# Coffee Berry Borer Control on a Micro Scale

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## The Questions

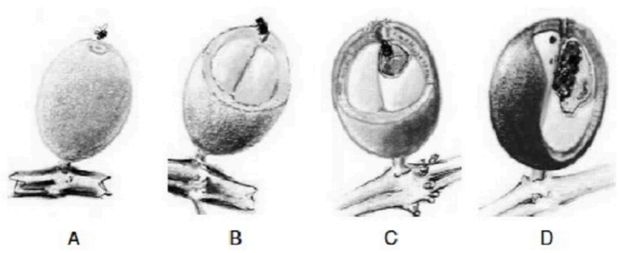
1. How small of an area is too small to control CBB?

2. Does BAM have an effect on CBB?

3. Does feral and unsprayed coffee make CBB control impossible?

## The Background

The Coffee Berry Borer, *Hypothenemus hampei*, is indigenous to Africa but has become a pest throughout major coffee growing regions of the world. It reduces coffee quality and yield. Control is achieved though an integrated pest management program.




*Stages of CBB infestation*

## The Experiment

- ~¼ ac unsprayed farm surrounded by feral coffee
- Six micro-plots; 3 trees ea.
  -Barriers prevent overspray

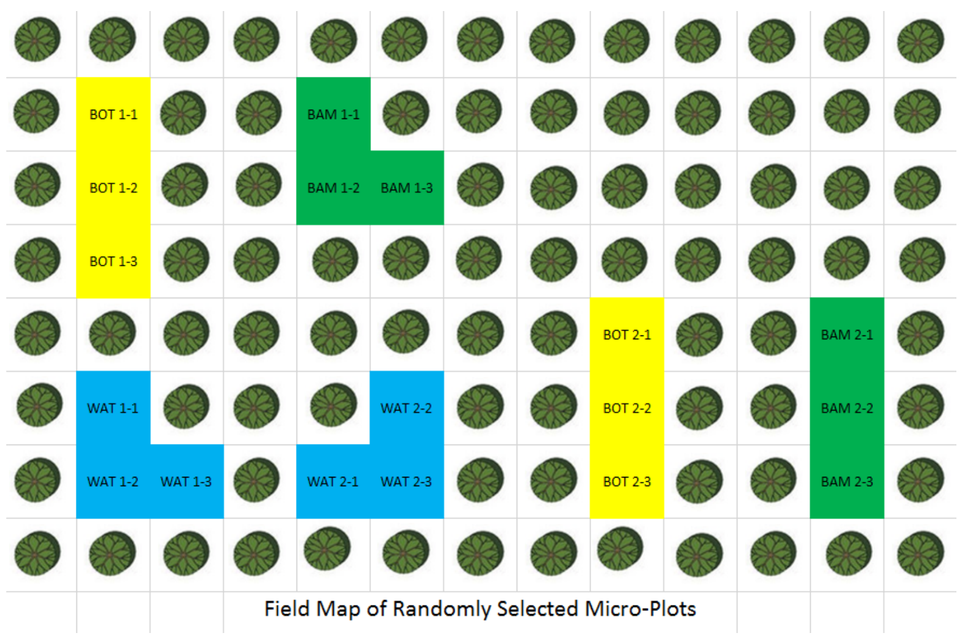
Treatments:

1) BotaniGard ES w/ Wide-spread Max; Label rate: 1qt/50gal water every 4wks
2) Beneficial active micro-organisms (BAM); Label rate: 1c/5gal water every 2wks
3) Water; every 2wks

- Spray tree to wetness
- Harvest coffee
- Determine cherry infestation and bean damage levels
- Compare treatments

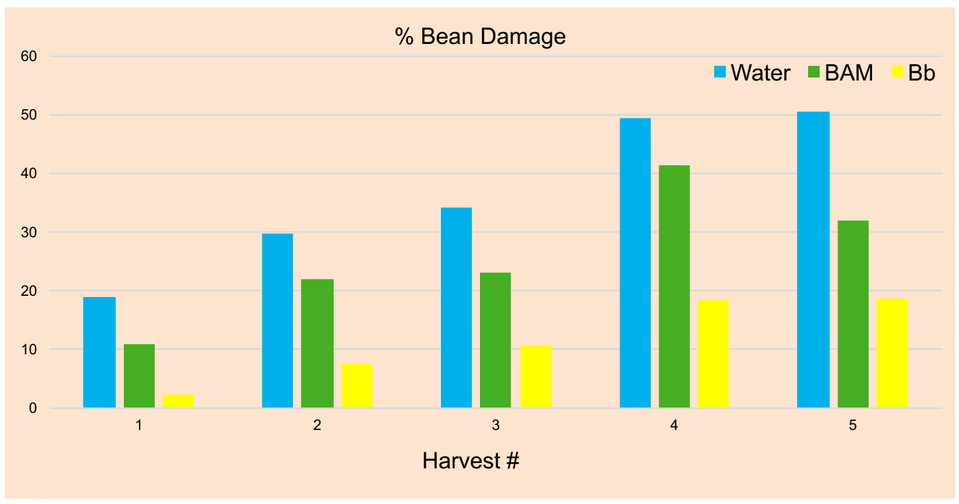
## The Findings

- The entire field was harvested five times (Oct to Dec)
- Accumulated season bean damage levels were used for this analysis
- Water=~37%, BAM=~24%, BotaniGard=~11% damaged beans




Field Map of Randomly Selected Micro-Plots

An example of trees used in this project (water = blue tags)




Physical barriers erected between treatments to prevent overspray

t-Test: Two-Sample Assuming Unequal Variances - Whole Season Bean Damage

| | Water vs. BAM | | Water vs. Botanigard | | BAM vs. Botanigard | |
|---|---|---|---|---|---|---|
| Mean | **37.17** | **24.15** | 37.17 | **10.84** | 24.15 | 10.84 |
| Variance | 206.89 | 168.87 | 206.89 | 59.46 | 168.87 | 59.46 |
| Observations | 78 | 70 | 78 | 67 | 70 | 67 |
| Hypothesized Mean Difference | 0 | | 0 | | 0 | |
| df | 146 | | 121 | | 113 | |
| t Stat | 5.79 | **Significant** | 14.00 | **Significant** | 7.33 | **Significant** |
| P(T<=t) one-tail | 2.12E-08 | | 2.32E-27 | | 1.86E-11 | |
| t Critical one-tail | 2.35 | | 2.36 | | 2.36 | |
| P(T<=t) two-tail | 4.25-08 | | 4.63E-27 | | 3.73E-11 | |
| t Critical two-tail | 2.61 | | 2.62 | | 2.62 | |

## The Answers

**1. How small of an area is too small to control CBB?**

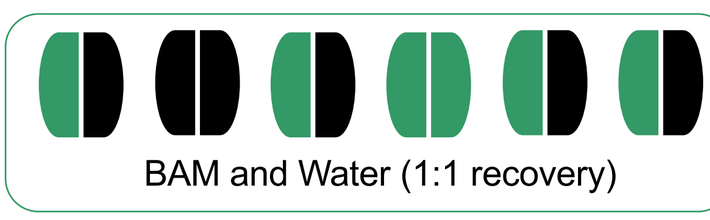
- CBB can be controlled on an individual tree basis using IPM
- *Beauveria bassiana* based products perform well on a micro scale
- Follow the 2015 CTAHR CBB IPM Recommend-ations. Found here at:

http://www.ctahr.hawaii.edu/oc/freepubs/pdf/IP-33.pdf

**2. Does BAM have an effect on CBB?**

- Yes, but it is not sufficient to provide farmers with maximum profit
  - Additionally, from infested cherry to actual bean damage:
    - BotaniGard has a 2:1 recovery (34.5% beans lost)
    - BAM and water have a 1:1 recovery (47.4% and 52.5% beans lost, respectively)

BotaniGard (2:1 recovery)



BAM and Water (1:1 recovery)

**3. Does feral and unsprayed coffee make CBB control impossible?**

- No, CBB can be controlled through best management practices
- Proximity to unsprayed and feral coffee has limited effect on properly managed coffee

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