

# 2004 Coffee Highlights

## University of Hawaii, CTAHR

HC 'Skip' Bittenbender  
Extension Specialist for Coffee  
University of Hawaii  
Honolulu



# Problems?

Who to call first? Our UH/CTAHR Extension Agents!

Virginia Easton Smith, W. Hawaii - 322-4892

Mel Nishina, E. Hawaii - 959-9155

Richard Ebesu, Kauai - 274-3471

Jan McEwen, Maui - 244-3242

Alton Arakaki, Molokai - 567-6934

HC 'Skip' Bittenbender, specialist - 956-6043

Kent Fleming, economist - 989-3416

Scot Nelson, pathologist - 322-4892



# Hawaii Island



Kent Fleming



Marc Meisner



Virginia Easton Smith



Scot Nelson



Mel Nishina



# Extension in Kona Virginia Easton Smith



- Monthly 'Coffee Talk' 2nd Wednesday and Workshops :  
Insects; Anthracnose disease; Calibration of moisture meters; Tax preparation for farm operations; Growing, processing and roasting Kona Coffee; Coffee Processing Engineering (Field) Workshop, Coffee Pruning Field Day; Root Knot Nematode, Weed Control, Marketing on the Internet, Varieties and breeding;

## Workshops:

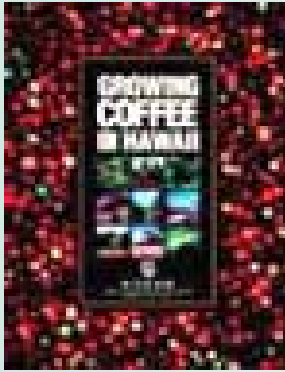
Producing High Quality Coffee, 1 wk long

Scot Nelson 30 participants

Designing Coffee Mills with Loren Gautz



# Publications Update



## Growing Coffee In Hawaii

- Reprinted, over 1000 copies, order from extension office, from CTAHR's Publication and Information Office

[www2.ctahr.Hawaii.edu/ctahr2001](http://www2.ctahr.Hawaii.edu/ctahr2001)



## Hawaii Coffee Quarterly,

- To provide the coffee industry of Hawaii with timely, relevant information on a range of topics related to coffee
- 2 issues to date
- VE Smith and SC Nelson, editors  
[vsmith@hawaii.edu](mailto:vsmith@hawaii.edu)



# Nematode Issues

- Don Schmitt retired; Mario Serracin returned to Panama.
- 60 coffee varieties and species were infested with the Kona Coffee root knot nematode, none were as good as the 'Fukunaga'.
- 'Fukunaga' CTAHR's nematode-tolerant rootstock, is being tissue-cultured by Integrated Coffee Technologies (Waialua, Oahu) so that uniform rootstocks or grafted plants can be sold.
- 'Fukunaga' seedlings (daughters and grand daughters) are being evaluated to for uniformity of nematode resistance.
- Sipes is evaluating treating nematode-infected trees with Actigard and compost tea to determine if coffee will produce its own anti-nematode chemicals.



Brent Sipes



# Disease Issues

## Scot Nelson



- His office and plant pathology and nematode lab are Kona Extension Office, Kainaliu.
- Starting project on biology and control coffee cherry anthracnose disease, a complex with Cercospora leaf spot, coffee twig borer, anthracnose. This is potentially serious problem in Kona.
- Developing a coffee insect and disease identification web page for growers.



# Insects and Pesticide Registration



Mark Wright



James Kam and Mike Kawate



Richard Ebesu



# Pesticide Registration

Mike Kawate

- Ethylene (Ethephon) for fruit ripening, EPA review for coffee has not been scheduled as Ethephon will be in reregistered. At least a couple more years before registered.
- Imidacloprid (Provado) for scale and sucking insect control. EPA review may be scheduled 2004-05. If review is completed and tolerance established in 2005, label is possible in 2006.



- Glyphosate (Roundup). Working with IR-4 and Monsanto to reduce the preharvest interval (PHI) to  $\leq 14$  days without having to provide additional residue data. If additional residue data are required by EPA, the probability of success is low without additional funding to generate the data.
- Buprofezin (Applaud) an insect growth hormone for green scale control. Preparing (site selection) for residue trials this Fall (2004). James Kam is contacting growers who are willing to cooperate. IR-4 is funding field residue trials (5) and the residue analyses of green bean and processed fractions (roasted bean and freeze dried coffee).
- Glufosinate (Rely) for weed control. Initiated a field trial to evaluate efficacy and phytotoxicity in coffee at Waimanalo Exp. Sta. For use as an alternative to paraquat, but is lower in toxicity (and not restricted [RUP]), and without the systemic herbicidal effect of glyphosate (from drift). At present, Bayer Crop Science has no objections to this use.



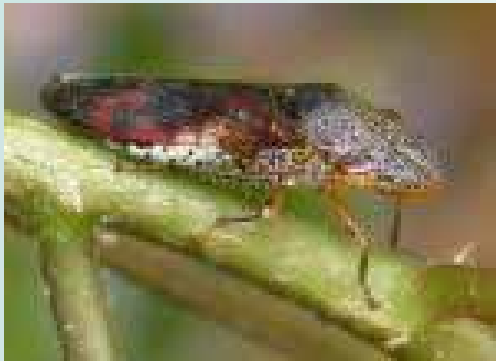
# Other Pests

- Ants - Glenn Taniguchi
  - Demonstrated effectiveness of Amdro bait stations on big headed ant and other oil/protein seeking ants. Bait in stations effective for 12 weeks. Does not attract sweet seeking ants like the long legged ant.
- Root mealy bug - Mark Wright
  - Survey in Kona found some but ‘Kona typica’ is tolerant.



# Potential New Pest & Disease

Glassywinged sharpshooter (*Homalodisca coagulata*) and other sharpshooters can spread Coffee Leaf Scorch disease. Even without the disease the insect sucks the sap. Control is with neem and imidachloprid. DOA is investigating a biocontrol option.



Adult 0.5 inch long. First found on Oahu near airport in April 2004. Not on Hawaii yet.



Immature, same or smaller size



- Coffee Leaf Scorch is a disease caused by the bacteria, *Xylella fastidiosa*.
- Symptoms are:
  - 1 Chlorotic appearance of entire canopy, 1 yr after infection.
  - 2 New leaves are deformed, smaller in shape.
  - 3 Necrosis begins at leaf tip then moving to leaf margins of old leaves. There is no wilt.
  - 4 These scorched leaves drop within weeks after showing necrosis.
  - 5 New growth has shortened internodes, and smaller, deformed leaves which scorch and abscise in weeks or months after expanding.
  - 6 This results in branches with leaves at the tip, called tufts; if fruit is present then dieback is likely.

Branch on left has  
coffee leaf scorch



Normal



# How might the disease arrive ?

- Infected sharpshooter arrives on live plants?
  - The host range is large including citrus, coffee, ornamental shrubs.
- Infected plants arrive, sharpshooter here sucks the bacteria, then infects healthy plants.

Check the Pest Advisories at the HDOA web site [www.hawaiiag.org/hdoa/](http://www.hawaiiag.org/hdoa/)



# Quarantine Fumigation for Roasting

Jack Armstrong, USDA-ARS-PBARC (Hilo)

- Completed work for continued use of methyl bromide on imported coffee for roasting.
- Research to develop a 10,000 ppm ozone ( $O_3$ ) at -30.5 cm vacuum and 55°F for 6 h to replace methyl bromide is in progress.
- $O_3$  would be labeled as an organic quarantine fumigant for imported green coffee beans.
- Sensory evaluations by professional cuppers found  $O_3$  did not affect the flavor or aroma of 2 Hawaii and 3 foreign coffees.
- $O_3$  kills coffee berry borer larvae, pupae, and adults, but does not kill all eggs. Research was initiated to determine if eggs, which cannot survive below 40% moisture, actually survive at all in green coffee.
- Efficacy tests of  $O_3$  fumigation against coffee leaf rust on green beans are planned.



# Engineering

Loren Gautz  
Lgautz@hawaii.edu



# Engineering Issues

## Loren Gautz

- Working on NIRS for rapid, low cost, authentication of different Hawaii origin green beans.
- NIRS has also been used to determine caffeine content.
- Developed fabrication methods for Cenicafé rake for stirring coffee.
- Supplying information on wet mills, particularly low water processing technology.
- Introduced 3 layer dyer.

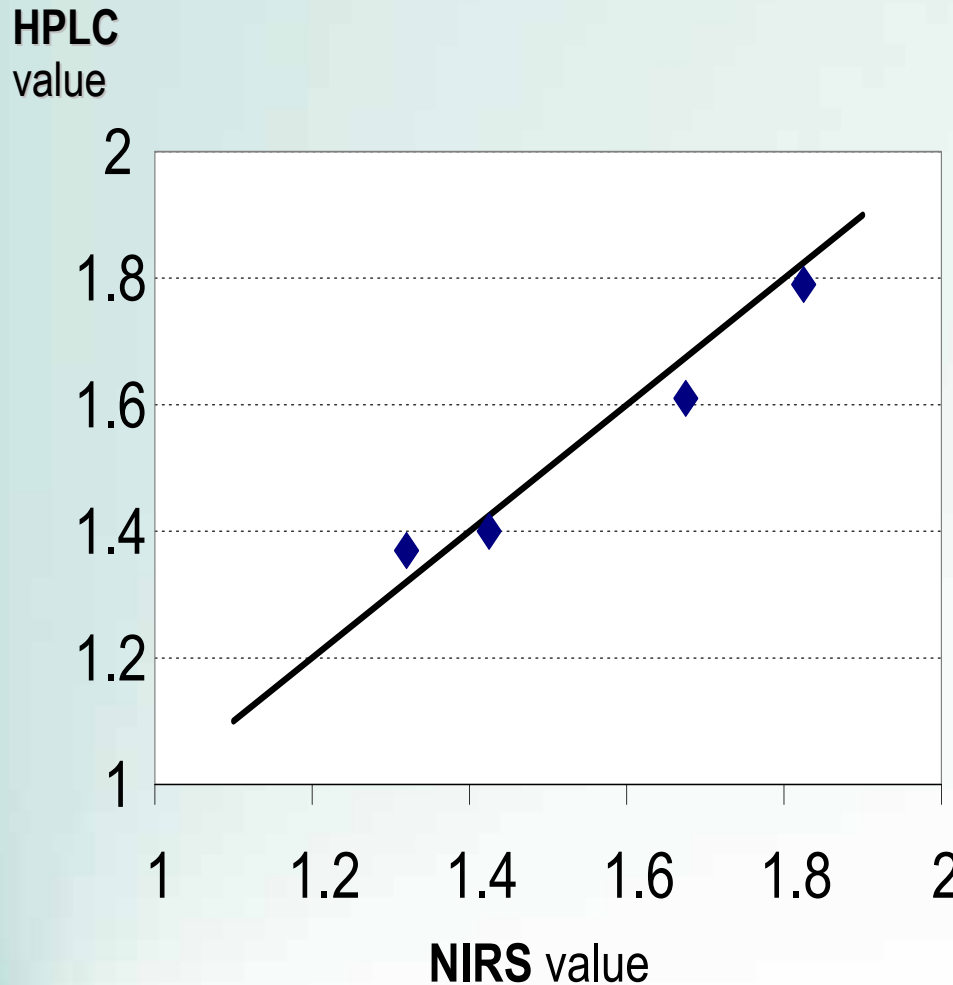


This result keeps us trying but still having problems.

Predicted and Actual Origin  
using equation from 1991-99 Kona and other islands



# NIRS and HPLC determination of Caffeine



NIRS is faster and less costly.

What is the value to you of knowing how much caffeine is in your coffee ?

What else would you like to know?

Tell Loren



# Cenicafé Rake Fabrication

Why?

Reduce time to dry on a deck by at least one day.

Utilize deck space more efficiently.

Fabrication:

Successful strength test of 4  
foot rake from 4 inch class 100  
PVC pipe.

Only need to be able to use  
saw, drill, pliers, and heat gun.



Two page instruction  
sheet available from  
Loren email  
<[Lgautz@hawaii.edu](mailto:Lgautz@hawaii.edu)>  
or your county agent.



# Wet mills using little water

Workshops and engineering support for mill installation

By using water only to wash and mechanical transport, mill uses only 1.3 gal water for 100 lbs of cherry (i.e. 3.6 gal for 100 lbs of dry parchment.)



# Small farm propane dryer

3 layer, 18-21 hrs

30 bags of Cherry  
produces

650 lb dry parchment

Operational cost half  
of a hoshidana

due to labor costs

Installed at

Koa Coffee Plantation



# Cultural Practices



Travis Idol  
HC Bittenbender

Shawn Steiman

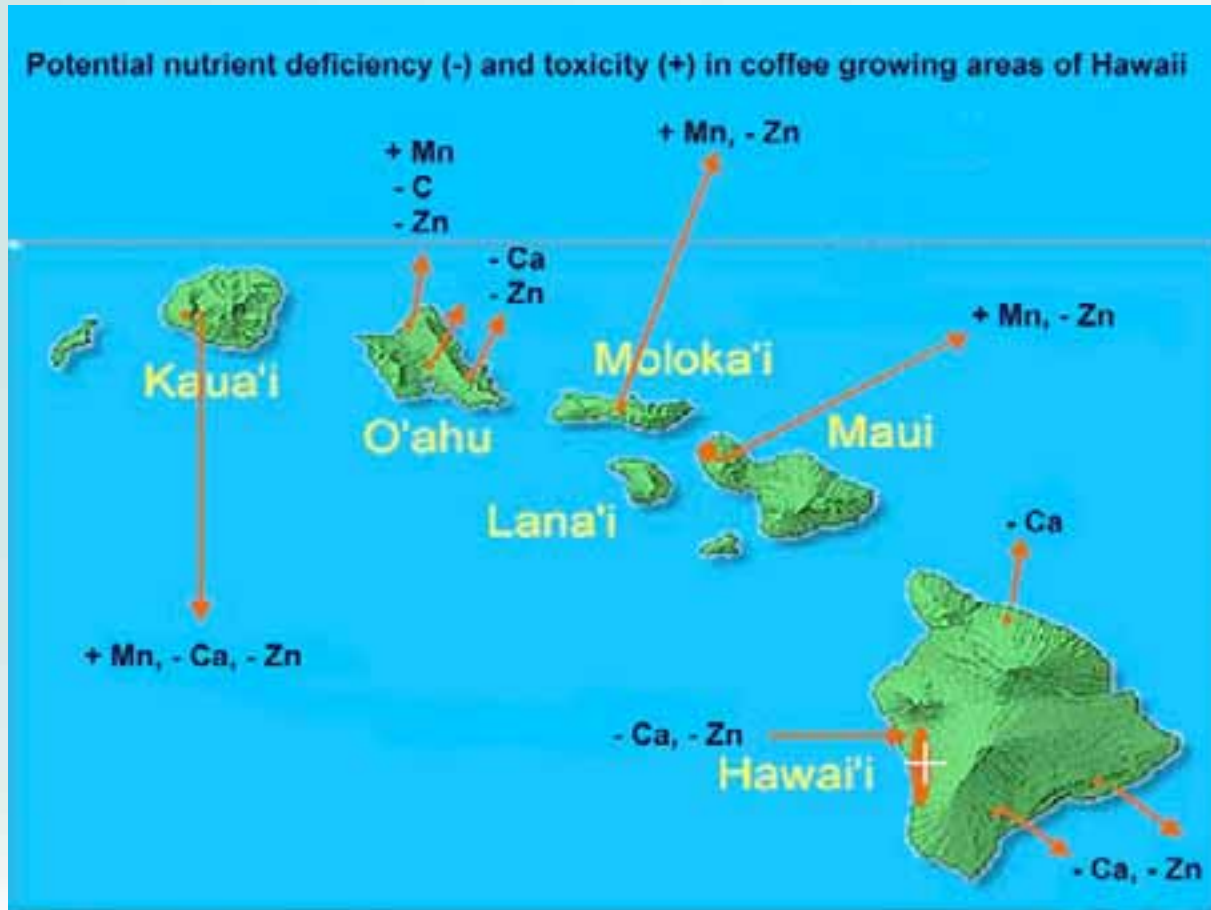


NV Hue



# Nutritional Status of Coffee

## N.V. Hue



- Low calcium (Ca) and zinc (Zn), limit coffee growth and production even in Kona.
- Nematode infested trees have lower nutrient levels.
- Ca in leaves should be 0.9% and Zn 15 ppm.
- Recommend annual leaf analysis by CTAHR's ADSC, leaf analysis is \$20, soil \$10 (pH & major nutrients). Tissue costs more it gives you better management info.
- Contact your CTAHR extension agent to drop off samples.



# Cultural Practices

## HC 'Skip' Bittenbender

Pruning demonstration planted at Kona Experiment Station in 2004.

Kona style vs. Beaumont-Fukunaga (stumping)

Evaluated as:

Irrigated vs rain-fed

Grafted vs ungrafted

3 vs 4 year BF

Kona style 4 vs 6 verticals

Team:

Marc Meisner, Kent Fleming, Virginia E. Smith.



# Quality and Yield of Shade vs Sun-grown Hawaii coffee

Effect of shade levels on coffee  
quality and yield

Sites on Oahu (Waimanalo and  
Kunia -hot sunny) and Kona.

Shade treatments-macadamia  
(Kona), 50% shade cloth,  
and spray on shade from  
kaolinite clay.

Grant from USDA, team Shawn  
Steiman, Skip, Travis Idol,  
Mel Jackson (HARC)



# Economic Analysis of Organic Farming of Kona Coffee

Tad Masuda  
CTAHR  
Ph.D. candidate



# Objectives

- To model organic and conventional farming systems and examine their impacts on Kona's environment and community well-being.
- To understand and measure the technological constraints of organic and conventional coffee farming systems in Kona.
- To search for the optimal combination of the two farming systems to improve regional well-being or community benefits.



# Contributions to Kona coffee farmers

- Efficiencies and inefficiencies of organic and conventional coffee production systems in Kona will be identified.
- Optimal combination of profit and environmental impacts will be identified.
- Decision-making options and their implications will be submitted to Kona coffee farmers and the Hawaii coffee industry.



If you are a Kona coffee farmer,  
conventional or organic, and  
want to participate in this  
study...

- Contact Virginia E. Smith tel. 322-4892  
<vsmith@hawaii.edu>
- Contact Kent Fleming tel. 989-3416,  
<fleming@hawaii.edu>
- Contact HC 'Skip' Bittenbender  
tel. 808-956-6043 <hcbitt@hawaii.edu>



# PAU

