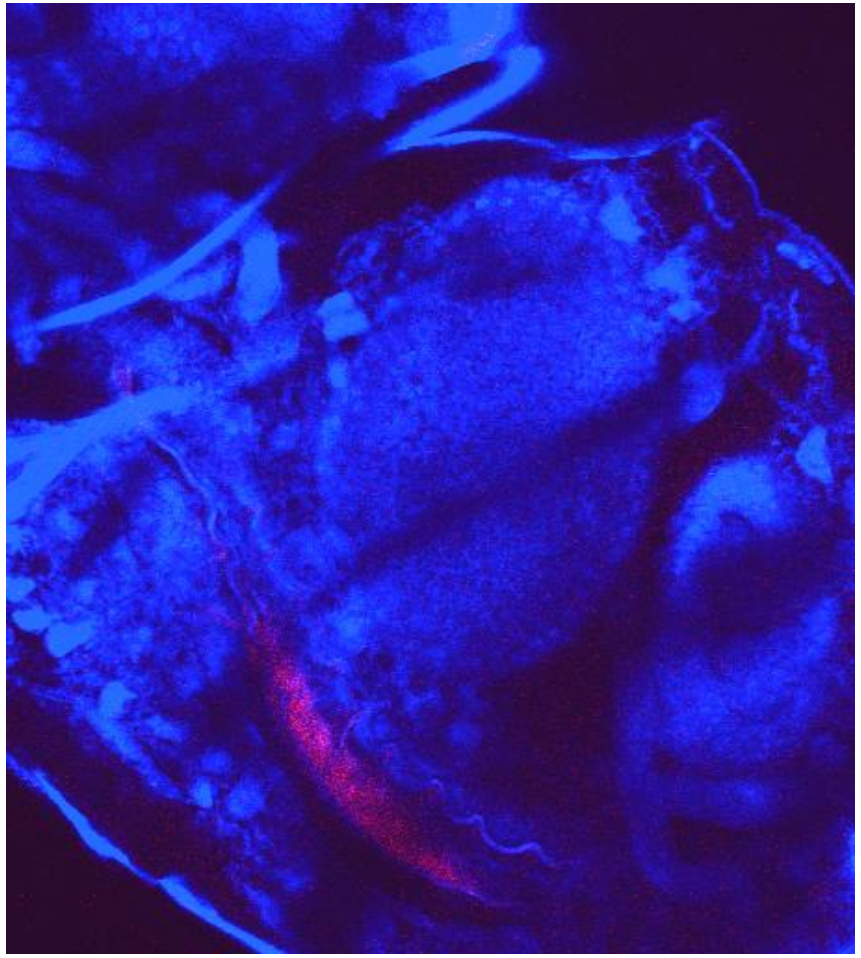
*USDA Agricultural Research Service

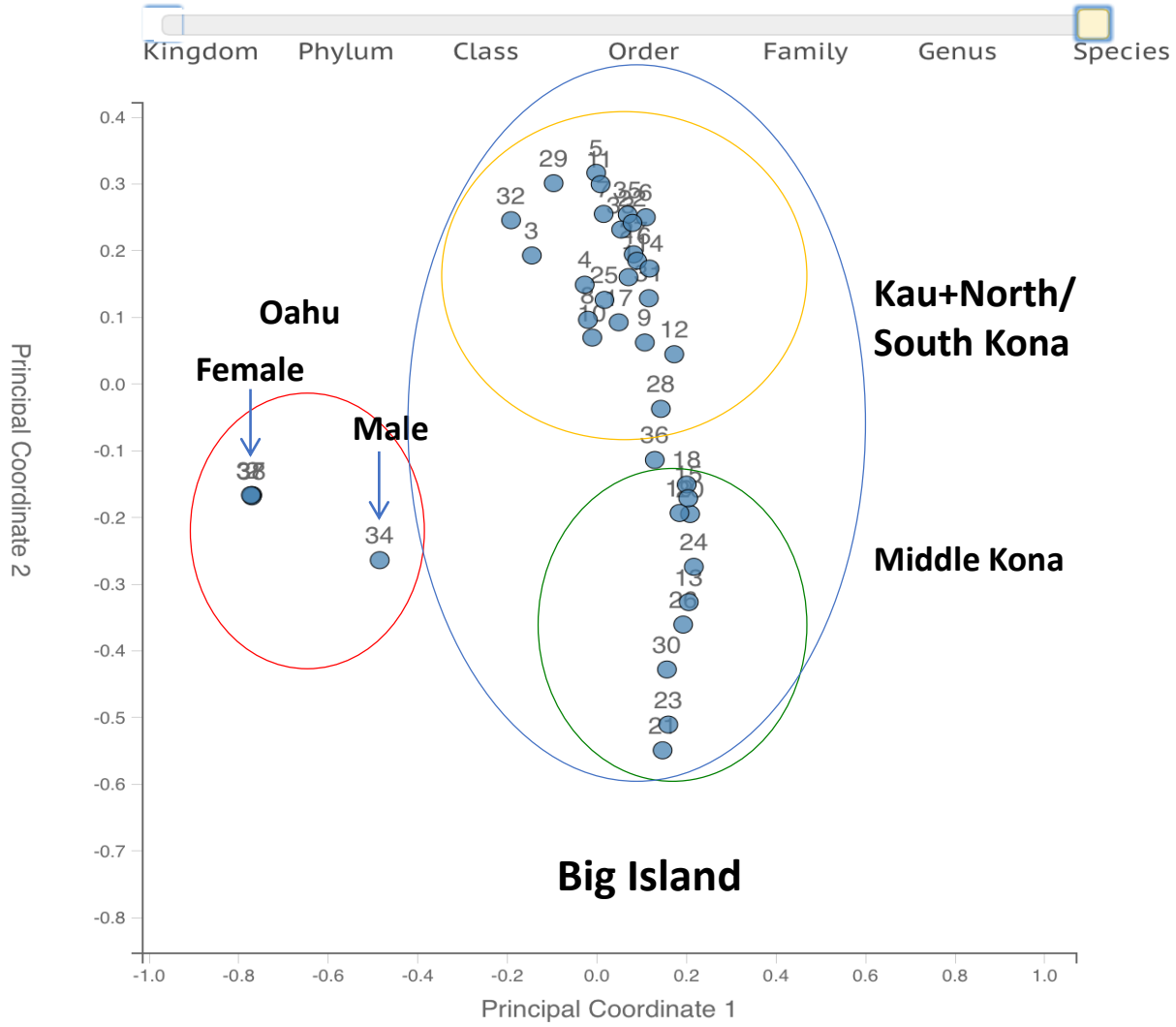
The importance

- Identification of bacterial symbionts associated with CBB and their interaction with CBB in Hawaii
- Determine the roles and functions of selected bacterial taxa in CBB's biology
- Could potentially contribute to pest management applications.



Fluorescence in Situ Hybridization (FISH) microscopy image of CBB hind-gut with eubacteria

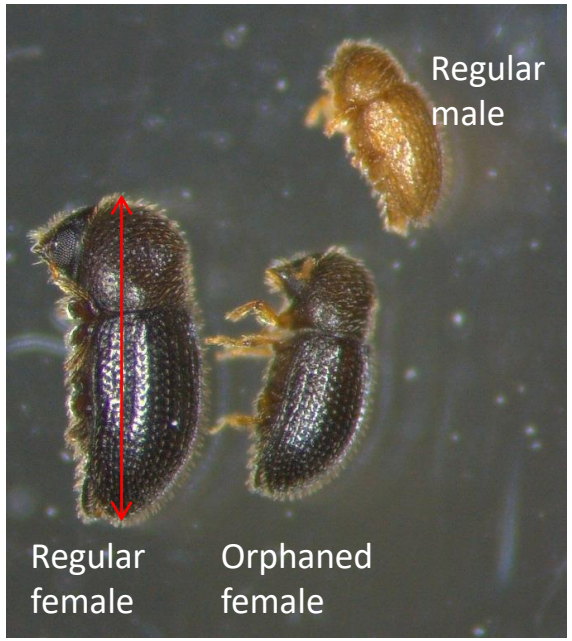
Principal Coordinate Analysis from 33 Sites



Different bacterial communities in different locations

Additional Findings

- 87% of CBB did not make it to adulthood within 2 months <u>when (first instar) larvae were separated from the adult female</u>
- Orphaned females were ~23% smaller than normal females
- Did not sclerotize properly



Orphaned female with wings

Regular male with degenerated wings

Hmmmm???…

- Could this be an indication of female nutritional provisioning to their larvae or an absence of beneficial symbionts?
- Can this knowledge be exploited to suppress CBB populations?

Measuring CBB Damage at Harvest or After Milling

HC “Skip” Bittenbender, TPSS

2011-2016 CBB Survey

- How are producers dealing with CBB?
- Are recommendations from CTAHR being used?
- Are these recommendations helpful?
- Estimate the percent of CBB-damaged coffee.

This survey is now being conducted by HDOA under its Beauveria Subsidy Program (Gwen Hicks) .

Example for Cherry Growers

Harvest date	Cherry (lb) Delivered	% CBB damage	Weighted Average
Aug-1	500	10	5000
Sep-1	1000	8	8000
Oct-1	1500	5	7500
Nov-1	1500	4	6000
Dec-1	1000	3	3000
Total for 2016	5500		29500

Total Weighted Average divided by Total (lb) Cherry Delivered is % parchment beans that are CBB damaged.

29500 ÷ 5500 = 5.4% CBB-damaged beans in the 2016 harvest.

Example for Estate Growers

What you need to know:

- Pre-CBB GBRR of 5.1
- Total cherry harvest for season (2016) = 5500 lb
- Total green bean weight = 1020 lb

Your GBRR = Total lbs of cherry divided by total lbs of green bean

5500 ÷ 1020 = 5.39.

Your CBB damage = Pre-CBB GBRR divided by your farm's GBRR, then 1 minus that number and times 100

5.1 ÷ 5.39 = 0.946

1 - 0.946 *100= **5.4% CBB-damaged beans in 2016**

Important to remember

Neither counting CBB-damaged parchment nor knowing your GBRR, will inform you about quality directly.

However, 20% bean damage or a 20% increase in GBRR will indicate that you have a lot of damaged green beans to sort out.

Field Sampling and Modeling of CBB

Ray Carruthers, PEPS
with USDA PBARC researchers
and CTAHR technicians

- Collect and analyze farm sampling data
  - 30 trees sampling method
- Collect and/or assess data on:
  - weather and climate
  - farm management practices
  - flowering, bean size and maturation
  - infested raisins
  - infested red berries

Take home message

- Strip pick your field before flowering.
- Begin monitoring for CBB activity within about 60 days from your first flowering.
- Monitor and spray early in the season if needed to knock down CBB population in the A/B position.
- CBB damage will occur and beetle numbers will increase during the season if you do not monitor and spray as needed.
- Harvesting alone will not typically control CBB. You must be vigilant and monitor your fields, treating when needed based on your decision table.

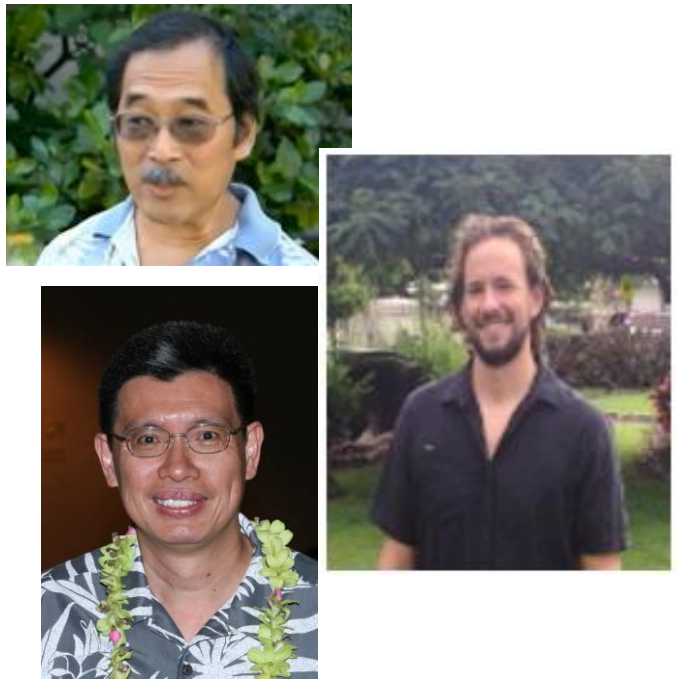
Economics Group Update

Stuart T. Nakamoto, PingSun Leung, John Woodill and Andrea Kawabata*
Department of Human Nutrition, Food and Animal Sciences; *TPSS

Dynamic Economic Model:

Using field level data to test three spray strategies:

- Always Spray
- IPM Recommendation (chart)
- Economic model



Results

Month	Always Spray	IPM Chart	Economic Model
Jan	-	-	-
Feb	-	-	-
Mar	Spray	Spray	-
Apr	Spray	Spray	-
May	Spray	Spray	Spray
June	Spray	-	Spray
July	Spray	Spray	Spray
Aug	Spray	-	Spray
Sept	Spray	Spray	Spray
Oct	Spray	-	Spray
Nov	Spray	-	Spray
Dec	Spray	-	
Net Benefit	$15,084.00	$13,228.00	**$15,536.00**

- Economic model optimizes net benefit and reduces C/D infestation levels

The chart shows preliminary results for each of the spraying strategies and the optimal decision under each strategy from January to December.

Our goal is to maximize the net benefit for each strategy to see which provides a higher benefit.

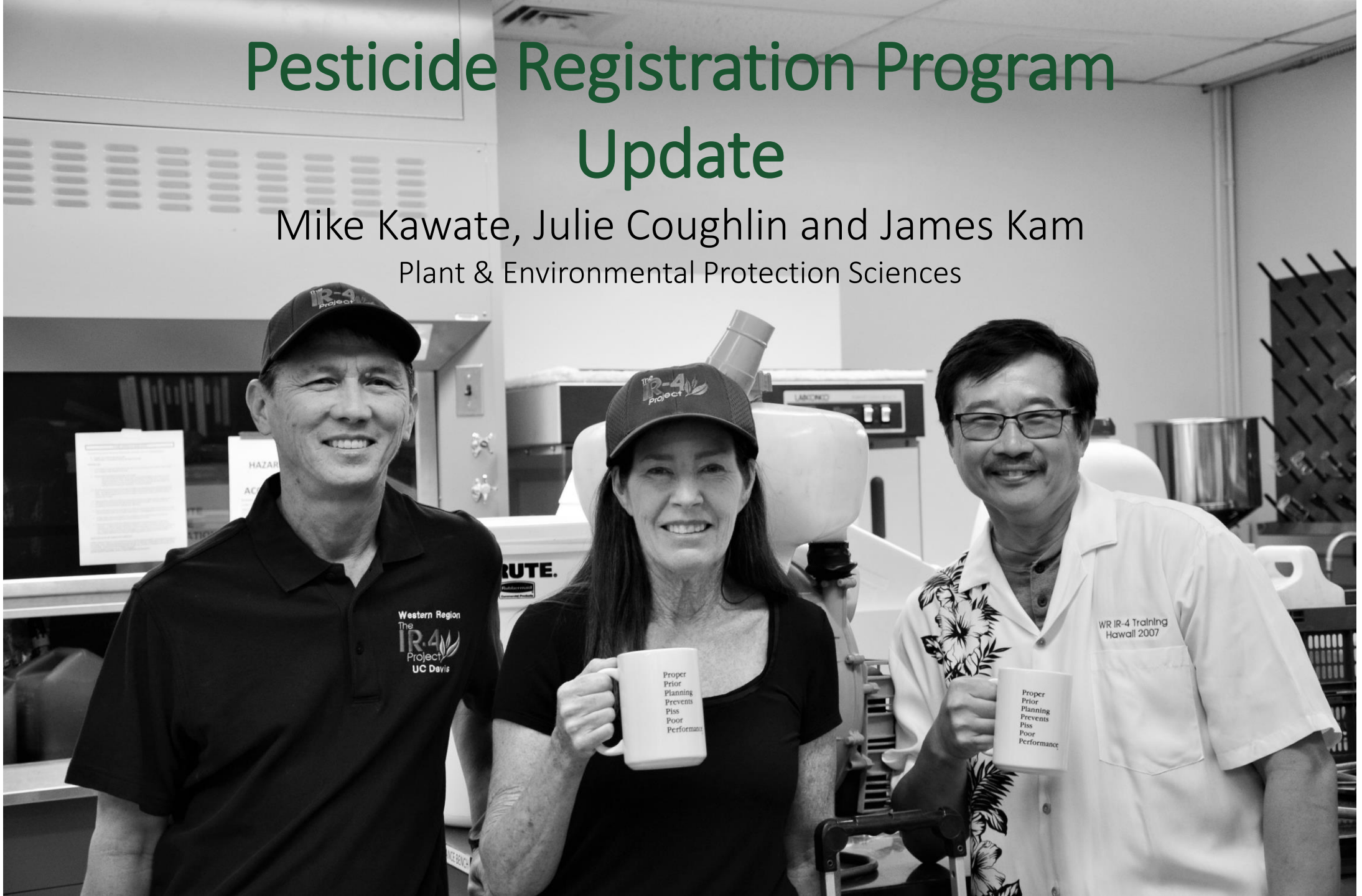
Our results suggest the economic model increases net benefit throughout the season and also reduces CD infestation levels better than if you were to always spray or follow IPM.

However, we need additional data to further verify these results and provide further sensitivity analysis.

Pesticide Registration Program Update

Mike Kawate, Julie Coughlin and James Kam

Plant & Environmental Protection Sciences



ONGOING PROJECTS - 2017

Field Residue Trials (IR-4)

-azoxystrobin + cyproconazole (Quadris Top) for coffee rust - 3HI, 2PR

-flupyradifurone (Sivanto) for green scale - 2HI, 1PR

Field Efficacy and Crop Safety (EC/S) Trials

-glufosinate (Rely) - Kauai

broad spectrum weed control

-flupyradifurone (Sivanto) - Kauai

green scale (*Coccus viridis*) control

excellent control

no phytotoxicity

PROJECTS IN THE PIPELINE

Indaziflam (Alion) – for weeds (PRE)

-Proposed rule, 05/19/16; but, final rule not yet published.

-Import tolerance already exists; 0.01 ppm.

Cyantraniliprole (Exirel) – for CBB

-Final MOR study signed by IR-4; ready for submission to EPA.

Indoxacarb (Avaunt) – for CBB

-All field residue and processing trials completed.

-Laboratory residue analysis of the samples are ongoing.

Pyrethrins + PBO (Evergreen EC 60-6) – for CBB

-Manufacturer (MGK) has IR-4 data, and will submit to EPA for tolerance.

-MGK (Py/PBO task force) working on establishing MRL for Japan.

NEW LABELS

ENTRUST SC (spinosad, EPA Reg No. 62719-621)

-for coffee leafminer and various lepidopterous larvae (includes banana moth).

DELEGATE (spinetoram, EPA Reg. No. 62719-541)

-same pests as ENTRUST SC.

-laboratory bioassay tests indicated that spinetoram is effective against CBB.

>but, our testing rate was 7 oz/A rate in 100 gpa

>the label rate is 5 oz/A

-however, sprays need to directly contact CBB, or be present on the berry before CBB enters it.

PLEASE REMEMBER THAT THESE PRODUCT LABELS MUST HAVE “COFFEE” LISTED AS A SITE. DO NOT TAKE AN OLDER PRODUCT AND ASSUME THAT IT MAY BE USED ON COFFEE.

FUTURE PROJECTS

Bifenthrin (Sniper) – for CBB

-Efficacy and crop safety data provided to FMC

2,4-D (Weedar 64) – for vine control

-Completed 2 years of E/CS trials

-Potential residue project for 2019.

TASC Proposal (submitted, awaiting approval)

-To address PBO MRL issue for exports to Japan.

-To address MRL issues for other insecticides that don't have established MRLs in Japan or other export markets.

-Provide growers with a guide to show them when they should stop spraying particular pesticides to avoid violating MRLs of their export markets.

PESTICIDE NEEDS FOR COFFEE

To Coffee Industry:

Consider drafting a list of prioritized pest and pesticides for us to work on for future projects.

The list can be updated at any time as needed.

Floating Out The Trash

Andrea Kawabata, Jen Burt, Stuart Nakamoto, Rob Curtiss, Gwen Hicks, & Nick Yamauchi
UH CTAHR and HDOA

Conclusions

Floating can be used to remove a high percentage of raisins and hollow beans.

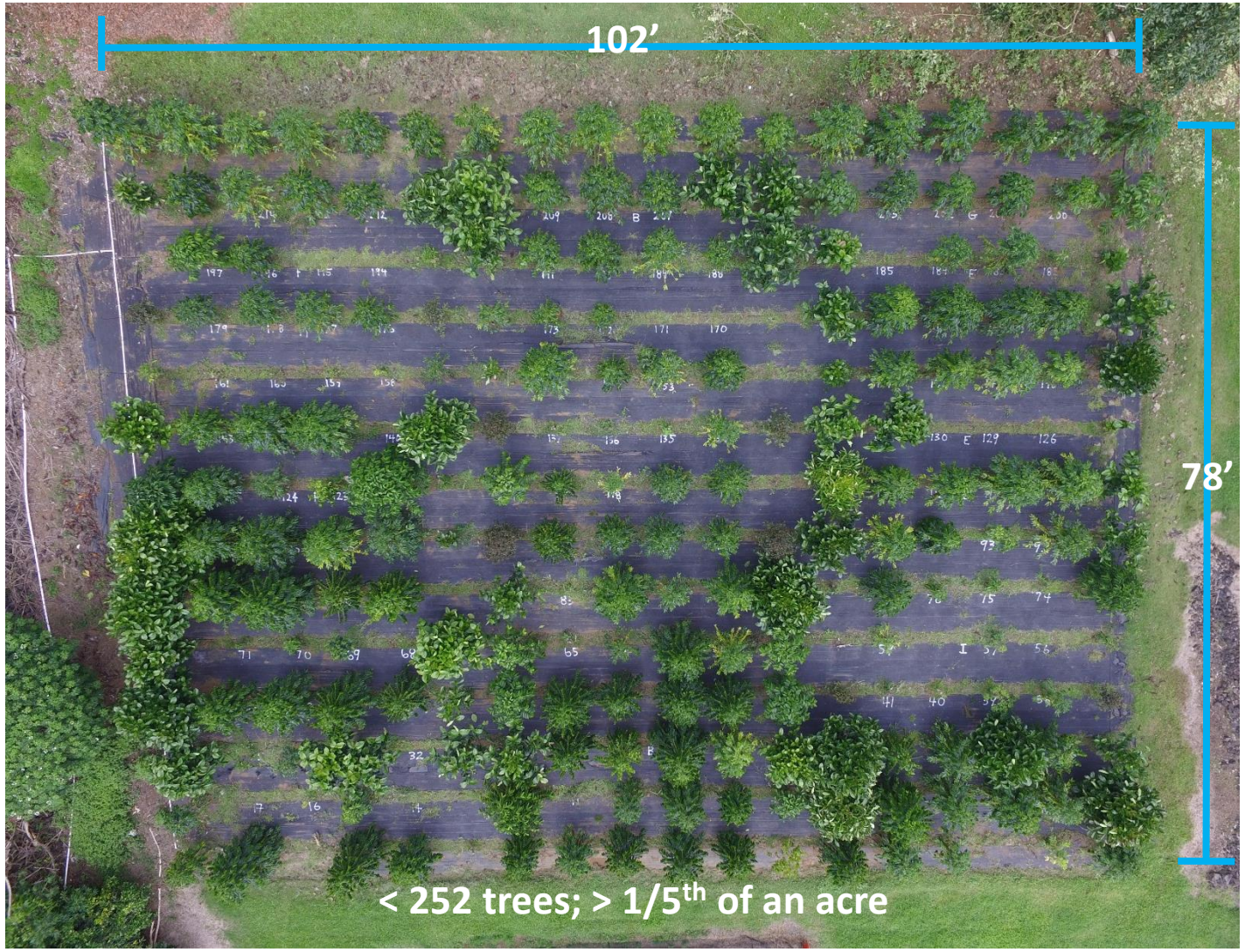
Floating is not a reliable post harvest method for removing CBB damaged beans at the cherry processing stage.

Control CBB early and with IPM.

Harvest completely by picking ripe, over-ripe, and raisin coffee.

Block stumping of small plot

The long-term responses of coffee rootstocks to root-knot nematode in Kona (2 yrs)



Keeping busy

- Coffee pruning demo project
- PBO project
- Efficacy of Delegate in the field for CBB control
- Outreach opportunities
- 30 trees sampling videos
- Rehiring Jr. Extension Agent for CBB
- CBB Conference in 2018?

Thank you!

Visit hawaiicoffee.weebly.com or contact me at andreak@hawaii.edu or 808-322-4892

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