2008 University of Hawaii Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

In September 1908, the opening of the College of Agriculture and Mechanical Arts made it possible for Hawaii students to pursue a college degree without traveling to the mainland or abroad. One hundred years later, we honor our university, our flagship campus, and our founding college with Hawaii's College of Tropical Agriculture and Human Resources. Discoveries made in our college have had influence worldwide, including techniques for grafting macadamia saplings and pruning coffee plants, and soil studies that have helped farmers throughout the tropics feed their families. CTAHR also celebrates the human resources side of the college, from early food science studies that proved the nutritional value of locally grown foods, to the Hawaii 4-H program, now in its 90th year, which provides leadership, citizenship, and life skills training to more than 15,000 youths annually. CTAHR outreach in nutrition and wellness, child and elder care, and household resource management has helped generations of families stay healthy and strong. As CTAHR enters its second century, University of Hawaii, Manoa is going through a campus-wide prioritization process to cope with further budget reduction anticipated in the next biennium. In addition to the 5% reduction prescribed for the current fiscal year, we are preparing for another 10% cut next year. Governor Lingle has issued a system-wide hiring freeze, and has proposed a one-day per month furlough for all state employees, and a freeze in scheduled pay raises. Under this backdrop CTAHR is moving forward following our strategic and implementation plans. A livestock extension agent reported to duty last October, a clinical nutritionist arrived in January, and a veterinarian and a community nutritionist will report to duty this August, all new faculty members in the Human Nutrition, Food and Animal Sciences department. A tropical flower horticulturist joined TPSS department last November, and a sustainable agriculture specialist is here in March. A new invasive species specialist will report to duty next month, and a community economist joined Center for the Family last month. With all these new additions, CTAHR will not be impacted as severely as some other units on campus. Hopefully, the economy will begin to improve in the second half of 2009, and UH will be allowed to fill vacant positions again in 2010.

Hawaii continues to rely on the visitor industry as its major source of income but finds that the industry is sensitive to outside forces beyond our control. In 2007 (latest data available), income from tourism increased slightly from $12 billion to $12.8 billion. The state's agricultural sales continue to average just below $2 billion dollars. Ag-tourism, the intersection of these two industries, benefits both sectors. Farm tours and on-farm sales, roadside stands, farmers' markets, farmer/chef collaborations, living-history farms, and agricultural events help Hawaii's farmers and ranchers create economically sustainable operations that sell high-value products and offer unique experiences directly to customers. The latter part of the 2008 fiscal year brought a major slowing of the world economies in the wake of a global credit crisis, and prospects are looming for a deep recession. In Hawaii, the visitor arrivals in September 2008 were down 19.5 percent from the same month one year before. As Hawaii confronts a deficit that is projected to top $1.1 billion by fiscal year 2011, state agencies like UH and CTAHR face painful budget cuts. We have also seen in 2008 dramatic shifts in the price of oil, which started the year near $100 per barrel, peaked above $145 per barrel in July, and ended the year well below $50 per barrel. Hawaii is exceptionally dependent on imported petroleum: it represents more than 90 percent of our fuel use and affects the prices that tourists pay to reach our shores and the cost of the goods we import. And among those imports, none is more important than food. Since more than 85 percent of what we eat arrives here from elsewhere, Hawaii is extremely vulnerable to interruptions in transportation systems. This has stimulated greater interests in buying locally produced foods. Producing more of Hawaii's food and fuel here on the islands is a vital step in creating a sustainable future, both in the near term and for the generations to come. Through our commitment to provide an excellent education for our students, support the diversification of our economy, protect our environment, and strengthen our families and communities, CTAHR is working to improve Hawaii's security and outlook. Many of the initiatives described in this report center on paths we can take to food security.

CTAHR outreach is helping farmers find new markets for their crops, promoting farm and food safety, assisting growers who have been harmed by natural disasters, and supporting the expansion of sustainable and organic food production in Hawaii. For commercial farmers and home gardeners alike, we offer advice, encouragement, and crop varieties developed in the college that are well suited to Hawaii's environments and year-round pest pressures. These are difficult times for Hawaii's native plants and animals, our irreplaceable natural heritage. CTAHR researchers are studying how we can lessen the damage that invasive species cause to wetlands and forests. Rising unemployment coupled with rising expenses have created difficult times for Hawaii's families and communities as well. Through affordable family counseling and volunteer projects that bring youth and elders together, our college is helping build strong, resilient ties of love and respect. We are also proud to highlight the accomplishments of our students, whose mastery of twenty-first century technology will help us tackle the challenges of charting a sustainable future. From a portfolio of more than 300 projects, we have selected the following 14 projects to showcase what we have accomplished last year.

Hawaii Coffee. For many java drinkers, coffee from Hawaii means coffee from Kona, a premier source of exceptional specialty coffees for more than a century. But as the sugar industry declined over the past several decades, Hawaii's coffee cultivation spread beyond Kona to eleven other regions on five islands. Among these, a relative newcomer, Kau, is developing a world-class reputation. After the Kau Sugar Company closed in 1996, more than two-dozen former sugar workers planted coffee farms and subsequently formed the Kau Coffee Growers Cooperative. Today about 35 coffee growers lease lands in Pahala from the Kau Farm and Ranch Company. In 2006, CTAHR extension educators began working with the Kau coffee growers as part of their outreach program to aid underserved immigrant farmers in Hawaii County, including former sugar workers growing papayas in Puna and vegetables in Waialua. In addition to helping individual growers, the team presented workshops on integrated pest management, crop production, marketing, farm finance, and food safety that bring farmers together with CTAHR extension specialists, county agents, and doctoral students as well as representatives from the Hawaii Department of Agriculture and federal agencies. Recently, they helped growers affected by volcanic smog (vog) apply for disaster assistance. The Kau growers' commitment to mastering coffee production has yielded remarkable results. At the Specialty Coffee Association of America's 2007 cupping competition, Kau coffees placed 6th and 9th, respectively, out of 104 international entries. Swift and Nakamoto's USDA grant helped fund the growers' participation in the contest. Also in 2007, another Kau coffee bested six Kona coffees at a cupping workshop in Kona. And at the 2008 SCAA cupping competition, a Kau coffee took 11th place, edging out a 12th-place Kona entry. Hawaii can now boast two of the world's top coffee regions!

Hawaii Kalo. Of all the plants that Polynesian settlers brought to Hawaii, kalo (taro) may be the most important. The starchy corm is rich in energy, minerals, and fiber, and the leaves provide vitamins and minerals. Prior to western contact, Hawaiians developed between 150 and 300 kalo varieties and may have planted more than 20,000 acres. Today, less than 400 acres of kalo remain, and very few Hawaiian varieties are produced commercially. For more than a century, CTAHR has sought to support and expand kalo cultivation, and current initiatives to encourage kalo production benefit from this history. For example, between 1928 and 1935 the college assembled the Hawaiian Taro Collection to prevent further losses of kalo. Now, at the annual Taro Variety Field Day on Molokai, CTAHR extension agents share this collection—more than 60 Hawaiian kalo varieties—with members of the community. Thousands of huli of these rare cultivars have been distributed since the field day was established more than 20 years ago. Efforts are underway to catalog the college's kalo holdings, reproduce the collection in new locations, and expand the distribution of huli. Another recent project builds on the college's past successes in breeding new taros through cross-pollination. In 1998, a CTAHR plant breeder set out to develop new varieties that combine taro leaf blight and aphid tolerance traits from non-Hawaiian parents with the desirable characteristics of Hawaii's dominant commercial kalo variety, 'Maui Lehua'. Several of the resulting hybrids have met the approval of farmers, processors, and poi testers, with taste and color comparable to 'Maui Lehua', but yields about 30 percent greater. These non-patented hybrids have been adopted by growers on four islands. To help this renewed interest in growing kalo, CTAHR revised the best-practices manual,Taro: Mauka to Makai, in this reporting period and the recently reprinted the classic 1939 bulletin Taro Varieties in Hawaii.

Family Affairs. On a Friday evening, families come together for dinner. Parents and their children share a meal. Afterward, toddlers, youths, teens, and adults spend time with their peers, playing games and talking story. But this isn't your usual pau hana gathering. The families are taking part in Family Education Training Center of Hawaii (FETCH), and each participant, from the youngest to the eldest, is learning new and more effective ways to relate to their loved ones. Through FETCH, the program's clients receive a valuable service at an affordable cost while university students experience family counseling firsthand and learn by serving the community. FETCH is unique in its coordinated approach to family learning. Each week the parents and children tackle identical concepts—such as respect, cooperation, communication, conflict resolution, and problem solving—through age-appropriate curricula. The parents attend sessions led by licensed professionals who volunteer their time, while the children, in four age-based groups, are guided through the week's lessons by students enrolled in Family Resources 425, Supervised Training in the Helping Skills. Additional Manoa students sit in on client sessions and assist by setting up and breaking down the classrooms and serving the dinner. Several graduate students from UH Manoa and Chaminade University have completed master's-level internships with FETCH. FETCH has served more than 300 families in its first five years. More than 90 percent of surveyed participants report that they are very satisfied and would recommend FETCH to their friends and relatives. The program produces statistically significant improvement in 20 problem areas familiar to many parents, including mealtime, bedtime, tantrums, chores, getting out the door in the morning, and fighting in the car. FETCH volunteers from CTAHR and the community have created a remarkable learning experience for parents, children, and students. For additional information or to register for the 12-week program, visit www.efetch.org.

Invasive species. Invasive plants in the understory of Hawaii's forests jeopardize native biodiversity and limit the abundance of culturally significant native plants. At CTAHR, a doctoral candidate is investigating how forest restoration efforts can support Native Hawaiian cultural practices by providing new sources of native plants that can be harvested on a sustainable basis.

Research plots at UH Manoa's Lyon Arboretum were planted with three native species chosen for their ecological functions and traditional uses. Mamaki (Pipturus albidus), a small tree or shrub whose leaves are used to make tea, may eventually attain a height comparable to the invasive shrub that currently dominates the site, shoebutton ardesia (Ardesia elliptica). Palapalai (Microlepia strigosa), a fern used in lei, provides ground cover that can shade out ardesia seedlings. Maile (Alyxia oliviformis), a slow growing vine or shrub from which fragrant lei are made, is an economically valuable and limited resource. Native plants grew best at the cleared sites, where they effectively suppressed reinvasion by ardesia. Both the palapalai and the maile have established well. The mamaki proved susceptible to mite damage and drought during establishment, but the surviving plants have flowered and fruited. Arboretum staff is now out planting palapalai widely to restore other areas and suppress invasive understory species. The project's first native plant harvest was held on July 17, 2008 in collaboration with the Na Pua Noeau Summer Institute program, through which Native Hawaiian high-school students explore the natural and environmental sciences within a framework of Hawaiian values, culture, and language. Students gathered palapalai fronds, collected data to assess frond traits and characterize sustainable yields, and made lei for hula. This research illustrates how cultural practitioners and land managers can create educational opportunities while increasing the availability of culturally important native plant resources.

Food Safety. In 2006, spinach contaminated with E. coli O157:H7 sickened nearly 200 individuals, causing over $77 million in industry losses and three deaths. An epidemic of food borne illness linked to Hawaii produce could do lasting harm to our agricultural industry and our reputation as a safe tourist destination. Even worse, it could needlessly injure and kill. CTAHR has coached more than 40 growers in safe food production and best handling practices. The CTAHR food safety team offers free on-farm safety coaching to limit contamination of produce, especially ground-grown crops that may be eaten raw. The team has also developed signage, hand washing stations, and caddies to keep harvest baskets off the ground. During an initial farm review, the "coach" assesses more than 40 criteria affecting worker and consumer health, including hygiene and first aid equipment, recordkeeping, pesticide handling procedures, sanitizing all surfaces that come into contact with food, and keeping animals away from the production and packing areas. At a follow-up meeting, the coach conducts a mock audit identical to the audits that the Hawaii Department of Agriculture performs. Thirty farms have completed the mock audit. Of these, 14 are now third party certified; the remaining 16 are in the process of gaining certification, which can open new retail markets to growers. The program builds on past food safety efforts such as the development of a solar-powered water pasteurizer to provide sterile water for washing produce at remote sites. Future goals include the development of rapid assays for food borne pathogens that can be conducted in the field.

Vog Damages. Kilauea is often called the world's most active volcano. While its spectacular lava flows help draw 1.5 million visitors to Hawaii Volcanoes National Park each year, Kilauea also releases sulfur dioxide and other acid-forming gases that can create "vog" (volcanic smog). The opening of a new vent on March 12, 2008 dramatically increased these emissions, impacting communities nearby and downwind. Diverse expertise and close relationships with clients allow CTAHR's Hawaii County extension faculty to offer wide-ranging aid to farmers, ranchers, and residents. Vog can devastate crops: protea growers in Ocean View report that vog damage has cost them, on average, 40 percent of their household income. A CTAHR research/extension team is looking into treatments that might minimize vog injury by closing leaf openings or neutralizing acidity. In a free publication available at county extension offices and on CTAHR's website, they identify more than 50 vog sensitive plants and suggest flushing leaves and flowers with water immediately before or after exposure to heavy vog, acid rain, or ash fall; raising the pH of acidic irrigation water with agricultural lime; and using greenhouses or limiting short-term exposure by covering plants temporarily. The team is also monitoring long term fluorine levels which may accumulate in forage plants and harm cattle. Many of those who live in these rural areas downwind from the volcano rely on rainwater catchment systems which have an impact on drinking water quality. Extension workers provide tools and advice to protect and treat this valuable resource. CTAHR offers water-testing materials at cost and has informational brochures online at www.hawaiirain.org. Through research and outreach, the college is helping vog-affected communities weather an ongoing disaster.

BBTV Control. Banana Bunchy Top Virus is destroying Hawaii's banana industry. Since the beginning of the BBTV control project, growers have gained a better understanding of the virus and are now changing their production practices in an effort to better manage the disease. Research from this project has been highlighted in a USDA-CSREES video and collaborators of this project have contributed to the design of a BBTV awareness poster. The project recognized the key spread of BBTV is due to planting of virus infected materials. This had lead to the development and establishment of Banana Tissue Culture Program at ADSC, CTAHR. This program has received tremendous positive inputs from the banana stakeholder and the public. Our goal to slow the spread of BBTV was being highlighted on the front page of the University of Hawaii main web page http: //www.hawaii.edu/ and the front page story of the December issue of the CTAHR Research News http://www.ctahr.hawaii.edu/acad/Research/ResearchNews.html. Interviews and press releases regarding BBTV were conducted with several local newspapers on the islands of Oahu, Lanai, and Hawaii. An interview was also conducted with Hawaii Public Radio. We now expect to see a reversal in banana acreage lost because of this intrepid virus. In addition, to accomplishing the original objectives of the project, we instituted additional goals that will substantially benefit the banana industry in Hawaii. In addition, two graduate students received their Master of Science degree on research conducted in accomplishing the objectives of the project. The aphid sampling plan developed for banana growers, can effectively identify infected plants and target pesticide usage.

Transgenic Papaya. We believe deregulation of Hawaii's transgenic papayas in Japan is close to approval. This is important because Japan is Hawaii's most important market niche, and to a large extent the Japan market determines the overall economic viability of the Hawaiian papaya industry. A more intangible, but no less important, impact of this work is that papaya will play a significant role in the controversy and debate on the use of transgenic technology in agriculture. Because it was not developed by a large company or by a large industry, the transgenic papayas deflects the concern some anti-GMO activists express about control of food production systems by multi-national companies. Thus, this work has impact beyond the direct benefit to Hawaii's papaya growers. Also important is the fact that papaya is consumed directly and is not blended or mixed in a formulated product. In effect, Japan consumers will provide a second market (besides the US and Canada) for consumers to make a direct choice for or against a transgenic choice, which is clearly labeled (as required by Japan). This data will be vitally important in the determining the public's acceptance or rejection of genetically engineered fruits such as papaya. Since the commercial release of Rainbow and SunUp in 1998, transgenic papaya acreage (mostly Rainbow) has increased every year (except for 1 year when seed availability was limited), from about 38% to just over 70% in 2007. Despite higher prices for non-transgenic Kapoho targeted for sale in Japan, growers have found it increasingly difficult to produce non-transgenic fruit. This large reliance on transgenics, places the industry at risk to the development or introduction of PRSV strains which can overcome the Rainbow resistance, which has led to the development and assessment of segmented- and synthetic coat protein gene transgenic resistance. We have identified several Sunrise lines with segmented gene resistance and have 6 lines with synthetic genes being assessed in the field. After final assessment, and if the resistance continues to be broadly expressed, these newer second generation transgenic papayas will mitigate the risk of new strain formation or introduction of strains from other countries, particularly from Asia. By pyramiding the first and second generation transgene constructs, we hope to develop even more broadly resistant papayas. Thus, this technology could impact papaya production in other areas of the world, besides Hawaii. We have been successful in establishing biological control of papaya mealybug, one of the most devastating pests of papaya if left unchecked, in the major papaya producing areas of Hawaii. Parasitism of PMB by the parasitic wasps ranges from 25% to 35%, and reduces pest density within three months of release into a particular area. The impact that these parasitoids have results in reduced dependence on insecticides by the growers.

Flourishing Floriculture. Repotting and rejuvenation of Dendrobium parent material over the past years resulted in more vigorous plants producing larger seed pods. In vitro propagation of valuable parent material ensures that our program can provide a steady supply of seed material to the orchid industry. Continued evaluation of new hybrids and selections, particularly of novel colors, enable the local orchid industry's need to remain competitive by incorporating a wider spectrum of colors into production. After the numerous seminars presented to orchid growers, more of them are familiar with the symptoms of Fusarium diseases. Growers now routinely clean up plants with symptoms of Fusarial diseases and pathogen levels at the nurseries are lower. All are anxious to have new fungicides registered. These results will provide the baseline research toward fungicide registration for dendrobium orchids. Early experiments with fertigation at extremely high experimental application rates showed we could increase net revenues from using the technology by 32% per acre. We expect similar or greater effects from our irrigation trials. This increase will occur not only because yield was increased but because the proportion of yield that is large sized flowers which command a higher price. For the Hawaiian Anthurium industry to remain competitive in world markets, yields and flower quality must increase. Increasing productivity with water and nutrient management will reduce average unit production costs. Results of our earlier research reported last year have been adopted. We expect our present results represent the necessary albeit more difficult next step for growers to acquire another boost in productivity.

Beef Initiative. The project's team played a pivotal role in coordinating, developing and documenting the 2007 Sustaining Ranching Communities Strategic Plan by partnering with the cattle industry. The plan is a critical roadmap for discussion and development of long-term solutions to effectively support and benefit the Hawaii Beef Cattle Industry. The Economics and Marketing sector developed Paniolo-XL, an integrated business model customized for Hawaiian conditions for ranchers to analyze their business management decisions and planning. The model includes Calf-XL for cost of production, Beef-XL for marketing analyses and Ranch-XL for financial management. The Calf-XL was endorsed and implemented in the Hawaii beef strategic plan. Value Added Technology sector focused on the flexible retort pouch to utilize subprimal cuts in producing a high value product with long shelf life and consistent quality. Researchers developed prototype products, regional recipes and initiated business plan development with industry stakeholders. A Rocky Mountain Institute study identified the FRP technology for beef as one of the top 12 viable alternatives for food sustainability in Hawaii. Best Management Practices to improve of former sugarcane lands were developed by the Pastoral Systems sector and were adopted by producers on four islands and by the USDA-Natural Resource Conservation Service. As a result of the adoption and implementation of these recommendations, former sugarcane lands have been improved for sustainable forage production, whereby reducing Hawaii's reliance of imports and feed costs, increasing beef carrying capacity, maintaining open agricultural landscapes, and providing jobs in rural communities. Genetic selection by DNA and ultrasound technology will make Hawaii a leader in the development of superior genetics for tropical grass-based production. A cooperative project with Hawaii ranchers is underway with goals of developing strategies to identify production efficiency and carcass traits adaptable in Pacific Basin. Agents conducted ultrasound and artificial insemination technology workshops that have trained 27 AI technicians. The Meat Science project sector's efforts have made significant impact on the upward trending 100% Hawaii Grown Beef market. The benefits of needle tenderizing technology were

evaluated, Hawaiian beef indentifying labels were developed, and healthy fatty acid profiles, quality and tenderness of grass-finished beef in the marketplace were evaluated, published and serves as a benchmark for future product enhancement. Extension faculty developed original and innovative outreach programs that have been emulated in other parts of the country. Mealani's Forage Field Day and A Taste of the Hawaiian Range Agricultural Festival is the educational centerpiece of the beef outreach program that has created market awareness of the quality of forage-based meats, vegetable and fruit crops produced in Hawaii. Since its inception, nearly 700 ranchers have participated in the field day and more than 10,000 people have learn about Hawaii's vibrant agriculture at the festival, including participants from 43 different states and 7 foreign countries.

Improved Landscape. A better understanding of industry barriers and opportunities has been experienced throughout all landscape sectors. An example of this was identification of ornamental invasive plants, and the qualitative research of codes of conduct; and the quantitative research of the new alternative plants that I am currently conducting. These two aspects has changed the landscape clientele from being combative and negative, to being supportive and collegial in methods to control invasive plants into the Hawaiian natural environment, without negatively affecting the landscape industry. The identification of specific needs of UH Manoa campus landscape & amenities has not only changed the physical campus appearance with such projects as Hawaii Hall, Sherman Courtyard, and HIG courtyard, these areas are being used more frequently by students, staff and faculty. This integrated research and extension program has improved understanding of plant-people relations in the built environment. An example can be seen in revealing that indoor tropical plants affect students academic and behaviors responses when plants are present in a class room environment. In addition, it has also been identified that particular plants, such as coconut palms, in the Hawaiian landscape actually lend to what has been termed "a Hawaiian sense of place". Through the dialogue that has been re-established with the various landscape sectors, there has been greater participation not only within each sector, but between sectors throughout the major islands. An example is the diverse attendance from all sectors at the last few Hawaii landscape industry conferences. This has generated better collaborations. A better awareness of the use of landscape information has been established with the development of website & extension publications. There has been greater interaction throughout industry all industry sectors in the opportunities which have developed from a more integrated dialogue between and within landscape sectors. From this, the develop of short and long range landscape solutions such as identifying alternative ornamental trees and shrubs to replace those identified as invasive species. There are now greater opportunities for research & education of Hawaiian landscape issues. This can be seen in the pilot studies of effects of ornamentals plants in school classrooms and that particular landscape plants lend to people's recognition of a Hawaiian landscape. A more comprehensive educational and practical use of the UHM landscape has been identified and utilized in new tropical landscape classes, as well as extension agent workshops. As a another result of the extension program, there is more comprehensive use and understanding of theoretical and practical knowledge of landscape issues and practices through of the newly developed landscape websites as well as the extension publications. In addition, there is improved communication and collaboration between landscape industry sectors. This increased communicated has created future opportunities for not only within each sector, but between sectors.

Agricultural Literacy. It is important to provide youths with an appropriate exposure to biotechnology used in agriculture. Exposure at a young age to the science behind biotechnology will also help the students make informed decisions about biotechnology as adults. I have conducted biotechnology education with children, and worked with various (total of 18) public and private schools in the state. Depending on the age of participants, younger students learn about food production and introductory genetics while older students learn about biotechnology, specifically those issues surrounding this technology. My outreach program includes educating over 1,500 4th and 5th graders yearly on the islands of Kauai, Hawai'i and Oahu. During these presentations, the children are provided with the opportunity to learn about genetics, look at real DNA, touch tissue-cultured plants, and learn the pros and cons of biotechnology, and taste GM and non-GM papaya. My greatest accomplishment for K-12 education was the launch (October 2007) of a new program titled Gene-ius Day. Gene-ius Day is a day filled with activities for children to learn about DNA and its implications in genetics, agriculture, and forensics. Students participate in various activities including storytelling, watching a DNA video, isolating DNA from papaya, a forensic detective activity, a genetic traits art activity, and an agricultural biotechnology lecture. The activities the students participate are age group appropriate. Gene-ius Day uses a comprehensive approach designed around a field trip that teaches elementary students introductory genetics. Prior to the field trip, fourth grade teachers receive training and materials to introduce the topic of genetics to their students. Students and their families are then introduced to genetic traits with a simple take-home assignment. The field trip consists of genetics related activities in university conference rooms and a functioning laboratory. These activities include an introduction to DNA, a concept that the curriculum covers in the seventh grade. At the end of the visit, students receive materials from the field trip to show their parents and the parents are provided with additional materials to read. Following the introduction to genetics at the fourth-grade level, follow-up classroom visits occur during the fifth and sixth grades to review and build on the information covered in the fieldtrip. These classroom visits provide additional opportunities for teacher and parent education and build a foundation for the introduction of biotechnology at the seventh-grade level. The inclusion of parents/guardians and teachers is a key feature of this project. The benefits from the fieldtrip are extended to the community. The development of shared learning experiences increases the likelihood that genetics based topics will be noticed and discussed throughout the year, reinforcing and extending the information covered. All supporting materials, including a website < http://www.ctahr.Hawaii .edu/geneius-day/ >, short video, brochure, and 24-page book have been created for this program. A total of 1100 school children attended the program during the

2007-08 school year.

Insect Museum. Making the UHIM a high quality resource contributes to the range and quality of research and education that the University can offer its members, and increases the profile and number of positive interactions that the University has with the public (we served over 180 visitors this past year), and other research and governmental institutions. Currently the Museum has approximately 60 research loans outstanding, with more occurring every year, demonstrating the increasing profile of the Museum. These loans benefit general research by supplying much needed insect material. The Museum resource benefits because the loans are returned with expert identifications of the insect species, which is priceless data that forms the basis of the Museum's value in developing a reference collection of native and invasive insect species in Hawaii. The number of visitors, visits to our website, and specimens collected and identified all relate to the stated goals of this project to develop a reference collection of invasive species and make the information available to researchers, and the general public. Through collaborations with the Hawaii Department of Agriculture, The U.S. Department of Agriculture, and the U.S. Forest Service, we are conducting surveys for Pest and native species of fly, beetle and moth, and sharing this data with interested agencies (see publications for some examples). This interagency collaboration enhances the impact of our research by benefiting multiple agencies and stakeholders.

Training First Responders. Our research efforts have created technologies useful for restoration and remediation of chemicals spills and hazardous substances in the environmental. The training workshop for Maui Hazmat teams was the second workshop after the initial training in 2005. The Hazmat team members have become familiar with the procedures to collect various hazardous substances efficiently, representatively and safely as well as properly for the next step laboratory diagnostics. The "All Hazards Field Sampling and Categorization - A training manual" (DVD and paper copy) has been a valuable tool available in all Hazmat stations in Hawaii. It has served as a useful reference tool. Successful isolation of bacteria species from contaminated soil in Hawaii laid a foundation to understand factors governing microbial degradation and provide insights into biodegradation mechanisms at molecular levels. Several species are novel and degrade persistent organic pollutants such as polycyclic aromatic hydrocarbons (PAHs) that are incomplete combustion by products as well as contaminants from petroleum products. PAHs are widely ubiquitously present in the environment and some of them are carcinogenic. We have found that the reactions between cationic metals and hydrides can generate free radicals and undergo subsequent oxidation to destroy organic chemicals and kill human cancer cells. The results have demonstrated novel applications of the processes for industrial organic wastewater treatment, recycling of human urine, and killing human cancer cells. This technology has the benefits of rapid destruction of organic chemicals in a few seconds, industrial application to remediate water contaminated with organic chemicals, and special application for human urine recycling in the aerospace application.

Total Actual Amount of professional FTEs/SYs for this State

Year:2008	**Extension**		**Research**	
	1862	**1890**	**1862**	**1890**
Plan	53.5	0.0	58.0	0.0
Actual	42.4	0.0	45.6	0.0

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

- Internal University Panel
- External Non-University Panel
- Combined External and Internal University Panel
- Expert Peer Review

2. Brief Explanation

CTAHR continues to use expert peer review panels to review individual Plans of Work, projects, publications, promotion and tenure applications, and post tenure reviews.All reviewers utilize their knowledge and experiences to evaluate programs and ensure that the planned programs address the critical issues of strategic importance, including those identified by the stakeholders; utilize multi disciplinary approaches and provide evidence of integration of research and extension; address the needs of under served populations of the State; describe the expected outcomes and impacts; and result in improved effectiveness and/or efficiency.

CTAHR's peer review process begins when a project proposal is submitted to a unit administrator. The unit administrator checks the proposal for completeness and format. A draft proposal that is ready for review is transmitted to the department's ad hoc Peer Review Committee. This committee is comprised of three departmental members who are familiar with the issue addressed by the plan or project. The Peer Review Committee reviews the proposal for (1) significance, (2) need, (3) approach, (4) new knowledge of programs to be generated, (5) potential for impact, (6) collaborative arrangements, (7) track record of the project leader(s), and (8) potential for success of the proposed project.After the committee completes its evaluation, the proposal and the peer evaluation forms are returned to the unit administrator.CTAHR administrators, program leaders and faculty may serve as resources to clarify plans of work for reviewers. Final review for plans of work occurs in the offices of the Associate Dean/Associate Director for Research and Associate Dean/Associate Director for Extension.

Each degree programs go through a comprehensive review by the university every five years. CTAHR was among the first colleges at UHM to undergo an internal review in July 2008.The review was organized in three distinct phases.In Phase 1, programs developed self-study documents describing curricula, students, research, outreach, staff support and facilities, and other important elements. Where possible, documents from other reviews (e.g., professional accreditations) were used as proxies for these reports. In Phase II, one or two members of the interview review team were assigned to each program and asked to carefully review his/her assigned program and develop a short (3 - 5 page) summary of strengths, weakness, and possible recommendations.Internal reviewers also conducted student interviews, toured facilities, interviewed faculty and administrators, and reviewed supplemental information.All of the self studies and internal review reports, as well as supplemental data were forwarded to the external reviewer.Phase III of the process involved a three-day site visit where the external reviewer and members of the internal review team met with faculty, students, staff, stakeholders, and administrators and conducted open-ended interviews regarding the strengths, weaknesses, and suggestions for the future of CTAHR.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals

Brief Explanation

As a standard practice CTAHR includes stakeholders in search committees for all extension positions, county administrators, department chairs, and college level administrators.CTAHR staff work closely with industry groups who work with and often advise these groups. This close working relationship provides a means for encouraging stakeholder participation and input on all matters of mutual concern. If CTAHR staff is not available in a particular locale, stakeholders often call upon college administrators or the county administrators with their input and concerns.

2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief Explanation

Stakeholders are considered by CTAHR to be anyone with an interest in, or those who will be impacted by, or participate in the activity or issue.These typically include producers, processors, consumers, decision makers, students, alumni, and members of the business community.Most of the commodities and program areas have one or more organizations representing their commodity or interests. Although input can be made by anyone and everyone, CTAHR prefers to listen to a spokesperson or organization that represents the majority of those affected by an issue.

2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public

Brief Explanation

CTAHR employed a variety of methods including soliciting input from the CTAHR Board of Advisors (semi-annual meetings), face to face discussions with industry representatives, the Hawai‘i Farm Bureau Federation, and a long standing "Industry Analysis Process" and "Strategic Planning Process" that were used for the Cattle Industry, Organic Farming, Tropical Fruit Crops, and Bioenergy crops.CTAHR also worked with the Hawaii Farm Bureau, governmental agencies, food manufacturers and others in conducting a feasibility study for a value added facility. This resulted in legislation this session for funding consideration for such a facility.

Other techniques used to gather stakeholder inputs were surveys, commodity organization meetings, through feedback and input from the Farm Bureau, direct input from stakeholders, and CTAHR faculty and administers regularly assist, facilitate and participate in strategic planning sessions for industry associations and organizations such as the Hawaii Association of Family and Consumer Education, Hawaii 4-H Foundation, Hawaii 4-H Livestock Association, Hawaii Coffee Growers Association, Hawaii Tropical Flowers and Shippers Association, Hawaii Tropical Fruit Growers Association, Hawaii Macadamia Nut Association, Hawaii Food Industry Associations, and many others.The college also receives many requests for research, outreach and other resources through emails, letters, meetings, and phone calls.Email list serve groups of CTAHR and external individuals are also used.Information, questions, and other exchanges take place on a regular basis

3. A statement of how the input was considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities

Brief Explanation

Inputs collected as described in the previous section are brought back for our research and teaching program planning.Stakeholder input is important for the review process for extension and research project proposals.If a project demonstrates that it is a stakeholder priority and has their support, chances of funding is significantly greater. Through our Industry Analysis Process, stakeholders assisted CTAHR in maintaining relevance of overall programs and help to assure program coordination among teaching, research and extension/outreach programs.

For example with the organic farming groups, we initiated efforts to address some of the issues identified, and look forward to working with HOFA, other groups, and organic growers to implement strategies to improve the capacity of Hawaii's organic sector to address its needs.This eventually resulted in the creation of a tenure track position in the College to serve this need. Another position that addresses the invasive species issue was also created. Recruitment for those two positions is nearing completion.

Another example is that observations by agents indicated that growers were replanting banana fields with plants that were not guaranteed to be banana bunchy top virus (BBTV) free. CTAHR faculty met with the Hawaii Banana Industry Association who indicated a need for clean, virus free banana planting materials. CTAHR invested some funds and created a program to identify the banana cultivars needed, quantities needed and developed tissue cultured plants which growers could purchase for a nominal cost. Nearly 14,000 disease free tissue cultured banana plants were distributed during this fiscal year.

Brief Explanation of what you learned from your Stakeholders

Stakeholders from all industry groups demand more research and extension program support.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
1198704	0	1334923	0

2. Totaled Actual dollars from Planned Programs Inputs

	Extension		Research	
	Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
Actual Formula	823248	0	1910548	0
Actual Matching	3689152	0	10523522	0
Actual All Other	1175695	0	1981022	0
Total Actual Expended	5688095	0	14415092	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous years

Carryover	640042	0	1152116	0

V. Planned Program Table of Content

Program #1

V(A). Planned Program (Summary)

1. Name of the Planned Program

1. Sustain, Protect, and Manage Hawaii's Natural Resources and Environment

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	0%		8%	
102	Soil, Plant, Water, Nutrient Relationships	25%		47%	
111	Conservation and Efficient Use of Water	10%		2%	
112	Watershed Protection and Management	10%		7%	
121	Management of Range Resources	5%		0%	
123	Management and Sustainability of Forest Resources	5%		0%	
124	Urban Forestry	5%		3%	
125	Agroforestry	10%		14%	
133	Pollution Prevention and Mitigation	20%		7%	
402	Engineering Systems and Equipment	0%		7%	
403	Waste Disposal, Recycling, and Reuse	10%		2%	
404	Instrumentation and Control Systems	0%		3%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	1.8	0.0	5.0	0.0
Actual	0.9	0.0	8.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
23912	0	396522	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
75671	0	1985322	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2832	0	254246	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Develop improved models and guidelines for use in policies and plans for the best management of forest, watershed (including coastal zone management), and agroforestry ecosystems.

•Conduct research that will assist the state to formulate visionary land and water use policies.

•Provide professional development opportunities for CTAHR faculty to improve capacity in natural resource management.

•Conduct needs assessment to establish current and future potential of bioremediation for Hawai‘i in both urban and rural environments.

•Conduct an "industry analysis" for environment resource management with goal of identifying needs to help Hawai‘i its ahupuaa systems.

•Develop and deliver programs to provide pollution control information and environmental education to the public, with emphasis on schools, youth groups, home gardeners and urban/residential communities. •Enhance CTAHR's international partnerships and collaboration on management of agricultural and natural resources.

•Develop a statewide emergency response team with internal and external partners (HDOA Plant Industry, Quarantine, State wide invasive species committees; etc) to quickly identify, mitigate, and transfer information about new pest invaders.

•Provide knowledge and technologies to improve the management of Hawaii’s resources to support agricultural production and enhance the environment.

•Conduct outreach activities and best management programs for handling waste products from animal livestock operations.

2. Brief description of the target audience

As intended by the Land Grant perspective, CTAHR’s "targeted" clients for this program in ***teaching*** are the undergraduate and graduate students in agriculture and allied fields. Targeted clients for ***research*** are peers and extension specialists. Clients for ***extension specialists*** are CTAHR’s county extension agents and the counterpart professional personnel of sister state and federal agencies (such as the Hawai‘i State Departments of Agriculture, Health, and Land and Natural Resources, and the USDA Natural Resources Conservation Service, NRCS). Clients for ***extension agents*** are land users and commodity producers and their organizations (such as the Hawai‘i Association of Soil and Water Conservation Districts, Hawai‘i Forestry Industry Association, and the Hawai‘i Farm Bureau), extension staff in other CTAHR units and at sister institutions, and other members of the professional community who deal with managing land, soil and water resources especially in tropical agro-ecosystems. Interfacing with other professional and community groups who can provide new and useful knowledge to facilitate making decisions is an important expectation for effectively meeting its commitments.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	1000	1600	45	100
2008	651	56099	0	350

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	1

Patents listed

Li, Qing Xiao; Human Consumable Essential Oil Highly Toxic to Pest Tephritid Fruit Flies. Provisional patent filed on 11/9/07

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	5	10	
2008	3	64	67

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of publications.

Year	Target	Actual
2008	12	64

Output #2

Output Measure

- Grant proposal submitted.

Year	Target	Actual
2008	5	24

Output #3

Output Measure

- Presentations at international and national meetings.

Year	Target	Actual
2008	6	18

Output #4

Output Measure

- Number of workshops and other educational activities held

Year	Target	Actual
2008	20	19

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Increased awareness and understanding of the issues
2	Number of people completing non-formal education programs
3	Number of agency professionals, including extension agents who actually implement or install demonstration or similar programs for clientele education
4	Number of people who actually adopt one or more recommended practices
5	Total dollar value of grants and contracts obtained.

Outcome #1

1. Outcome Measures

Increased awareness and understanding of the issues

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	250	256

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The health and vitality of Hawaii's natural resources is essential for the long term survival of the islands. Public and private land owners need to develop management plans to insure their long term well being.

What has been done

Provided K-12 classroom instruction, conducted research, developed websites, held workshops and in-field demonstrations on cooperators land, and provided individual consultations via telephone, email, and walk-in clients on forest and rangelands issues. Also assisted with forest stewardship management plans, participated in conferences, wrote extension and research publications. A 317 page manual was developed for the Hawaii Grazing and Livestock Management Academy, Range and Pasture Management 101 course.

Results

Over 1000 people attending the Hawaii Conservation Conference gained new knowldedge on native koa forest restoration methods. Fifty nine participants attended and completed the Range and Pasture Management 101 course. Over 700 people visited a 'virtual field day' demonstrating new technologies for invasive species control in native forest lands.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
111	Conservation and Efficient Use of Water
403	Waste Disposal, Recycling, and Reuse
125	Agroforestry
112	Watershed Protection and Management
121	Management of Range Resources
102	Soil, Plant, Water, Nutrient Relationships
133	Pollution Prevention and Mitigation

Outcome #2

1. Outcome Measures

Number of people completing non-formal education programs

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	30	142

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The health and vitality of Hawaii's natural resources is essential for the long term survival of the islands. Public and private land owners need to develop management plans to insure their long term well being.

What has been done

Conducted the Hawaii Range and Pasture Management 101 course, provided K-12 classroom instruction, conducted research, developed websites, held workshops and in-field demonstrations on cooperators land, and provided individual consultations via telephone, email, and walk-in clients on forest and rangelands issues. Also assisted with forest stewardship management plans participated in conferences, wrote extension and research publications. A 317 page manual was developed for Range and Pasture Management 101 course.

Results

Fifty nine participants attended and completed the Hawaii Grazing and Livestock Management Academy, Range and Pasture Management 101 course.

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources
123	Management and Sustainability of Forest Resources
102	Soil, Plant, Water, Nutrient Relationships

Outcome #3

1. Outcome Measures
Number of agency professionals, including extension agents who actually implement or install demonstration or similar programs for clientele education

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	3	6

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The health and vitality of Hawaii's natural resources is essential for the long term survival of the islands. Public and private land owners need to develop management plans to insure their long term well being.

What has been done

Conducted the Hawaii Range and Pasture Management 101 course, provided K-12 classroom instruction, conducted research, developed websites, held workshops and in-field demonstrations on cooperators land, and provided individual consultations via telephone, email, and walk-in clients on forest and rangelands issues. Also assisted with forest stewardship management plans participated in conferences, wrote extension and research publications. A 317 page manual was developed for Range and Pasture Management 101 course.

Results

A demonstration of underplanting of six native trees was initiated by the Guam Forestry Division in consultation and collaboration with CTAHR faculty.

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources
102	Soil, Plant, Water, Nutrient Relationships
403	Waste Disposal, Recycling, and Reuse
123	Management and Sustainability of Forest Resources

Outcome #4

1. Outcome Measures

Number of people who actually adopt one or more recommended practices

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	15	142

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The health and vitality of Hawaii's natural resources is essential for the long term survival of the islands. Public and private land owners need to develop management plans to insure their long term well being.

What has been done

Conducted the Hawaii Grazing and Livestock Management Academy, Range and Pasture Management 101 course, provided K-12 classroom instruction, conducted research, developed websites, held workshops and in-field demonstrations on cooperators land, and provided individual consultations via telephone, email, and walk-in clients on forest and rangelands issues. Also assisted with forest stewardship management plans participated in conferences, wrote extensiona and research publications. A 317 page manual was developed for Range and Pasture Management 101 course.

Results

Forest stewardship management plans covered a total of 9,500 acres and stand to be awarded a total of $2,313,442 of cost-share funding over the next ten years. The Nature Conservancy, one of the largest landowners in Hawaii, initiated a field-scale thinning trial of koa forests on 10 acres. This is the first large-scale thinning in natural koa forests that has been attempted in Hawaii and TNC is serving as an outstanding example for other landowners.

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse
102	Soil, Plant, Water, Nutrient Relationships
121	Management of Range Resources
123	Management and Sustainability of Forest Resources

Outcome #5

1. Outcome Measures

Total dollar value of grants and contracts obtained.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	275000	240518

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
403	Waste Disposal, Recycling, and Reuse
133	Pollution Prevention and Mitigation
112	Watershed Protection and Management
124	Urban Forestry
125	Agroforestry
121	Management of Range Resources
111	Conservation and Efficient Use of Water
123	Management and Sustainability of Forest Resources

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Other (Quarantine procedures)

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)

Evaluation Results

Key Items of Evaluation

Program #2

V(A). Planned Program (Summary)

1. Name of the Planned Program

2. Hawaii's Diversified Tropical Crop Systems for Sustainability and Competitiveness

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		6%	
202	Plant Genetic Resources	10%		2%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	10%		20%	
204	Plant Product Quality and Utility (Preharvest)	10%		11%	
205	Plant Management Systems	10%		40%	
206	Basic Plant Biology	10%		20%	
211	Insects, Mites, and Other Arthropods Affecting Plants	10%		0%	
212	Pathogens and Nematodes Affecting Plants	10%		0%	
213	Weeds Affecting Plants	10%		0%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	10%		0%	
216	Integrated Pest Management Systems	10%		1%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	21.5	0.0	36.0	0.0
Actual	14.3	0.0	13.1	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
283563	0	409600	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1334609	0	3831987	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
216828	0	150202	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Conduct basic and applied research to increase production, efficiency and profitability of diversified agricultural industries while protecting the environment.

Provide diagnostic and analytical services for soil testing, water analysis, plant tissue analyses, plant disease identification, insect pest identification, and feed and forage analyses.

Conduct outreach programs to provide best management practices needed to grow and market existing and new crops.

Increase the competitiveness of local agricultural production systems by reducing costs and increasing efficiency.

Provide training in identification and management of costs of production, identification of niche market opportunities.

Incorporate research-based technology that reduces losses due to pests, disease, and inefficient use of resources into production systems.

Perform a Sector-wide analysis by industries or clusters of industries for existing industries. Use this information to set priorities.

Conduct analysis of sustainable agriculture programs and needs for research and extension. Review and Evaluate academic programs as they relate to sustainable agriculture.

2. Brief description of the target audience

As intended by the Land Grant perspective, CTAHR's "targeted" clients for this program in ***teaching*** are the undergraduate and graduate students in agriculture and allied fields. Targeted clients for ***research*** are peers and extension specialists. Clients for ***extension specialists*** are CTAHR's county extension agents and the counterpart professional personnel of sister state and federal agencies (such as the Hawai`i State Departments of Agriculture, Health, and Land and Natural Resources, and the USDA Natural Resources Conservation Service – there are a whole bunch of human service groups here too). Clients for ***extension agents*** are potential and existing farmers/producers and their organizations (such as the Hawai'i Association of Soil and Water Conservation Districts, Hawai'i Macadamia Nut Association, Hawai'i Papaya Industry Association, and the Hawai'i Farm Bureau Federation), packing houses and shippers, extension colleagues, and other members of the community who are involved in the agriculture sector.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	14000	8000	1000	175
2008	1251	3695	82	373

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	2
2008 :	1

Patents listed

John Cho; Colocasia Esculent #2005-23, Plant patent filed 1/4/08.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	15	30	
2008	16	58	74

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of workshops, research/field day demonstrations conducted

Year	Target	Actual
2008	135	226

Output #2

Output Measure

- Published information such as extension newsletters, fact sheets, videos, and other publications

Year	Target	Actual
2008	220	71

Output #3

Output Measure

- Stakeholder participation in on-farm cooperative trials

Year	Target	Actual
2008	12	112

Output #4

Output Measure

- Number of publications

Year	Target	Actual
2008	30	74

Output #5

Output Measure

- Presentations at international and national meetings

Year	Target	Actual
2008	20	39

Output #6

Output Measure

- Number of diagnostic samples analyzed

Year	Target	Actual
2008	12000	11807

Output #7

Output Measure

- Number of grant proposals submitted.

Year	Target	Actual
2008	25	60

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Increased awareness of best management practices to promote environmentally responsible agricultural and landscape management
2	Adoption of best management practices to promote environmentally responsible agricultural and landscape management
3	Number of people completing non-formal education programs
4	Number of agency professionals, including extension agents who actually implement or install demonstration or similar programs for clientele education
5	Number of people who adopt one or more recommended practices
6	Number of commodities with increased exports
7	Number of commodities where reliance on imports is reduced
8	Total dollar value of grants and contracts obtained.

Outcome #1

1. Outcome Measures

Increased awareness of best management practices to promote environmentally responsible agricultural and landscape management

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	350	6286

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
206	Basic Plant Biology
212	Pathogens and Nematodes Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
216	Integrated Pest Management Systems
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
213	Weeds Affecting Plants
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
202	Plant Genetic Resources
211	Insects, Mites, and Other Arthropods Affecting Plants

Outcome #2

1. Outcome Measures

Adoption of best management practices to promote environmentally responsible agricultural and landscape management

Not reporting on this Outcome for this Annual Report

Outcome #3

1. Outcome Measures

Number of people completing non-formal education programs

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	30	7543

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
205	Plant Management Systems
213	Weeds Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
212	Pathogens and Nematodes Affecting Plants
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
216	Integrated Pest Management Systems

Outcome #4

1. Outcome Measures
Number of agency professionals, including extension agents who actually implement or install demonstration or similar programs for clientele education
Not reporting on this Outcome for this Annual Report

Outcome #5

1. Outcome Measures
Number of people who adopt one or more recommended practices

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	25	2266

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
213	Weeds Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
212	Pathogens and Nematodes Affecting Plants

Outcome #6

1. Outcome Measures

Number of commodities with increased exports

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	2	7

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

Of the top 20 commodities produced in Hawaii, the following seven crops increased production in 2006 (most recent data avail): seed crops, cattle, tomatoes, bananas, potted palms, cut anthurium flowers, and sweet potatoes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
206	Basic Plant Biology
204	Plant Product Quality and Utility (Preharvest)
216	Integrated Pest Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
205	Plant Management Systems
213	Weeds Affecting Plants

Outcome #7

1. Outcome Measures

Number of commodities where reliance on imports is reduced

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	2	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

Commodities that increased production (top 20)where reliance to imports were cattle, tomatoes, bananas, and sweet potatoes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
216	Integrated Pest Management Systems
213	Weeds Affecting Plants
212	Pathogens and Nematodes Affecting Plants
206	Basic Plant Biology
204	Plant Product Quality and Utility (Preharvest)

Outcome #8

1. Outcome Measures
Total dollar value of grants and contracts obtained.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	4200000	2819986

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area

213	Weeds Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
202	Plant Genetic Resources
211	Insects, Mites, and Other Arthropods Affecting Plants
205	Plant Management Systems
204	Plant Product Quality and Utility (Preharvest)
216	Integrated Pest Management Systems
212	Pathogens and Nematodes Affecting Plants
206	Basic Plant Biology
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)

Evaluation Results

Key Items of Evaluation

Program #3

V(A). Planned Program (Summary)

1. Name of the Planned Program

3. Hawaii's Livestock and Aquaculture Systems For Sustainability and Competitiveness

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals	30%		21%	
303	Genetic Improvement of Animals	20%		15%	
304	Animal Genome	10%		8%	
305	Animal Physiological Processes	10%		26%	
306	Environmental Stress in Animals	5%		10%	
307	Animal Management Systems	15%		7%	
308	Improved Animal Products (Before Harvest)	10%		2%	
312	External Parasites and Pests of Animals	0%		4%	
313	Internal Parasites in Animals	0%		3%	
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	0%		4%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	4.6	0.0	3.0	0.0
Actual	3.3	0.0	5.4	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
76346	0	153197	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
290893	0	892590	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
92224	0	22595	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Develop marketing models and economic analyses of the key segments of the beef industry.
- Evaluate best management practices and technologies for conversions of intensive mono cropping systems to sustainable tropical grazing production.
- Initiate program for genetic identification for the university's beef research herd and seed stock producers and analyze for economically important markers under tropical ecosystems.
- Conduct research station field days, demonstration sites conferences, and other outreach and educational activities for stakeholders.
- Develop a gender-specific molecular sex marker in shrimp and prawns.
- Identify the period when shrimps are receptive to the sex reversing effects of exogenous androgenic hormone.

2. Brief description of the target audience

As intended by the Land Grant perspective, CTAHR's "targeted" clients for this program in ***teaching*** are the undergraduate and graduate students in agriculture and allied fields. Targeted clients for ***research*** are peers and extension specialists. Clients for ***extension specialists*** are CTAHR's county extension agents and the counterpart professional personnel of sister state and federal agencies (such as the Hawai`i State Departments of Agriculture, and Land and Natural Resources, and the USDA Natural Resources Conservation Service, NRCS). Clients for ***extension agents*** are land users and commodity producers and their organizations, extension staff in other CTAHR units and at sister institutions, and other members of the professional community who deal with livestock and aquaculture industries.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	600	2200	75	75
2008	1251	3695	82	373

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	1

Patents listed

Jinzeng Yang; Microsatellite Sequences for Pacific Threadfin Identification and Parental Assignment; Provisional patent filed on 5/2/08.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	3	10	
2008	4	19	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of workshops, conferences and other outreach events

Year	Target	Actual
2008	10	26

Output #2

Output Measure

- Publish scholarly work

Year	Target	Actual
2008	10	23

Output #3

Output Measure

- Conduct Mealani Forage Field Day for stakeholders

Year	Target	Actual
2008	1	2

Output #4

Output Measure

- Write grant proposal to secure additional funds

Year	Target	Actual
2008	5	20

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Increase sales from shellfish aquaculture industry in Hawai'i
2	Total dollar value of grants and contracts obtained.
3	Number of ranchers who have adopted a recommended practice
4	Increased numbers of beef cattle kept in Hawai'i for local consumption

Outcome #1

1. Outcome Measures

Increase sales from shellfish aquaculture industry in Hawai'i

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	100000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Shellfish production dropped from a high (1.4M lbs)in 2002 to 0.06 M lbs in 2007 most current data. High cost of production and foreign competition has all but eliminated commercial production of shrimp in Hawaii.

What has been done

The industry however, has focused on producing specific pathogen-free (SPF) shrimp broodstock that is shipped worlwide.

Results

Hawaii specific pathogen-free shrimp broodstock producers have set the standard for high quality SPF shrimp broodstock and producers have among the most advanced production facilities in the world.

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals
301	Reproductive Performance of Animals

Outcome #2

1. Outcome Measures

Total dollar value of grants and contracts obtained.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	110000	96147

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
308	Improved Animal Products (Before Harvest)
304	Animal Genome
303	Genetic Improvement of Animals
301	Reproductive Performance of Animals
307	Animal Management Systems
305	Animal Physiological Processes
306	Environmental Stress in Animals

Outcome #3

1. Outcome Measures

Number of ranchers who have adopted a recommended practice

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	7	46

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In order for cattle ranching to be successful, ranchers must know and use best management practices to produce and market livestock, and increase the competitiveness of the local livestock production systems by reducing costs and increasing efficiency.

What has been done

Over the past year two Hawaii Grazing and Livestock Management Academy, Range and Pasture Management 101 courses were held on the island of Hawaii with a total of 59 participants; 31 for the classroom sessions and 26 for the field day events. Work continued on development of materials and presentations on the second tier of courses for 101 alumni. Participants to the 101 course have included livestock producers, land owners who lease land to livestock producers, K-12 agricultural teachers, federal, state, and county land management personnel, and extension personnel. A 317 page manual of course material and 6 presentations have been developed for this project.

Results

Producers who have attended the course trainings have implemented the principles and practices introduced in the program to varying degrees. Grazing and animal production practices that are rather simple to implement have been largely adopted. On the other hand, monitoring programs are least likely to be adopted and it is difficult to convince producers of their value. All participants have indicated, through course evaluations, that they intended to adopt at least some of what they learne

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
303	Genetic Improvement of Animals

Outcome #4

1. Outcome Measures

Increased numbers of beef cattle kept in Hawai'i for local consumption

Not reporting on this Outcome for this Annual Report

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

Cost of petroleum prices have affected the cost of transportation, fuel, fertilizer, and practically everything else. Hawaii is especially vulnerable because of our high dependence on import for energy, foods, and most other materials producers have significant disadvantages.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #4

V(A). Planned Program (Summary)

1. Name of the Planned Program

4. Invasive Species Education and Management

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
121	Management of Range Resources	10%		0%	
123	Management and Sustainability of Forest Resources	10%		5%	
136	Conservation of Biological Diversity	10%		5%	
211	Insects, Mites, and Other Arthropods Affecting Plants	20%		13%	
212	Pathogens and Nematodes Affecting Plants	20%		50%	
213	Weeds Affecting Plants	20%		27%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	10%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.1	0.0	5.0	0.0
Actual	2.5	0.0	6.4	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
81829	0	358534	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
201070	0	1350883	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
19240	0	240244	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Provide outreach activities to educate stakeholders on biology, management techniques, and other information on targeted invasive species. •Coordinate activities with partner agencies, community groups, and other interested stakeholders.
•Conduct pertinent research on the biology, and control of the invasive species.

2. Brief description of the target audience

As intended by the Land Grant perspective, CTAHR's "targeted" clients for this program in ***teaching*** are the undergraduate and graduate students in agriculture and allied fields. Targeted clients for ***research*** are peers and extension specialists. Clients for ***extension specialists*** are CTAHR's county extension agents and the counterpart professional personnel of sister state and federal agencies (such as the Hawai'i State Departments of Agriculture, Health, and Land and Natural Resources, and the USDA Natural Resources Conservation Service, NRCS). Clients for ***extension agents*** are potential and existing farmers/producers and their organizations, (such as the Hawai'i Association of Soil and Water Conservation Districts, individual commodity associations, and the Hawai'i Farm Bureau), packing houses and shippers, extension staff, and other members of the community who are involved in the agriculture industry, and environmental groups.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	80	150	100	250
2008	948	417	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	1

Patents listed

James Leary; Herbicide Ballistic Technology; Provisional patent filed on 5/21/08.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	1	5	
2008	4	54	58

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of workshops, field days, demonstrations held

Year	Target	Actual
2008	2	19

Output #2

Output Measure

- Number of publications

Year	Target	Actual
2008	10	58

Output #3

Output Measure

- Number of grant proposals submitted

Year	Target	Actual
2008	10	15

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Number of people completing non-formal education programs
2	Number of agency professionals, including extension agents who implement or install demonstration or similar programs for clientele education
3	Total dollar value of grants and contracts obtained.

Outcome #1

1. Outcome Measures

Number of people completing non-formal education programs

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	25	627

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Despite Hawaii being one of the most isolated island chain in the world, many invasive species are introduced accidentally or intentionally. Unfortunately, the impact of invasive species on Hawaii's environment is probably as severe as it is anyplace in the world. The effort to educate and manage invasive species is too much for any single agency to handle. CTAHR, therefore, collaborates and partners with many other governmental and NGO groups.

What has been done

CTAHR has conducted research with biological, chemical, and cultural control measures. Improved invasive species management systems have been developed for natural, pastures and ranges, golf courses, crops, and other areas that are safer for workers and non-target species. Results are published or disseminated through printed information, websites, videos, workshops, demonstrations, posters, the classrooms, displays, and other means.

Results

The improved control methods have resulted in better control, less impact on non-target species, and overall healthier plant systems. Native plants are being used more for landscaping in many situations, thus reducing the impact of invasive species.

4. Associated Knowledge Areas

KA Code	Knowledge Area
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
211	Insects, Mites, and Other Arthropods Affecting Plants
121	Management of Range Resources
123	Management and Sustainability of Forest Resources
213	Weeds Affecting Plants
212	Pathogens and Nematodes Affecting Plants

Outcome #2

1. Outcome Measures

Number of agency professionals, including extension agents who implement or install demonstration or similar programs for clientele education

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	6	10

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
121	Management of Range Resources
214	Vertebrates, Mollusks, and Other Pests Affecting Plants

Outcome #3

1. Outcome Measures
Total dollar value of grants and contracts obtained.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	275000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
121	Management of Range Resources
211	Insects, Mites, and Other Arthropods Affecting Plants

123	Management and Sustainability of Forest Resources
213	Weeds Affecting Plants
212	Pathogens and Nematodes Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #5

V(A). Planned Program (Summary)

1. Name of the Planned Program

5. Youth, Family and Community Development

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
801	Individual and Family Resource Management	10%		4%	
802	Human Development and Family Well-Being	15%		94%	
803	Sociological and Technological Change Affecting Individuals, Families and Communities	10%		2%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	30%		0%	
805	Community Institutions, Health, and Social Services	20%		0%	
806	Youth Development	15%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	10.4	0.0	3.0	0.0
Actual	12.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
229977	0	66551	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1250062	0	437669	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
411883	0	943713	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Extension workers held 148 workshops, conferences, and educational sessions with 6,654 people attending.Volunteers (2,318) provided 59,860 hours of volunteer time worth (at $17/hour) $1,017,620 in CTAHR's program area 5.Donors (848) gave in kind goods and services that was estimated to be worth $690,614. CTAHR has 24 extension projects in this program area.

CTAHR maintains active urban garden extension activities and Master Gardeners' (MG) program in all four counties.The island of Hawaii, because of its size maintains two MG program, one in Hilo and the other in Kona.The Pearl City Urban Garden Center (PCUGC) is the flagship of the College's urban horticulture effort with about 140 volunteer MG's.Active MG programs are also conducted on Maui and Kauai islands.Efforts to coordinate MG efforts on a state-wide basis has been initiated.

Outreach efforts have been conducted to involve youth and volunteers in our 4-H Youth Development Program through the three basic delivery modes: Traditional 4-H club program; 4-H Special Interest programs; and 4-H School Enrichment programs. To provide youth an opportunity to develop leadership skills, practice citizenship, and gain life skills, 4-H programs were implemented in all communities and counties throughout the islands.Recruitment of new 4-H members is a continuous activity by all members, volunteers and staff.The 4-H Juried Curricula were used to strengthen the capacity of volunteer 4-H leaders in all counties/communities.

The program is in the process of recruiting a State 4-H Youth Development Program Leader and should be on board next fiscal year. In line with national initiatives, Science, Engineering, and Technology (SET) programs have been a major focus. A 3-day statewide SET camp was held. Other major coordinated youth programs conducted during the fiscal year include Kindergartners are Most Precious, Robotics, and the Livestock Program.

Hawaii's 4-H Military Youth program is active and well with an enrollment of 850 youth, and 15 4-H clubs on eight Army and one Air Force base and as far away as Camp Zama, Japan. CTAHR this fiscal year also was selected as the lead institution for the 4-H Navy program.

Conduct youth development training for youth program staff at military installations, youth program staff at youth organizations such as the Boys and Girls Club, YMCA/YWCA, Boy Scouts, Girl Scouts, etc., utilizing the "Moving Ahead Together" curriculum developed by 4-H/CSREES. Share 4-H Juried Curriculum to educators, youth program staff, volunteers through workshops.Develop and/or adapt curriculum and conduct training in building effective collaborations and create opportunities to build new collaborations within the College and/or amongst the community at-large. Develop and maintain outreach programs in youth, family and community development and leadership development.

2. Brief description of the target audience

As intended by the Land Grant perspective, CTAHR's "targeted" clients for this program in ***teaching*** are the undergraduate and graduate students in family and consumer sciences and allied fields. Targeted clients for ***research*** are peers and extension specialists. Clients for ***extension specialists*** are CTAHR's county extension agents and the counterpart professional personnel of sister state and federal agencies (such as the Hawai'i State Departments of Health and Social Services). Clients for ***extension agents*** are children, youth and families "at risk" in targeted communities through the "New Community Projects" program, kindergartners and parents through the "KAMP" programs, adults (4-H leaders) and youth (ages 5-19) through the 4-H Youth Development program, young children and parents through the literacy programs, adults through the Family Education and Family Community Leadership Programs, home gardeners, and the elderly, extension staff in other CTAHR units and at sister institutions, and other members of the professional community who deal with family, youth and health issues.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	7000	30000	12000	7000
2008	12122	178286	6678	4746

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	3	5	
2008	84	31	115

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of people completing non-formal education programs on parenting, youth development, and leadership development

Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Number of volunteer hours

Year	Target	Actual
2008	60000	59860

Output #3

Output Measure

- Number of publications

Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Presentations at international and national meetings.

Year	Target	Actual
2008	5	12

Output #5

Output Measure

- Grant proposals submitted.

Year	Target	Actual
2008	10	29

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Number of post-training focus group on practices adopted or working positively with youth at their schools or centers or clubs
2	Number of educators, youth program staff and others that adopt 4-H Juried Curriculum in their youth programs
3	Number of people completing non-formal education programs on parenting, youth development, and leadership development, who adopt one or more parenting principles, behaviors, or practices
4	Total dollar value of grants and contracts obtained.

Outcome #1

1. Outcome Measures

Number of post-training focus group on practices adopted or working positively with youth at their schools or centers or clubs

Not reporting on this Outcome for this Annual Report

Outcome #2

1. Outcome Measures

Number of educators, youth program staff and others that adopt 4-H Juried Curriculum in their youth programs

Not reporting on this Outcome for this Annual Report

Outcome #3

1. Outcome Measures

Number of people completing non-formal education programs on parenting, youth development, and leadership development, who adopt one or more parenting principles, behaviors, or practices

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	50	1920

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development
802	Human Development and Family Well-Being
801	Individual and Family Resource Management

Outcome #4

1. Outcome Measures

Total dollar value of grants and contracts obtained.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	1100000	1332124

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
803	Sociological and Technological Change Affecting Individuals, Families and Communities
805	Community Institutions, Health, and Social Services

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)

Evaluation Results

Key Items of Evaluation

Program #6

V(A). Planned Program (Summary)

1. Name of the Planned Program

6. Health and Wellness of Hawaii's Families and Communities

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
702	Requirements and Function of Nutrients and Other Food Components	0%		14%	
703	Nutrition Education and Behavior	10%		0%	
704	Nutrition and Hunger in the Population	10%		0%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.	20%		42%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	20%		30%	
721	Insects and Other Pests Affecting Humans	0%		2%	
722	Zoonotic Diseases and Parasites Affecting Humans	10%		10%	
723	Hazards to Human Health and Safety	10%		2%	
724	Healthy Lifestyle	20%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	13.8	0.0	3.0	0.0
Actual	4.4	0.0	3.5	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
94679	0	333441	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
383279	0	657244	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
432688	0	227481	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Develop research, extension, and education initiatives to protect the state from bioterrorism.
- Maintain and upgrade research and extension laboratory resources needed to rapidly detect, analyze and identify chemical and biological samples.
- Establish effective working relations with state and federal laboratories and programs focused on agroterrorism.
- Establish formal and information education and training programs for students, first responders/detectors and agriculture producers.
- Develop and maintain an effective pesticide management program.
- Develop a CTAHR response plan in conjunction with Hawai'i Department of Health in preparation for an emergency or unexpected outbreak.
- Provide training to extension faculty to educate Hawai'i farmers and ranchers to help mitigate effects of a zoonotic or foreign animal disease outbreak.
- Promote locally grown commodities to minimize unnecessary imports from mainland and international destinations.
- Establish a Pacific Agrosecurity system to provide training for partners in the American Pacific to ensure that first responders are prepared.
- Conduct outreach programs for stakeholders to strengthen their capacity to make educated decisions to improve their health, wellness and overall quality of life.

2. Brief description of the target audience

As intended by the Land Grant perspective, CTAHR's "targeted" clients for this program in ***teaching*** are the undergraduate and graduate students in family and consumer sciences and allied fields. Targeted clients for ***research*** are peers and extension specialists. Clients for ***extension specialists*** are CTAHR's county extension agents and the counterpart professional personnel of sister state and federal agencies (such as the Hawai'i State Departments of Health, and Social Service). Clients for ***extension agents*** are youth, families, and extended families, especially those on limited budgets, youth and adults at risk for obesity and diabetes and related diseases, farmers and farm workers, especially those that are immigrants, the general public and consumers of local produce, extension staff in other CTAHR units and at sister institutions, and other members of the professional community who deal with family, youth and health issues.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	4000	10000	1000	150
2008	14680	78613	4498	14750

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	2	3	
2008	0	30	30

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of molecular diagnostic methods, tools and techniques developed for ABTA's

Year	Target	Actual
2008	0	0

Output #2

Output Measure

- Number of outreach activities and events conducted

Year	Target	Actual
2008	100	489

Output #3

Output Measure

- Number of mitigation and remediation techniques or tools developed

Year	Target	Actual
2008	0	0

Output #4

Output Measure

- Number of students, scientists, technicians, first responders, and government officials completing training to evaluate effective ABTA response protocols

Year	Target	Actual
2008	15	0

Output #5

Output Measure

- Number of publications

Year	Target	Actual
2008	5	30

Output #6

Output Measure

- Presentations at international and national meetings.

Year	Target	Actual
2008	5	7

Output #7

Output Measure

- Grant proposals submitted.

Year	Target	Actual
2008	5	9

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Number of people trained and who receive their pesticide applicators license
2	Number of people who changed their behavior to better their health
3	New methods are developed for rapid extraction and measurement of toxic chemicals
4	Number of people who increased their knowledge in health and wellness through outreach activities
5	Total dollar value of grants and contracts obtained.

Outcome #1

1. Outcome Measures

Number of people trained and who receive their pesticide applicators license

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	75	130

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Pesticides are tools for managing pests efficiently. They enable pest manages to effect immediate though short-term pest control. Pesticides are potentially harmful and polluting. Careless handling of pesticides can result in human and wildlife poisonings and long-term soil and water contamination. Training on the proper use and application of pesticides can minimize the environmental and non-target effects.

What has been done

Conducted five short courses for 130 pesticide applicators; four issues of a newsletter, that included articles used by 152 certified applicators, were published and distributed to 555 subscribers. Conducted four lectures on safe pesticide application to 45 attendees, including Master Gardeners, landscapers, arborists, botanical garden employees, and agricultural college students. Developed four study guides: Fumigation Study Guide for Hawaii, Chlorine Gas Study Guide for Hawaii, and Aerial Application of Pesticides in Hawaii.

Results

Program coordinator estimates that 330 trainees (pesticide study packet buyers and short course trainees) adopted pesticide safety recommendations and practiced them 1,359 times. Long term impacts will be evaluated in the future.

4. Associated Knowledge Areas

KA Code	Knowledge Area
723	Hazards to Human Health and Safety
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.

Outcome #2

1. Outcome Measures

Number of people who changed their behavior to better their health

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	50	493

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

A lack of physical activity, combined with unhealthy eating practices, can result in significant health complications, such as obesity, high blood pressure, coronary heart disease, diabetes, cancer, and arthritis. Education is essential in building strong individuals, families, and communities. Research reveals that health problems can be avoided or delayed through appropriate lifestyle and health prevention activities.

What has been done

CTAHR's nutrition outreach program is now coordinated through a state program leader. This resulted better coordination and efficiency of nutrition programs in Hawaii for all stakeholders in Hawaii. This effort collaborates with partners in other land grant institutions, involves large outreach programs such as the EFNEP and the SNAP programs, and partners with other state, federal, local, and NGO agencies to hold workshops, demonstrations, classes, individual consultations, websites, projects, conferences, and other tailored nutrition outreach efforts for specific stakeholders.

Results

Four hundred and ninety three individuals have been documented to have changed their behavior to better their health by adopting at least one new recommended eating practice or physical activity.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population

Outcome #3

1. Outcome Measures

New methods are developed for rapid extraction and measurement of toxic chemicals

Not reporting on this Outcome for this Annual Report

Outcome #4

1. Outcome Measures

Number of people who increased their knowledge in health and wellness through outreach activities

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	100	12677

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

A lack of physical activity, combined with unhealthy eating practices, can result in significant health complications, such as obesity, high blood pressure, coronary heart disease, diabetes, cancer, and arthritis. Education is essential in building strong individuals, families, and communities. Research reveals that health problems can be avoided or delayed through appropriate lifestyle and health prevention activities.

What has been done

CTAHR's nutrition outreach program is now coordinated through a state program leader. This resulted better coordination and efficiency of nutrition programs in Hawaii for all stakeholders in Hawaii. This effort collaborates with partners in other land grant institutions, involves large outreach programs such as the EFNEP and the SNAP programs, and partners with other state, federal, local, and NGO agencies to hold workshops, demonstrations, classes, individual consultations, websites, projects, conferences, and other tailored nutrition outreach efforts for specific stakeholders.

Results

Over 12,000 persons increased their knowledge of nutrition and wellness issue by completing non-formal education classes offered by CTAHR.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle
704	Nutrition and Hunger in the Population
703	Nutrition Education and Behavior

Outcome #5

1. Outcome Measures

Total dollar value of grants and contracts obtained.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	225000	443747

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
722	Zoonotic Diseases and Parasites Affecting Humans
723	Hazards to Human Health and Safety
704	Nutrition and Hunger in the Population
703	Nutrition Education and Behavior
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.
724	Healthy Lifestyle

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)

Evaluation Results

Key Items of Evaluation

Program #7

V(A). Planned Program (Summary)

1. Name of the Planned Program

7. Generate and Improve Hawaii's Products, Processes and Market

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies	10%		19%	
502	New and Improved Food Products	10%		3%	
503	Quality Maintenance in Storing and Marketing Food Products	5%		2%	
511	New and Improved Non-Food Products and Processes	0%		44%	
601	Economics of Agricultural Production and Farm Management	25%		14%	
602	Business Management, Finance, and Taxation	5%		0%	
603	Market Economics	15%		1%	
604	Marketing and Distribution Practices	10%		4%	
605	Natural Resource and Environmental Economics	0%		10%	
607	Consumer Economics	15%		1%	
608	Community Resource Planning and Development	5%		2%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2008	**Extension**		**Research**	
	1862	**1890**	**1862**	**1890**
Plan	1.3	0.0	3.0	0.0
Actual	1.8	0.0	5.6	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		**Research**	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
32942	0	192703	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
153568	0	1367827	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	142541	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Identify and develop new value added products from locally grown crops and livestock.
- Assist and provide the latest technology to local entrepreneurs in the development of new value added products.
- Provide consulting service to individual farmers, processors, packers, and industry groups with developing new markets, developing new marketing strategies, writing successful business/marketing plans to expand their business.
- Assist data collection and provide scientific data to facilitate the introduction of transgenic papaya into Japanese maret.
- Conduct porfolio and indusry analyses to identify bottlenecks for industry expansion.

2. Brief description of the target audience

As intended by the Land Grant perspective, CTAHR's "targeted" clients for this program in ***teaching*** are the undergraduate and graduate students in agriculture and allied fields. Targeted clients for ***research*** are peers and extension specialists. Clients for ***extension specialists*** are CTAHR's county extension agents and the counterpart professional personnel of sister state and federal agencies (such as the Hawai'i State Departments of Agriculture, Business, Economic Development and Tourism, and Land and Natural Resources). Clients for ***extension agents*** are farmers, small business owners, food manufacturers, commodity producers and their organizations (such as individual grower associations, and the Hawai'i Farm Bureau), extension staff in other CTAHR units and at sister institutions, and other members of the professional community who deal product development and marketing.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	80	50	0	0
2008	490	10250	55	95

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	1

Patents listed

Winston Su; A Novel Whole-Plant Bioreactor for Producing Proteins and Chemicals; Provisional patent filed on 5/2/08.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	1	2	
2008	2	13	15

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Develop new food and other products of added value.

Year	Target	Actual
2008	0	0

Output #2

Output Measure

- Number of publications.

Year	Target	Actual
2008	5	13

Output #3

Output Measure

- Presentations at international and national meetings.

Year	Target	Actual
2008	5	24

Output #4

Output Measure

- Grant proposals submitted.

Year	Target	Actual
2008	10	14

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Number of people completing non-formal education programs on economic or enterprise development
2	Number of new businesses started and number of existing businesses maintaining or expanding operations resulting from economic development programs
3	Total dollar value of grants and contracts obtained

Outcome #1

1. Outcome Measures

Number of people completing non-formal education programs on economic or enterprise development

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	25	342

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
503	Quality Maintenance in Storing and Marketing Food Products
608	Community Resource Planning and Development
607	Consumer Economics
603	Market Economics
501	New and Improved Food Processing Technologies

Outcome #2

1. Outcome Measures

Number of new businesses started and number of existing businesses maintaining or expanding operations resulting from economic development programs

Not reporting on this Outcome for this Annual Report

Outcome #3

1. Outcome Measures

Total dollar value of grants and contracts obtained

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	60000	490119

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
607	Consumer Economics
503	Quality Maintenance in Storing and Marketing Food Products
608	Community Resource Planning and Development
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
603	Market Economics
502	New and Improved Food Products

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)

Evaluation Results

Key Items of Evaluation