



**Department of Agriculture
State of Hawaii**

**REPORT TO THE TWENTY-FIFTH STATE LEGISLATURE
REGULAR SESSION OF 2010
STATE OF HAWAII**

**A Report to Expedite the Production and Delivery
of Hawaii Cacao to the Marketplace**

**In Response to House Concurrent Resolution No. 326, H.D. 2
Hawaii State Legislature 2008**

**Submitted by
Hawaii Department of Agriculture**

December 2009

A Report to the Twenty-Fifth Legislature
In Response to HCR 326 No. 326, H.D. 2

House Concurrent Resolution No. 326, H.D. 2, Hawaii State Legislature 2008, requests that the Department of Agriculture convene a task force to devise a plan within one year to timely expedite the introduction and delivery of Hawaii cacao to the marketplace.

The four objects of the resolution are:

- 1) accelerate the growth of the cacao industry;
- 2) increase the manufacture and supply of locally grown cacao;
- 3) promote its use and products; and
- 4) Identify any potential obstacles to the industry.

In addition to two meetings hosted by Representative Corrine Ching between key stakeholders in the local cacao industry, the College of Tropical Agriculture and Human Resources (UH-CTAHR) also conducted a one-day workshop entitled “Future of Cacao in Hawaii” on October 23, 2008. The workshop discussed key issues facing the local cacao industry, and was well attended by industry representatives statewide.

I. Introduction and Background

In recent years, food aficionados and curious tourists alike have been seeking out Hawaii-grown chocolate. For now, this pricey, Hawaii artisanal product is among the most expensive on the market with price pushing \$40 a pound. With low production volumes and high production costs, this high price is likely to remain into the foreseeable future.

Cacao is native to the central and western Amazon region. It is widely distributed throughout the humid tropical regions with commercial production concentrated in Brazil, Ivory Coast, Ghana, Indonesia and Nigeria. Cacao is adapted to a humid tropical climate and grows best in fertile, well drained soils. Trees grow best with light shade but they will grow well in full sun with adequate soil moisture. In its natural habitat, cacao grows as a forest understory tree at altitudes up to 3,000 feet. In Hawaii, due to our higher latitude, the practical limits for cacao are likely 2,000 feet in leeward areas and 1,500 feet in windward areas.

Cacao was first introduced into the Hawaiian Islands in 1850 by a German physician, Dr. William Hillebrand, who grew the trees at the present Foster Botanical Gardens in Honolulu. Since then, cacao planting has experienced up and down interest by growers. In 1996, after the closure of the Waialua Sugar Mill, the Dole Food Company planted 20 acres of cacao on Oahu’s North Shore. A year later, Bob and Pam Cooper bought a cacao orchard in Keauhou and added a processing plant which is now best known as *The Original Hawaiian Chocolate Factory*. A resurgence of interest in this commodity is reflected in this House Concurrent Resolution.

II. Planting Acreage and Production Potential

Due to the limited number of growers in the state, the USDA-National Agricultural Statistics Services (NASS)/Hawaii Agricultural Statistics (HAS) does not survey, track or publish any statistics relating to Hawaii cacao production. The best informal survey available suggests that there are 50 acres of cacao trees statewide. According to UH Extension Service staff, the potential growth of cacao acreage statewide is estimated at between a low of 315 acres and 3,000 acres. Currently, seedlings of the three common varieties of cacao – *Criollo*, *Forastero* and *Trinitario*, as well as their hybrids (such as *ICS 95* and *Amelonado*) are grown statewide. *Criollo* cacao is native to South America and Central America and has thin walled, red or yellow fruits. It produces a lighter bean with lower chocolate flavor but a unique sugar note. *Forastero* cacao is from the Amazon Basin and has a thick walled, smooth, yellow fruit. It is a robust, disease-resistance and highly productive variety that dominates world production. Finally, *Trinitario* cacao originates from Trinidad as a cross between the *Criollo* and *Forastero* varieties. It exhibits a greater diversity of flavors and is considered high quality for chocolate production.

While local farmers are keenly aware that Hawaii's rich soil and perennial warm climate could sustain cacao trees that produce a high quality product, the optimal tree genetics and actual host environment have not been established. Research is ongoing. In terms of current yield, an acre of seedlings produces between 800 to 1,000 pounds of dry seed (cacao bean). This translates into an annual production of 40,000 to 50,000 pounds of dry seed in the state, based on the current planted cacao acreage. According to HC Bittenbender, UH Extension Specialist, once grafted high yielding varieties are selected by cooperator evaluation and planted, annual yields should approach 1,500 to 2,500 pounds of dry seed per acre. This is equivalent to an annual production of 75,000 to 125,000 pounds on those same 50 acres.

III. Uses and Health Benefits

While cacao is grown primarily for chocolate production, there are many other uses. The edible pulp is a popular serving in many cacao producing regions. Cacao butter is used as a medicine for healing bruises and is also utilized in the pharmaceutical and cosmetic industries. The alkaloid found in cacao seed, theobromine (xanthose), is a stimulant similar to coffee. It has been recognized as one of the compounds contributing to chocolate's reputed role as an aphrodisiac. Theobromine is also used in medicine today as a vasodilator (blood vessel widener), a diuretic (urination aid) and heart stimulant.

The dry cacao seed (bean) and its tasty derivatives, chocolate and chocolate beverages, are rich in specific antioxidants. The bean itself may contain as much as 18 percent of cacao flavonoids. Cacao and chocolate are among the most concentrated sources of the proctanidin flavonoids, catechin and epicatechin. Cacao flavonoids have potent antioxidant activity, and there is an increasing body of evidence that confirms its ability to scavenge free radicals and to inhibit the oxidation of LDL by 75 percent (red

wines inhibit LDL oxidation by 38 percent). Often epidemiological studies have linked cacao flavonoids to anti-inflammatory and immunomodulatory benefits, and their contribution to cardiovascular and immune system health.

The perceived health benefits of cacao are an important selling point to consumers today as they strive to seek healthier alternatives in their food consumption. However, despite the positive attributes and conditions, the cacao industry in Hawaii, by all indications, is still in its “infancy” stage of development.

IV. Tasks requested of HDOA specified by HCR No. 326, H.D. 2 to develop a plan to identify strategies for the following areas are:

1) *Accelerate the Growth of the Cacao Industry:*

A. Industry Potential

According to Ed Sequine, Vice-President of *E. Guittard Chocolate*, Hawaii grown cacao currently enjoys a price premium that is two to four times higher than fine flavor cacao that is traded in world markets. In 2007, fine flavor cacao received a price premium of \$800-\$2,500 per metric tonne above dry cacao beans traded in the New York Market. This is equivalent to \$2,850 to \$4,550 per metric tonne (\$1.29 to \$2.06 per pound). The relative value of dry cacao beans in Kona is about \$4.57 per pound.

This high price of Hawaii cacao beans provides a strong incentive for local growers to stay in business and to explore other complementary activities, such as agri-tourism to provide for a rural, sustainable farming lifestyle. However, the high cost of doing business in Hawaii, including the high price of land, labor, and other factor inputs, diminishes to a large extent the potential profit margin in cacao production.

B. Economic incentives

The judicious application of appropriate economic incentives could accelerate the growth of the cacao industry in Hawaii. Individual incentives or incentives applied collectively, such as designation of Important Agricultural Lands (IAL) with offerings of income tax credits, excise tax exemptions, low interest loans and matching grants could mitigate the high cost of doing business in Hawaii, as well as, promoting needed investment and generating interest in growing cacao and chocolate production.

C. Agri-tourism

As stated in section A above, agri-tourism is an ideal complementary activity to growing cacao and to manufacturing chocolate. As a “value-added” activity, it often contributes more revenue than the actual crop growing activity itself. However, any agri-tourism activity must be conducted in an appropriate and

reasonably safe environment which doesn't hinder or supplant the farming operation. Likewise, the rules and regulations governing agri-tourism should not be unreasonably burdensome to the agri-tourism operator and discourage the provision of the activity altogether. Overall, a clearly defined county ordinance governing agri-tourism operators could enhance the economic viability of growing cacao and manufacturing artisanal chocolate in Hawaii.

2) Increase the Manufacture and Supply of Locally Grown Cacao:

A. Availability of quality planting material

In order to have a viable cacao industry in Hawaii, some level of scale economy is needed, even for artisanal chocolate, in this increasingly competitive industry. The availability and easy access to high quality plant materials – air layers, cuttings or grafts are necessary to support growers in their quest to produce high and consistent quality cacao in Hawaii. Appropriate commitments for research to support and sustain the production of genetically superior varieties and their suitability to various soil types and local environments must be made. Research collaboration with USDA-AMS and other international institutions specializing in cacao may also enhance the effectiveness of Hawaii's efforts.

UH-CTAHR is preparing for field variety trials using grafted trees with the genetics represented by *Criollo*, *Forastero* and *Trinitario*. Planting of the grafted trees by cooperators around the state will commence on Oahu in November 2009. Sites on Hawaii and Kauai will be planted in 2010. Each site will have four individual grafted trees. The 11 selections for field trials listed below are:

Selection No.	Description	Plant Source
1	UH 4 HC Bittenbender (CTAHR)-identified	CTAHR Waimanalo Station seedling
2	UH 8 HC Bittenbender (CTAHR)-identified	CTAHR Waimanalo Station seedling
3	UH 9 HC Bittenbender (CTAHR)-identified	CTAHR Waimanalo Station seedling
4	D1 Dole-identified	Waialua farm seedling
5	W1020117 C. Nagai (HARC)-identified	Waialua farm seedling
6	W1010709 C. Nagai (HARC)-identified	Waialua farm seedling
7	Red Criollo seedling (orange ripe pod color) HC	CTAHR Poamoho

	Bittenbender (CTAHR)-identified	Station seedling
8	Green Criollo (yellow ripe pod color) Kauai, HC Bittenbender (CTAHR)-identified	Farm, Kauai seedling
9	ICS 95 international variety	USDA ARS Hilo grafted tree
10	Amelonado international variety	USDA ARS Hilo grafted tree
11	R5T5 is a seedling of N02-11 Kunia HARC field R6T15. High tolerance or resistant to black pod-F. Zee (ARS/USDA)-identified	USDA ARS Hilo seedling

B. Outreach and extension services

Beyond the genetic research as outlined above, continuous outreach activities and extension services to train and support cacao farmers on an on-going basis is necessary to increase the supply of locally grown cacao. The nutritional characteristics of cacao offer a competitive marketing edge but appropriate harvesting and handling techniques are equally important to preserving the nutrition values of the locally grown cacao. Outreach and extension services are offered by the UH Agricultural Extension Service.

C. Increasing processing capacity – new facility on Oahu

At this point in time, Hawaii has only one cacao processing facility in Kona. This facility utilizes cacao from its own farm operation and also buys cacao from other growers on the island. It currently processes approximately 6,000 pounds of cacao beans annually. With about half of all cacao production on Oahu, Kauai and Molokai, there is an argument to be made for the establishment of a second, larger capacity cacao processing facility on Oahu. This facility, as proposed by some industry members, could be privately owned or owned by a cooperative of growers. Additionally, this facility could pair chocolate manufacturing with educational/agri-tourism to attract tourists that are visiting the island. The visit to a cacao farm and processing facility could draw potential recreational dollars from both local residents and visitors alike. If feasible, the additional processing facility should be capable of processing 10,000–15,000 pounds of cacao beans annually. Currently, there are small, on-farm cacao-to-chocolate processing facilities on Oahu, Kauai, East and West Hawaii, in addition to the larger one in Kona.

3) Promote Use and Products:

A. Branding and quality standards

The branding of locally produced, fine artisanal chocolate is an important facet to assure and reassure potential customers that the product they are buying is indeed a genuine product from Hawaii. Additionally, branding provides product differentiation that could separate Hawaii cacao or chocolate as unique or distinct from the rest of the world. The term “*Hawaii Cacao*” or “*Hawaii Regional Cacao*” are terms that have been suggested by producers in the industry. This branding option when applied in combination with high quality and consistent product standards that are to be established and regulated by the industry, could elevate the standing of Hawaii cacao even further. Hawaii already enjoys the reputation as a high-end resort destination. By offering agri-tourism on cacao farms, we could effectively pair and enhance local cacao with Hawaii’s fine tourism reputation.

B. Chocolatiers

There are chocolatiers in the fine chocolate segment of the chocolate industry worldwide who are looking for fine flavor cacao/chocolate to differentiate their product offerings in the increasingly competitive global economy.

While 99% of chocolatiers buy fine, specialty chocolate from established manufacturers such as *Guittard Chocolate Company*, *Barry Callebaut*, and *Valrhona*, from which to produce their confections and chocolate products, the trend to partnering with small artisan chocolate makers and cacao growers on specialty products has been growing over the last three years. There are small but expanding American and European markets for cacao growers/processors to produce a specific fine chocolate under contract to a single chocolatier.

A few chocolatiers now work directly with growers/manufacturers in developing chocolate under their brand. *Amedei* has been particularly successful with this model globally because of its strong marketing skills.

Some chocolatiers have gone a step further to establish their own small artisan chocolate manufacturing plants to process beans into chocolate. In addition to promoting the quality of Hawaii Cacao, this could serve as an alternate avenue of investment in the state as it might make more financial sense to build a small manufacturing plant close to the source of the beans so they can ship chocolate liquor (cocoa paste) rather than dried beans which are susceptible to mold in transit.

The local cacao industry could also partner with international chocolate associations, such as the *Fine Chocolate Industry Association (FCIA)* and the *Craft*

Chocolate Makers of America (CCMA), as well as established chocolate schools such as *Richardsons Researches, Inc.* and *Ecole Chocolat* to promote Hawaii cacao.

C. Chefs

When some of Hawaii's most talented young chefs got together in 1991 to exchange ideas, they created the *Hawaii Regional Cuisine (HRC)* concept, which focused on utilizing local ingredients to place the Aloha State on the fine dining map throughout the world. With this pathway established, it would serve the local cacao industry well to partner with the HRC chefs to earn their endorsement. In addition to chef cooking demonstrations, new recipes and cookbooks could then be developed to further promote awareness and use of Hawaii cacao. Beyond that, the local cacao industry could partner with international culinary associations, such as *Les Dames d'Escoffier* and with established culinary institutions, such as the *Culinary Institute of America* or the *French Culinary Institute* in New York to promote Hawaii cacao.

D. Promotions – tradeshow, retail and websites

The traditional channels to promote products, such as tradeshow and retail venues are still very relevant in the current business environment. Tradeshow still attract a lot of buyers at the wholesale, retail and restaurant level, and could generate many useful feedback and performance metrics. Leading trade shows, such as the *Natural Products Expo West (NPEW)* in Anaheim, CA attracts some 40,000 buyers in just one weekend. Other trade shows that fit chocolate are the *Fancy Food Shows* produced by the National Association for the Specialty Food Trade (NASFT). The *Summer NASFT Fancy Food Shows* are held annually on the East Coast while the *Winter NASFT Fancy Food Shows* are held annually on the West Coast. See www.specialtyfood.com for more information.

Retail shows in specialty stores may appeal to and reinforce the product in the minds of the targeted customer base. Should Hawaii cacao be marketed as a high-end, nutritious, niche-market product, retail promotions at stores such as Neiman Marcus or Whole Foods may make good sense. The customer base at these stores is likely more affluent and more willing to pay a higher price for a quality product.

Finally, websites relating to food and lifestyles may also serve as good partners in promoting product awareness and generating consumer demand. In the local marketplace today, websites such as the *Share Your Table* (www.shareyourtable.com) and *Honolulu Magazine* (www.honolulumagazine.com) generate much interest in food trends and loyal followings.

E. Cacao trade association

There are many facets to establishing a Hawaii cacao industry that is profitable and sustainable over time. Beginning with the availability of farm land, farm infrastructure, quality planting materials, technical support, processing facility and appropriate technology to product standards, food safety, transportation and marketing (branding, packaging, advertising, and sales), the different parts must come together like a “cog-wheel” to establish a world-class, Hawaii cacao industry.

From an industrial organization standpoint, it is clear that a strong and vibrant cacao trade association is essential to guide, direct and manage all aspects of a growing cacao industry in Hawaii. The model to adopt may well follow the footsteps of the *Hawaii Coffee Association (HCA)* – an amalgam of growers, processors, researchers, marketers, government officials and others who have come together to represent the best interest of the coffee industry in Hawaii.

Like coffee, the local cacao industry needs a venue to work on a wide range of issues - from good plant genetics, best management practices, product consistency, fine flavor, good texture, overall product quality, certification standards, packaging, branding, marketing, promotion, etc. There is a strong need to exchange and share information. Among other things, the proposed trade association could collaborate with the state to establish quality standards and certification criteria (variety, origin, organic, etc.) for both cacao beans and chocolates produced in the state.

4) Potential Obstacles to the Industry:

Farming is a difficult business. With high operating risks (weather, droughts, winds, floods, pests, etc.), rising input costs (fertilizers, pesticides, plant materials, labor, etc.), fluctuating markets, increasing global competition and the prevailing expectation for relatively cheap food, farmers must continuously seek out different avenues to increase their farm revenues and to remain sustainable in agriculture production.

A. High yielding and quality trees

Hawaii still lacks “high yield and quality” grafted cacao trees that are necessary to achieving a sustainable, competitive, artisanal (niche) chocolate industry in Hawaii. More research needs to be supported to optimize the mix of grafted varieties with microclimates, processing techniques, blending, and varying levels of producer skill-sets in order to establish superior flavor that is so essential in specialty chocolate markets. While the UH-CTAHR is preparing for field variety trials of grafted trees, the project faces severe budget constraints.

B. Fermentation and drying protocol

Additionally, the achievement of high quality and high value cacao beans must include a consistent process for fermentation and drying. Fermentation is the first critical process to curing the cacao beans' flavor. Once fermentation begins, the sugar in the pulp is converted by enzymes into acids that change the chemical/taste composition of the beans. The next critical process is drying, usually basking in the sun or by hot air blowers. Optimal drying prevents retardation of the fermentation process, molding and off-flavors. Further investments into research of these two issues are also critical to a successful cacao industry in Hawaii.

V. Conclusions

There is considerable agreement amongst local cacao producers that the time has come for the industry to come together and move forward to the next level in all aspects of Hawaii cacao production. While a detailed analysis and plan require resources not provided by this resolution, it is clear that a proposed Hawaii cacao trade association could spearhead the multi-faceted challenges to move forward in key areas, such as availability of superior planting materials, best management practices, premium quality products, high market value, certification protocols, branding, transportation and marketing activities.

Additionally, there is a general consensus that Hawaii could indeed produce high quality cacao with fine flavors and good texture that is marketable at a premium price and competitive with products from other cacao producing regions. Producers in Hawaii also believe that an agri-tourism component which offers educational/recreational experiences to local residents and visitors alike could complement their revenues from fruits harvested and finished chocolate products. Given the existing economic downturn in the state, such an opportunity could help to further diversify the agricultural industry in Hawaii and to maintain, if not increase, employment in both the farming and food processing sectors. Certainly, a nucleus of farmers, researchers, chocolate makers, chocolatiers, and other professionals with the appropriate skill sets exist in the state.

Appendix

HOUSE OF REPRESENTATIVES
TWENTY-FOURTH LEGISLATURE, 2008
STATE OF HAWAII

H.C.R. NO. 326
H.D. 2

HOUSE CONCURRENT
RESOLUTION

REQUESTING THAT THE DEPARTMENT OF AGRICULTURE CONVENE A TASK
FORCE TO DEVISE A PLAN WITHIN ONE YEAR TO TIMELY EXPEDITE
THE INTRODUCTION AND DELIVERY OF HAWAIIAN CACAO TO THE
MARKETPLACE.

1 WHEREAS, the State of Hawaii has a propitious opportunity
2 to develop a new industry in the growing, cultivating,
3 processing, and shipping of Hawaii-grown cacao to the mainland
4 United States and the rest of the world; and

5
6 WHEREAS, *theobroma cacao*, otherwise known as chocolate,
7 when translated into English means the "food of the gods," and
8 was first introduced to the Hawaiian islands in 1830; and

9
10 WHEREAS, cacao has been used for centuries as medicine, and
11 Asia, in particular, has a growing demand for cacao and its
12 medicinal benefits; and

13
14 WHEREAS, Hawaii is ideally located to capture and prosper
15 from the opportunities offered by a growing cacao market; and

16
17 WHEREAS, in 2003, the Hawaii Tropical Fruit Growers
18 organized a cacao chapter; and

19
20 WHEREAS, in 2004, Dole Food Company rejuvenated its Oahu
21 cacao production; now, therefore,

22
23 BE IT RESOLVED by the House of Representatives of the
24 Twenty-fourth Legislature of the State of Hawaii, Regular
25 Session of 2008, the Senate concurring, that a Cacao Task Force
26 be convened consisting of but not limited to representatives
27 from the following stakeholders of the cacao industry: the
28 Department of Agriculture, current cacao growers, Dole Food
29 Company, other farms, manufacturers, retailers, confectioners,
30 and any other relevant parties; and

HCR326 HD2 HMS 2008-3730



1 BE IT FURTHER RESOLVED that the Cacao Task Force develop a
2 plan to identify strategies to:

- 3
4 (1) Accelerate the growth of the cacao industry;
5
6 (2) Increase the manufacture and supply of locally grown
7 cacao;
8
9 (3) Promote its use and products; and
10
11 (4) Identify any potential obstacles to the industry;

12
13 and

14
15 BE IT FURTHER RESOLVED that the Cacao Task Force will have
16 one year to complete the plan and expedite the production and
17 delivery of Hawaiian cacao to the market; and

18
19 BE IT FURTHER RESOLVED that certified copies of this
20 Concurrent Resolution be transmitted to the Governor,
21 Chairperson of the Department of Agriculture, Department of Land
22 and Natural Resources, Department of Business, Economic
23 Development, and Tourism, Department of Labor and Industrial
24 Relations, Hawaii Chamber of Commerce, Mayor of the City and
25 County of Honolulu, and the Honolulu City Council.

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