Developing Harvest Management Strategies by Manipulation of Coffee Flowering

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Non-synchronized fruit development

- Increases harvesting costs
- Damage to trees with multiple harvests
- Berries can be a source of CBB if left in field
Reducing CBB levels in the field

Without sanitation, coffee berries will always be present in this field.
Sporadic Rainfall and Coffee Flowering
Plant Hormones associated with Coffee Flowering

Abscisic Acid (ABA)

Gibberellic Acid (GA)

ABA
Goal of Research
GA treated trees harvested earlier

Ripe and Green Coffee Berries harvested per tree

Ripe berries (kg) each harvest date

- Control
- ProGibb + FP

- 10/6/2010
- 10/28/2010
- 11/15/2010
- 12/15/2010

Green
Ripe
ABA soil drench increases total berry yield

Total Green and Ripe Berries

- Untreated Control
- VBC030051 Foliar weekly (x4)
- VBC030051 Drench weekly (x7)
- ProGibb 100 ppm GA3 weekly (x2)

Total Berries harvested on each harvest date

- 3-Nov-12
- 29-Nov-11
- 27-Dec-11
- 24-Jan-12
- Green
Kauai Coffee Yellow Catuai Field
Total Yellow Catuai Berry Harvest Kauai 2011

- **Control**
- **100 ppm sABA + Foliar & Drench**
- **1000 ppm sABA Drench**
- **25 ppm GA3 x 4 foliar sprays**
- **50 ppm GA3 x 2 foliar sprays**
- **100 ppm GA3 foliar spray**

**Legend:**
- Green
- Ripe
Kona berry harvest if stripping/sanitation completed in December for CBB sanitation
Ripe berries in Kona Nov 16, 2012

Untreated Control

300 ppm s-ABA foliar plus GA3 foliar* (1 app)

300 ppm s-ABA drench (4 apps) plus GA3 foliar*
Application at Waialua 2012
Mechanical Harvest

1\textsuperscript{st} Harvest
September 11, 2012

2\textsuperscript{nd} Harvest
September 26, 2012

9-11-12
Average berry harvest per tree (total yield/total # trees)

**Total Berries Harvested**

<table>
<thead>
<tr>
<th></th>
<th>9/11/2012</th>
<th>9/27/2012</th>
<th>Total</th>
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<tr>
<td>UTC</td>
<td>5.2</td>
<td>4.7</td>
<td>9.9</td>
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<tr>
<td>ProGibb</td>
<td>5.7</td>
<td>4.7</td>
<td>10.3</td>
</tr>
<tr>
<td>ProTone</td>
<td>5.3</td>
<td>5.1</td>
<td>10.3</td>
</tr>
<tr>
<td>ProTone + ProGibb</td>
<td>5.3</td>
<td>5.8</td>
<td>10.9</td>
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Subsample and separation

Separate cherry into
  • Overripe (brown)
  • Ripe (red)
  • Green
Harvested too early
Currently in progress

Quality evaluation of harvested cherries
  • Samples sized and will be cupped commercially for taste

Kona, Waialua and Kauai Coffee
  • Commercial applications onto 3 rows with
  • 100 ppm GA3 (ProGibb) foliar
  • 300 ppm s-ABA (ProTone) foliar
  • 100 ppm GA3 (ProGibb) + 300 ppm s-ABA (ProTone) foliar
  • ~2 to 3 applications during flowering cycle
Commercial Application
Coffee Berry Borer Control

Monitoring
- Trapping
- Field Scouting

Sanitation
- Field (field stripping and removal of fallen/old cherries)
- Mill

Biological and Chemical Controls
- “Pesticides”
- Chemicals
- Entomopathogenic Fungi
- Predators (insects and nematodes)
Future Plans

- Soil applications of ABA to increase yield
- Methods to remove fallen cherries
- Soil entomopathogenic fungi and nematodes for fallen cherries
Mahalo to:
Dole Foods Hawaii/ Waialua Estate
Greenwell Farms
Kauai Coffee
Valent Biosciences – Johnny Lopez

Coffee Flowering
Darsen Aoki

Collaborators
Dr. Lisa Keith
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