



CTAHR's Coffee Research and Extension Update 2015

Andrea Kawabata
andreak@hawaii.edu

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

Key CTAHR personnel working with coffee around the State



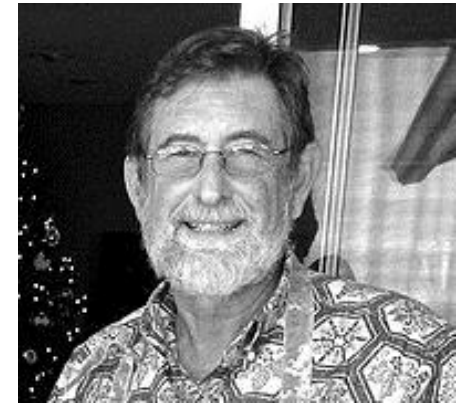
Dr. Stuart Nakamoto
Ag. Economist



Dr. Loren Gautz
Biological Engineer



Andrea Kawabata
Extension Agent



Skip Bittenbender
Extension Specialist



Dr. Mark Wright
Entomologist



Dr. Mike Kawate
IR-4 Program



Dr. Russell Messing
Entomologist

Also Marc Meisner,
Sayaka Aoki, Ishakh
Pulakkattu Thodi, Dr.
PingSun Leung, John
Woodill



Coffee Pesticide Registration

Dr. Mike Kawate and team

Registration status:

Cyantraniliprole (Cyazypyr, Exirel) – For CBB control. Residue analysis complete; final report under review with Quality Assurance and manufacturer (DuPont).

Pyrethrins + piperonyl butoxide (Pyronyl Crop Spray, Evergreen) – For quick knock down of CBB. Residue analysis complete; all data received at IR-4 HQ's.

Spinosad (Success, Entrust (organic formulation)) – Still awaiting final ruling to be published in the Federal Register. EPA decision should have been made in 6/15.

Spinetoram (Delegate) – Still awaiting final ruling to be published in the Federal Register. EPA decision should have been made in 6/15.



CBB Laboratory Bioassay of Effectiveness of Insecticides

Plan to test the following insecticides for new and additional data:

- beta-cyfluthrin (Baythroid)
- lambda-cyhalothrin (Warrior II)
- flupyradifurone (Sivanto)
- pyrethrins (Pyganic Crop Protection)
- *Bacillus thuringiensis galleriae* (beetleGONE!)



Field test with indoxacarb (Avaunt) to provide DuPont with additional efficacy data:

In-orchard sleeve test of indirect exposure of CBB to indoxacarb (Avaunt).

Indoxacarb was effective.

IR-4 field residue tests to be initiated in fall 2015 for indoxacarb (Avaunt).

3 field trials in HI (to include generating samples for roasted and freeze dried coffee)

2 field trials in PR



IR-4 Food Use Workshop to be held in Chicago in September.

Will possibly try for field residue trials for either bifenthrin, beta-cyfluthrin or zeta-cypermethrin in 2016.

Regulatory status of synthetic pyrethroids will determine whether IR-4 proceeds or not.

Essentially all synthetic pyrethroids are RUPs.



PBO:

PBO (piperonyl butoxide) residues in coffee (green bean) causing problems for exports. Why? No MRL (maximum residue limit) for PBO in coffee in the importing country (in this case Japan).

Pyrethrins + PBO (Pyronyl Crop Spray, Evergreen) are, at the present time, exempt from the requirement of tolerances in the US, and various products containing these active ingredients are legal for use in coffee in the US.

Currently working with MGK (PBO Task Force) and IR-4 to establish MRL for PBO in coffee in Japan. IR-4 is working on completing the final report for the residue trials we completed last year. That final report will be used to hopefully establish an MRL for PBO in coffee in Japan.

Before exporting coffee to other countries, exporters need to check whether MRLs exist for pesticides being used in the exported coffee crop. Growers/Exporters may check with US FAS or the importing country's regulatory agency.



Efficacy and crop safety field trials:

2,4-D (Weedar 64) for vine control.

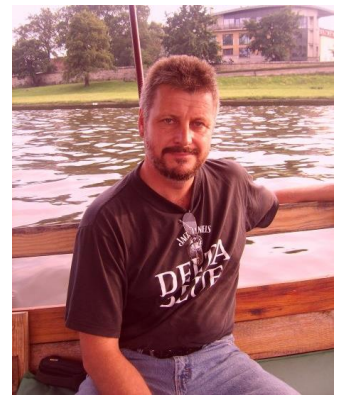


Mark Wright's CBB team

Dr. Ishakh Pulakkattu Thodi

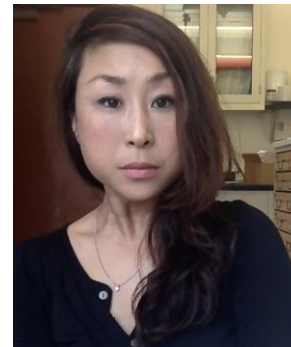


Located in Hilo, he is working on simplifying estimating CBB infestation, spatial distribution of CBB, and improving effectiveness of *B. bassiana* and pyrethroid insecticides.



Alex Ching

Student assistant to Saya working on spatial aspects of CBB movement among orchards on Oahu.



Sayaka Aoki
Ph.D. student
working on CBB
microbial symbionts



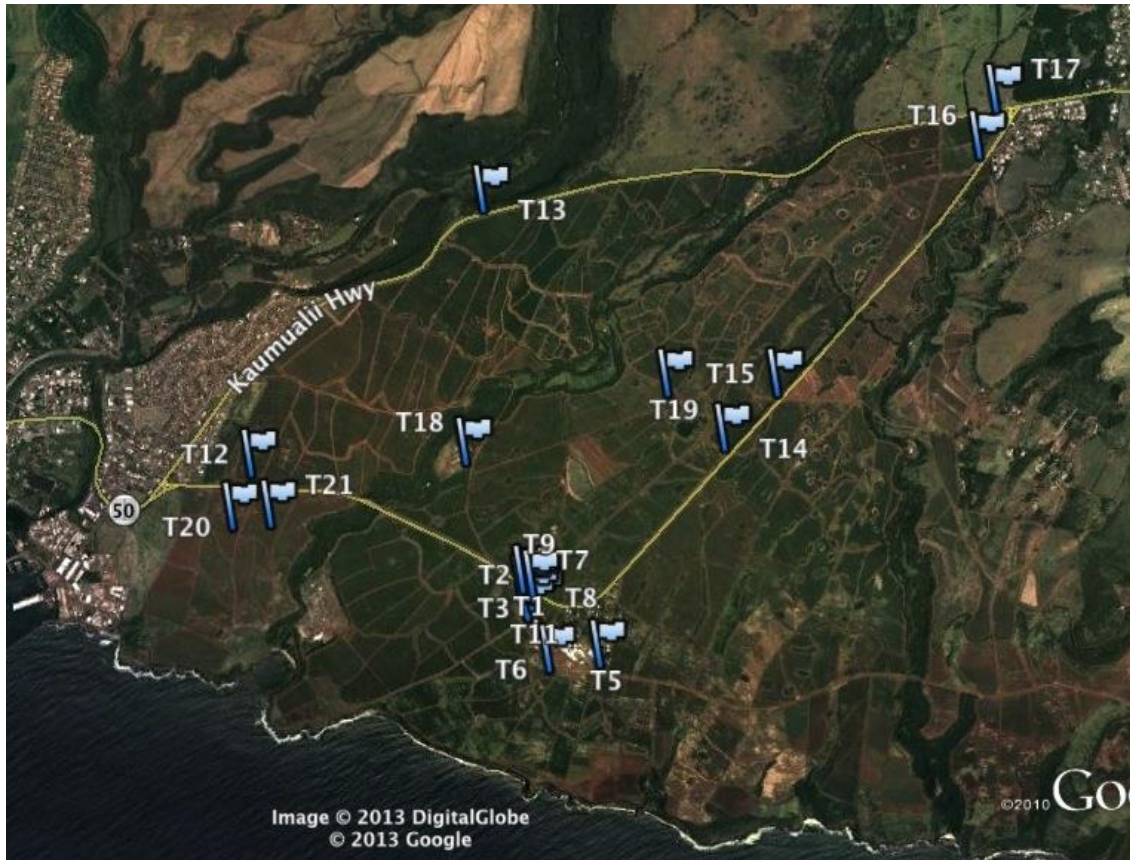


Russell Messing

1. Monitoring at Kauai Coffee for nearly 3 years; no CBB yet.

2. Slight shift of strategy, we cut back on the number of traps - **(to about 8-10)** but are spending more time walking transects through the coffee fields, inspecting berries for signs of CBB entry holes.

3. Our efforts are still concentrated around the visitor center, offices, and processing plant.



Rapid Response Team for Oahu CBB Survey

- Dec. 2, 2014: Tracie Matsumoto collected suspect beetles at the Waialua Estate coffee farm on Oahu.
- Dec. 4, 2014: Beetles were confirmed by Bernarr Kumashiro (HDOA) as CBB.
- Dec. 5, 2015: Deployed a rapid response team to conduct a delimitation survey. Approximately 25 people participated on short notice, including UH-CTAHR, HDOA, USDA-ARS, and Waialua employees.
- Short training session conducted at Dole Plantation for all personnel to review symptoms of beetle damage and survey methods.



- Two-person teams were assembled at a staging point in the coffee fields. Each team was assigned blocks in which to scout every fourth row of trees, visually scanning 3 branches containing coffee berries at 1-2 meters height at 5 meter intervals along the row.
- About 5% of the trees in each block were scouted; altogether 81 of 113 blocks were surveyed (72%), not counting stumped areas.
- Teams scored each block as having either: (A) zero CBB symptoms; (B) low CBB infestation (1 infested berry per tree); or (C) high CBB infestation (> 5 infested berries per tree).
- Data were reported back to base camp and entered on a master map and a spreadsheet.
- The delimitation survey of the entire farm was completed by 4:00 pm on Dec. 5 (Friday), 48 hours after initial confirmation of the beetles' identity.

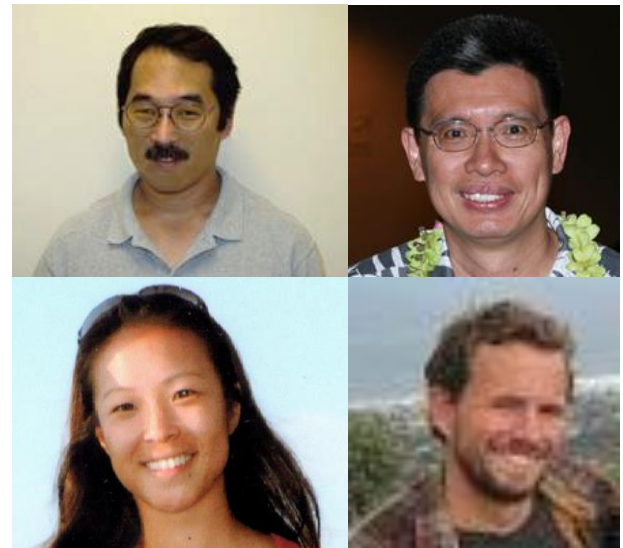


- CBB was found to be well-established and widely distributed throughout the farm. The distribution of beetles was not uniform: there were some hot spots of high CBB density, while other blocks appeared uninfested.
- Highest levels of infestation occurred near the entry gates and along Kam Highway. Very high levels of CBB in some spots (comparable to Kona infestation levels), indicate that the infestation had been ongoing for more than several months.
- It was the unanimous opinion of entomologists from UH-CTAHR, ARS, and HDOA that eradication was an unlikely possibility, given the high density of beetles in some areas, and the wide distribution of beetles around the farm.
- Waialua Estate was advised to move to a pest management mode, adapting what information has been gleaned from Kona farms, but recognizing the considerable additional challenges of controlling CBB on a mechanized farm.



Economics of CBB Management

- Stuart Nakamoto
- PingSun Leung
- Andrea Kawabata
- John Woodill

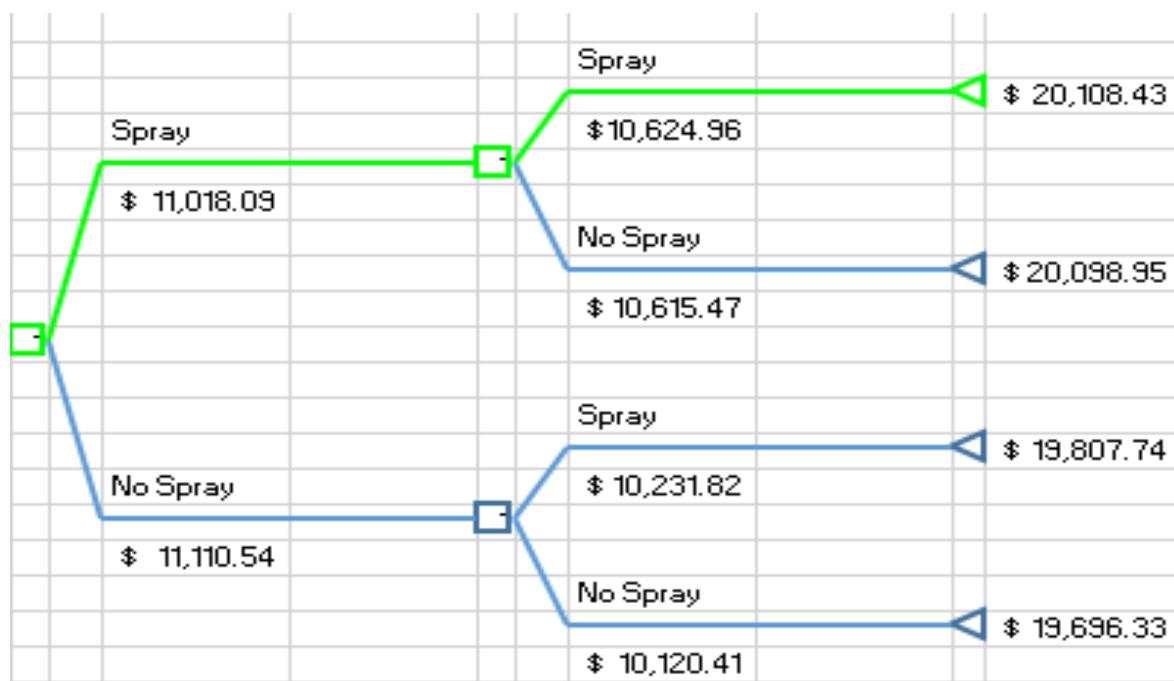


- Andrea, Stuart, and Rob Curtiss organize the annual CBB Summit. CBB IPM Management and current Proceedings can be downloaded from CTAHR website.
http://www.ctahr.hawaii.edu/oc/freepubs/pdf/CBB_Summit_2015_Proceedings.pdf
- Last year reported on estimated economy-wide impact due to CBB for 2011 and 2012.



Previous report ‘Economics of Coffee Production in Hawaii’ is based on the 2007 USDA Agriculture Census. Information from the 2012 Ag Census is being analyzed to provide a pre- and post- CBB comparison.

A Decision Tree Model is being tested. This will help determine the best strategies for CBB management, for both policymakers and growers.



Coffee Engineering



Dr. Loren Gautz
<lgautz@hawaii.edu>

- Hot air quarantine treatment for CBB in green bean up to 100 lbs
- Small do-it-yourself or student built huller
- Burial tests for CBB mitigation



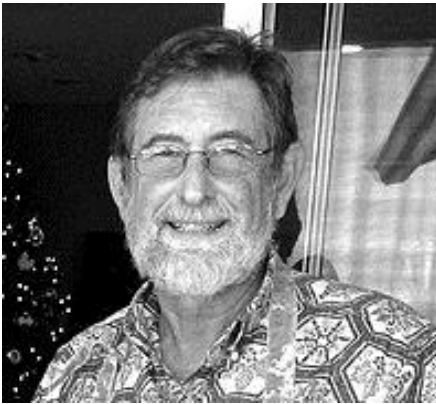
- Heating green bean coffee to 50°C and holding that temperature for 15 minutes was shown in 2010 to kill all life forms of CBB at Probit 9 level of confidence. This was reported at the 2010 ASIC Conference in Costa Rica.
- A device to thoroughly heat a 100lb burlap bag of green bean was installed at the Kona Research Station in Kainaliu. Taste tests with naive coffee drinkers and professional tasters detected no detrimental changes in their coffee beverage. There still remains a need for this treatment to be approved as satisfying HDOA quarantine requirements.
- Another method of CBB mitigation in unsaleable coffee cherries is burial. Experiments determined CBB infested coffee cherries must be buried at depths greater than 100mm (4in.) in wet (friable) soil and 150mm (6in.) in dry soil to prevent escapes of CBB adults.



Small scale huller & winnower of wood or high density polyethylene

- Huller will handle parchment, raisins (naturals) and cacao.
- If DIY material costs \$12 to 25 plus shop vacuum cleaner.
- If made by CTAHR student club request \$200 donation.





CBB Annual Survey Summary

H.C. "Skip" Bittenbender <hcbitt@hawaii.edu>,
A.M. Kawabata, S.T. Nakamoto, and P.S. Leung

- Fourth annual CBB survey was sent in August 2014 to coffee leaders and growers.
- Our goal is to monitor the successful adoption of CBB IPM and the damage reported by growers and processors and to better understand the financial impacts of CBB
- 63 farmer/processors responded
- This survey summary can be found on pages 11 and 12 in the 2015 CBB Summit Proceedings



Chemical Desuckering of Stump Pruned Coffee

Too many verticals (suckers) are produced on stump pruned coffee, if the number is not reduced by July of same year then self-shading will reduce yield in following year.

Hand desuckering is labor intensive and must be repeated during the pruning year.

Best chemical method has been Gramoxone spray. It is a restricted use pesticide.

Aim is being evaluated but is not as effective. It also a contact herbicide and labeled for coffee.



2014 experiment is on a mechanically harvested farm. Using tractor-mounted sprayer, apply at 2 oz Aim in 100 gal per acre. Treatments are:

- Hand desucker as needed – collect time to desucker and 2015 yield.
- Aim and as needed hand desucker - collect time to desucker, Aim application cost, and 2015 yield.
- Aim only, collect application costs and 2015 yield



No spray, not yet desuckered



Aim kills broadleaf weed seedlings and young growth coffee but not grass



Sprayed twice below stump cut, now spraying above stump cut to thin top verticals.





Aim did reduce new verticals 4” below the top. But after 3 sprays (ending in mid July), verticals at the top were 9 with Aim and 7 with hand-desuckering.

Results for 2014

Costs

- Hand desuckering, assume 2 passes and \$15/hr labor is \$400/acre/year
- Aim spray 3 passes at \$24 for Aim/acre + driver and tractor with sprayer \$40/acre.
- $\$24 + \$40 * 3$ passes is \$193/acre/year.
- Impact on yield is unknown until 2015 harvest



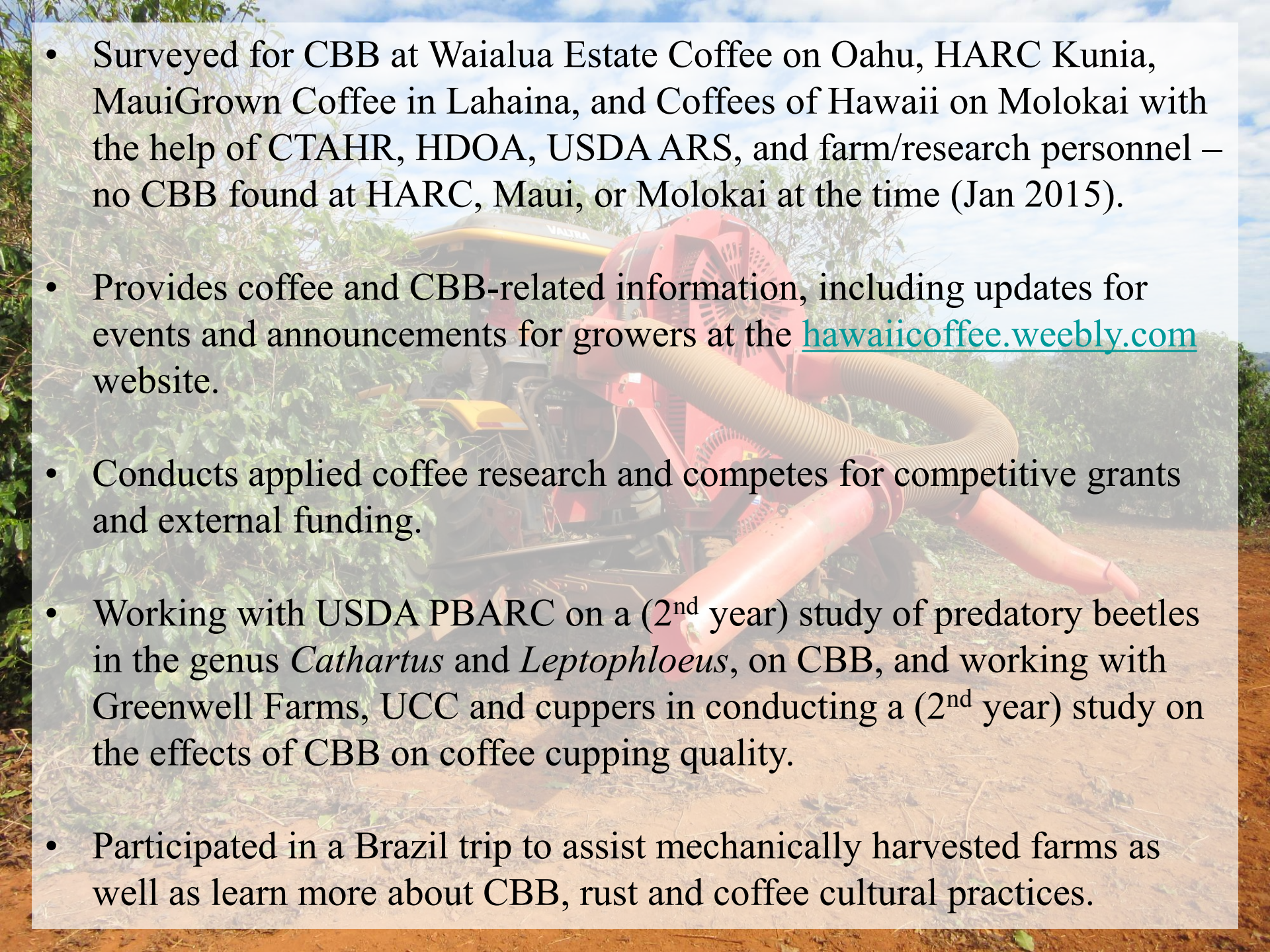
Andrea Kawabata

Extension Agent for Coffee and Orchard Crops



- Hosted or co-hosted coffee and CBB-related events 23 events (535 participants) in 2014, and so far, 18 events (489 participants) in 2015 with the help of Jen Burt, Kally Goschke (former), and Ryan Tsutsui (former).
- Provides coffee and CBB educational outreach at industry conferences, expos, festivals, conducts farm visits and corresponds with farmers, researchers, agencies and industry stakeholders state-wide.
- Organizes the CBB Summit and co-authors the CBB IPM Recommendations with Dr. Stuart Nakamoto (CTAHR) and Rob Curtiss (HDOA)



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- A red mechanical harvester, likely a coffee picker, is shown in a coffee field. The harvester has a large red hopper and a yellow engine. It is positioned in the middle ground, with coffee plants in the foreground and background. The background shows a dirt path and more coffee trees under a clear sky.
- Surveyed for CBB at Waialua Estate Coffee on Oahu, HARC Kunia, MauiGrown Coffee in Lahaina, and Coffees of Hawaii on Molokai with the help of CTAHR, HDOA, USDA ARS, and farm/research personnel – no CBB found at HARC, Maui, or Molokai at the time (Jan 2015).
 - Provides coffee and CBB-related information, including updates for events and announcements for growers at the hawaiicoffee.weebly.com website.
 - Conducts applied coffee research and competes for competitive grants and external funding.
 - Working with USDA PBARC on a (2nd year) study of predatory beetles in the genus *Cathartus* and *Leptophloeus*, on CBB, and working with Greenwell Farms, UCC and cuppers in conducting a (2nd year) study on the effects of CBB on coffee cupping quality.
 - Participated in a Brazil trip to assist mechanically harvested farms as well as learn more about CBB, rust and coffee cultural practices.



Dr. Alyssa Cho

acho@hawaii.edu

Assistant Researcher in Sustainable Farming Systems with an Emphasis on Fruit & Nut Production

Located in Hilo at the Komohana Research and Extension Center

- Research (60%)
- Extension (30%)
- Instruction (10%)



Please visit the hawaiicoffee.weebly.com and www.ctahr.hawaii.edu/Site/CBB.aspx websites for additional coffee and CBB information and to download the 2015 CBB Summit Proceedings for a better understanding of CBB research and extension activities.

Questions or Comments?

