

# Educating Hawai'i Coffee Growers about Coffee Berry Borer Integrated Pest Management



Andrea M. Kawabata<sup>1</sup>, Rob T. Curtiss<sup>2</sup>, Stuart T. Nakamoto<sup>1</sup>, Jari S. Sugano<sup>1</sup>, Ryan K. Tsutsui<sup>1</sup>, Maria D. Diaz-Lyke<sup>1</sup>

1. University of Hawai'i College of Tropical Agriculture and Human Resources – Cooperative Extension Service; HI, USA; 2. Hawai'i Department of Agriculture – Plant Pest Control Branch; HI, USA

## Abstract

Kona coffee has over 200 years of cultural history and economic importance in the islands. Hawai'i's mild climate, rich, volcanic soils, and low pest and disease pressure, allowed growers to produce world-renowned, quality coffee with relative ease. In August 2010, discovery of the Coffee Berry Borer *Hypothenemus hampei* (CBB), caught the Kona coffee industry by surprise. The industry was ill-prepared and hesitant to band together to tackle CBB as a cohesive unit. By 2012, CBB damages soared above 80% causing coffee yields and quality to plummet. The CBB invasion also began expanding to neighboring districts. Early CBB integrated pest management (IPM) recommendations were helpful but often viewed as confusing and conflicting by farmers.

Hawaii Extension Agent Andrea Kawabata recognized the need to unite the industry's educational voice. In January 2013, Kawabata

and others organized a CBB Summit. A comprehensive 13-page document was generated and adopted by summit participants and all coffee organizations in Hawaii. This document became the basis of all state-wide CBB educational efforts.

From June 2013, 99.4% of event participants reported an increase in knowledge and understanding of CBB. Additionally, 91.2% of participants indicated that three or more concepts were learned and applicable to their operation. Annual grower surveys also show a stabilizing green bean recovery ratio, implying that farmers using current CBB IPM recommendations are having greater success at controlling CBB. Getting growers to jump on the area wide IPM bandwagon is essential for the long term sustainability of Hawai'i's \$35 million coffee industry.

## Safeguarding the Hawai'i Coffee Industry



The Coffee Berry Borer (CBB), *Hypothenemus hampei*, was first discovered in Kona, Hawai'i in 2010. This beetle has since spread throughout the Big Island. CBB causes major damage to green and ripe coffee cherry by boring into the cherry, mining through and consuming the bean, and raising multiple generations of CBB in each infested berry. Severely damaged roasted coffee is astringent with an unpleasant smoky, burnt and/or pipe tobacco flavor.

## CBB: Economic Pest



Originally from Africa, this Scolitid beetle can wipe out > 80% of a coffee crop if left uncontrolled or if ill-managed. CBB can easily be transported from farm to farm by pickers, used harvest equipment, and with infested coffee trucked to the mill.

## Hawai'i Growers' Concerns

- New pest in Hawai'i
- Varied CBB IPM Strategies
- Grower confusion
- Abandoned & neglected farms
- Feral coffee trees
- Finding and training laborers
- Uneven and steep terrain
- High cost of CBB IPM
- Reduced yield
- Maintaining coffee quality

## CBB IPM Approach



- Prevention
- Routine Monitoring
- Fruit Sampling
- Field Sanitation\*
- Proper Pruning
- Pesticide Application
- Timely Harvesting
- Multi-agency supported
- Grower 'Buy in'

\* Field sanitation is the **most important practice** during and following the harvest season

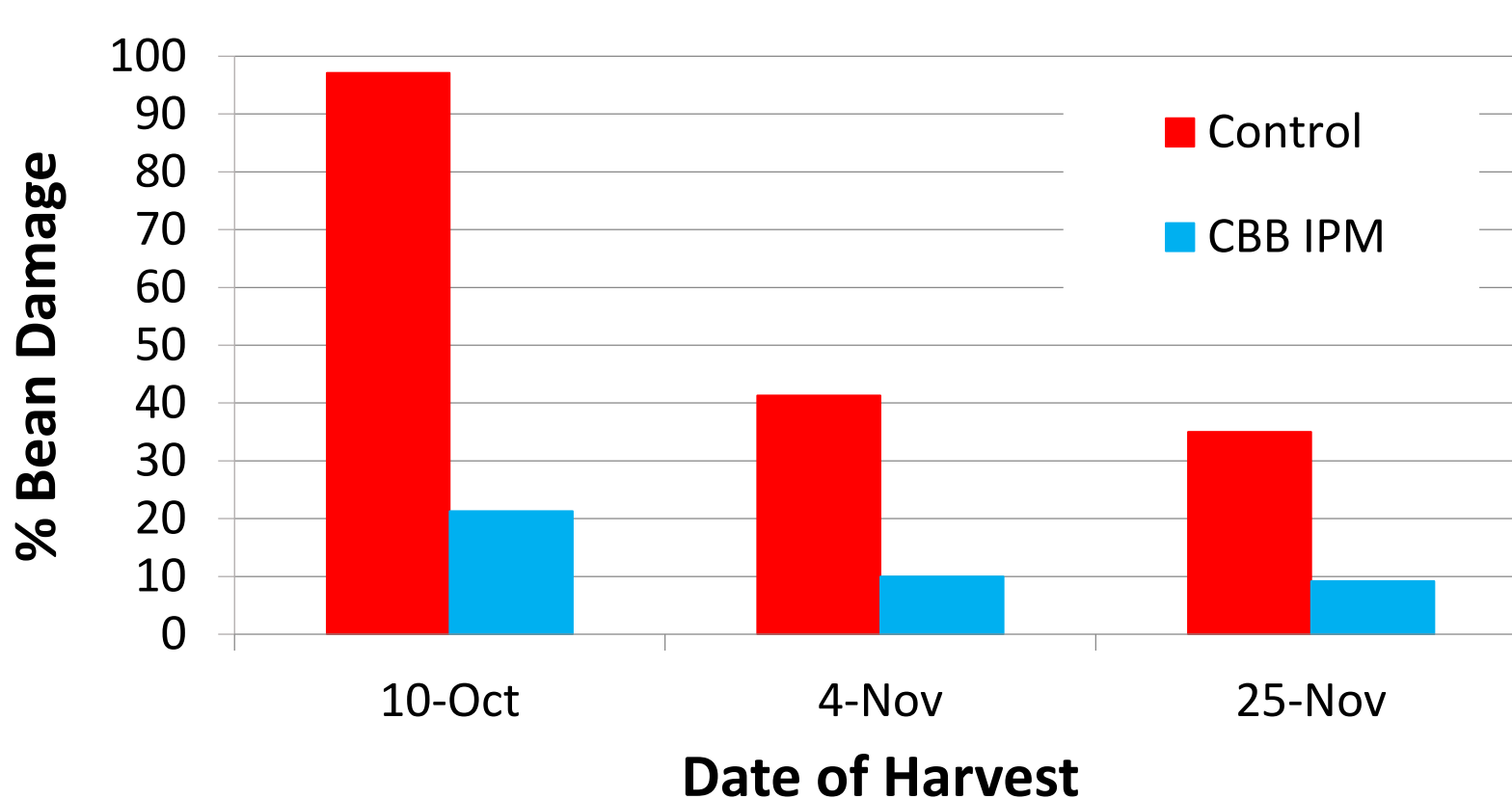
## Unified Multi-Agency Support

In 2013, statewide agricultural professionals met for a two-day "Coffee Berry Borer Summit to develop a CBB Integrated Pest Management Methods and Protocols for Hawai'i". Participants included researchers, entomologists, extension specialists and agents from UH CTAHR, USDA Daniel K. Inouye Pacific Basin Agricultural Research Center, and the Hawaii Department of Agriculture; coffee industry leaders; and those teaching or advising coffee farmers.

The goal of the summit was to organize a standard protocol or management strategy to present to those in the education sector of the industry with the intent of reducing CBB infestation levels through a unified IPM approach.

## Engagement of Coffee Farmers to Adopt CBB IPM Practices

Figure 1: Efficacy of CBB IPM



UH CTAHR Cooperative Extension agents and specialists worked hand in hand with farmers to promote the use and better understanding of CBB IPM management strategies. Applied research (Fig. 1) was used to demonstrate the effectiveness of the IPM recommendations and that growers could reduce bean damage by more than 73%. Growers were shown how to use the Thirty Trees Sampling and Monitoring Method to time pesticide sprays as well as to determine the effectiveness of spray applications. Farmers taught the same CBB IPM strategies to other farmers and openly shared their experiences. In addition, seminars held on other islands, focused on the importance of introduction prevention and the adverse realities of CBB management.

### CTAHR IN FOCUS

Out of Kona: Integrated Effort Counters the Coffee Berry Borer

A beetle barely a sixteenth of an inch long, the coffee berry borer threatens a \$4 million agricultural market on the Big Island. The borer, *Hypothenemus hampei*, bores into coffee cherries, mining through and consuming the bean, and raising multiple generations of CBB in each infested berry. The borer was first discovered in Kona in 2010. It has since spread throughout the Big Island. CBB causes major damage to green and ripe coffee cherry by boring into the cherry, mining through and consuming the bean, and raising multiple generations of CBB in each infested berry. Severely damaged roasted coffee is astringent with an unpleasant smoky, burnt and/or pipe tobacco flavor.

CTAHR was awarded a grant to support the development of a standard protocol or management strategy to present to those in the education sector of the industry with the intent of reducing CBB infestation levels through a unified IPM approach.

UH CTAHR Cooperative Extension agents and specialists worked hand in hand with farmers to promote the use and better understanding of CBB IPM management strategies. Applied research (Fig. 1) was used to demonstrate the effectiveness of the IPM recommendations and that growers could reduce bean damage by more than 73%. Growers were shown how to use the Thirty Trees Sampling and Monitoring Method to time pesticide sprays as well as to determine the effectiveness of spray applications. Farmers taught the same CBB IPM strategies to other farmers and openly shared their experiences. In addition, seminars held on other islands, focused on the importance of introduction prevention and the adverse realities of CBB management.



## Program Impact

- ✓ Generated a comprehensive 13-page document with multi-agency and statewide stakeholder group endorsement
- ✓ Organized a unified statewide CBB IPM extension educational program for coffee farmers
- ✓ Increased farmer understanding and adoption of CBB IPM
- ✓ Developed a simplified 1-page CBB IPM summary in 4 languages
- ✓ Conducted 23 state-wide educational events
- ✓ Stabilized CBB infestation levels & Hawai'i's 35 million dollar coffee industry
- ✓ Assisted in securing grant support from federal and state agricultural agencies to continue CBB IPM extension efforts statewide.