



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

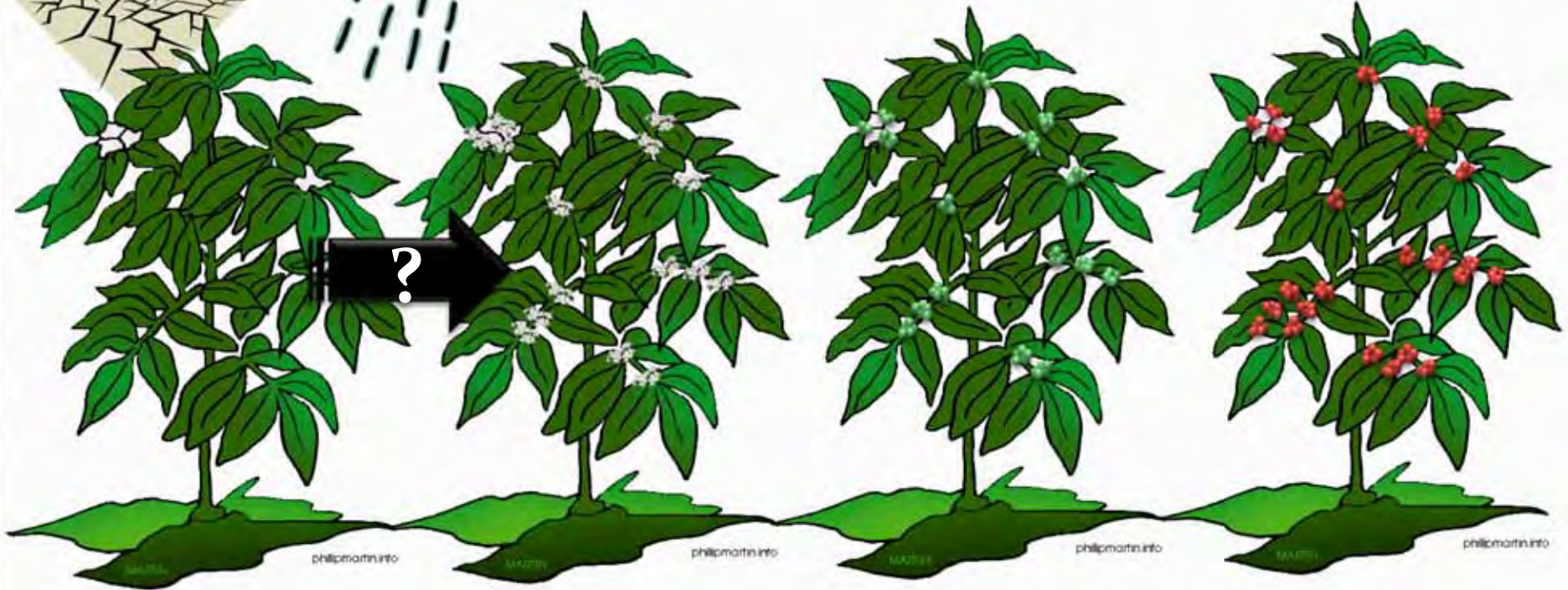
Reducing CBB levels in the field



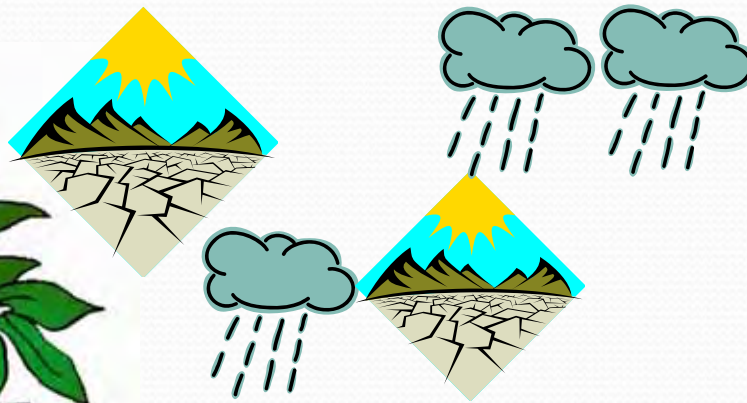
Without sanitation
coffee berries will
always be present in
this field



Coffee Flowering



Sporadic Rainfall and Coffee Flowering



Plant Hormones associated with Coffee Flowering



<http://informedfarmers.com/proced-sync-coffee-flowering/>



philpmartin.info



philpmartin.info

↑ Abscisic Acid (ABA)



philpmartin.info

↑ Gibberellic Acid (GA)

↓ ABA

Goal of Research

The diagram illustrates the goal of research for ProGibb 40%. It features two coffee plants: one on the left that is smaller and has fewer cherries, and one on the right that is larger and has many cherries. Between them are four weather icons: a sun over cracked earth, a sun over cracked earth with a rain cloud, two rain clouds, and a sun over cracked earth with a rain cloud. In the center is a white jug of ProTone sg and a label for ProGibb 40%.

OMRI Limited
ProTone^{sg}
Plant Growth Regulator
Water Soluble Granule
FOR ORGANIC PRODUCTION

Active Ingredient:	Gibberellin A ₃	40.0% w/w
Other Ingredients:		60.0% w/w
Total		100.0% w/w

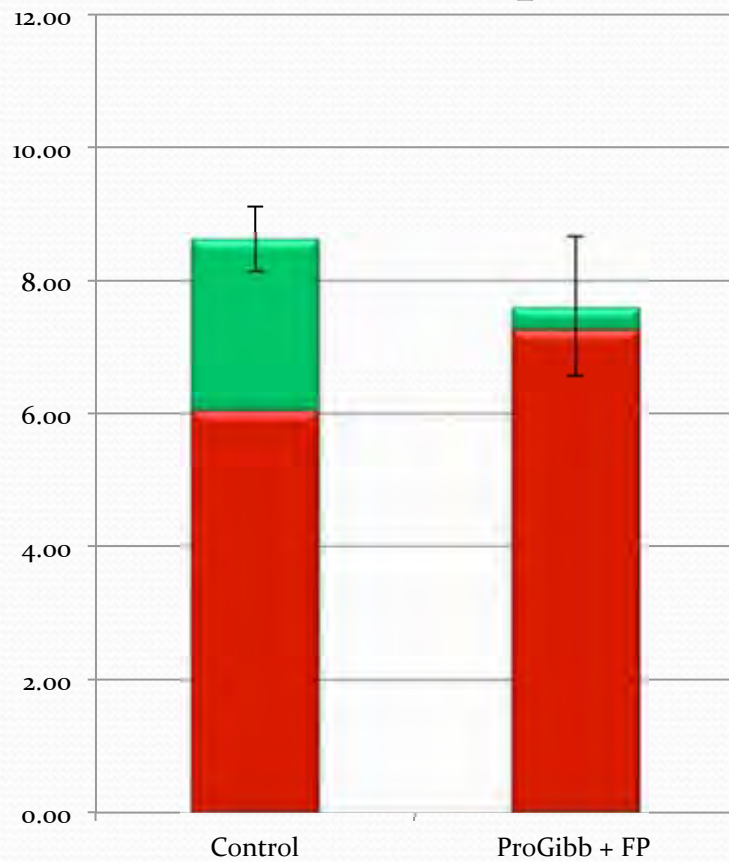
Contains a total of 128 g of Gibberellic Acid in 320 g of product.

EPA Reg. No. 73045-1
EPA Est. No. 33762-1A-001 (Lot Suffix 'S4') List No. 60218
EPA Est. No. 067256-1L-001 (Lot Suffix 'TH')

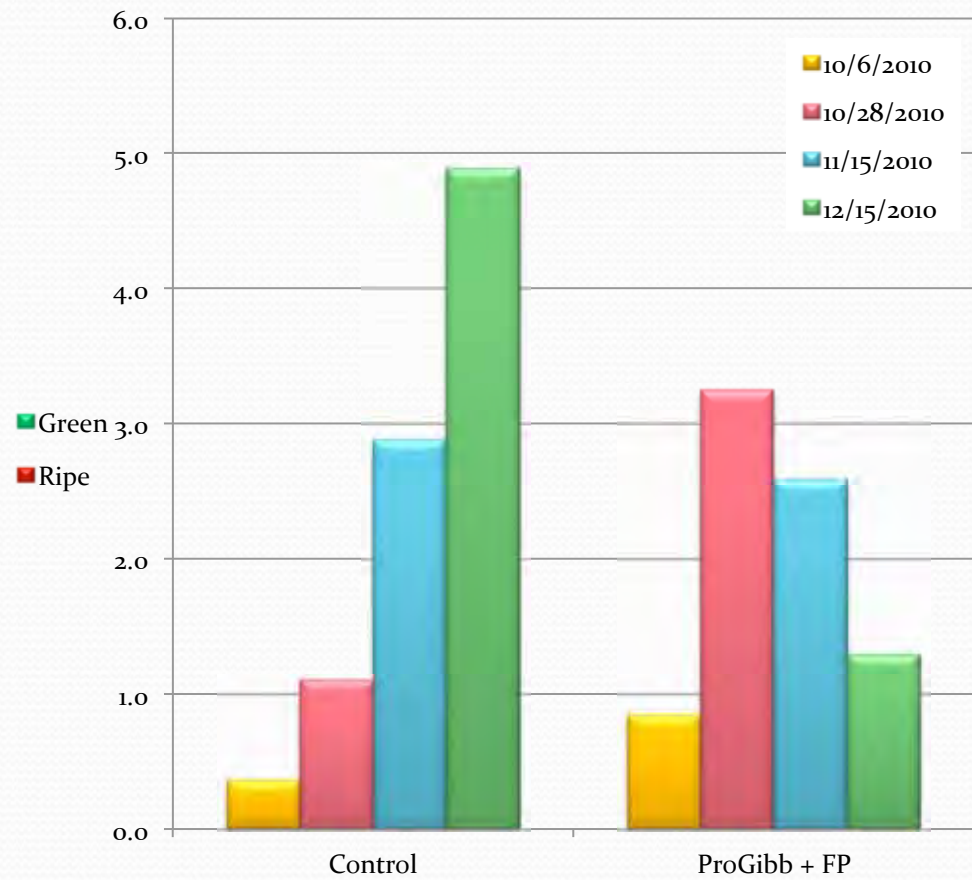
philmartin.info

GA treated trees harvested earlier

Ripe and Green Coffee Berries harvested per tree

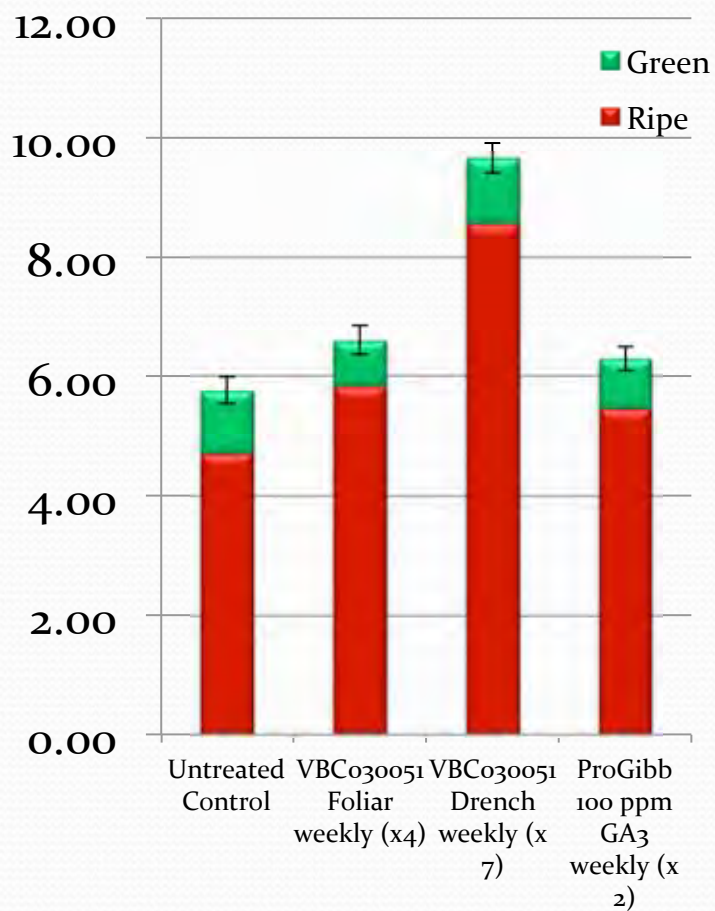


Ripe berries (kg) each harvest date

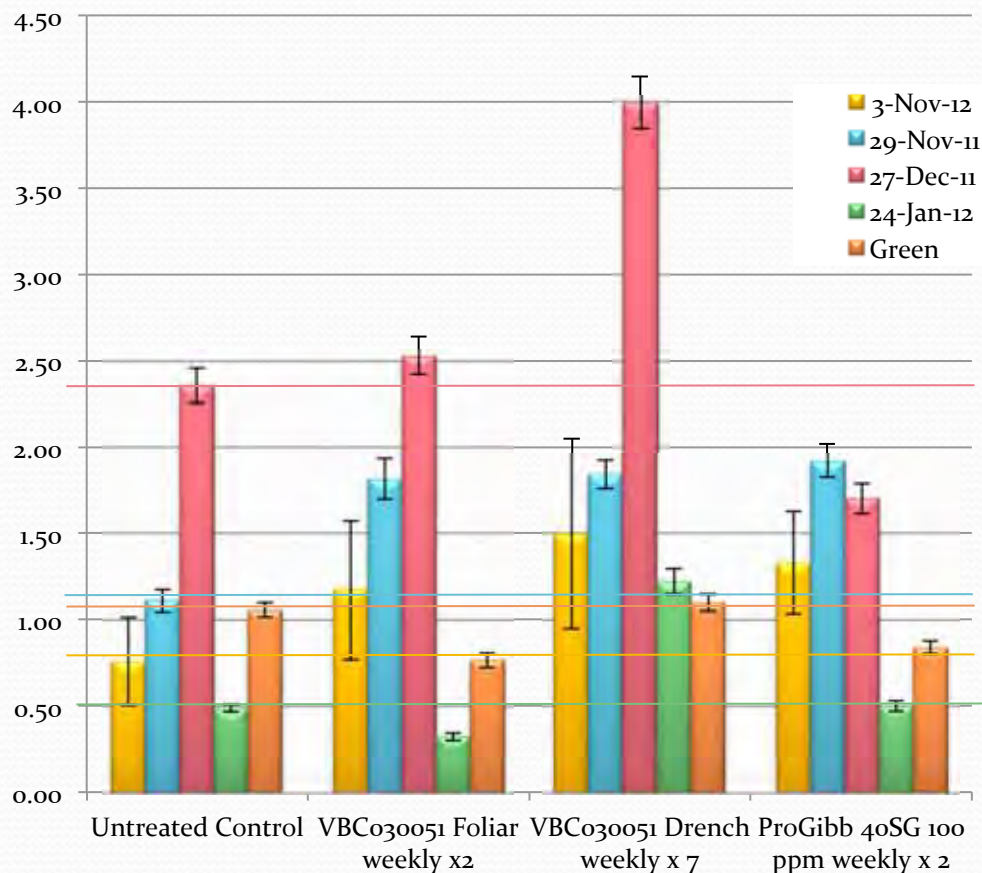


ABA soil drench increases total berry yield

Total Green and Ripe Berries



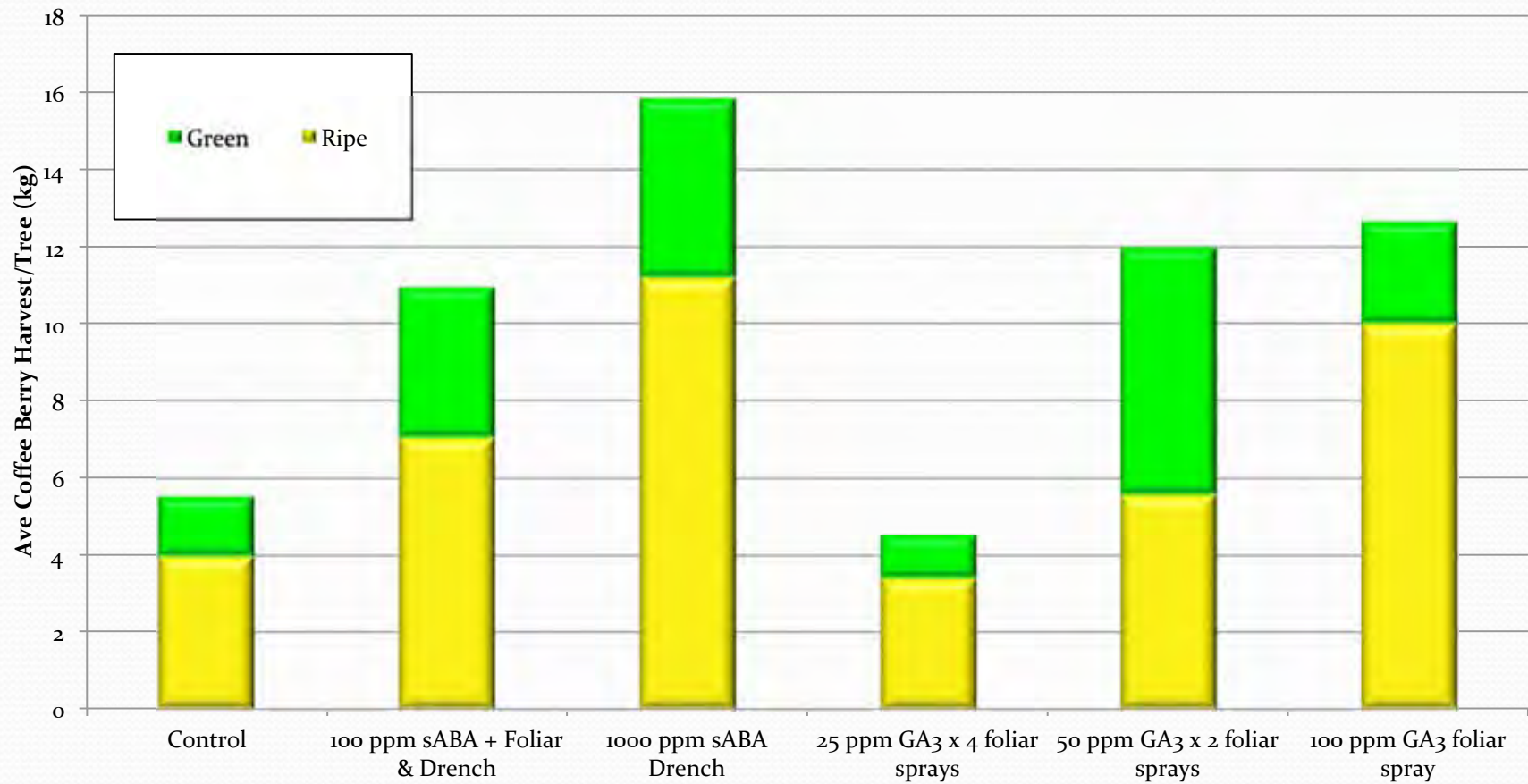
Total Berries harvested on each harvest date



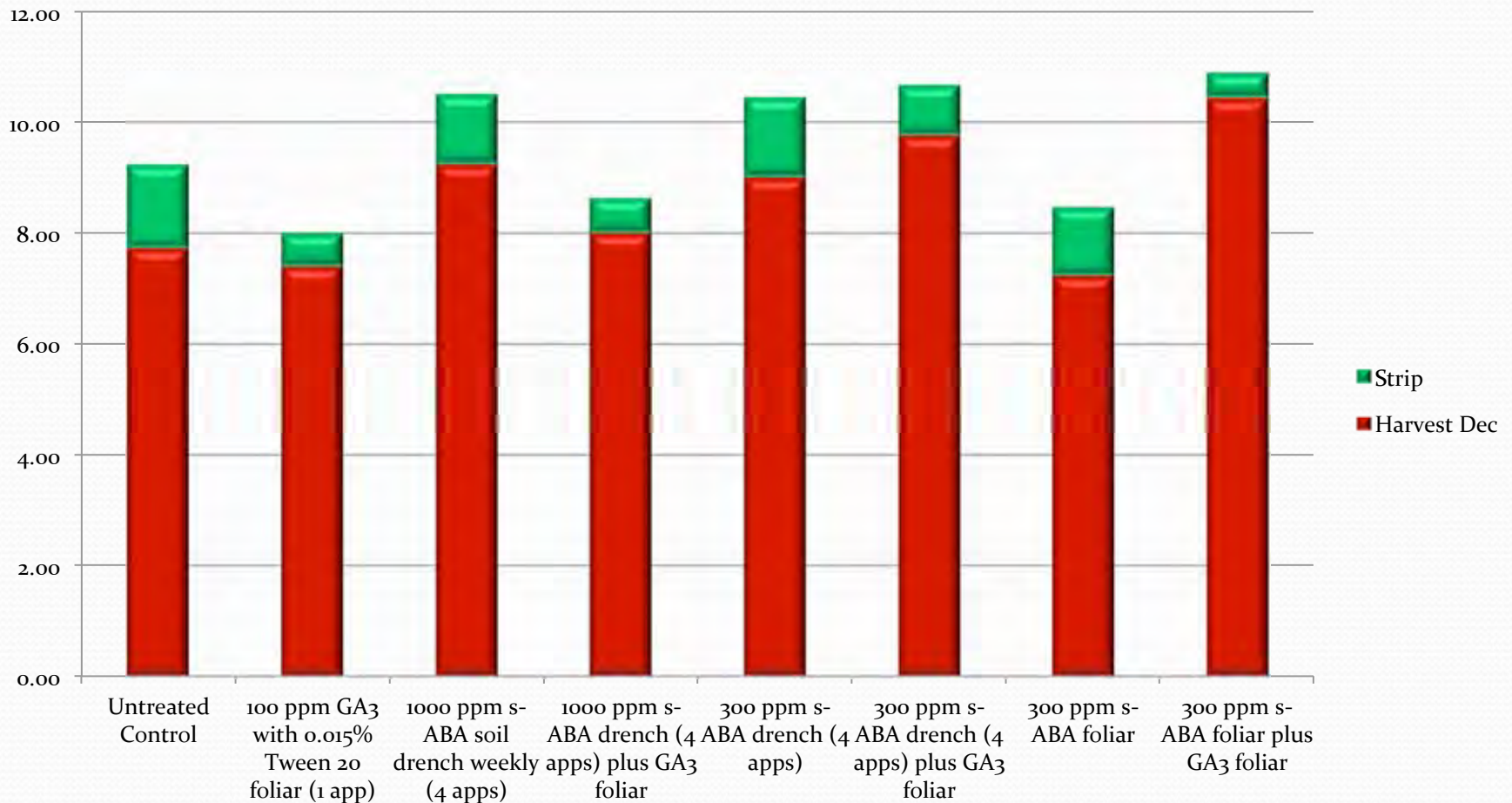
Kauai Coffee Yellow Catuai Field



Total Yellow Catuai Berry Harvest Kauai 2011



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



2-16-12

Mechanical Harvest

1st Harvest
September 11,
2012

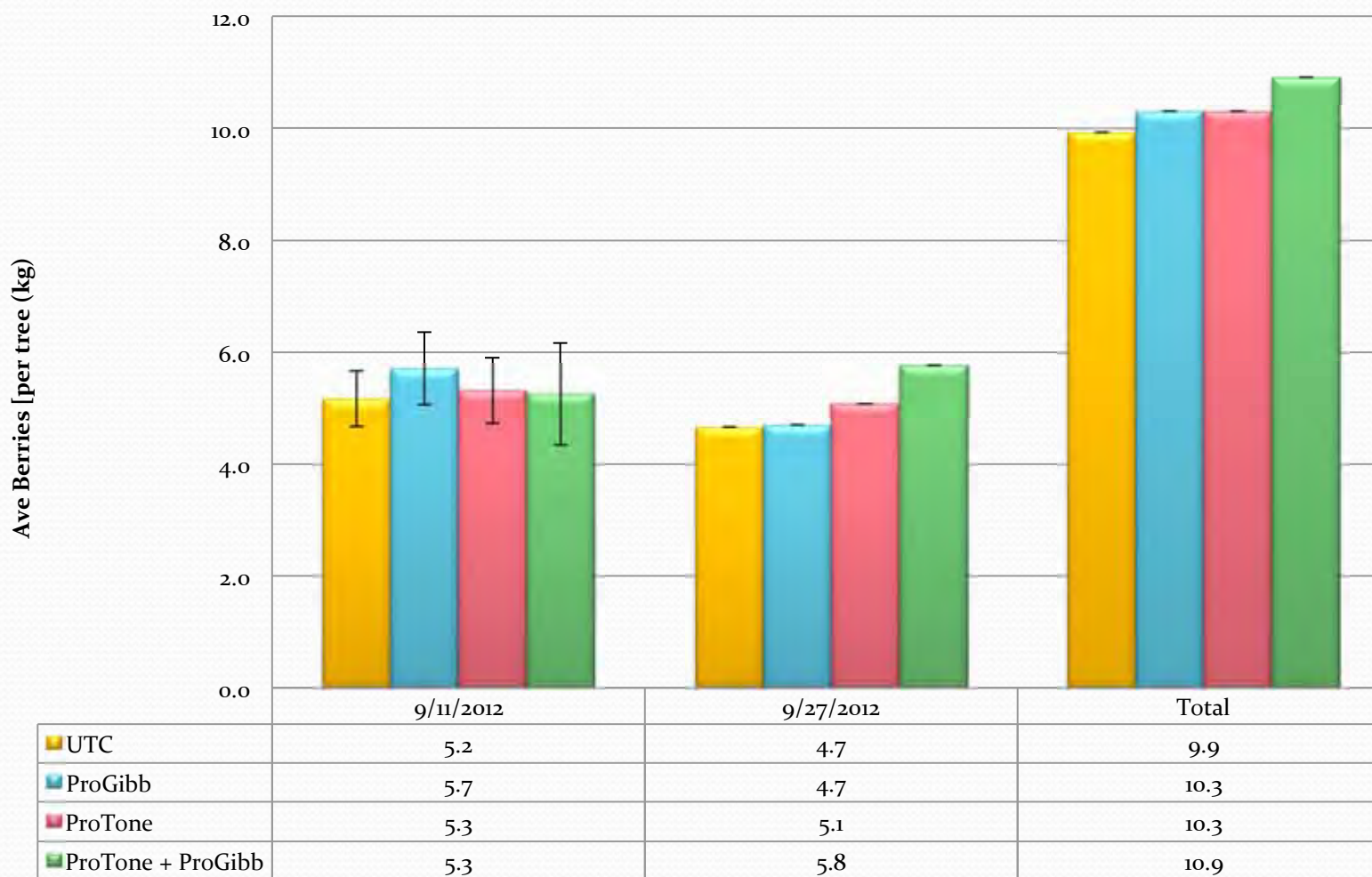
2nd Harvest
September 26,
2012



9-11-12

Average berry harvest per tree (total yield/total # trees)

Total Berries Harvested



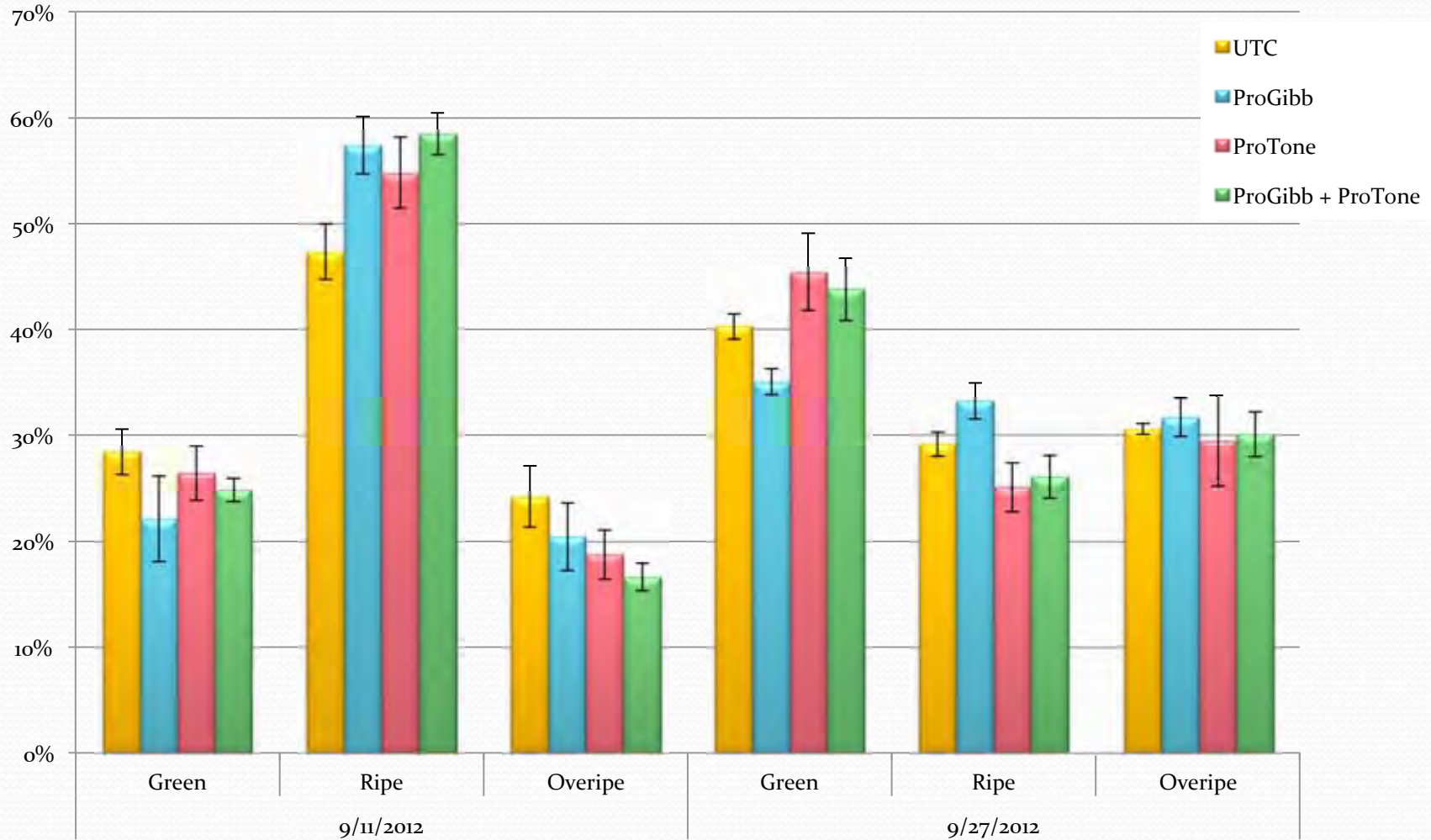
Subsample and separation



- Separate cherry into
- Overripe (brown)
 - Ripe (red)
 - Green



Distribution of harvested berry per tree



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

Monitoring

“Pesticides”
Chemicals
Entomopathogenic
Fungi
Predators (insects
and nematodes)

Biological
and
Chemical
Controls



Sanitation

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

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
Dr. Robert Hollingsworth
HARC – Dr. Chifumi Nagai

“Native” Beauveria
Angelica Tangalin
Mariel Mogote

