

April 2, 2009

MEMORANDUM

TO: Cacao growers and Hawaii chocolatiers

FROM: HC Bittenbender Extension Specialist, TPSS

SUBJECT: First Cacao to Chocolate (C2C) Newsletter

Aloha Hawaii Cacao to Chocolate Pioneers,

Since our Oct 23, 2008 meeting at the CTAHR Urban Garden Center in Pearl City much has happened. What you asked, well that's for all of us to share. While I have not sponsored a newsletter for growers before Hawaii's Cacao to Chocolate Industry is unique. First I have not organized the founding committee for a Hawaii Cacao to Chocolate Association. It's not too late but it may be too earlier, I'll see how you respond.

At UHM:

Two young scientists joined our c2c group. Dr. Nat Bletter who is at the Kona Chocolate Festival wrote a chapter in Chocolate in MesoAmerica. He is an avid chocolatier using tropical fruit flavors.

Mr. Dan O'Doherty is completing a M.S. Botany at UHM and is joining my Hawaii State-wide Cacao Variety Trial project. Currently he is working on grafting cacao in the early seedling stage.

Meanwhile Dr. Loren Gautz working with Dr. Mel Jackson's lab at the Hawaii Agricultural Research Center is testing yeasts and bacteria in pure culture isolated from cacao ferments around the state. Loren has applied for a follow on grant for this work with Jackson and Susan Schenck (HARC). Loren is also leading a grant writing team of myself, Dr. Chifumi Nagai (HARC), Dr. Ray Schnell and several other USDA scientists working with MARS.

The grant aims to fill the pipeline to Hawaii with varieties evaluation work, new selections, and map of cacao genes. I have a grant proposal pending for the Hawaii State-wide Cacao Variety Trial project. Now that we are making solid progress on propagation, we can begin to sign up cooperators to grow 40 trees representing a wide range of cacao genetics including promising yield potential and chocolate characters. If you want to be a cooperator send me an email with your location, elevation and whether you have irrigation. The trial will include wet warm, dry warm, cool wet, and cool dry sites.

Mr. Erik Kling received his M.S. in 2008. He studied the establishment of transplanted and direct seeded cacao using mini cages. He found that if you are going to plant seedlings then you can bypass the plastic bag in the nursery using mini cages. Several growers are trying this so we'll have news from the orchard soon.

Dr. Mike Kawate, pesticide specialist, notes there are several pesticides labeled for cacao:

- 1) Ecozin 3% EC Botanical Insecticide, active ingredient is azadiractin from neem.
- 2) Ecozin Plus 1.2% ME, active ingredient is azadiractin from neem.
- 3) Prev-Am Ultra, active ingredient is sodium tetraborohydrate decahydrate ("borax")
- 4) Carbaryl 4L, SLN HI-970003, active ingredient is carbaryl (Only on nonbearing cacao)

If you have Chinese rose Beetle problems the carbaryl is probably more effective than the Ecozin. Always follow the label.

In this first issue of my C2C newsletter we've heard what's happening at CTAHR, for the next issue please send me your news and problems in growing cacao and especially in fermenting as this is the main harvest period.

3190 Maile Way, Honolulu, HI 96822, USA
Telephone (808) 956-6043, Fax: (808) 956-3894
Email: hcbitt@hawaii.edu www2.ctahr.hawaii.edu/ctahr2001/
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Future of Cacao in Hawaii Meeting
Thursday, October 23, 2008
UH Pearl City Urban Garden Center, Oahu

Agenda For Cacao Meeting

- 9:00 Welcome and purpose
- 9:05 Introductions: Name, relation to chocolate, expectations for meeting
- 9:30 Updates: Farming, making chocolate, research, extension (hold questions)
- 11:00 Questions about updates
- 12:00 Lunch
- 12:30 Identification of industry core values
- 2:00 Identification of sustaining and restraining forces
- 3:30 Next steps
- 3:50 Evaluation of meeting
- 4:00 Adjourn

Expectations of Participants

- Hear group's views about cacao in HI
- See what's happening with Hawaii cacao
- Learn what's going on
- Listen and to make contacts
- Make contacts, get info
- See where industry is at See budding industry
- Learn how to support industry
- Find out what is going on
- Find out how we can move forward
- Network and find ways to work together
- Learn about industry and how to assist growers
- Know what's going on so she can relate it to chocolate processors and users
- How it pertains to future of his company
- Representative Ching created task force
- See State put effort behind cacao
- Create report for legislature on how industry can move forward
- Highest quality of cacao grown in HI
- Listen to what industry has to say about taste profile and differentiation relative to his research
- Where Hawaii is going with flavor profiles and pricing
- Correct perspective on where HI cacao flavor is vs. other fine flavors in the world
- Global economy vs. world economy
- Offer his experience in cacao processing
- Quality is important - farmer awareness
- Make suggestions about making a super chocolate that evolves into an upscale product that is marketed
- Bring things together to create an industry that produces superior chocolate
- Look for opportunities to develop sustainable cacao production
- To see how others view how to sell HI chocolate at local, national, and international markets (e.g. pricing and branding)
- Perceptions of value and pricing
- Expectations and needs of industry for research so that can fund high priority research
- How to find long and short term research funding
- To see opportunity for agriculture tourism
- Listen to others to determine if economic model of success exists for small growers

Production/Farming

What we want to know:

- Island, acres, age of trees, potential, variety
- How far do you take product? What do you sell?

Oahu

Waialua Estate

- 18 net acres; 12,000 trees
- 12 year old trees
- Dry bean production; 17,000 lbs/year; (7.7 metric tons)
- Mixed varieties (seedlings)
- Sell dry bean and chocolate
- Potential growth up to 150 acres

Matsuda/Fukuyama Farms (Kahuku grower)

- Less than acre; 300-400 trees
- Less than three months
- Dry/wet bean sale
- Seedlings (from UH)

Waimanalo (UH)

- 17 trees
- 20 years old
- Will sell chocolate
- Parent trees of Dole and other Oahu orchards
- Expand to one acre

HARC

- Kunia 80 trees Trinitario type
- Seed source
- Mauna Wili 20 trees
- Collection of seedlings and grafted trees

Hawaii Island

Original Hawaii Chocolate (north Kona)

- 1 acre; 1,400 trees
- 18-20 year old
- Grafted Forastero and other varieties
- Could add one more acre
- Represent 12 additional growers – sell chocolate local, national, international

Kealia Ranch (S. Kona)

- 1,300 trees, planted additional 1 ¼ acres and 1,300 Criollo trees
- 6 – 8 years old

Sweet Paradise Chocolate (Hamakua)

- 200 seedlings
- Trinitario and Criollo
- 6-8 months old
- could add 2 acres
- Sell chocolate confections

Likao Kula Farm (Gini)

- 1 ¼ acre; 1,200 trees
- 6 years
- Trinitario; few Forastero crosses few Criollo seedlings
- Fermenting and drying
- Sell dry bean or other product
- Potential growth, 3 acres

Alae (Hamakua coast)

- 3,000 trees; 5 acres
- Trinitario UA clones and others
- 20 years old
- Potentially sell chocolate and co-branding
- Potential growth 20 – 40 acres

Tom Sharky

- 1 – 1 ½ acres

Puna

- About 20 acres

Molokai

Pure Paradise Chocolate (Ag park by airport)

- < 1 acre; 600 trees
- mostly seedlings – 20+ years
- Mixed variety
- Potential growth on Molokai scene
- Sell chocolate
- Have other growers on Molokai

Kauai

Ferris Farms

- 500 trees
- 7 years old
- Pure yellow Criollo
- Potential growth...continues
- Intentions of selling chocolate

Steel Grass Farms

- 300 trees in group; 1,000 mixed variety seedlings in nursery
- seedlings – 7 years old
- Sell seedlings for nursery
- Potential growth 500-600 trees
- May send to processor but want to sell on Kauai to support agricultural tourism

Ka Alanani

- 60 trees; 1 year old; 200 seedlings in nursery (all Criollo)
- Potential growth 3 acres and 3,000 trees
- Evaluating how far to take product

**Ed Sequine (VP E. Guittard Chocolate and member of World Cocoa Foundation)
on World Outlook**

- 2.3 Billion trees world-wide, 70 million are fine flavor (3%)
- 5 million cacao farmers world-wide, 90% with less than 10 acres
- Conversion of wet bean to dry bean at 8% moisture is 100 to 35 or 0.35.
- Price purchase of wet beans in Kona \$1.60 /lb (1.60/0.35 = \$4.57 /lb dry bean)
- Current New York Market is \$2050/ mT (\$0.93/lb) for dry bean; 2007 highest commodity price was \$3100/mT (\$1.40/lb)
- Fine Flavor cacao receives a price premium of \$800- 2500/mT above NYM price or \$2850 to \$4550 /mT (\$1.29 to 2.06/lb). 2007 highest price premium was \$2.50/lb.
- Hawaii prices are 2-4 times higher than current Fine Flavor cacao

CTAHR/UH Update

Research and Extension – HC ‘Skip’ Bittenbender

- CTAHR cacao goal: Statewide variety experiment plantings in 10 sites across state (wet, dry, cool, and warm sites) is sought to determine which sites have best production)

- Pods collected from each experiment site will be sent to campus and processed the same way to reduce effect of different fermenting conditions. Guittard Chocolate will make chocolate uniformly.
- Guittard taste panel will be used to determine environment and variety effect on quality.
- Will give grower an option to replace some of their seedling trees with trees with better genetics from experiment.
- Can't go very far with seedlings if we want a quality product.
- Eventually, will result with having understanding of which variety grows best in the 4 different combinations of situations/locations studied. Each island will be has 1 or more sites.
- Will be planting next year and will have yr./quality data in year 3
- Fermentation: Crucial, critical point in process.
- Black box. For Hawaii individuals will need a consistent product and fermentation may be different depending on when, where done.
- Looked at microbes of farmers who are fermenting
- Fermentation varies from 4 – 10 days
- Isolated microorganisms for fermenting cacao to create fermentation 'cocktail' to for growers to use.
- Extension website – with information

HARC Update (Hawaii Agricultural Research Center)

C. Nagai

- (HFBB funded)
- Finger printing of cacao trees in Hawaii
- Large variation
- Each tree is different
- Criollo – 2 original trees- (red immature/orange ripe pods and green immature/ yellow ripe pods .
- Need not import other varieties for testing in Hawaii
- Report will be provided (DOA funded)
- Selection of high productive/quality varieties for Hawaii
- Select trees at Dole Waiialua
- Long term research to identify DNA markers associated good yield/quality and propagate, grafting was not successful considering propagation by tissue culture of somatic embryos(not GMO!)

Mel Jackson

- Fermentation research
- Working with Loren Gautz (CTAHR)
- Yeast and removing mucilage (sweating)
- Mucilage (sweatings) are interesting—providing co-product potential
- Lacto bacillus – build rise in temperature to kill seed temperature in range of 48 – 50 degree Celsius (122 degree Fahrenheit) Aerobic
- Aceto bacter – metabolizing components. Get bean to mobilize substrate so have desirable flavors
- Permeation, temperature
- Same process has to occur every time to create a consistent product
- You are at the mercy of environment during this process
- Yeast may not win (mold may win competition)
- Need to preload with yeast and bacteria at beginning of process so they can outcompete mold, etc.
- Reactions and time are important
- Not all fermentation piles are the same; can be colonized by different bacteria and yeast can be different in different locations
- If you have some unique bacteria, can reproduce it and front end load your fermentation so that you have your own unique finished chocolate
- Did experiments with same bean but different fermentation and came out with different chocolate
- Huge potential to produce chocolate that is different from others, but consistent
- All locations in Hawaii have challenges with fermentation because don't have consistent (high) temperature and (high) humidity during harvest like other cacao-producing areas of world

- Is wood a good container to use for fermentation? Yes But should explore other materials

Task Force

- “HR 270/HCR 236: Convene a task force to devise a plan within one year to timely expedite the introduction and delivery of Hawaii grown cacao to the marketplace”
- Objectives 1-4
 1. Accelerate the growth of the cacao industry
 2. Increase the manufacture and supply of locally grown cacao
 3. Promote its use and products
 4. Identify any potential obstacles to the industry

Core Values These are values that we hold in common.

We brainstormed a list then clustered like ideas (letters) , then discussed then prioritized (numbers) it by giving people 3 votes each.

- A Quality – 11 votes
- B Sustainable economics/economic viability – 11 votes
- B Scalability
- D Harmony -10 votes
- D Sharing and openness
- D inclusiveness
- C Differentiation – 4 votes
- C Mystique
- E Dependability – 1 vote
- F Environment
- G Passion
- G Scope and commitment

Discussion of core values

A Quality

Putting Hawaiian name on something that enhances brand

Quality already contains a differentiation

Price is not constraint; if you're selling high quality, then the challenge is marketing

B Sustainability

Dependent upon costs

Working together with support of the government can overcome economic challenges

If government supports marketing, no one bears all costs of industry and can meet economic challenges

Having appropriate scale is necessary to market products

D Sharing, openness, inclusiveness

Here to learn from each other; can't do it alone

We now have critical mass

Model where growers, researchers, government, and producers are aligned and working together to benefit the industry

The passion needs inclusiveness to be successful

Create structural inclusiveness and vertical integration

Hawaii is known as the gathering place and is the model

Sharing will drive sustainability

C Differentiation

Being able to create a unique product that separates you from the rest of the world

“Hawaiian Regional Cacao”

G Passion: everything stems from this

Group then split into three groups to discuss, prioritize agreed points then report back to entire group.

Cluster 1: Quality

This includes good genetics, good flavor, good packaging, branding Hawaii reg. cacao consistency, flavor, texture that can be measurable but also can be subjective

- Hawaii grown cacao should meet and exceed world fine flavor cacao standards including defects
- Educate HI industry what WFFC standards are and how to achieve them—best management practices
- Research/extension, government support and development of tools, technology that help grower exceed WFFC standards
- Meet certification standards to achieve Hawaii reg. cacao brand at dry bean and couverture

Cluster 2: Harmony, Sharing, Inclusiveness, Openness

- Having individual be vertically integrated
- Consistent communication that is supported by a structure that promotes it
- Creates structure that enables inclusiveness (e.g. Individual association)
- Create venues where people can learn from each other
- Creating incentives that promote collaboration and build trust within the industry
- Stakeholders are operating jointly on all the large issues affecting the industry
- Creating an organization that represents and benefits everyone encourages sharing and promotes individual awareness and lifts everyone
- Only when we work together can we create the critical mass that can make a difference
- Determining areas in which people have challenges with sharing and inclusiveness and then develop strategies to address them
- Creating a bigger market diminishes the need for competition
- Having a commitment to developing awareness about our product benefits everyone
- The more opportunities we create to get to know one another the greater our desire to work together collaboratively
- Proposed model of Hawaii Cacao industry works together at all scales to define problems, develop plans, implement, evaluate, training/education, external marketing

| | |
|---|--|
| Government | Growers Family, small, large |
| Research & Extension CTAHR, HARC, USDA | Chocolate producers Home, small, industrial |

Cluster 3: Sustainable Economics

Concrete behaviors:

- Find/explore economic models relevant to Hawaii situation; grower specific
- Dole has model that works for their situation. Cannot continue at existing size (must get bigger) if other producers come online. Has explored model for expansion at acreage for full processing to confection product.
- Identify pitfalls and potential challenges to successful growing and producing
- Make market larger
- Market directly to chefs
- Raise awareness of high quality
- Develop good website by Hawaii Cacao Association
- Get government sponsorship of association marketing efforts
- Chocolate festival at air conditioned facility (Dole Cannery); big media involved
- Individual producers should not sell under cost, get agreement not undersell our individual costs
- Exploit association with U.S. food safety/quality/reputation
- Focus on highest-value products (confections)
- Centralized production by best producers
- Appellation development/identification → distinct reputations

- For small grower viability, need sharing and inclusiveness

Scalability

- Encourage small growers to see/visit successful models (farms) at appropriate scale
- Must be able to market distinct product/quality/texture as niche model
- R&D funding from state/federal government
- Secure existing growth/farm infrastructure
- Apprenticeships/extension work to improve quality

Force Field Analysis

Group considered the current cacao industry situation by brainstorming a list of those Sustaining forces that move us to a desired ideal, and those Restraining Forces that prevent us from moving to that ideal.

Sustaining Forces

- Increasing demand for product and more educated consumers
- Product uniqueness
- Favorable views of Hawaii, i.e. Hawaii factor
- Buyers come to us, i.e. tourists
- Agro-tourism
- Good PR
- Focus in state on diversified ag
- Environmentally friendly crop, i.e. green
- Supporting technology is available.
- Genetic research available in state
- Limited pests and diseases
- Good climate for disease prevention
- Passion
- Desire of people to come together to make it happen
- Have industry champions and expertise
- Chocolate has healthier identity
- Unique marketing opportunities, e.g. cookbooks
- Positive association with high quality coffee in Hawaii
- Collaborative marketing with other local products, e.g. coffee
- Unique relationship with USDA, ability to make demands
- State government presently supportive
- First world infrastructure available
- No 3rd world political instability
- “Made in USA”, food safety
- “Locally grown”
- Emphasis on slow-food, local, sustainable foods

Restraining Forces

Cluster items we have less control over and those we control

Less Control

- Inflation
- High wage rates
- No economies of scale
- High land costs
- High shipping costs
- Not ideal climate for cacao production and fermentation
- Challenging economic climate at present

We have more control

- Lack of money

- Low-yield seedling orchards
- Young age of existing orchards
- Low propagation efficiency
- Accidental introduction of pests/diseases
- Perception that “Hawaiian Host” = Hawaii-grown products like macadamia and cacao
- Low awareness that industry exists, low profile
- Large confectioners resistant to high prices
- Not sufficient local manufacturing/production facilities
- Processing requires engineering solutions

Next Steps

Skip Bittenbender (CTAHR) will:

- organize a strategy to provide processing information on cacao
- provide technical information via a website
- act as the contact person for sending out and receiving cacao information

Chifumi Nagai (HARC) will:

- provide her research results on fingerprinting
- provide summary of her presentation

Meeting participants: When group memory (minutes) distributed, meeting participants:

- are encouraged to share the group memory with others interested and those indicating interest
- Dan Belmont and Ed Sequine will make a concerted effort to include large confectioners

Suggested GOAL: Form organizing group who will create a plan to formalize industry organization and address objectives of cacao task force- these meeting notes maybe sufficient.

Organizing group:

- Mike Conway
- Gini Choobua
- Philippe Padovani
- External advisor: Ed Sequine
- Skip Bittenbender
- Dan Belmont
- Melanie Boudar
- Derek Lanter

Deadline for plan: first week of December 2008

Build in opportunity for neighbor island meeting where all industry segments invited and information shared.

Wall Safe

- Branding of 100% Hawaiian
- Quarantine to keep unwanted pests out of Hawaii
- Hawaiian vs. Hawaii
- Selling of “raw” cacao, dried but not roasted beans carries salmonella risk

Evaluation

+ Things people liked about the meeting

- Facilitator
- Chocolate tasting
- Brainstorming
- Hearing everyone’s input
- Willingness
- Having established method for meeting
- Diversity of representation
- Location

Δ Things people recommended we could change

- Representatives of broader group
- Missed having big HI confectioners
- Need more growers
- Try evening meeting for more growers
- Meet on other islands
- Send agenda early so people can attend at appropriate times

Hawaii Cacao October 23, 2008 Attendee List

| First Name | Last Name | Company | Email Address |
|------------|--------------|--|--|
| Dan | Belmont | President - Hawaiian Fudge Sauce Company | dan@hawaiianfudgesauce.com |
| HC "Skip" | Bittenbender | CTAHR/ University of Hawaii | hcbitt@hawaii.edu |
| Melanie | Boudar | Sweet Paradise Chocolatier | melanie@visitvolcano.com |
| Donna | Ching | Facilitator, CTAHR | donnac@hawaii.edu |
| Gini | Choobua | Grower/Treasurer HTFG | Gini.Choobua@hawaiiantel.net |
| Michael | Conway | grower, Oahu, Dole Food Company of Hawaii | michael_conway@NA.dole.com |
| Pam | Cooper | grower, Hawaii and Original Hawaiian Chocolate Factory | info@originalhawaiianchocolatefactory.com |
| Colette | Devou | Office of Representative Corinne W. L. Ching | devou@capitol.hawaii.gov |
| Andy | Friend | Grower, Kauai | asproperties@hawaii.rr.com |
| Loren | Gautz | Bioengineering, CTAHR | lgautz@hawaii.edu |
| Travis | Idol | Agroforestry, CTAHR | idol@hawaii.edu |
| Mel | Jackson | HARC | MJACKSON@harc-HSPA.COM |
| Paddy | Kean | Kauai | psmckean@mac.com |
| Spenser | Kean | Grower, Kauai | psmckean@mac.com |
| Erik | Kling | graduate student studying cacao, CTAHR | ekling@hawaii.edu |
| Derek | Lanter | Sales Manager Waialua Coffee & Cacao | derek_lanter@na.dole.com |
| Matthew | Loke | DOA | Matthew.K.Loke@hawaii.gov |
| Tony | Lydgate | grower, Kauai | tony@steelgrass.org |
| Tom | Menezes | grower Hawaii | tommy.menezes@hawaiiantel.net |
| Chifumi | Nagai | H.A.R.C. | cnagai@harc-hspa.com |
| Philippe | Padovani | Padovani's Chocolates | philippe@padovanichocolates.com |
| Bradley | Sakamoto | grower, Molokai | bradley_sakamoto@hotmail.com |
| Nathan | Sato | Malie Kai Chocolates | info@maliekai.com |
| Ed | Seguine | Guittard Chocolate Company | Seguine@Guittard.com |
| Jari | Sugano | extension agent, oahu, | SuganoJ@ctahr.hawaii.edu |

CTAHR

| | | | |
|--------|----------|----------------|--|
| Doug | Vincent | CTAHR Adm | vincent@hawaii.edu |
| Stevie | Whalen | H.A.R.C. | SWHALEN@harc-hspa.com |
| Pam | Williams | Ecole Chocolat | info@ecolechocolat.com |