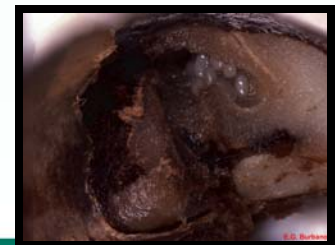


Effectiveness of trapping, fungus and Surround WP as management alternatives for the coffee berry borer

Elsie Burbano Greco
eburbano@hawaii.edu



Outline

1. Capture of CBB using different traps
2. Trap height effect on CBB capture
3. Effectiveness of 3 doses of Botanigard[®]
4. Effectiveness of Surround WP (Kaolin) as a protectant against CBB attack
5. Win the battle!
6. Time for questions..



1. Capture of CBB using different traps



Homemade
trap



Red Japanese beetle
trap

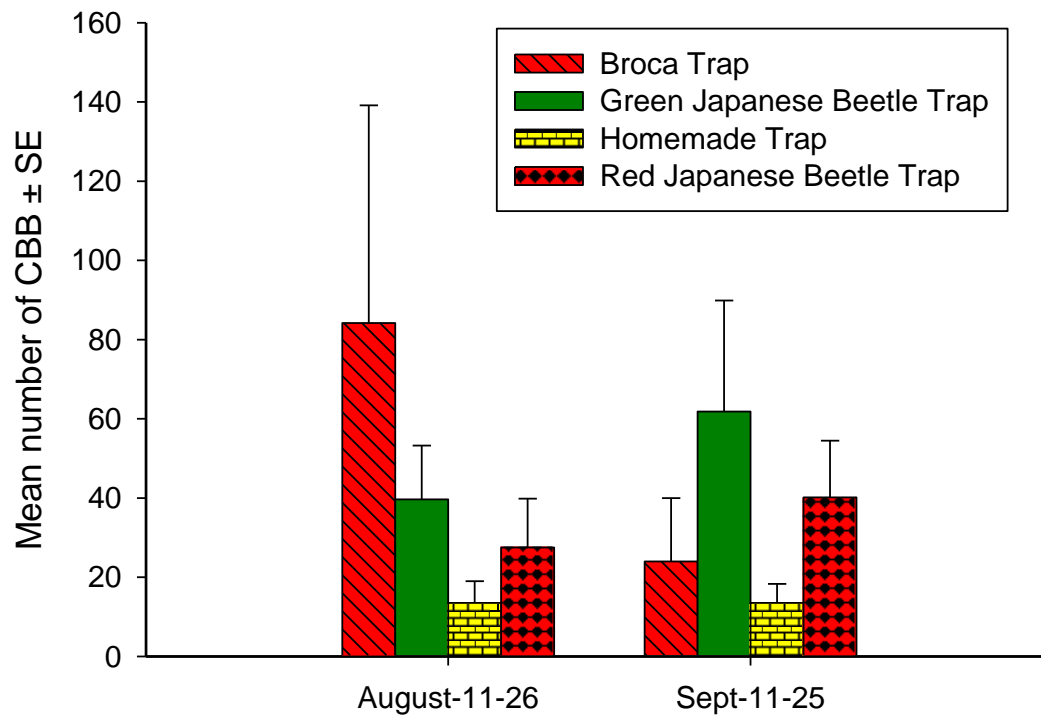


Green Japanese beetle
trap



Broca trap

1. Capture of CBB using different traps (data 2011)



Broca Trap



Green Japanese Beetle Trap



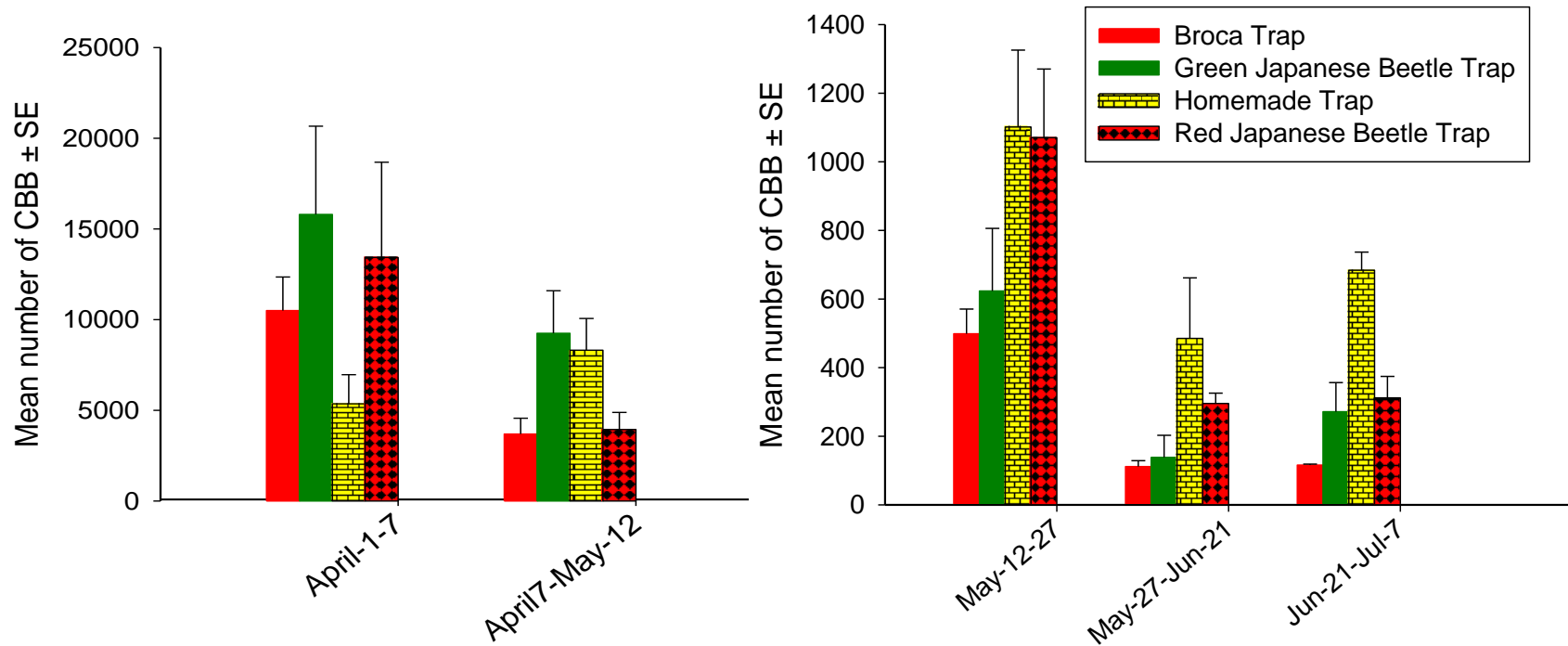
Homemade Trap



Red Japanese Beetle Trap



1. Capture of CBB using different traps (data 2012)



Broca Trap



Green Japanese Beetle Trap



Homemade Trap



Red Japanese Beetle Trap

2. Trap height effect on CBB capture: 472 m, Keauhou Mauka (data 2012)

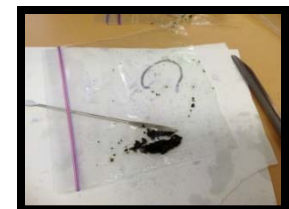
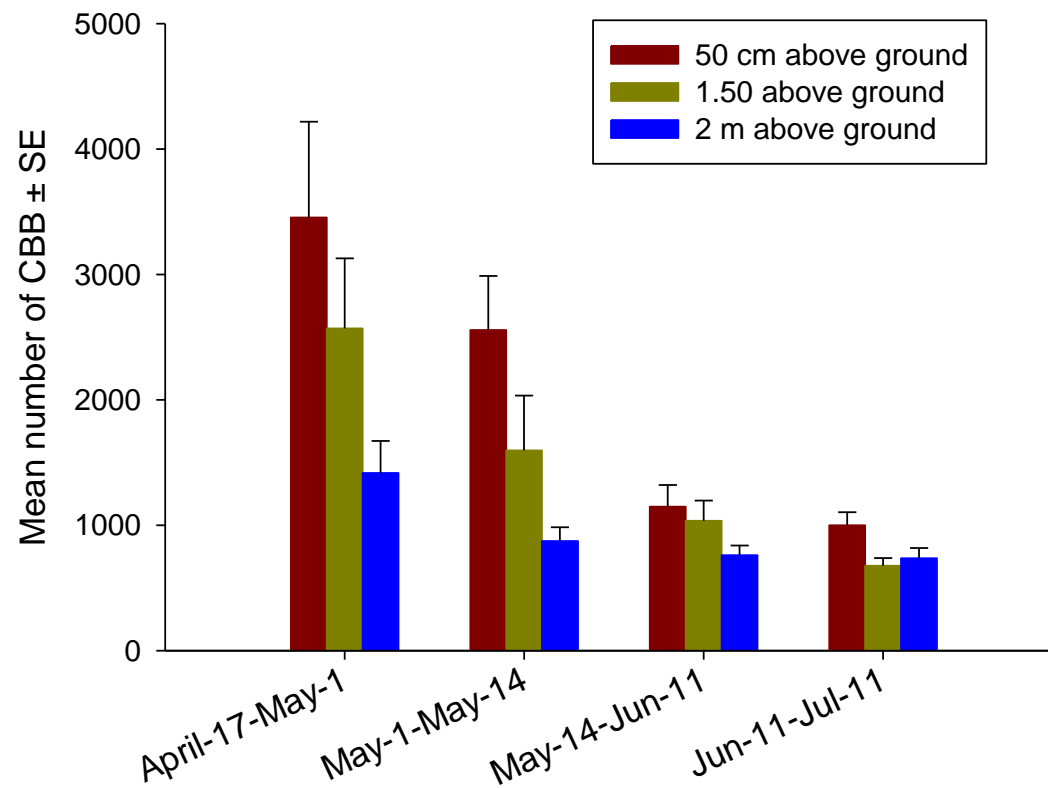
~ 2 m above ground

Chest height: 1.50 m

Knee height: 50 cm



2. Trap height effect on CBB capture: (Keauhou Mauka: 472 m, data 2012)



3. Effectiveness of 3 doses of Botanigard®

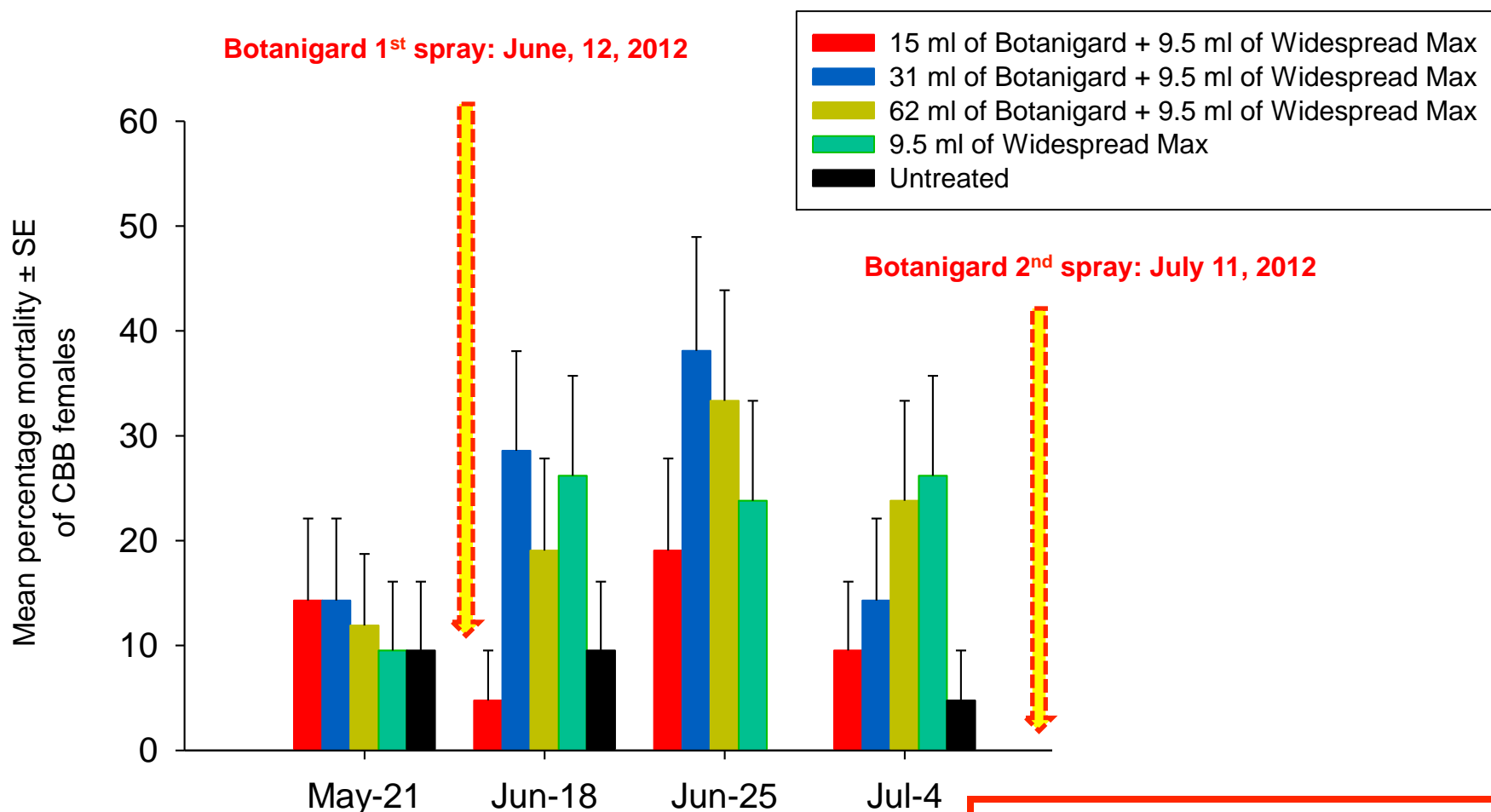
- Two farms: **Holualoa and Honuanao**
- 10- tree experimental units
- Treatments
 - Botanigard® : (8, 16 and 32 oz per acre)
 - Widespread Max
 - Untreated trees
- 3 replicates per farm

- Count number of infested berries before spray
- One time spray and **a second spray after a month (still collecting data)**
- Count infested berries with and without fungus every week per 1 month
- Sample and dissect 7 infested berries per replicate
- **Count number of dead CBB female,** eggs, larvae and pupae



Current fungus' s dose used:
7 oz of fungus + 3 oz of surfactant per acre.
If using a 4-gallon backpack, it will take 30 gallons of water per acre.

3. Effectiveness of 3 doses of Botanigard[®] (Holualoa: 430 meters, data 2012)



Current fungus' s dose used:
 7 oz of fungus + 3 oz of surfactant per acre.
 If using a 4-gallon backpack, it will take 30 gallons of water per acre.

4. Effectiveness of Surround WP (Kaolin) as a protectant against CBB attack

- 2 year project
- 5 farms
- Purpose
 - Control CBB
 - Increase yields over 2 year cycle
- 6-tree experimental units
- 3 replicates per farm
- Treatments
 - Control
 - Surround WP (1 liter of water + 50 g of Surround WP + 3 ml of Nu Film)
 - *B. bassiana*
 - Surround WP + *B. bassiana*
- Spray trees every 2 weeks
 - 6 weeks after flowering until end of harvest



4. Effectiveness of Surround WP (Kaolin) as protectant against CBB attack

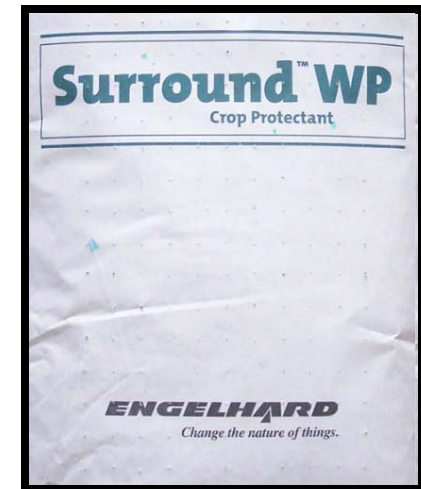
- Select four randomly branches per replicate
 - Number of holes/total number of cherries
- Harvest all ripe coffee
 - Weight



4. Effectiveness of Surround WP (Kaolin) as protectant against CBB attack

What is Surround WP (Kaolin)?

- Organic certified product
- Pest deterrent
 - Chemical absorbent
 - Physical abrasion
 - Irritation
 - Color confusion
 - Bad taste



Glenn et al. 2002. A Reflective, Processed-Kaolin Particle Film Affects Fruit Temperature, Radiation Reflection, and Solar Injury in Apple. *Journal of the American Society for Horticulture Science*. 127 (2): 188-193.

4. Effectiveness of Surround WP (Kaolin) as protectant against CBB attack

Effect of Surround WP (Kaolin) on plants:

- Radiation reflection
 - Temperature reduction
- Increase coffee yields



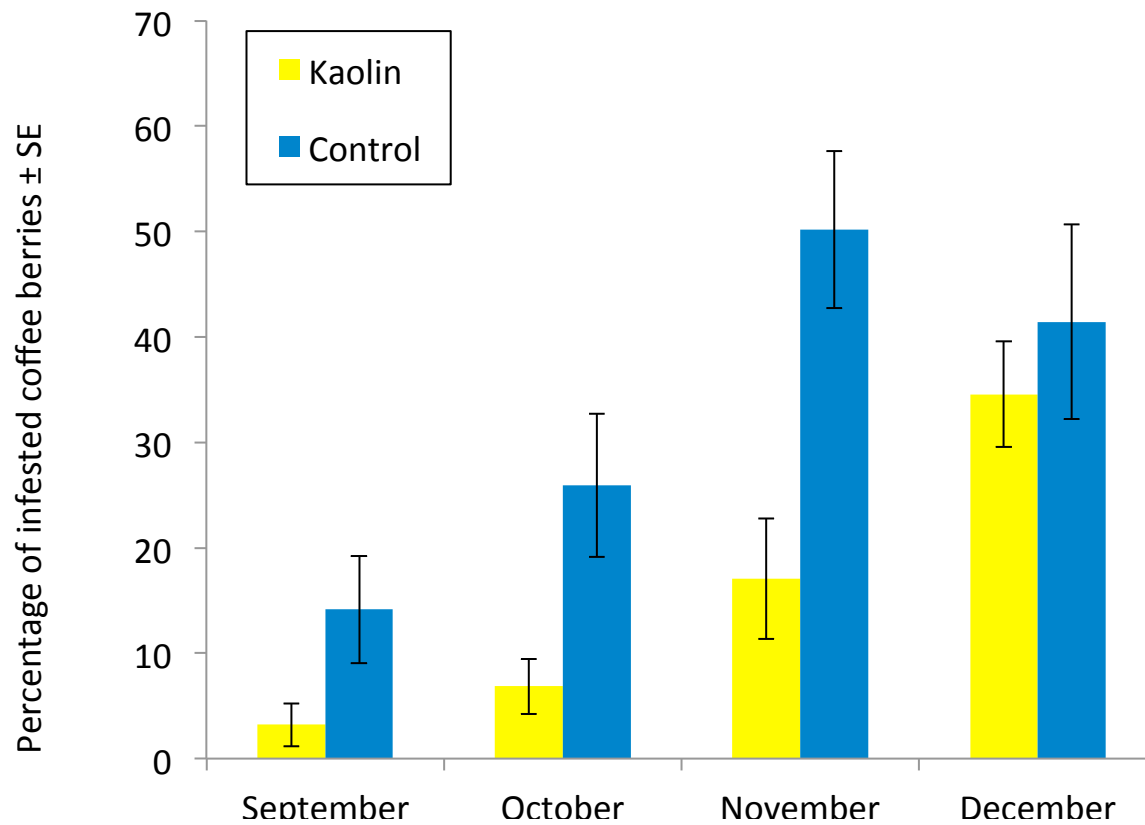
4. Effectiveness of Surround WP (Kaolin) as protectant against CBB attack

CBB control:

Farm	Treatment	% infested berries
1	Control	21.4 A
	Kaolin	31.02 A
2	Control	33.8 A
	Kaolin	13.7 B
3	Control	18.9 A
	Kaolin	15.4 A
4	Control	4.7 A
	<i>Beauveria bassiana</i> (Mycotrol O)	3.0 AB
	Kaolin	1.0 B
	Kaolin + <i>B. bassiana</i> (Mycotrol O)	0.6 B

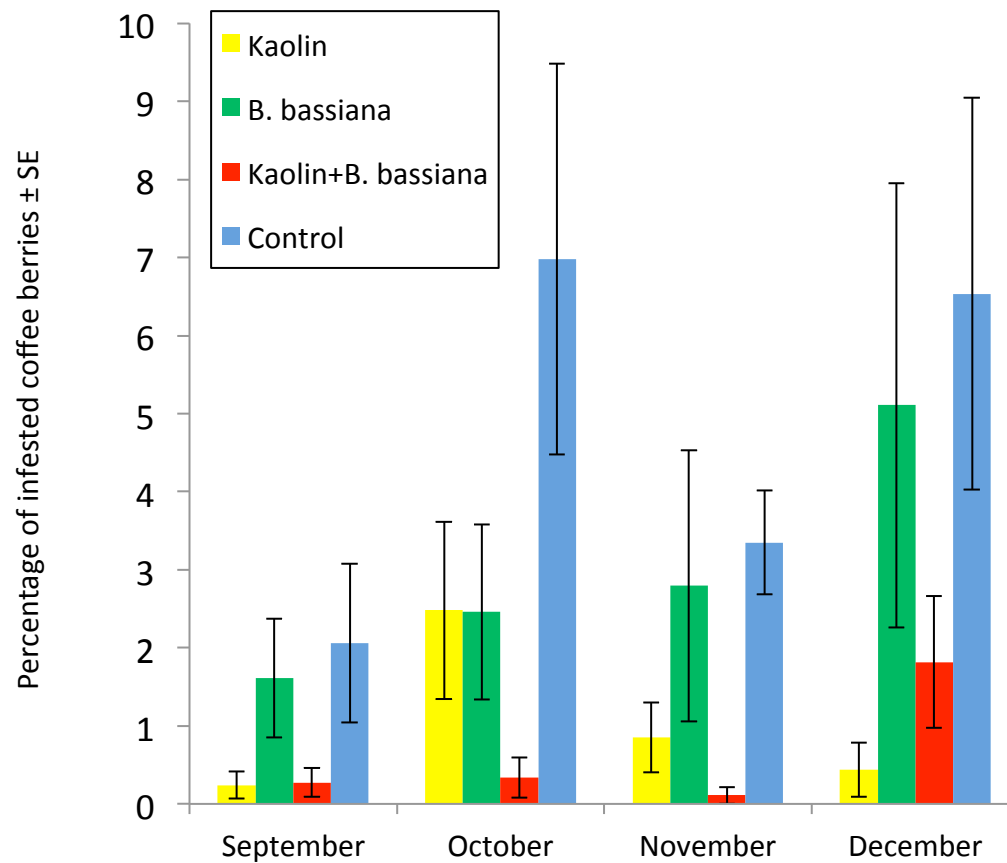
4. Effectiveness of Surround WP (Kaolin) as protectant against CBB attack

CBB control: Farm 2 (260 m)



4. Effectiveness of Surround WP (Kaolin) as protectant against CBB attack

CBB control: Farm 4






4. Effectiveness of Surround WP (Kaolin) as protectant against CBB attack

Coffee yield:

Farm	Treatment	Average yield (Kg)
1	Control	5.4
	Kaolin	4.3
2	Control	30.7
	Kaolin	46.1
3	Control Kaolin	Harvested accidentally 😞
4	Control	9.2
	<i>Beauveria bassiana</i> (Mycotrol O)	12.4
	Kaolin	22.2
	Kaolin + <i>B. bassiana</i> (Mycotrol O)	18.6

Win the battle!

- Reward coffee farmers for producing quality coffee  Interest in CBB management
- IPM concepts: understandable, approachable and easy to apply by farmers
- CBB research applicable to HI coffee conditions
- Economic support by government, coffee industry...to continue the CBB studies
- Strengthen collaboration between the coffee associations, UH, ARS-USDA, HDoA and extension agents
- CULTURAL CONTROL, SAMPLING  TIME CONSUMING  WORTHY
- Cost / benefits studies to estimate pest levels and losses



Dawn and Robert Barnes and Joenell Nullar:
Rainforest Coffee



Bob Nelson and Brian Axelrod:
Lehuula farms



Ronald and Mary Lake:
Kona Lisa



Brooks and Bill Wakefield



Consuelo Lemus and
Ivan Lemus.
Loren Gautz:UH

Big Mahalo!

- Crop Production Services
- Surround WP manufacturers
- USDA-ARS and Hatch (CTAHR Office of Research)
- (Arianna Farm) (Kaolin-2012 trial)
- Jesse Kaiwi: Captain Cook



Bob Foerster:
Dragon's Lair State



Justin and Deb Sims:
Sweet spirit farm



Andrea Kawabata: UH



Aileen Li: UH Manoa



Mark Wright: UH



Dave and Trudy Bateman,
Miguel and Lupe Mesa:
Heavenly Hawaiian



Shawn Steiman:
Collea Consulting

Viva coffee land!

