

CTAHR Theme on Revitalizing the State Economy

***Context for Specific Initiatives**

Expanding the Development of High-Value Tropical Agricultural Products

Growth of Hawaii's agriculture will depend on crops and products that are competitive globally. In order to have a competitive advantage, producers have to employ cost efficient technology and have information systems to make quality decisions to enhance their profitability. Because of Hawaii's high costs for basic inputs, we need to focus on products that generate value-added products. Examples of high-value products with large external markets for which we have a competitive advantage include flower and nursery crops, seed, tropical fruit and beverages and medicinal and cosmetic plants.

In 1998, these crops contributed \$186 million to Hawaii's \$510 million of total farm gate value. These data do not reflect the value added beyond the farm gate. The bulk of these products are currently exported from Hawaii and many carry a strong Hawaii-brand recognition among consumers. The market for these types of crops has significant potential growth in North America, Europe and Asia.

The dramatic growth of the vegetable industry on Oahu has demonstrated that with proper scale, technology and marketing local growers can compete with large growers on the U.S. mainland. Import substitution may further expand the local market for some of Hawaii's high value crops (especially vegetables). Adding value to products locally will be a more effective way to expand local income and employment. A good example is the coffee industry which has moved from selling bulk green beans to exporting estate-roasted coffee in retail packs.

Hawaii's increased and sustained global competitiveness in these crops will not be due alone to our location and climate. We believe that local producer access to improved varieties, effective (and environmentally acceptable) pest, disease and nutrient management systems, processing technology and market information systems are the key to their long-term success.

Constant development efforts with these existing crops will allow Hawaii to remain one step ahead of the competition. At the same time, new crops and products must be explored for commercialization. Accompanying this effort is the need for market intelligence to identify market trends and needs. Perhaps an annual "What's New and Hot in Agriculture" meeting should be held for CTAHR faculty and other stakeholders to share information about new and potential developments.

*See attached *Initiative* tables that outline Objectives, Methods, Resources, Partners and Impacts

Strengthen the Apparel Industry in Hawaii

The apparel industry in Hawaii consists of manufacturers, contractors, wholesalers, and retailers. Operations can range in size from individuals who make and sell their items to large international companies. The greatest impact can be made with the craft industry, smaller manufacturers, and smaller retailers who are making little profit. Coordination and assistance

similar to that given to small agricultural industries is needed in order to strengthen the apparel industry

Land and Water Use Policy Analysis

Heightened concerns regarding water quality have recently risen to the top of the agricultural-environmental research agenda in Hawaii. There have been several instances of water contamination from agricultural chemicals in Hawaii in recent years. Agriculture has been identified as the principal contributor of nonpoint source pollution of ground water in the state. Given the fact that approximately 95 percent of the population of Hawaii is served by public water supplies with a ground water source, the case for preserving the quality of ground water supplies becomes compelling. Preventing further degradation in water quality may require substantial investments in new technology and innovative management strategies.

Irrigated agriculture is one of the largest consumers of fresh water in Hawaii. Pineapple, sugarcane, and diversified crops such as coffee, macadamia nuts, flower and foliage, vegetables, aquaculture and dairying, are some of the other major agricultural water users of Hawaii. In the face of steadily increasing demand for water in Hawaii, the case for developing effective strategies and techniques for water conservation and improved water use efficiency in agriculture has taken on a new urgency.

Effective and efficient water resource management is undoubtedly one of the most important policy issues facing agriculture in Hawaii in the years ahead. Increasing competition for existing water supplies, decreasing quantities of undeveloped water supplies, and increasing water quality problems are combining to focus the attention of policy makers and researchers on the critical need for developing and implementing water management strategies.

Rapid urban expansion is making major inroads into the limited amount of prime agricultural land in Hawaii. Research is needed to address the challenges facing Hawaii's agriculture from serious urban encroachment and land-use/ownership policies. Preserving agricultural land in undiminished quantity and quality is central to the future of economically viable and sustainable agriculture in Hawaii.

Over 95% of the land in Hawaii is classified "conservation" or "agriculture". When sugar was important and labor was cheap, many of these lands, zoned "agriculture", were cultivated. However, without sugar and/or with a higher cost of labor, these lands have been left fallow or for lower value use. Land has become more speculative. Hawaii's farmers, who have to compete with the US mainland counterparts, have; a) difficulty obtaining loans with long-term leases, b) cannot plan for long-term growth and stability, and c) are then less likely to adopt cutting edge technology.

The continual development of large agriculture sub-divisions for housing estates, erode our tax base since agricultural land has one of the lowest taxes. On a per unit sq. foot, these properties pay less property taxes, which is then a tax loophole at the county level, therefore, potential revenues are lost. The State general fund is further stretched to meet the counties demand as they would compete for a greater share of their "pie".

The Problem

Areas of major concern to Hawaii's agriculture in meeting its water and land use needs are: (1) water conservation, (2) competition for water from nonagricultural uses (3) water quality problems associated with groundwater contamination from agricultural chemicals and, (4) urban,

suburban and rural conflict on land use policy, rate of economic growth and the extent of urban sprawl. Tackling these problems calls for a significant research effort on the part of CTAHR

Ag-Tourism Program

Very simply, "ag-tourism" (or "agritourism") is the overlap between agriculture and tourism. It has been called "farm tourism" and described as "travel associated with farming." It includes a range of components, including but not limited to farm visits with retail sales of locally-grown produce, longer-term farm stays, bicycle, walking and automobile tours throughout a farming region, farm-related bed and breakfast (B & B) accommodations, restaurants serving regional cuisine, agricultural fairs and festivals, and living history farms.

Tourists increasingly are interested in learning more about the region they are visiting, learning about its local culture(s), traditions, environmental issues, and agriculture (including the regional cuisine). The "new visitor" wants to learn about and experience regional characteristics that make a particular place unique. The new visitor is not attracted by the increasing global homogenization that is a consequence of vast retail, food and accommodation franchises. The new visitor is relatively less satisfied by the conventional pastimes and entertainments offered by most resorts. These new visitors are often more well-educated and well-traveled, with many alternative travel opportunities from which to choose. Given their array of choices, Hawaii is in competition with a wide range of other tropical destinations vying for the visitor's attention. Hawaii cannot simply rely, as it has in the past, on advertising Waikiki, golf courses and sunny beaches.

Ag-tourism is not new. It is well established in Bali, Japan, Australia, New Zealand many parts of Europe and the Mainland, especially Italy, France, Ireland and the UK, New England, and Northern California. And almost universally ag-tourism is becoming economically important, in some areas its more important than the harvested crop. Wherever ag-tourism has become a priority, it is now a significant component of the agricultural economy. A number of Hawaii farmers have already been reaching out to the visitor, but in general Hawaii ag-tourism is relatively underdeveloped. Strengthening Hawaii ag tourism is the single development that could have the greatest impact on (a) the economic viability of most individual farms and the farming community as a whole, and (b) the visitor's desire to extend his or her stay.

Enhance Tropical Agricultural Biotechnology Research and Development

In the bio-based economy, plants will replace petroleum for all industrial applications. Thus, agriculture will not only produce food, but fuels, fibers, plastics, carbon skeletons for manufacturing, and a variety of other products. At the heart of this new economy are basic science efforts in genomics, biotechnology, engineering and innovative bioprocesses. New varieties resistant to bacterial and viral diseases or tolerant to pesticides are becoming common. However, the future will bring new plant varieties that produce high value chemicals, fragrances, vaccines or specific nutrients, flowers with engineered colors, plants with resistance to environmental stress, fruits that ripen on demand as well as agricultural technologies that remediate environmental problems. As a result food will be safer, more reliable and nutritious, the environment will be cleaner, and producers will have expanded opportunities for success. To fully realize this vast potential, care must be taken to educate consumers about biotechnology and provide adequate assurances that products are safe for consumption and the environment.

Modern agricultural biotechnology is also being merged with medical bioscience leading to, for example, the development of anti-cancer drugs and vaccines from plants. This type of scientific innovation can generate high value "intellectual products" that will stimulate the development of new industries in Hawaii. These industries, which grow directly out of high-technology research, will provide new career opportunities and vital economic diversification.

CTAHR Information Resource System

Entrepreneurs require the most up-to-date information in order to make informed decisions. Information that covers the best production, marketing and business practices must be available if Hawaii businesses will have any chance of competing in a global economy. Currently much of the required information is inaccessible, outdated, difficult to access, incomplete, or does not exist.

Despite the potential wealth of information that does exist there are two reasons that keep entrepreneurs from accessing it:

- 1) Because CTAHR lacks a cohesive information management system and operational policy clients cannot come to CTAHR as a one-stop shop for research results, how-to answers, simple solutions to common problems, and publications.
- 2) Hawaii entrepreneurs are not accustomed to searching for knowledge; it is usually brought to them by the College's outreach system, or is not sought at all. Further, there is no organized plan to upgrade, on a Statewide basis, entrepreneur's skills for acquiring new or updated knowledge, such as would be found over the Internet.

Although the development of new knowledge and new technology is needed for any community to be competitive in today's global economy, new information in itself will not improve the present situation nor create new opportunities. CTAHR can assist it's clientele to improve their present operation, create new opportunities and become more productive by disseminating and assisting in the implementation of present or new knowledge and information. By developing an Information Resource System, all of the present and new knowledge/information will be compiled, analyzed and distributed to CTAHR's clientele.

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Initiative	Objectives	Methods	Resources Required	Partners	Impacts
Ag-Tourism Program	<ol style="list-style-type: none"> 1. Establish center to foster ag-tourism in Hawaii 2. Establish institutional working agreements with European and other US universities with programs in ag-tourism, and the International Assn. Of Experts in Rural Tourism (IAERT) 3. Establish a formal partnership between CTAHR and TIM to coordinate UH role in this activity with State, county and visitor industry groups. 	<ol style="list-style-type: none"> 1. Develop how-to- materials for and , short courses, conferences, to develop skills in growers and rural communities. 2. Organize conference to bring agriculture and visitor industry members together. 3. Bring in experts from around the world to demonstrate how other areas have developed ag-tourism. 4. Develop short courses to provide in depth skills for ag-tourism entrepreneurs. 5. Provide personnel to answer calls, emails inquiries to direct inquires to resources. 6. Develop and maintain the agtourism website (http://agtourism.org/). 	<ol style="list-style-type: none"> 1. Small increase in resources for clerical and faculty time 2. Funding to bring in experts, conferences to seek grants e.g. Hawaii Tourism Authority 	<ol style="list-style-type: none"> 1. UH-School of Travel Industry Management (TIM) 2. Statewide Hawaii Tourism Authority 3. DOA 4. DBED 5. County Economic Develop. Boards 6. Farm Bureau Federation 7. Commodity Associations 8. Hawaii Regional Cuisine group 9. Other US and European universities 10. Inter. Assoc. of Experts in Rural Tourism 	<p>Short term impacts</p> <ol style="list-style-type: none"> 1. Increase awareness of opportunities to boost incomes of growers, rural communities the and visitor industry. 2. CTAHR/TIM develop a closer relationship based on perceived mutual benefits. 3. Survival for family and corporate farms on the verge of closing without increased diversification (can occur in less than a year) <p>Long term impacts</p> <ol style="list-style-type: none"> 1. Increased incomes in rural communities, farm family, corporate farm, and traditional visitor industry businesses (hotels, resorts). 2. Visitors stay longer (reducing need for more flights and related infrastructure). 3. Hawaii is chosen as an international rural ambiance destination as people do now for Tuscany and Umbria in Italy.

Initiative	Objectives	Methods	Resources Required	Partners	Impacts
<p>Enhance Tropical Agricultural Biotechnology Research and Development</p>	<ol style="list-style-type: none"> 1. To improve future competitiveness for the tropical region. 2. To train future biotechnologists. 3. And to enhance the well-being of Hawaii’s citizens and the environment. 	<ol style="list-style-type: none"> 1. To apply appropriate biotechnology to the agricultural, environmental, and high technology industries by establishing Tropical Agriculture Biotechnology Innovation Center, (TABIC). 2. Conduct risk assessment research as well as public education about the biotechnology. 3. Secure short-term operational funding. 4. Coordinate partnership “Board”, establish short and long-term goals. 	<ol style="list-style-type: none"> 1. \$5 million (one time equipment and CIP to renovate obsolete laboratories) 2. \$2 million/yr for operations – 5/yr 3. \$1 million/yr for staffing 4. Staffing: There are currently more than 50 faculty, post docs, staffs and graduate students working in this general area. However there are opportunities that are not being addressed. To develop TABIC to its fullest potential, a center Director and clerical support are needed. At least 12 permanent faculty positions are needed to capitalize on existing opportunities. 	<ol style="list-style-type: none"> 1. USDA-ARS 2. Hawaii Agriculture Research Center (HARC) 3. Biotech-based companies already here in Hawaii, as well as mainland companies that have expressed interest in relocating to take advantage of year-round growing seasons 	<ol style="list-style-type: none"> 1. New career opportunities for the people of Hawaii and our University of Hawaii graduates; directly addresses the Governor’s plan for economic development 2. New businesses established in Hawaii 3. Added resources directed toward solving agricultural constraints in the State. 4. Improving pest control while protecting the environment, developing new products (including value added) as rapidly as possible to help maintain global competitiveness. 5. Staying competitive with agricultural developments on a worldwide basis

Initiative	Objectives	Methods	Resources Required	Partners	Impacts
<p>Expanding the Development of High-Value Tropical Agricultural Products</p>	<p>1. Develop a critical mass of expertise in CTAHR to apply new technological advances and generate quality market-related information for decision makers.</p>	<p>1. Plant and animal breeding research for high-value agricultural products such as coffee, macadamia nuts, flowers, foliage, vegetables and selected animal products (improvement of existing and development of new products).</p> <p>2. Production management research with emphasis on the high-market potential value agricultural products.</p> <p>3. Market analysis/market intelligence research/identification of potential new products</p> <p>4. Food product and nutrition research</p>	<p>1. Leverage R & D dollars. Work with commodity associations for assessments, check-offs, etc. These dollars can be used to leverage funding Legislature or other agencies.</p> <p>2. Faculty replacements. In the next 5 years, there will be many retirements in critical areas. Areas needing additional resources include breeders, crop and animal production and protection specialists, market analysts and food scientists.</p>	<p>1. With partners such as DBEDT, HARC.</p> <p>2. DOA and USDA partnerships and collaborations. Needed for market analysis and trends, to share information.</p> <p>3. Producer partnerships. As industry grows, and producer scale increases, the industry becomes a sustaining partner in technology development</p>	<p>1. Improved technology to raise and sustain factor productivity; better educated workforce</p> <p>2. Low-cost efficient production, which leads to a larger market share</p> <p>3. Higher returns to producers, processors, and the economy</p> <p>4. Provide market intelligence information for quality decision making</p> <p>5. Increase food quality and nutrition</p>

Initiative	Objectives	Methods	Resources Required	Partners	Impacts
<p>Strengthen the Apparel Industry in Hawaii</p>	<ol style="list-style-type: none"> 1. To coordinate and assist the apparel industry in Hawaii with new product development, marketing and global competition issues, and training programs to provide a qualified and competitive workforce. 2. Emphasis might be placed on small craft and small manufactures including; contractors, wholesalers and retailers of clothing. 	<ol style="list-style-type: none"> 1. Interviews/focus groups with the segments of the apparel industry in cooperation with other involved organizations. 2. Involvement of faculty from the community colleges, faculty from CTAHR (TXCL, NREM), and representatives from the industry associations. Focus will be on bottlenecks in the various segments of the industry that need assistance. 3. Articulation of needs for education and assistance with the community colleges and industry representatives and the drafting of a master plan. 4. Provision of resources and education through the specialist in partnership with the community colleges and industry associations. This could involve other specialists in the college and a cross-marketing of products from the agricultural sector. 5. The development of a design inspiration center at UH-Manoa using the costume collection. 	<ol style="list-style-type: none"> 1. Funding of the focus groups (in part, with cooperation of associations) and analysis of data. 2. Hire of a specialist with start-up funding 3. An APT (technician) to help manage costume collection requests. 	<ol style="list-style-type: none"> 1. Retail Merchants of Hawaii 2. Hawaii Fashion Industry Assoc. 3. Community Colleges 4. Hawaii Arts and Crafts Assoc. 5. Hawaii Craftmen Assoc. 6. City and County of Honolulu 7. Small Business Development Center 	<ol style="list-style-type: none"> 1. More profitable apparel-related businesses. 2. More employment opportunities for CTAHR graduates. 3. More products that say “Hawaii”, with appeal to tourists. 4. Wider markets for “Made in Hawaii” products. 5. New research opportunities for graduate students and faculty.

Initiative	Objectives	Methods	Resources Required	Partners	Impacts
CTAHR Information Resource System	1) CTAHR clients will be the most informed, equipped, and capable entrepreneurs in the Country.	1) By July 2003: archive existing knowledge in (updated) written and still picture and video form . Written materials could then be recast in a variety of digital forms in a simultaneous effort. Dean promulgates the concept of an all-inclusive information system that serves two purposes: a) to provide the most up-to-date, and best information to clients thereby helping them make more informed decisions b) identify a critical mass of CTAHR experts that will prioritize critical information needs and provide resources to operate the necessary information 2) By March 2001 survey all CTAHR clients to understand their top 5 information needs. 3) Build a team to evaluate and determine potential export products or reduce imported products. 4) Develop partnerships with CTAHR's clientele and other State agencies and form decision-making groups for identified key commodities; develop product manuals of identified commodities. The manuals will provide start-up instructions and identify potential problems	<i>Leadership needs</i> 1) Acknowledgement by all staff and faculty that they will be willing to contribute their knowledge and time to the CTAHR information resource initiative and that they will reprioritize their time to work with the writing and research team. 2) Willing collaboration of all developers of the databases. <i>Infrastructure needs</i> Computer needs <ul style="list-style-type: none"> • 1 computer server • 4 computer workstations • web and database software • 10 digital cameras • 1 digital video camera 	1) Faculty of the Hamilton library 2) Faculty in universities worldwide 3) Colleagues at the Hawaii Department of Agriculture, the Department of Business, Economic Development and Tourism, the Department of Health and so forth. 4) Colleagues at business and non-profits	Impacts arising from this worthwhile but resource-intensive effort include: <i>Short term impacts</i> <ul style="list-style-type: none"> • Faculty, staff, and the Office of Communications staff will raise the awareness of CTAHR' research and outreach efforts. • A reduction in the repetitive calls for common information. Faculty and staff have more time to service other needs and develop their skill base. • The residents of the State of Hawaii will have an enhanced awareness of CTAHR's contribution to the State.

		<p>(production to marketing) with recommended solutions.</p> <p>5) Develop a networking system among scientists, extension agents and specialists to assist agriculturalists in identifying and solving critical agricultural problems.</p> <p>6) By July 2001 establish a comprehensive, easy-to-use web-based information system that assimilates and make obsolete the CTAHR information systems mentioned above. Commodity-specific information to be assembled in a “modular” form within hardcopy and digital best management practices manuals that can take advantage of common information such as soil testing.</p> <p>7) By March 2002 have reached out to 100% of all CTAHR clients and 60% will have attended a CTAHR-sponsored web-based, technology-adoption workshop on how to access the information of the evolving CTAHR information system.</p>	<p>Workforce:</p> <ul style="list-style-type: none"> • 1 project coordinator (Chief Information Czar) • 2 enthusiastic and fast writers • 1 database specialist • 1 web designer • 2 information technologists (to help get information into new system) <p>These resources could come from existing faculty and staff or from retirements.</p> <p>Travel</p> <ul style="list-style-type: none"> • budget for 50 technology-adoption workshops state-wide 		<p><i>Long term impacts</i></p> <ul style="list-style-type: none"> • Hawaii clients will make better decisions that will lead to an increase in profitability. • Faculty and staff will be freed-up to take on new challenges and develop new skills. • Hawaii will have a stronger agricultural sector. The agricultural and related sectors will increase their contributions to the overall economy by 100% (i.e. 15% of the state economy)
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Initiative	Objectives	Methods	Resources Required	Partners	Impacts
Land and Water Use Policy Analysis	<ol style="list-style-type: none"> 1. Develop and assess technologies and management strategies for their potential to conserve water, improve water quality and enhance profitability of irrigated and non-irrigated agriculture in Hawaii. 2. Determine the cost/benefit of urban encroachment and various forms of land ownership, and evaluate alternative policies to promote smart growth. 	<ol style="list-style-type: none"> 1. Establish a Focus Group to identify important land and water issues for Hawaii. 2. Study the impacts of specific irrigation technologies and management strategies on water conservation, water quality and productivity in terms of sugar, pineapple and diversified agricultural crops to be selected after carefully investigating their irrigation water requirements. 2. Study alternative policies governing allocation, supply and pricing of water in Hawaii under different scenarios. Toward this end, the impact of water cost to the profitability and sustainability of agriculture will be determined for the major agricultural crops in the state, including diversified crops. 3. Study the impact of alternative agricultural land conservation and tenure policies 	<ol style="list-style-type: none"> 1. Current faculty and replacements due to retirement. 2. Additional faculty with specialty in resource economics and management. 3. Short term travel. 	<ol style="list-style-type: none"> 1. UH Water Resources Research Center 2. Department of Land and Natural Resources 3. Hawaii Land Use Foundation (HLUF) 4. Department of Health 5. Department of Agriculture 6. Honolulu Board of Water Supply 7. Hawaii Agriculture Research Center (HARC) 8. Commodity Associations 9. U.S. Geological Survey (Water monitoring). 	<p>Short-term Impacts</p> <ol style="list-style-type: none"> 1. Foster public awareness of the critical water and land management issues facing Hawaii's agriculture. 2. Provide empirical evidence and information to the state legislators to develop appropriate legislative measures. <p>Long-term Impacts</p> <ol style="list-style-type: none"> 1. Develop and implement strategies to increase water conservation and water use efficiency in agriculture. 2. Develop and implement measures to prevent/reduce contamination of groundwater from agricultural chemicals. 3. Develop and implement a rational scheme of water allocation that will ensure a "safe minimum supply" of water for agricultural uses. 4. Implementation of zoning laws and regulations to prevent urban encroachment of prime agricultural lands. 5. Identification of these lands and their preservation, allows for stability in production and diversity of our economic base. 6. Identification of lands

					would allow evaluation of land capacity per island and allow for more even playing field for economic development in the neighbor islands that are disadvantaged by “lift-cost” of their products to the market center of Honolulu. It reduces their vulnerability to a single economic engine for job generation e.g. sugarcane in the Ka’u and Hilo-Hamukua districts.
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