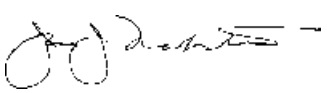
Fiscal year 2002 has been one of the most challenging years for agriculture in Hawaii. The effects of the terrorist attacks on the mainland reverberated around the country and hit the economy of our state in an unprecedented manner. Yet, despite the formidable wrench that was thrown in the state's economic recovery, it has been a year that has again provided testament to the strength and resilience of Hawaii's agricultural community. Despite global price declines, the terrorist attacks and the fourth consecutive year of drought conditions, diversified agriculture continued to post record farm level revenue of $357 million, helping maintain statewide agricultural revenues of $511 million.

During this year, Hawaii consumers were hit with the hard reality of the state's dependence on imported food. Voices in our community called for the state to be more self-sustaining agriculturally. However, local farmers need the support of the local community. Thus, the department committed considerable effort and funds to support and promote the "Buy Hawaii," a concept initially developed by the Hawaii Chamber of Commerce. The department's television and point-of-purchase promotions aimed to encourage the public to support Hawaii agriculture by making a conscious selection of Hawaii-grown products. It is a concept that should continue in our everyday lives, not only when the state faces an economic crisis.

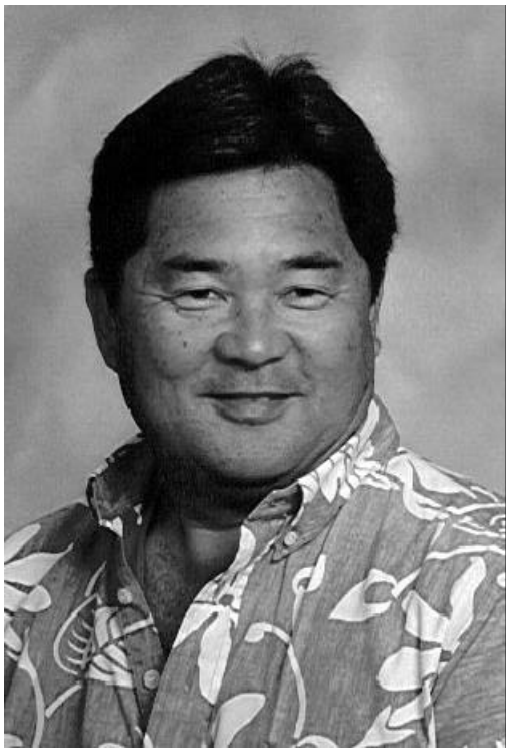
Although it was a challenging year, there were many encouraging signs that agriculture is flourishing. Floriculture and nursery sales reached a record $88 million in 2001, more than six percent higher than the previous year. Orchid sales were up 10 percent to nearly $20 million. Vegetable and melon sales hit a record $48 million, up seven percent. Sale of herbs climbed 10 percent to a record $6 million. Revenues from Hawaii's seed industry rose to record high of almost $33 million for the 2001/2002 season, the 11th consecutive year of increase. Hawaii's aquaculture is leading the nation in cage cultured fish and algae production. In addition, we have for the first time pegged a value on ag-tourism in Hawaii which is estimated at about $26 million per year and has enhanced revenue for many local farms.

Agriculture has always been an unpredictable, labor-intensive industry that must constantly adapt to a variable climate, figuratively and literally. During my years as Chairperson of the department and board, I have tried to steer a course to strengthen the state's agricultural base and to open new opportunities for Hawaii agriculture within our communities and abroad. As the torch is passed, I would like to thank those who have assisted this administration in our many endeavors and achievements.

With warmest Aloha,



James J. Nakatani
Chairperson, Board of Agriculture



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Editor/Desktop Publisher: Janelle Saneishi
Printer: Hagadone Printing Company

This annual report is also accessible via the department's website at: www.hawaiiag.org/hdoa

This annual report can also be made available in large print, taped or in Braille to meet special needs, if requested in advance by calling (808) 973-9560.

Cover: Photographs from the "Buy Hawaii" campaign. Clockwise from top left: Jodi Jewell, Island Flower Design (photo courtesy Mitchell Silver); Clyde Fukuyama and Melvin Matsuda, Kahuku Brand; Phyllis Shimabukuro Geiser, Mikilua Poultry Farm Inc.; Katsuo "Kats" Higa, Hawaii Kai farmer.

The Department of Agriculture is basically a regulatory agency administering a wide range of programs including plant quarantine, pesticides, control of plant diseases and pests, livestock disease control, animal (rabies) quarantine, inspection and grading of commodities, monitoring the production and processing of milk, and measurement standards. In addition to the department's regulatory functions, it also provides support to the agricultural industry by providing agricultural statistics, import and export statistics and analysis, as well as marketing and promotional programs to showcase Hawaii-grown products throughout the world.

The mission of the Hawaii Department of Agriculture (HDOA) is to promote the conservation, development and utilization of agricultural resources in the state. More specifically, it is the department's goal to develop an industry in which prime agricultural lands are fully utilized in profitable diversified crop and livestock production; opportunities for export competition and import substitution are maximized; and agribusinesses involved in the production, processing, distribution and marketing of agricultural commodities are competitive in a changing global market.

The mission of support in an expanding agricultural sector is essential to the overall viability of the State's economy. Agriculture in Hawaii currently generates one-half billion dollars in farm-gate revenues annually and provides thousands of jobs statewide. Recent findings indicate that when the economic value of other agriculture-related industries is considered, the total value of agriculture jumps to nearly $3 billion a year and provides approximately 42,000 jobs statewide. In addition, Hawaii agriculture contributes to a desired physical environment for both residents and visitors and promotes economic as well as social well-being in rural districts across the state.

The following is a list of highlights of the department's efforts in FY 2002:

- The department sponsored, co-sponsored or participated in several tradeshows on the mainland, including:
  - The Natural Products Expo West Tradeshow in Anaheim;
  - The National Restaurant Association Tradeshow in Chicago;
  - The Tropical Plant Industry Exhibition in Florida;
  - The Ninth Island Expo in Las Vegas; and
  - The American Institute of Floral Designers' Symposium in San Diego;
- Sponsored a trade mission to Japan to promote and develop new marketing avenues for Hawaii's coffee industry.
- In conjunction with the Hawaii Chamber of Commerce, developed the "Buy Hawaii" marketing campaign, including media ads and point-of-purchase advertising to promote Hawaii agricultural products and related services.
- Provided financial support, organizational and manpower support to the Hawaii Farm Bureau Federation's Hawaii State Farm Fair.
- Approved a total of 38 agriculture and aquaculture loans adding up to almost $11 million.
- Activated emergency loan programs to provide Hawaii ranchers relief from losses incurred due to the prolonged drought.
- Completed several irrigation projects including:
  Hakalaoa Falls Restoration Tunneling project
  Replacement of Flume #30 of the Lower Hamakua Ditch
  Construction of the new Honokaia Reservoir (Big Island)
  Upcountry Maui Irrigation Project - Phase I
  Waikolu Valley Pump Improvements
- Cared for and confined 4,681 dogs and cats in rabies quarantine. An additional 349 animals were also processed as pets transiting to other destinations.
- Maintained the state's disease-free status for livestock diseases such as Bovine Tuberculosis, Bovine Brucellosis, Bovine Anaplasmosis, Swine Brucellosis & Pseudorabies.
- Secured federal grants to assist in the evaluation of open ocean aquaculture.
- Conducted research on chemical toxicants to control coqui frog infestations. Applied for and received emergency authorization from the Environmental Protection Agency to use caffeine to control coqui frog.
- Conducted aerial spraying of biological control pathogen to control miconia infestations in inaccessible areas on Maui. Miconia is an invasive plant that can take over forested areas, crowding out native plants.
- Successfully completed Phase I of "Project Eradication" in North Kona, which was an intensive campaign to remove all banana plants within a 10-square-mile area to eradiate the banana bunchy top virus that threatened the Big Island's banana industry. Residents were allowed to replant banana plants.
- Bulldozed more than 650 acres of abandoned papaya fields in an effort to help control the Papaya Ringspot Virus in Kapoho on the Big Island.
- Began construction of the new facilities for the Plant Quarantine Branch and the Quality Assurance Branch near Sand Island, Oahu. The branches moved into the new quarters in August 2002.
- A new training facility was completed for the Hawaii Detector Dog Program located at the Animal Quarantine Station in Halawa Valley.
- Conducted 685 visits to businesses that are subject to price verification inspections to ensure correct pricing by retail scanning equipment. Compliance rate increased to 93 percent versus 87 percent the year prior.
- Completed replacement of three old wooden siphons in the Waiahole Water System, drastically reducing water losses in the system.

Planning & Development

The department actively seeks to protect existing farming areas and promote increased access to and productive use of the thousands of acres of prime agricultural lands and infrastructure vacated by sugar plantations throughout the state. The department, as principal advocate for agriculture among state agencies, offers consultative input into land use zoning, environmental program implementation, and broader planning and economic development issues that affect agricultural resources and the growth of agricultural businesses. Each division's development-focused activities are described elsewhere in this report.

In years past, the department has reported on the progress of Hawaii farmers in achieving estimated farm-gate values of selected crops as described in "Hawaii's Agriculture: 2000 and Beyond." In the year 2000, the total actual diversified crop value fell short of the estimated value of $104.6 million by only 0.3 percent. An improved version of this effort will be released for general review early in the next fiscal year upon completion of an internal review. It will contain a more clearly defined role for the department, other agencies and agricultural industries and bring focus for their activities, programs, and investments. In the years to come, most of the 14 selected crops will invariably experience ups and downs; however, there will be continued real growth. It is the collective responsibility and in the best interests of the public and private sectors to maintain or increase this growth. While modest in comparison to the visitor industry's $11 billion in economic activity, the economic activity generated by diversified agriculture is solid, steadily increasing, and will be bolstered by the continued strength of the pineapple industry and the resurgence in sugar production.

The following is a listing of activities for fiscal year (FY) 2001-2002 that supported the protection of agricultural resources, increased the use of former sugarcane lands and infrastructure, and expanded diversified agriculture development in general:

- Submitted comments and recommendations on proposals for inclusion in the just-approved 2002 Farm Security and Rural Investment Act (2002 Farm Bill). The sugar loan program was renewed and contains amendments favorable to Hawaii's sugar industry. A significant proposal not incorporated into the Act was a linkage of on-farm conservation practices to the enhancement of broad environmental protection goals and creation of a state block grant program to allow states the flexibility to target federal resources to specific environmental and conservation needs. The intent here was to offer a partial offset of the onerous economic burden to be placed on Hawaii's many small farmers and agriculture-related activities who need to be in compliance with unfunded or underfunded federal environmental laws.

- Submitted extensive testimony before county councils and departments, State Land Use Commission, and community organizations on agriculture-related issues including: the City and County of Honolulu's proposed agricultural property tax, initiative to preserve prime agricultural lands, redefinition of the agriculture zoning ordinance, and the ongoing conflict between urban and agriculture in Kamilonui Valley; Maui County's proliferation of bed and breakfast/vacation rentals; facilitating discussions between farmers and landowners on "good neighbor" and land tenure issues; and amendments to county agricultural zoning and community plan ordinances.

- Represented the department's and agriculture's interests before the following committees and organizations: National Association of State Departments of Agriculture, Western Governors' Association, Water Quality Standards Technical Advisory Group, U.S. Department of Agriculture State Technical Committee, Community-Based Economic Development Advisory Council, and Hawaii Forestry and Communities Initiative Working Group and Executive Board.

- Commented on more than 70 land use applications, legislative bills, and environmental rule-making that have significant impact on agricultural resources throughout the state such as establishment of Critical Habitats for threatened/endangered species, water quality standards for streams, non-point source pollution program rules, and identifying and protecting important agricultural lands. Preliminary work was begun on House Concurrent Resolution 94, HD 1, SD 1 (2002 Legislature) that creates an Agricultural Development Task Force responsible for improving the viability of agriculture in Hawaii, expand agricultural opportunities, and increase the role of agriculture in the diversification of Hawaii's economy.

- Responded to more than 100 telephone, walk-in, and written requests from citizens, government agencies, legislators, consultants, non-profits, and out-of-state organizations for information and limited analysis of issues pertaining to agricultural resources, development opportunities, urban farming, low-land flooding, planning for emergency food collection and distribution during emergencies, farm labor, alternative crops, land leases, etc.

Agribusiness Development & Research

The mission of this program is to ensure the vitality of agriculture and the industry's contribution to a diversified and expanding state economy. The program is designed to respond to emergencies without having to wait for supplemental legislative funds, which helps to contain losses and mitigate adverse effects. Consistent and ongoing investments for agricultural research, and marketing and promotional activities are critical for the continued growth of Hawaii's agriculture.

The following are projects that the Hawaii Board of Agriculture approved for funding in FY 2002:

- **Anthurium Germplasm Maintenance ($20,000)**
  Anthuriums can be clonally propagated by tissue culture means. This allows cultivars and species to be maintained in an aseptic environment for extended duration. This is the first year of a three-year project that will establish and maintain anthurium germplasm in-vitro. A collection of anthurium varieties will help the industry to meet the changing preferences of the marketplace and access varieties as production problems may arise.

- **Biological Control of Melastomes and Fayatree ($50,000)**
  Melastomes (miconia and tibouchina) and fayatree are considered to be major pests of rangeland and forest watersheds. With the limited physical space problem in Hawaii's quarantine laboratories, the number of plant species that have to be challenged by the potential agent has increased dramatically over the years due to the requirements under the Endangered Species Act. Species need to be several years old to be reproductive or that the experiments can only be conducted at specific times of the year such as when the buds are beginning to grow. Given this situation, this project is being conducted in the country of origin. This is the final year of a five-year project that will identify biological control agents for melastomes and fayatree.

- **Post-harvest Quality of New Low Acid Pineapple Varieties ($25,861) FY2001**
  The purpose of this project is to develop the basic data on the occurrence and extent of fruit diseases and basic information on post-harvest handling that can severely affect the marketing of low acid pineapple varieties. This is the second year of a two-year project.

- **Coffee Growth in Meloidogyne konaensis Infested Soil in Response to Root and Stem Pruning ($9,000)**
  Pruning the taproot or the distal root mass is a common practice when transplanting from the nursery to the field and even though some growers give testimony that pruning the taproot or even more severe root pruning is beneficial, the natural habit of the root is altered. This project will evaluate the impact of pruning the taproot of coffee seedlings in Kona coffee root-knot infested soil and determine the optimum shoot pruning practices of root-knot nematode infected plants.

- **Search and Evaluation of New Insecticides for Mealybug Control and Ant Control ($21,320) FY2001**
  Since the approved insecticides are under review by the Environmental Protection Agency, evaluation and registration of new insecticides are important to optimize control of mealybugs and ants in pineapple cultivation. This is the second year of a two-year project that will continue to evaluate and collect efficacy data on insecticides for mealybug control and ant baits for ant control.

- **Collection of Coffee Germplasm from International Accession for Assessing Resistance to Kona Coffee Root-Knot Nematode for Potential Use as Rootstocks in Hawaii ($16,000)**
  Exploring exotic coffees for resistance to root-knot nematode is important because resistance is the most feasible approach to managing this nematode. This is the second year of a two-year project that will evaluate coffee germplasm for resistance to the Kona coffee root-knot nematode and will determine if resistance to the Kona coffee root-knot nematode will be effective against the root-knot nematode recovered from Maui and the lesion nematode recovered from Molokai and Oahu.

- **Updating Macadamia Nutrients Recommendations: Implementing Crop Logging and Correcting the Apparent Root Inefficiency ($30,000) FY2001**
  This is the final year of a three-year project that will continue to update the current nutrient management system and develop a management practice to correct the frequent low nutrient levels of foliar phosphorus while soil phosphorus is excessively high. This project will also identify additional tissue for sampling.

- **Demonstration of Advanced Technologies for Commercial-scale Intensive Hatchery Production of Marine Finfish for Aquaculture ($50,000)**
  Since Hawaii is experiencing rapid growth of its marine finfish aquaculture industry, one of the major components is the supply of high-quality seedstock from commercial hatcheries of which live feeds represents the most complex component to production. To improve the outlook for marine fish hatchery production in Hawaii, both the live feeds and larval rearing components need to become more automated, stable, productive, and cost-effective. This project will demonstrate modern methods of live feeds production for marine fish larviculture and provide information on labor and cost savings using modern feed production and larviculture methods.

- **Breeding and Selection of Hawaii Coffee with Cupping Quality, Disease Resistance and High Yield ($37,300)**
  Currently, all coffee cultivars used in Hawaii are imported from other countries and the best solution to produce unique Hawaii coffees are to breed new varieties. The objectives of this project are to develop high-yielding unique Hawaii coffee cultivars with excellent bean and cupping quality that is adapted to specific growing conditions in Hawaii.

- **Development and Evaluation of Strategies to Manage Closteroviruses, Mealybugs and Mealybug Wilt of Pineapple ($70,000)**
  Recently, studies have shown that there are at least two pineapple mealybug wilt associated closteroviruses (PMWaVs) infecting pineapple. Both of these viruses are transmitted by mealybugs. The goals of this three year project are to develop and field evaluate environmentally safe strategies for the management of PMWaVs, mealybugs and mealybug wilt of pineapple, and to evaluate the roles of PMWaVs in precocious flowers, fruit yield, and plant quality.

- **Rambutan Flowering, Fruit Set and Production in Hawaii ($30,000) FY2001**
  Rambutan, native to Malaysian and Indonesia, grows in an environment that is characterized by high rainfall, high humidity, low evaporation rates and an average minimum temperatures above 68º F. Since Hawaii's environment is significantly different from the traditional growing areas, rambutan production in some areas in Hawaii can be erratic. This is the second year of a three-year project that will continue to determine the factors responsible for the development of deformed or aborted fruits and to evaluate different cultivars and its relationship to fruit set and fruit development.

- **Development of a Monitoring Plan and Identification Materials for the Aster Leafhopper on At-risk Crops ($24,955)**
  The aster leafhopper appeared for the first time in the state of Hawaii on Oahu in 2001 on watercress farms. The leafhopper vectors a complex of phytoplasms collectively referred to as aster yellows. The aster leafhopper and the aster yellows complex affect a broad range of horticultural, agronomic, and ornamental crops, many of which are important to Hawaii's diversified agriculture. The purpose of this project is to develop and implement an aster leafhopper monitoring program.

- **Evaluation of Systemic Acquired Resistance for Nematode Control in Pineapple ($20,700)**
  Systemic Acquired Resistance (SAR) inducers have been commercialized from a natural defense pathway found in plants and is currently being used against fungal and bacterial diseases in apple crops. SAR inducers have also reduced egg production of plant-parasitic nematodes. This project will evaluate SAR inducers for nematode control in pineapple. Greenhouse experiments will be conducted to evaluate the effect of chemical inducers on nematode reproduction and plant growth.

- **Genetic Resistance to Burrowing Nematode in Anthurium ($40,000)**
  Improvements of anthurium varieties through breeding are proven to enhance the competitiveness of domestic flowers. Such improvements can utilize genetic engineering to place genes for nematode resistance into flowers of commercial value. This is the first year of a three-year project that will employ genes for protease inhibitors as a means to control nematode growth and their rate of production.

- **Mass Rearing Natural Enemies of Gray Pineapple Mealybug for Augmentative Releases ($8,800)**
  This project was designed to refine the mass rearing protocols for the encrytid parasitoid Euryrhopalus propinquus to control the gray pineapple mealybug. It will complement efforts to develop an augmentation program for the management of the pink pineapple mealybug (PPM), Dysmicoccus brevipes, in pineapple plantings where ants are present.

- **New Materials for Amending Soils for Pineapple Production ($12,260)**
  There is insufficient knowledge of the interrelationships among soil pH and soil aluminum and manganese solubility as well as soil calcium availability in soils in which pineapple is grown. This project will evaluate the effects of calcium sulfate, agricultural lime (calcium carbonate), and basaltic dust on soil pH, plant calcium supply, iron uptake and plant calcium nutrition. The project will also determine the effect of calcium source and amount on fruit quality, particularly translucency, acidity and sugar content of pineapple.

- **Phosphorus Fertilizer Calibrations on Vegetable Farms ($18,000)**
  Previous research indicates that vegetable growers throughout the state normally over fertilize in fields that already have levels of phosphorus. This project will develop recommendations for phosphorus application rates (pounds per acre) to maximize yields, based on soil analysis and evaluate the benefits of using starter phosphorus applications during the winter months or at high elevations.

- **Pineapple Nematode Management ($23,472)**
  The profitability of pineapple production in Hawaii still requires nematode control and therefore an acceptable alternative must be found, developed and commercialized. This project will evaluate environmentally sensitive products for their potential to control nematodes in pineapple. DiTerraâ has demonstrated potential to control nematodes and its use will be further refined for ultimate use in commercial practice. This project will also develop biological and cultural nematode control methods as alternatives to nematicides.

- **The Effect of Slow Release Fertilizers and Micronutrients on the Growth and Disease Development of Taro ($20,000)**
  Frequently heavy and continuous rainfall has made water management a challenge for taro growers since excess water washes away fertilizers following application of nitrogen. This project will test the effects of slow-release nitrogen fertilizers and zinc concentrations on taro yield and disease incidence.

ADMINISTRATIVE SERVICES OFFICE

Elaine Abe
Administrator

The goals of the Administrative Services Office are to streamline and improve its operations, while providing administrators and program managers with guidance, training and management "tools" to enhance their decision-making capabilities in administering their programs.

The following is a list of projects that have been completed:

- Participated in several teams established to identify different functional areas that will be used to design and implement a plan for modernizing the civil service system pursuant to Act 253, SLH 2000 (Public Employment Reform Act).
- Developed Department's Workplace Violence Policy and received concurrence on the policy from the Hawaii Government Employees' Association.
- Developed Internal Complaint Procedures for the Department.
- Conducted Frontline Leadership Training for Supervisors in other State departments.
- Coordinated two investigative procedures workshops for supervisors presented by DHRD Labor Relations staff.
- Reviewed and processed classification actions for updated position descriptions in the Administrative Services Office.
- Created electronic version of frequently used forms such as the G-1, Transfer of Property, Detail Inventory, and Telecom Requests, for department personnel use.
- Identified departments' fixed assets and its value and recorded on department's property inventory as part of the new financial reporting standards mandated by the Governmental Accounting Standards Board Statement No. 34.
- Networked department's local area network to the State's Next Generation Network (NGN) through a fiber connection.
- Installed DSL connectivity to Kauai, Lanikaula and Aquaculture Development Program Offices.
- Developed on-line application to record and track training courses taken by departmental employees.
- Developed and implemented an on-line system for referencing journal vouchers.
- Enhanced the on-line motor vehicle inventory system to include program charges for gas, oil and repairs.
- Completed repairs to the necropsy laboratory roof and constructed a training facility for the Department's Plant Quarantine detector dog teams.
- Established a 10-year replacement schedule for the department's motor vehicles.
- Updated the department's telephone directory.
- Developed procedures for inventorying property and its improvements funded by capital improvement program funds or other funds.

Major projects still in progress are:

- Implementing the new EMCP Performance Evaluation and Variable Pay Program for Department's excluded managers.
- Implementing the Department's Workplace Violence Policy.
- Developing a Standard Operating Procedure Manuel for the Department.
- Moving termination of DSL lines from department's T-1 to ICSD's DS3.
- Installing the SANS at the new Kapalama facilities for Plant Quarantine Branch and Quality Assurance Division Offices.
- Working with consultants to design and implement on-line system for Maui Risk Assessment.
- Upgrading the Hawaii Agricultural Gateway web server's hardware and software.
- Continuing to network all Oahu and neighbor island offices to State's NGN.

- Continuing various capital improvement projects to correct safety concerns and other deficiencies at Department facilities including asbestos abatement, roof repairs and air conditioning improvements at the Kanahoahoa Building, demolition of a caretakers cottage, improvements needed to upgrade existing fire systems, improvements needed to make reasonable accommodations for individuals with disabilities, and electrical improvements for King St. complex.

- Continuing work on bringing the Department's vehicle fleet into compliance with the U.S. Department of Energy Alternative Fuel Vehicle (AFV) program.

- Continuing work on updating and implementing the Department's on-line telephone directory.

Other future projects include conducting survey to determine customer satisfaction with personnel related matters, implementing new Form HRD-1 which will replace three current forms, establishing an on-line printing and supply request system, and implementing in-house printing capabilities for summary warrant vouchers.

AGRICULTURAL DEVELOPMENT DIVISION

Matthew K. Loke, Ph.D.,
Acting Administrator
(December 2001-June 2002)

Not pictured:
Samuel Camp, *Acting Administrator*
(July 2001-December 2001)

The Agricultural Development Division assists in the market research, planning, development, and expansion of Hawaii's agricultural industries through market research and promotional events, as well as disseminating a collection of production and marketing information.

MARKET DEVELOPMENT BRANCH
Calvin Lee, *Manager*

The mission of the Market Development Branch is to assist in the development of the agricultural industry, consisting of commodity groups and food processors, through the expansion of new and existing markets.

Major activities during FY 2002 were:

Trade Shows and Trade Missions

- Partnered with Japan Airlines on a trade mission to Sapporo, Japan to develop new markets for value added Hawaii products.

- Through a Western United States Agricultural Trade Association (WUSATA) grant, sponsored and worked jointly with the Chairperson's office with a trade mission to Japan to develop new markets and distribution for Hawaii-grown coffee.

- Co-sponsored a Hawaii exhibit at the Natural Products Expo West Tradeshow in Anaheim, California to develop new markets for Hawaii natural products.

- Co-sponsored a Hawaii exhibit at the National Restaurant Association Tradeshow in Chicago to develop new markets for Hawaii products.

- Sponsored a Hawaii exhibit at the Tropical Plant Industry Exhibition (TPIE) Tradeshow in Florida to develop markets for Hawaii's nursery plants.

- Sponsored the Ninth Island Expo in Las Vegas to develop markets for Hawaii's products in Las Vegas.
- Sponsored a demonstration and promotion of Hawaii's lei flowers and lei making at the American Institute of Floral Designers' Symposium in San Diego.
- Sponsored and worked jointly with the Chairperson's office to host a mini trade show in Honolulu to introduce Costco buyers to Hawaii producers.

Promotional Materials

- Together with the Chamber of Commerce of Hawaii, distributed "Buy Hawaii" point-of-purchase materials to promote the sales of local produce and manufactured products in Hawaii retail outlets.

Matching Funds Promotional Contracts

- Pineapple Growers Association of Hawaii $120,000 matching funds promotional program, targeting the local and tourist markets has been implemented. A highlight of the program was the Second Annual Pineapple Festival was held at McCoy Pavilion in Ala Moana Park in the Fall of 2002 and the development of the first Pineapple Growers Association of Hawaii website.
- Hawaii Macadamia Nut Association $150,000 matching funds promotional program helped to develop a 100 percent Grown in Hawaii Brand Macadamia Nut, which has been implemented for the second year. The continuing promotion builds on the base established during the first year and is expanding to the Mainland market.
- Hawaii Coffee Association $98,000 matching funds promotional program to promote the sale and awareness of all of Hawaii's coffees to trade buyers and consumers on the Mainland and in Hawaii. Activities include an expanded participation in the Specialty Coffee Association of American Trade Show, coordinating and implementing the Hawaii Coffee Association Conference and Trade Show, consumer advertising, and updating of a Hawaiian Coffee Website.
- Hawaii Farm Bureau Federation $50,000 contract to promote the Hawaii State Farm Fair.

Local Market Promotions and Activities

- Participated in agricultural trade and consumer fairs and exhibits such as the Lodging, Hospitality, and Foodservice Expo on Oahu; the Made In Hawaii Festival on Oahu; and the Big Island Farm Fair on the Island of Hawaii.
- Directory of Hawaii Agricultural and Food Producers – Facilitated the registration of local companies in the department's database (directory) that gives companies the ability to access the global market.
- Assisted in organizing the Department of Agriculture's participation in the Hawaii State Farm Fair including:
  - Developed "A Conceptual Agenda and Target Themes For the Agricultural Exhibit Area at The 2002 State Farm Fair".
  - Developed a registration package that responds to the needs of exhibitors, providing the information for equipment and utilities allocation and establishing a communication system between the Market Development Branch, exhibitors, and various parties involved in the fair.
  - Recruited agricultural companies and related organizations to showcase, promote, and sell their products and/or services.
  - Developed and implemented exhibits that educated the fairgoers.
  - Organized cooking demonstrations by chefs that featured local vegetables and seafood. The audience was invited to sample the dishes.
  - Participated in the 10th Anniversary Gala Celebration of the Hawaii Regional Cuisine at the Royal Hawaiian Shopping Center and the Sheraton Waikiki Hotel. The event also included a farmers' market and escorted farm tours for travel writers.
  - Assisted in coordinating the agricultural participation in the "Buy Hawaii" campaign that was designed to stimulate business after the September 11th event.
  - Tabulated, analyzed, and evaluated Hawaii Food Manufacturers Association's exhibitors' survey data collected at trade shows such as the Made in Hawaii Festival and the Lodging, Hospitality, and Food Service Expo.
  - Updated the Calendar of Events of trade shows, fairs, and festivals that benefit agricultural and food producers and Ag-tourism companies.
  - Consummated the purchase of the "Made in Hawaii with Aloha" and the "Grown in Hawaii with Aloha" trademark logos.

Mainland and International Market Promotions and Activities

- Participated in developing, coordinating, and implementing the third Governor's Exporter of the Year program.
- Coordinated and administered the WUSATA Market Access Program of the USDA, Foreign Agricultural Service (FAS) that consists of 1) a generic program that included a trade mission to Japan to establish markets for Hawaiian grown coffee and a trade mission to Japan to develop value added markets for Hawaiian cut flowers, 2) a branded program that assisted five Hawaiian companies in developing specific export markets for their products, and 3) an export readiness program that provides one-on-one export consultation advice by an expert to Hawaiian companies.

HAWAII AGRICULTURAL STATISTICS SERVICE BRANCH
Donald Martin, *State Agricultural Statistician*

The Hawaii Agricultural Statistics Service (HASS) Branch is a cooperative effort between the Hawaii Department of Agriculture and the National Agricultural Statistics Service, U.S. Department of Agriculture. This partnership, spanning nearly four decades, allows the efficient use of state and federal resources, while at the same time, providing a comprehensive array of agricultural intelligence and reducing respondent burden.

Major activities of HASS included data collection, analysis, and timely publication of agricultural statistics for the State. The result of these efforts was a measure of total farm income of $510 million during FY 2001. Most of HASS data collection efforts were in the diversified agriculture sector that was valued at $354 million in FY 2001.

Activities during FY 2001 included the following:

- ❖ Conducted first ever survey and published results of Ag-tourism.
- ❖ Conducted special farmer computer use survey.
- ❖ Conducted special acreage variety survey for papaya industry.
- ❖ Made 15,500 individual contacts via personal interviews, telephone, and mail questionnaires.
- ❖ Published 130 reports.
- ❖ Distributed more than 43,000 releases to farmers, other individuals, businesses, universities, and governments worldwide.
- ❖ Answered more than 1,200 individual requests for information by mail, telephone, and office handouts.

Statistical reports are available on the HDOA website at: www.hawaiiag.org/hdoa/

HASS also publishes annually the *Statistics on Hawaii Agriculture.*

MARKET ANALYSIS AND NEWS BRANCH
Matthew K. Loke, Ph.D., Manager

The Market Analysis and News Branch (MANB) is responsible for enhancing the effectiveness and efficiency of agriculture by conducting economic, market and business feasibility research, evaluating the efficiency and effectiveness of market development programs, collecting data on agricultural commodity shipments, supply and wholesale prices and disseminating information through various media. Through these functions, MANB assists the state's agricultural industry in its development and expansion efforts and provides sound input for program planning and policy making within and outside the department.

MANB is tasked with two primary, yet distinct functions. The first involves research on all market aspects of agricultural products. Toward this end, MANB conducts some ten research or program evaluation studies annually. The second function is carrying out the market news program, jointly with the Market News Branch of the Agricultural Marketing Service, United States Department of Agriculture. This program provides up-to-date information on current market conditions – wholesale market prices throughout the state, movement of fresh fruits and vegetables, and supply and demand information on different products.

Activities and accomplishments for FY 2002 included the following:

- ❖ Assisted the Hawaii Farm Bureau Federation (HFBF) to obtain a $600,000 federal grant to help Hawaii farmers reduce their excess inventories and to subsidize their transportation costs in the aftermath of the September 11th events. A sum of $100,000 was dedicated to support the "Buy Hawaii" marketing program, initiated by the Hawaii Chamber of Commerce.
- ❖ Jointly published, with the University of Hawaii's College of Tropical Agriculture and Human Resources (CTAHR), an article entitled "Agriculture's Contribution to Hawaii's Economy – An Update." This article looked at various economic measures of agriculture's contribution to the state economy, such as sales, valued added, employment and personal income.
- ❖ Jointly developed with CTAHR, a query database, web-site application that provides price trend over time for 25 select fresh fruits and vegetables grown in Hawaii.
- ❖ Updated a study on the market share for fresh fruits and vegetables in Hawaii and conducted a comprehensive survey study on farmers' markets on Oahu.
- ❖ Continued to collaborate with the National Agricultural Statistics Service (NASS) and the National Association of States Department of Agriculture (NASDA) in enhancing the data collection efforts of the MANB.
- ❖ Continued to collect, compile, publish and disseminate weekly reports on a timely basis with limited personnel. The reports include:
  - ♦ Honolulu Wholesale Prices of Fresh Fruits and Vegetables;
  - ♦ Neighbor Island Wholesale Prices of Fresh Fruits and Vegetables;
  - ♦ Weekly Honolulu Arrivals of Fresh Fruits and Vegetables;
  - ♦ Honolulu Barge Arrivals; and
  - ♦ Honolulu Wholesale Egg Market.
- ❖ Conducted a survey study entitled "Hawaii Floral Products Test Market Project, 2002," to explore the market potential for Hawaii's floral and value-added products to Japan.

AGRICULTURAL LOAN DIVISION

Doreen K. Shishido
Administrator

The Agricultural Loan Division remains committed to the growth, development, and well being of the agricultural and aquacultural industries in Hawaii. Financial assistance to these industries continues to be the primary focus of the division. As diversified agricultural activities continue to grow throughout the state, this service has become increasingly more important.

The Agricultural Loan Division continues to position itself toward the facilitation of the promotion, development, and maturity of Hawaii's agricultural and aquacultural industries. For the past year, $10.9 million in loans were approved through the program with financial assistance provided to a wide variety industries throughout the state. Of this, $5.89 million was approved for the Agricultural Loan program under Chapter 155 Hawaii Revised Statutes (HRS), $500,000 was approved for the Aquaculture Loan Program under Chapter 219 HRS, and $4.525 million was approved under a special loan program for Kauai under Acts 78 and 266 to stimulate economic activities on the island. As the loan ceiling for the Agricultural Loan Program is $4.5 million per year the balance of the $5.89 million that was approved above the ceiling will need to be disbursed and funded during the next fiscal year. As the loan ceiling for the Aquaculture Loan Program is $500,000 per year, the entire allocation was used during the period. For Acts 78 and 266, $5 million was set aside from the Agricultural Loan Division's revolving loan funds to carry out the Acts.

The funding provided under the division's loan programs serves a range of purposes including the expansion of operations, development of infrastructure to improve operations, purchasing of equipment to increase efficiency, and to help in the recovery from natural disasters. This assistance helped to sustain and further develop these industries, which continues to provide jobs and income to residents, reduces dependence on imports, and provides green and open space appreciated by residents and visitors alike.

While diversified agriculture continues to expand, agriculture is often seen as a relatively risky industry. In addition to the normal business risks such as economic conditions, competition, and governmental regulations, agriculture faces added risks that include natural disasters like drought, floods, and high winds, as well as diseases and pests. Often times these added risks preclude loans from conventional commercial sources. The Agricultural Loan Division bridges this financing gap when conventional lending sources are unable to provide funding independently. To this end, the division cooperates with conventional lenders to minimize their risks through insured and participation loans. The division also provides direct funding to borrowers that have been denied loans from conventional sources and meet the program's eligibility criteria.

During the past fiscal year, the division provided financial assistance to a broad range of operations throughout the state in a variety of ways. Examples include loans for expansion such as to an Oahu dairy to purchase heifers to increase the milk cow herd and a loan to a Keaau orchid operation on the Big Island to purchase additional farm land and to develop shade houses. The program enabled a small Oahu vegetable farmer to relocate from Manoa to Haleiwa and helped a new farmer on the island of Hawaii in Naalehu purchase equipment to farm coffee more efficiently. Within the fiscal year, the program approved the first loans to food manufacturers. Act 51 was passed in the 2000 legislative session to allow the program to provide funding to food manufacturers that utilize Hawaii-grown agricultural products. The intent was to assist farmers by not only expanding usage and demand for local products through food manufacturers but also allow farmers to use otherwise unsalable products. One loan was made in participation with a commercial lender to a candy manufacturer that utilizes Hawaii-grown macadamia nuts and another was to an operation that processes taro burgers.

In participation with a private lender, the division provided a food manufacturer loan to Hawaiian Candies & Nuts, Ltd. to purchase equipment and to expand into new markets.

In FY02 the program also provided loans to aquaculture operations including a prawn farm in Kahuku on Oahu and a shrimp broodstock hatchery operation and a seahorse producer in Kona at the Natural Energy Laboratory of Hawaii Authority site at Keahole. In addition to the Agricultural Loan Division's regular loan programs, Acts 78 and 266 were also in effect during the fiscal year, which were passed in the 2001 Legislative session. The intent of the acts was to establish a special Kauai economic development loan program to stimulate economic activity on the island through aquaculture and agriculture.

During the 2001 Legislative session, the Legislature also requested that the Agricultural Loan Division emphasize outreach to small farmers outside the farming mainstream. These farmers are to a large extent immigrant farmers and others that typically are not members of formal agricultural and commodity organizations. As part of the effort, the division undertook activities designed to reach some of these farmers. Among ways in which the division sought to reach these farmers was to network with micro-lenders that focus on this segment of businesses such as the Pacific Gateway Center (formerly known as Immigrant Center), seek input from the program's existing borrowers both immigrant and non-immigrant, and visit areas of concentration of producers. The division expects to continue these outreach efforts to make this segment of the farming community more familiar with the loan program.

The program also continues as a "safety net" during emergency situations. During the prior fiscal year, the emergency loan program was activated for two situations. On July 17, 2000 the emergency loan program was activated to provide relief from drought for Hawaii's cattle industry. On November 6, 2000 the emergency loan program was again activated to provide relief from torrential rains and flooding on the Big Island and Maui. During that fiscal year six emergency loans were approved to assist borrowers in their recovery efforts. These emergency loan programs were still active in the early part of the FY 2002. In this fiscal period, another three emergency loans were approved: two to help beef cattle ranchers on Maui recover from the drought and another loan to help a farmer on the island of Hawaii recover from heavy rains and flooding. In addition, in May 2002 heavy rains and flooding caused damage to some farmers located on Oahu. Although the damage was not sufficiently widespread to justify activation of the emergency loan program, the division approved two loans under the regular loan program to farmers in Waiahole, Oahu to recover from the damage.

In providing the financial services as described, the Agricultural Loan Division is a self-sustaining entity as it operates from its own revolving fund and does not require annual fund appropriations. As a revolving fund, principal amounts collected from loan payments are used to replenish the revolving fund, while interest payments pay for all of the division's administrative and operating costs. The administration of the program is a balancing act as the division is self-sufficient requiring reasonable expectation of repayment while also existing to assist those that are unable to obtain financing from conventional sources.

Working with the Pacific Gateway Center, the division was able to assist Randy Sourivong with a working capital loan for his vegetable farm in Kahuku

Major highlights of FY 2002 were the following:

- Approved 38 loans for $10.9 million during FY02. Of this 29 loans for $5.89 million was approved under the Agricultural Loan Program, 5 loans for $500,000 was approved under the Aquaculture Loan Program, and 4 loans for $4.525 million was approved under Acts 78 and 266 for the special Kauai economic development loan program.
- The division's portfolio as of June 30, 2002 was valued at $19.9 million with 221 loans booked. Of this, $11.3 million was attributed to the county of Hawaii, $4.1 million to the county of Oahu, $2.6 million to the county of Kauai, and $1.9 million to the county of Maui.
- FY2002 collections yielded $5.016 million. Of the collected amount, $1.075 million was in interest and $3.940 million was in principal.
- The division continues to upgrade its information technology capabilities. During this fiscal year, documentation for loans and administrative tasks were converted from older software as the software was not fully compatible with the current operating platform. Approximately 60 forms and documents have been converted.
- During this fiscal year, the Legislature transferred $4.8 million from the division's revolving loan funds to the State's general funds to help balance the budget deficit.

AGRICULTURAL RESOURCE MANAGEMENT DIVISION

Brian Kau, P.E.
Administrator/Chief Engineer

The Agricultural Resource Management Division works to ensure that the state has adequate and reliable sources of agricultural water, farmland, infrastructure for farming and agricultural-related processing facilities. The division provides administrative oversight over state agricultural park lots, processing facilities and several irrigation systems statewide.

By maintaining and operating abandoned plantation irrigation systems, the division supports and encourages the development and expansion of diversified agriculture on former mono-crop plantation lands.

Activities for FY 2002 included the following:

- The September 11, 2001 World Trade Center tragedy impact was felt by many of our agricultural park tenants. Act 15 of the 2002 Third Special Session authorized the waiver of leases for parties that suffered significant losses due to the attack. The division, through the board of agriculture, was able to grant six months of lease rental relief for fifteen farmers, totaling approximately $14,000.

- Due to reconstruction and repairs to the Lower Hamakua Ditch Watershed Project, the Lower Hamakua Ditch was unable to supply irrigation water for an extended period of time. At the request of the Hamakua/North Hilo Agricultural Cooperative, the Board of Agriculture, acting under the authority of Section 4-153-3(b)(8), Hawaii Administrative Rules, approved a waiver of Hamakua Agricultural Park lease rental payments for a six month period beginning April 1, 2001.

- The emergency action plan for the 60 million gallon Waimanalo reservoir was approved in December 2001. The plan describes the roles and responsibilities of the department and other agencies in the event of an emergency. It has been reviewed and distributed to various county and state agencies, including the Honolulu fire and police departments.

- The irrigation system administrative rules for the Kekaha Agricultural Park Irrigation System were repealed. Due to the tenant makeup of the Kekaha Agricultural Park, the irrigation system was not being utilized. Concerns regarding the liability of the unused system were addressed by repealing the rules and issuing a revocable permit to operate and maintain the system to Pioneer HI-Bred International.

- The division has applied for a Department of Interior, Bureau of Reclamation grant to begin the Agricultural Water and Use Development Plan. This grant is authorized by Public Law 106-566. The grant will be used to begin the plan. The funds will be used to hire consultants who will review selected irrigation systems that are critical for diversified agriculture.

- The year 2002 was a year of change for the division's personnel. Several retirements, including the Administrator and Chief Engineer (Paul T. Matsuo), and a reorganization took place. We welcomed new faces for the Waimea Irrigation System, an administrative account clerk, and the Maui and Hawaii County district property manager. Key position vacancies include the Molokai Irrigation System manager and the division's civil engineer.

- The division opened communication with Molokai Ranch (as new owners of the Kaluakoi Resort) to assist with their efforts to revitalize the resort. Arrangements for water storage and repayment were completed. The ranch now has an integral role with the Molokai Irrigation System.

- The agricultural park program continued to monitor and replace lessees who did not meet the program's objective and continued to re-award leases to qualified applicants. Staff continued to counsel and work with lessees who were experiencing difficulty meeting their lease terms and conditions at older agricultural parks in Pahoa, Keahole, Panaewa Waimanalo, and Waianae. Farmers with new or recently granted leases at Kahuku, Hamakua, Molokai, Kalaeloa, and Kekaha started their farming operations.

Capital Improvement Projects for FY 2002:

- The 2002 legislative session was a successful year. Approximately $11 million was appropriated for various projects, agricultural parks, and irrigation systems statewide. The funding is anticipated to complete and/or continue many of the projects listed below.

Construction of the new Honokaia Reservoir on the Big Island.

Big Island of Hawaii

Projects completed this year:

- Hakalaoa Falls Restoration Tunneling Project
- Design and Replacement of Flume #30 (Lower Hamakua Ditch)
- Construction of the new Honokaia Reservoir
- Repair of the Kau Irrigation System

Ongoing projects:

- Paauilo Reservoir Lining-construction
- Paauilo Pipeline Replacement-construction
- Phase I Flume Replacement-construction (Lower Hamakua Ditch)
- Phase II Flume Replacement-design (Lower Hamakua Ditch)
- Honomalino Watershed (South Kona)-planning

Maui

Projects completed this year:

- Upcountry Phase I

Ongoing projects:

- Upcountry Phase II (main line extension-design)
- Upcountry Phase III (main line extension, Kimo Road lateral, and Pulehuiki/Kamehamehaiki lateral)

Molokai

Projects completed this year:

- Well #22
- Waikolu Valley Pump Improvements

Ongoing projects:

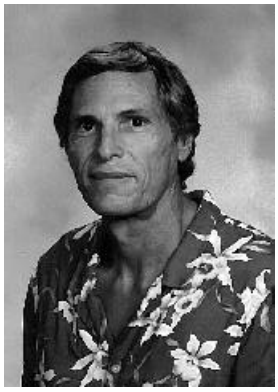
- ADA improvements to Molokai Irrigation System office.

Kauai

Ongoing projects:

- East Kauai Irrigation System
- Design/Build Project for Portable Power Generators

ANIMAL INDUSTRY DIVISION



James Foppoli, Ph.D., D.V.M.
Administrator

The mission of the Animal Industry Division is to protect Hawaii's livestock and poultry industries and the public health through the control and prevention of pests and diseases. The division conducts the following programs: animal disease surveillance and epidemiology, administration of voluntary livestock and poultry disease certification programs, laboratory diagnosis, dog and cat quarantine to prevent rabies introduction, animal and bird importation inspection, and livestock brand registration. The primary focus of the division is shifting to implementing new disease surveillance and control programs in support of the livestock industry. The development of expertise to insure rapid and appropriate response to incursions of highly contagious diseases, such as foot and mouth disease or newly emerging diseases, is a division priority. Hawaii's statuses for diseases under the State-Federal Disease Control Program are:

Brucellosis Free, cattle and swine
Pseudorabies Free, Stage V
Bovine Tuberculosis, Accredited Free

In addition, Hawaii is recognized as free of anaplasmosis and bluetongue virus, facilitating the export of cattle from Hawaii to Canada.

The Livestock Disease Control Branch is continuing activities relating to voluntary disease control programs such as Scrapie in sheep and goats and Johne's disease in dairy cattle, and initiating surveillance for bovine spongiform encephalopathy (BSE) a disease that can cause human disease and that devastated the cattle industry in England and several other European countries.

The division's plan for responding to a highly contagious animal disease is progressing however additional details associated with implementation of the plan still need to be finalized. A Homeland Security Fund Grant in the amount of $68,000 was obtained by the division for emergency preparedness activities. A substantial portion of these funds will be used to construct a statewide computer mapping system for livestock and poultry with associated informational databases.

ANIMAL QUARANTINE BRANCH

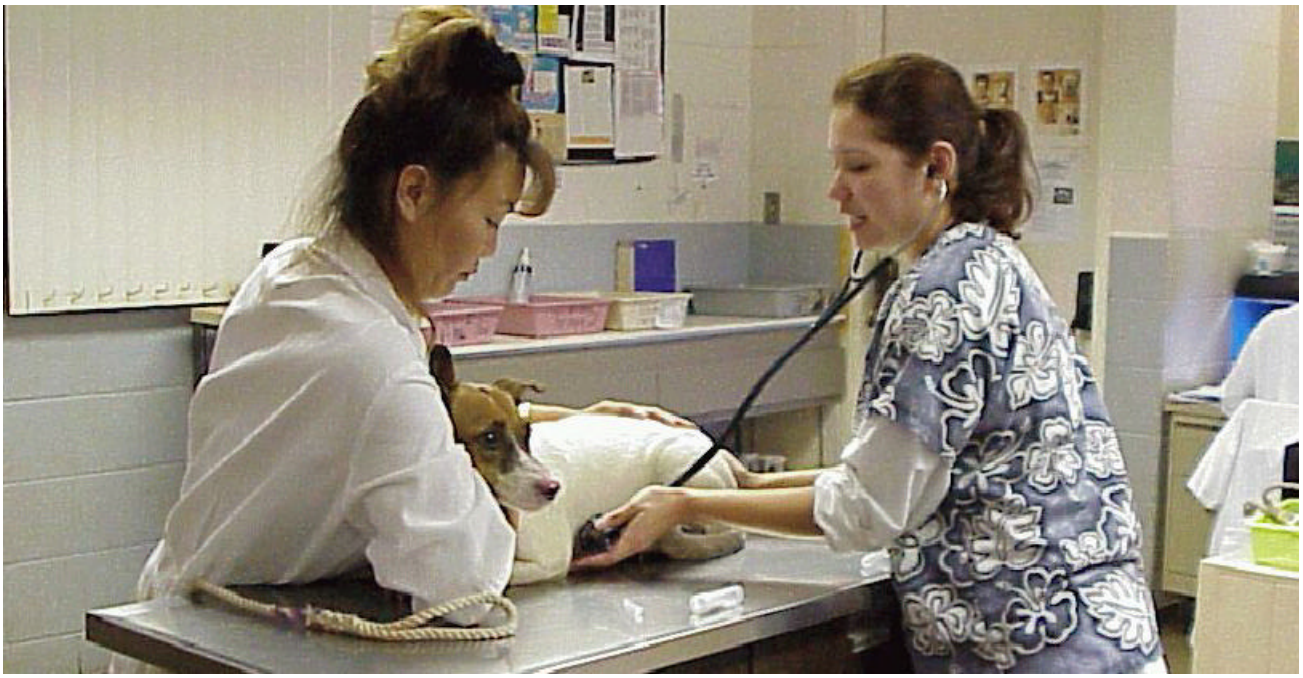
Isaac M. Maeda, D.V.M., *Program Manager*

In May 2002, Hawaii's rabies quarantine received national media attention when the castaway dog "Hokget" was rescued from the South Pacific off of the derelict ship Insinko and brought to Hawaii. Inspectors from the department met the tugboat American Quest at Honolulu Harbor and transported Hokget to the Animal Quarantine Station in Halawa to be examined and routinely processed. Hokget was eventually quarantined at the Kauai Humane Society. The Kauai Humane Society is a privately owned facility which was approved as a satellite quarantine station in February 2002. Publicity surrounding Hokget demonstrated the uniqueness of Hawaii as one of the few rabies-free areas in the world.

This was the sixth fiscal year for the 30-day quarantine program. The administration of the 30-day program continues without significant difficulty. In contrast to the 120-day program, the 30-day program relies heavily on computerized databases to monitor and verify information relevant to 30-day quarantine qualification. The department also maintains a website dedicated to Hawaii's rabies quarantine program. The department's interactive website contains all of the information and forms relating to quarantine and the importation of cats and dogs. Pet owners can access pre-arrival rabies test results, 30-day quarantine-eligible dates, as well as download relevant forms and information at this HDOA website.

During FY02, the portion of quarantined dogs and cats undergoing 30-day quarantine was 74.4 percent similar to FY99 thru FY01. Thirty-day quarantine qualification for active duty military personnel decreased slightly from a peak of 83.5 percent during FY01 to 79.5 percent in FY02. The average daily population was 758 animals with a range of 508 to 846 animals occupying the quarantine station at any given time during FY02. Similar to FY01, cats represented 36.4 percent of incoming animals. Active duty military pets comprised 33.8 percent of quarantined dogs and cats, representing a four percent decrease from prior years.

As shown in the accompanying figure, the total number of animals completing quarantine increased slightly compared



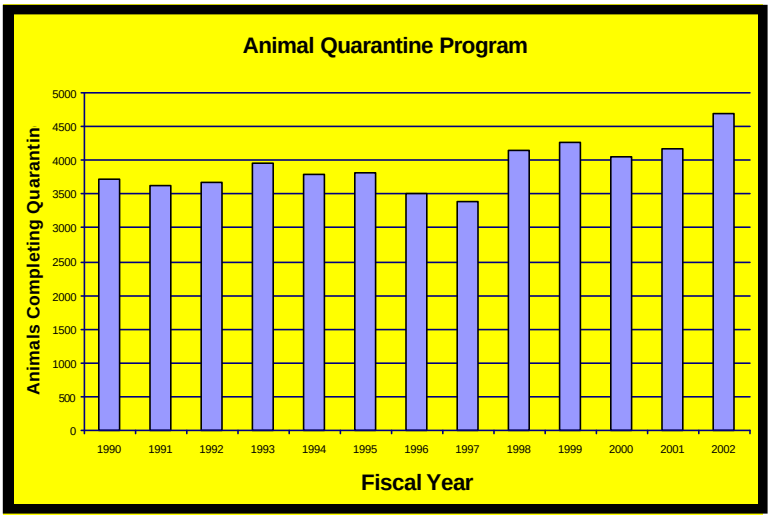
Hokget, the dog rescued from an abandoned tanker, receives an initial examination at the Animal Quarantine Station dispensary by staff veterinarian Dr. Raquel Wong (right) with assistance from veterinary technician Debbie Cambra (left).

to FY01. In addition to 4,681 animals completing quarantine, 349 dogs and cats spent varying lengths of time at the quarantine station while transiting to other destinations.

In response to the Rabies Import Analysis 2002, a proposal was submitted to the Board of Agriculture to incorporate a five-day confinement period option along with the existing 30-day and 120-day programs. This option would be available to cats and dogs meeting specific pre-arrival vaccination, blood testing and waiting period requirements.

In FY00, the Twentieth Legislature passed Act 278, SLH 2000 that provided a $500,000 general fund appropriation for the purpose of a quarantine fee reduction. Most quarantine users were eligible to receive a fee reimbursement of either $120 or $220. To date, 85 percent of the funds appropriated for reimbursement of quarantine fees have been expended. Efforts have been ongoing to individually contact remaining users who have not applied.

In addition to rabies exclusion, the quarantine program continues to monitor dogs carefully for ticks exotic to Hawaii. No exotic ticks of medical importance were discovered during FY02. Rhipicephalus sanguineus, the brown dog tick, is currently the only tick established in Hawaii associated with dogs.



LIVESTOCK DISEASE CONTROL BRANCH
Jason D. Moniz, D.V.M., *Manager*

The Livestock Disease Control Branch prevents, investigates, conducts surveillance, controls and eradicates animal diseases that have serious economic impact on the local and national livestock and poultry industries, some of which impact public health. The branch inspects animals entering the state and insures compliance with division rules and laws pertaining to the control and eradication of animal diseases.

❖ **Bovine Tuberculosis**
Bovine Tuberculosis free status maintained
Bovine tuberculosis a chronic, debilitating disease of cattle, bison, goats, cervids and other animals that can also cause a serious disease in man, is caused by the bacteria Mycobacterium bovis.

The state is classified by USDA as bovine tuberculosis free. The last infected herd found on the eastern end of Molokai in 1997 (Ualapue), was completely depopulated. After detection of a single infected cow at slaughter, no additional infected cattle were found in this herd or the ensuing investigation, which resulted in the testing of 5,000 head of cattle on Molokai and Maui. No cattle affected with bovine tuberculosis have been detected since.

A State-USDA-hunter assisted survey of wildlife, which began in 1998, continues on Molokai to monitor the occurrence of bovine tuberculosis in axis deer, feral swine, feral goats and mongoose. Two feral swine infected with bovine tuberculosis were found (Ualapue and Kaluaaha) in 1999 and another infected feral swine was discovered near these areas (Mapulehu) in December 2001. Since 1998 and as of the end of fiscal year 2002, 373 feral swine were submitted for testing by hunters. No other wildlife has been found infected with bovine tuberculosis during this survey. Historically, feral swine, axis deer and mongoose have been found infected with bovine tuberculosis in areas where infected cattle herds were found. The wildlife survey, with focus on sampling the Ualapue and adjacent lands, continues. The plan is to continue the survey for surveillance purposes, while causing a focal reduction of feral swine around the Ualapue area. Hunters are paid USDA-Veterinary Services stipends of $50 per sample submitted for gross examination and laboratory culture, histopathology and PCR testing.

In addition to the wildlife surveillance, all cattle east of Kamalo, Molokai are required to have an annual negative bovine tuberculosis test or be tested negative within 30 days prior to movement out of the area. All herds are in compliance with these movement and test requirements.

A quarantine of feral swine disallowing their movement east of Kamalo is also in place to prevent the potential spread of bovine tuberculosis infected feral swine from the area.

In addition to surveillance activities on Molokai during the fiscal year, 6,078 head of cattle statewide were tested negative for surveillance or export purposes.

❖ **Bovine Brucellosis**
Bovine Brucellosis class free status maintained
Bovine brucellosis is an infectious disease of cattle, bison and elk, caused by the bacteria Brucella abortus. Brucellosis can also infect man.

During the fiscal year, 10,632 cattle were tested which resulted in two (2) suspects being found. Epidemiological investigations found no evidence of herds infected with bovine brucellosis. Supplemental testing, epidemiological investigations and herd tests found no evidence of Brucella abortus infections. Hawaii has been officially classified free of brucellosis since 1983. Infrequent suspects and reactors have been found to be caused by Brucella suis, which rarely affects cattle, or Yersinia enterocolitica infections. Brucella suis, which causes brucellosis infections in swine, has been found to occasionally affect cattle causing a self-limiting, subclinical infection. The cattle testing positive originated in areas where they have contact with feral swine known to be infected with Brucella suis. Due to the self-limiting nature of Brucella suis in cattle no quarantines or other control actions were deemed necessary to address these findings. Self-limiting gastrointestinal infections with Yersinia enterocolitica has also been determined to cause false positive responses to the Brucella abortus surveillance serological tests.

❖ **Bovine Anaplasmosis**
Hawaii remains free of Anaplasmosis
Anaplasmosis is an infectious disease of cattle caused by the rickettsia, Anaplasmosis marginale, which is characterized by anemia, jaundice, loss of appetite, weight loss, fever and mortality rates up to 50 percent. Anaplasmosis is not infectious to man.

During the fiscal year, 5,753 cattle were tested for anaplasmosis. No suspects or reactors were found.

Hawaii's ability to maintain its cattle herds free of anaplasmosis has resulted in Canada regionalizing Hawaii and recognizing Hawaii cattle as free of anaplasmosis. This free status allows for the shipment of feeder cattle from Hawaii to Canada without the need for pre-entry testing.

❖ **Swine Brucellosis & Pseudorabies**

Hawaii maintains free statuses for Swine Brucellosis and Pseudorabies

Brucellosis in swine is caused by the bacteria Brucella suis. Infected swine experience reproductive failures including abortion and infertility. Brucella suis can cause serious infections in man.

Hawaii retained its disease-free status for swine brucellosis despite finding a single infected farm in Holualoa in the North Kona district on the island of Hawaii. A sow found to be a reactor at slaughter was traced back to its farm of origin. A complete herd test found 60 percent of the swine in the herd to be reactors. The herd was depopulated on January 16, 2002 with indemnity, cleaned, disinfected, secured from contact with feral swine and repopulated 30 days after all herd plan requirements were met. An epidemiological investigation traced no additional farms to the infected herd and although there was no direct evidence of contact with feral swine, feral swine were presumed to be the source of infection.

Feral swine in the Kona, Hamakua (Hawaii), Kahakuloa (Maui), Ft. Shafter westward through Waimea (Oahu) are known to be infected with swine brucellosis.

In addition to the testing of all sows and boars more than six months of age at slaughter annually, 25 percent of the herds in the State are randomly selected and tested to determine their status. In addition, all swine more than six months of age, at slaughter, are tested for surveillance purposes. During FY 2002, 1,224 domestic swine and 52 feral swine were tested for surveillance purposes.

Pseudorabies, a viral infection of swine, causes respiratory disease and reproductive failure. Pseudorabies can cause an acute fatal disease to other species but does not affect man. Surveillance testing of 1,177 swine during fiscal year 2002 found no infected domestic swine. An additional 50 feral swine were tested with four (4) from the island of Oahu testing positive. Feral swine on the island of Hawaii, Maui and Oahu are known to be infected with pseudorabies. Infected feral swine populations serve as a constant threat for reinfection of domestic swine populations.

A quarantine remains in effect that disallows the introduction of feral swine into domestic herds and also disallows the inter-island movement of feral swine. Historically, all domestic herds found infected with pseudorabies or swine brucellosis in the State have been traced to exposure with infected feral swine.

❖ **Porcine Reproductive and Respiratory Syndrome (PRRS) Survey**

A serological survey for PRRS conducted in FY 2001 found significant infection rates for PRRS on Oahu, Maui and West Hawaii. A few farms infected on Molokai and East Hawaii and no farms infected on Kauai. As a result of these findings, Quarantine Order No. 92 was put in place to protect the swine industry on Kauai from infection with PRRS. Swine for movement to Kauai must be test negative, isolated, and retested negative prior to entering swine herds there.

Foreign Animal Disease Outbreaks

❖ **Foot and Mouth Disease**

During the spring of 2001 the U.S. was threatened by multiple Foot and Mouth Disease (FMD) outbreaks, most notably in England and several countries in South America. This threat continued through FY 2002. USDA, and the State Departments of Agriculture, to preclude the introduction of FMD, put increased preventive and surveillance measures in place. In Hawaii, increased detection efforts occurred at all ports of entry, Swine Health Protection Act activities were heightened resulting in increased identification and inspection of swine operations feeding garbage. Measures were taken to insure that all foreign garbage arriving in the state was properly sterilized and disposed of. As a result of the threat from this highly contagious foreign animal disease Hawaii received four additional USDA positions assigned to the detection and prevention of foreign animal diseases. In addition, a state veterinary medical officer received certification and training at the USDA Plum Island Foreign Animal Disease Laboratory as a Foreign Animal Disease Diagnostician (FADD). Hawaii currently has one State and three USDA veterinarians trained as FADDs.

❖ **Transmissible Spongiform Encephlopathies**

Scrapie

Scrapie is a transmissible, insidious degenerative disease affecting the central nervous system of sheep and goats.

Hawaii has adopted and is recognized as being consistent with the USDA, Voluntary Scrapie Certification Program Standards. A State Scrapie Certification Board to oversee the program has been formed and began the process of certifying goat and sheep flocks within the voluntary program. Scrapie has never been diagnosed in any goat or sheep flocks in Hawaii. Interstate movement requirements were put in place that requires that all female sheep moving interstate or to shows are identified back to their flock of origin with the use of official government approved ear tags.

- **Bovine Spongiform Ecephalopathy (BSE)**
  FDA regulations prohibiting the feeding of ruminate containing feed to ruminates is in place in Hawaii and throughout the Nation. No cases of BSE have ever been found in the U.S. Surveillance for BSE is in place nationwide. Hawaii submitted seven samples for BSE surveillance during FY 2002.

- **West Nile Virus (WNV)**
  During FY2002 new outbreaks of WNV occurred in the U.S. spreading westward as far as the Rocky Mountains. Steps to create a working group of pertinent scientific personnel from HDOA, state Department of Health, state Department of Land and Natural Resources, U.S. Fish & Wildlife Service, U.S. Geological Survey and the University of Hawaii were put in place to evaluate the risks associated with the potential introduction of this disease and to propose possible preventive and mitigative measures.

Importation/Exportation of Livestock, Poultry and Other Animals

There were no embargos put in place during FY 2002.

Inspected and approved for entry into the State:
- 21,303 head of livestock
- 287,639 poultry and other birds
- 5,025 cases hatching eggs
- 6,813 dogs and cats
- 14,453 other animals

Conducted a total of eight compliance investigations resulting in two citations being issued. Issued 181 written warnings and refused entry on 15 shipments.

VETERINARY LABORATORY BRANCH
Vacant, *Program Manager*

The Veterinary Laboratory participates in diagnostic and disease surveillance activities supporting the Livestock Disease Control (LDC) Branch. Routine serologic testing for livestock diseases of economic and/or human health significance such as bovine and swine brucellosis, anaplasmosis, bluetongue virus, pseudorabies virus, porcine reproductive and respiratory syndrome virus, and Johne's diseases are important ongoing local and national programs. Demonstration of disease free statuses facilitates the export of livestock to national and international markets and contributes to improving the general health and well-being of Hawaii's livestock herds and poultry flocks.

During FY 2002, the laboratory replaced the Card test for swine pseudorabies with an ELISA test that provides a more efficient method of diagnosis. The laboratory reinitiated testing blood samples from dairy cattle for Johne's disease, a chronic debilitating bacterial disease, also using an ELISA technique. The aim of the testing program was to support the partnership between the LDC Branch, USDA, and dairy industry aimed at participating in the National Johne's Disease Voluntary Herd Certification program.

The Laboratory was recertified to perform several diagnostic procedures through training offered at the National Veterinary Service Laboratories (NVSL/USDA), Ames, Iowa. Recertification was for Equine infectious anemia (agar gel immunodiffusion test) and pseudorabies (ELISA test).

The Veterinary Laboratory continues supporting the local cattle industry by performing required export tests. During FY 2002, approximately 4,000 blood tests were performed on live cattle being exported to Canada.

Pathological cases from livestock and poultry have remained relatively constant but diagnostic procedures on pets such as dogs, cats and birds have decreased as the laboratory is no longer accepting routine samples from these animals. Routine examination of samples for intestinal parasites from quarantined dogs and cats has been steady for the past two years, averaging about 350 tests a month. The number of blood samples processed for post-arrival rabies serology increased from 3,901 to 3,936 as the number of quarantine entries increased from FY 01 to FY 02. Brain samples from mongoose submitted to the Department of Health for rabies testing increased as a result of increased submissions from the neighbor islands.

AQUACULTURE DEVELOPMENT PROGRAM

John Corbin
Manager

The Aquaculture Development Program (ADP) provides essential support services to encourage further growth and diversification of the aquaculture industry. ADP is a planning, development, and problem-solving organization whose goals are to assist in the start-up of production, service businesses, and contribute to their success. Specific activities include plan and policy formulation, new business development, permit facilitation, marketing assistance, disease diagnosis and prevention assistance, and co-funding of statewide technical extension.

The mission of ADP is to: prepare and implement state aquaculture plans and policies for the expansion of aquatic farming, and research and technology transfer business; coordinate statewide development activities; and directly assist both public and private sector interests in achieving their aquaculture-related goals, so as to create jobs and diversify the economies of all islands.

Major activities for FY 2002 were:

- Continued the implementation of the amended Chapter 190D, HRS, Ocean and Submerged Lands Leasing law by facilitating the approval of the second aquaculture lease by the Department of Land and Natural Resources to Black Pearls, Inc. Wrote article for Sea Technology Magazine on Hawaii's ocean leasing experience.

- Served on the Advisory Committee to a study managed by the University of Delaware, Center for Marine Policy that produced a report for Congress entitled, Development of a Policy Framework for Offshore Marine Aquaculture in the 3-200 Mile U.S. Ocean Zone. Appointed to a multi-disciplinary team to produce a follow-up report to develop operational guidelines for aquaculture leasing in the Exclusive Economic Zone (EEZ).

- Secured federal grant to continue to evaluate open ocean aquaculture sites using GIS and regulatory processes in collaboration with the UH Sea Grant College Program and the Office of Planning, Department of Business, Economic Development and Tourism.

- Participated in the governing boards and advisory committees of: the Pacific Marine Aquaculture Center, Pacific Aquaculture and Coastal Resources Center at UH Hilo, Center for Tropical and Subtropical Aquaculture, National Association of State Aquaculture Coordinators, Natural Energy Laboratory of Hawaii Authority, Marine and Coastal Zone Management Advisory Group, Commodity Advisory Group for Agriculture, University of Hawaii Sea Grant College Program, and Hawaii Aquaculture Association.

- Assisted with permits for species importation and siting for farmers on Oahu, Kauai, Maui and Hawaii, in particular facilitated the decision by a second multinational company to locate the second large-scale shrimp breeding center in Hawaii.

- Co-chaired the Marine Ornamentals 2001 Conference, November 2001 in Orlando, Florida attended by 156 delegates from 22 countries. Contributed a chapter to a book on the marine ornamentals industry based on conference presentations. Negotiated the return of the conference to Hawaii, for Marine Ornamentals 2003 and co-chairing the Organizing Committee.

- Promoted the consumption of aquaculture products by participating in the State Farm Fair, Made in Hawaii Exposition, Sam Choy's Poke Contest, the Hotel and Restaurant Expo, and the Taste of Aquaculture Festival. Also worked with television, radio and print media to promote the industry.

Big Island Abalone Corp. (BIAC) President Michael Buchal holds up a handful of Japanese ezo abalone destined for Japan and US markets. BIAC, the largest abalone farm outside of China, is one of fifteen aquaculture companies located at the Natural Energy Laboratory of Hawaii Authority (NELHA) at Keahole Point, Kona on the Big Island ***(see photo on page 20)***

- Carried out for aquatic animal health management over 100 field trips and analyzed 300 case submissions, and provided animal health consultation services to producers and research organization, statewide, including conducting workshops on disease diagnosis and prevention.
- Received a continuation grant from the USDA for research in disease management for the Hawaii aquaculture industry.
- Co-funded statewide technical extension services to the aquaculture industry, in cooperation with the UH Sea Grant Extension Service leveraging over $200,000 in matching funds through the project.
- Provided technical reviews of research proposals to the UH Sea Grant College Program, U.S. Department of Commerce, U.S. Department of Agriculture, and the Pacific Tropical Ornamental Fish Program (PTOFP). Also assisted in organizing the proposal solicitation and review process for the second year of the PTOFP program which distributed over $300,000 in grants.
- Served on the Board of Directors and provided assistance to the Hawaii Aquaculture Association (HAA) in the areas of meeting and conference development and execution, grant writing and promotion through the annual Taste of Hawaii Aquaculture reception.

The Natural Energy Laboratory of Hawaii Authority (NELHA) pumps nutrient rich seawater to the surface from a depth of more than 2,000 feet. With Kona's year-round sunshine, the process has proven a successful combination for NELHA's 15 aquaculture companies involved in the production of algae, fish and shellfish.

PLANT INDUSTRY DIVISION

Lyle Wong, Ph.D.
Administrator

The Plant Industry Division consists of three branches, the Pesticides Branch, Plant Pest Control Branch and the Plant Quarantine Branch. Together, the branches work to protect Hawaii's agricultural industries by preventing the entry and establishment of detrimental insects, weeds and other pests and by assuring the safe and efficient use of pesticides in Hawaii. The division also works with growers, exporters, and other government agencies to resolve quarantine restrictions in order to allow export of Hawaii's fresh fruits, vegetables, flowers and foliage products to markets worldwide.

PESTICIDES BRANCH
Robert A. Boesch, *Manager*

The Pesticide Program regulates the distribution and use of pesticides through a program of licensing, testing the competency of restricted-use pesticide applicators, and educating and monitoring pesticides distributors and applicators. This is to ensure the efficient, effective and safe use of pesticides to minimize adverse effects on the environment.

Three of the major activities of the program in FY 2002 were as follows:

❖ Emergency Authorization to Use Caffeine to Control Coqui Frogs Received from EPA

The program received emergency authorization from the Environmental Protection Agency (EPA) to use caffeine to control Caribbean tree frogs. A permit program was set up to evaluate sites to be treated. Before treatment was authorized sites were inspected to assure:

- minimal risk of exposure to sensitive persons (pregnant women, individuals with heart conditions, children with attention deficit and hyperactivity disorder and infants);
- no entry to the site for 24 hours after treatment;
- monitoring for nontarget species; and
- the applicant is certified by the department.

Caffeine was to be provided through the normal restricted-use pesticide distribution channels. No use of caffeine to control frogs was accomplished due to the costs (estimated to be over $1,000 per acre), and the conditions placed on its use.

❖ **Ground Water Review Procedure Being Reassessed**

Pesticides user concerns about the ground water protection program resulted in a reevaluation of how the program is being implemented. The Hawaii Department of Agriculture has been using a risk assessment procedure to assess potential of pesticides to leach to drinking water that includes the following steps:

- Label and data review for the following risk factors:
  - Review of the pesticide use pattern for applications to the soil (soil fumigants applied to control nematodes, herbicides applied to the soil to prevent weed seeds from germinating, and ground treatments for termites);
  - EPA approved label advisories or restrictions based on potential to contaminate ground water:
  - Pesticide persistence (half-life) and mobility (solubility, affinity for organic carbon) and using a geographic information system with model using soil and chemical properties to map leaching potential in areas of potential use;
  - Magnitude and extent of potential use.
- If the label and the data suggest that the pesticide may leach, an additional step is taken to provide data summaries provided by the manufacturer, the label on potential use practices and other information to the University of Hawaii for an recommendation on potential regulatory actions.
- Consult with user groups on potential benefits of the new chemicals.

This procedure has developed since 1987, when the Hawaii Pesticides Law was changed to require the Department of Agriculture to determine if unreasonable adverse effects exist when the use of a pesticide will result in the detection of residues in drinking water.

Model development and fieldwork over the past decade has provided much information on pesticide fate in the environment. Some newer pesticides have not been licensed in the State due to potential to leach to drinking water sources.

Since many of these newer pesticides are considered safer to people, the Department of Agriculture has awarded a contract to the Water Resources Research

Center to determine the environmental fate of some of the newer pesticides and to make recommendations on the current decision making process used by the pesticides program.

❖ **Enforcement Initiative for Fumigation Commenced**

Fumigation of structures with toxic gases presents a great risk to the health and safety of building occupants and neighbors if not done correctly. Part of the authorized use of fumigants is to allow the building to aerate for at least six hours following removal of the tarpaulins. After six hours, the fumigator is required to test the atmosphere inside the building to make certain that levels are below toxic levels. For many reasons, buildings may not have been tested before they are reoccupied.

To enforce the above procedure, fumigation inspections were increased in FY 2002 to assure that once a tarpaulin is removed, the buildings are locked and posted until the fumigator tests the air and confirms that the structure is safe to enter.

This increase emphasis in fumigation safety resulted in considerably more administrative penalties being collected in FY 2002 than prior years.

PLANT PEST CONTROL BRANCH (PPC)
Larry M. Nakahara, *Manager*

The primary function of the Plant Pest Control Branch is to reduce population densities of plant pests that cause significant damage to agriculture and the environment to manageable levels. This is achieved through statewide programs to eradicate or control plant pests, which include destructive insects, mites, snails and slugs, noxious weeds, plant diseases, and any other organisms harmful to plants, by utilizing chemical, mechanical, biological, and integrated control measures. It also certifies the genetic purity of seeds grown in the State. The Branch consists of the Biological Control and the Chemical/Mechanical Control Sections.

Some of the activities of the Branch during FY 2002 included the following:

New Pest Detection and Identification

❖ Identified 181 samples of insects and other organisms from which 27 specimens were processed and added to the Branch's Zoological Reference Collection. The collection now contains approximately 165,850 specimens.

❖ Recorded 10 new immigrant organisms in Hawaii during FY 2002. Of these, eight are pest insects, one is a beneficial insect, and one is a plant disease organism. The following are considered to be of significance to agriculture in the State:

❖ **Nettle caterpillar**, Darna pallivitta Moore (Lepidoptera: Limacodidae). Specimens of the nettle caterpillar were first collected from rhapis palm at Panaewa on the island of Hawaii in September 2001. This species occurs in Southeast Asia. In Hawaii, it was initially found on various palms, and subsequently on ti, dracaena, and mondo grass. The caterpillars are a health concern because they have stinging spines that can cause a burning and itching sensation to the skin of those who touch or rub against them. An unsuccessful eradication was attempted against this pest by the HDOA, UH-CTAHR, and the grower.

❖ **Watercress leafhopper**, Macrosteles sp. nr. severini Hamilton (Homoptera: Cicadellidae). Specimens of this leafhopper were found on Oahu at watercress farms in Waiawa near Pearl City in October 2001. The leafhopper has been implicated as the vector of the aster yellows phytoplasma that causes watercress plants to become chlorotic and stunted with the proliferation of many side shoots. Affected plants eventually deteriorate and decompose. Watercress grown in an aquatic environment has been the only crop host affected so far. Both the watercress leafhopper and the aster yellows phytoplasma are new to the State.

❖ **Daylily rust**, Puccinia hemerocallidis Thuem. Daylily foliage infected with this rust fungus was first found in East Hawaii at a daylily nursery in Kurtistown in early-February 2002 and later in the month on Oahu at a Tantalus residence. This rust is native to Asia and is believed to have been introduced into the United States on daylily planting material from Central America. A distinctive sign of the rust is the appearance of the powdery yellow to orange spores on the leaf surfaces. Heavy infections result in the shriveling up and death of daylily leaves.

❖ **Giant whitefly**, Aleurodicus dugesii Cockerell (Homoptera: Aleyrodidae). Infestations of this whitefly were first observed on red hibiscus in the Honolulu International Airport-Mapunapuna area of Oahu in May 2002. It is called the giant whitefly because the adult stage of this species is larger than most other whitefly species. Giant whitefly nymphs damage plant foliage by using their needle-like mouthparts to suck out plant sap and their excretion of copious amounts of honeydew results in a great deal of sooty mold on the foliage. The nymphs also produce an abundance of long, white, waxy filamentous material that covers the lower surfaces of leaves. Presently, hibiscus is the only known host of the giant whitefly in Hawaii.

Projects of the Branch's Biological Control Section included the following during FY 2002:

- **Yellow Sugarcane Aphid** [Sipha flava (Forbes)]. Yellow sugarcane aphid (YSA) population densities continued to upsurge and recede in response to heavy rain and periods of drought common to range lands in Hawaii. Propagation of the Pakistan biotype of the YSA parasitoid Lysiphlebus ambiguus (Haliday) continued in the Hilo insectary with a total of 88,800 adults being produced. Production was excellent during the first four months of FY 2002, peaking at 16,100 adults in October 2001. However, inclement weather from November 2001 through March 2002 severely affected the propagation of sorghum host plants and the rearing of YSA production stock. Contamination of sorghum plants by other aphids and other pests further hampered production. Parasitoid production during that period averaged 2,490 adults per month, bottoming out at 600 adults in February. Fortunately, a dramatic improvement in April that coincided with fair weather resulted in the production of 9,950 adults. Production was maintained near that level for the remainder of the year. During FY 2002, 14 releases, consisting of a total of 31,650 adults, were made on the island of Hawaii in kikuyu pastures at Kahuku Ranch, Waikii Ranch, Waimea (Hawaiian Homes), Kukuihaele Farms (Hamakua), and at Huluhulu (Saddle Road) and the UH-CTAHR Komohana Extension Service plot in Hilo. Six shipments, totaling 16,350 adults, were sent to Maui and released in pastures at Kula and Ulupalakua Ranch. One other shipment to Maui, consisting of 2,400 adults, was released in a sugarcane field. Six shipments, totaling 26,300 adults, were made to Kauai and released in sugarcane fields at Kaumakani. L. ambiguus was introduced from Pakistan in 1997 and 1998 as a potential biocontrol agent to suppress YSA infestations in grass pastures and sugarcane fields in Hawaii. Attempts to introduce this parasitoid, previously identified as Adialytus ambiguus (Haliday), from Western Europe (mainly France) in 1990 were unsuccessful despite some earlier signs of establishment in pastures on the island of Hawaii. Recovery of this YSA biocontrol agent in pastures at Kohala during FY 2001 confirmed establishment in West Hawaii. In December 2001, mummified YSA were found on Maui at 4,000 feet elevation at an upcountry residence in Kula. This site is in a residential area at 4,000 feet elevation and is down slope from the Haleakala Ranch pastures. Adult specimens reared from the YSA mummies were L. ambiguus. Similar YSA mummies were subsequently collected on kikuyu grass near the Kula electrical substation in late-December. The detection on Maui, in addition to all previous recoveries of this parasitoid in West Hawaii, increases prospects for eventual control of the YSA in pastures and sugarcane fields in Hawaii.

- **Citrus blackfly** [Aleurocanthus woglumi Ashby]. The citrus blackfly (CBF) is no longer a problem on Oahu as a result of the establishment of the CBF parasitoid Encarsia perplexa Huang and Polaszek, formerly E. opulenta (Silvestri). This aphelinid wasp, a well-known CBF biocontrol agent, is believed to have arrived in Hawaii in association with the CBF and also through biocontrol introduction via HDOA exploration in Guatemala. In addition, the exploration also resulted in the introduction of Amitus hesperidum Silvestri, another well-known CBF parasitoid. This platygasterid wasp complements the biocontrol activity of E. perplexa very well because it is most effective when the CBF population is at high densities. As CBF infestations are suppressed, E. perplexa becomes dominant and maintains the CBF population at densities that are so low that no other control measures are necessary.

  On Kauai, follow-up visits were made in late August 2001 to two residences where E. perplexa was released previously. The CBF was under excellent control and only traces of it were observed at those sites in Poipu and Hanapepe. At the Kilauea citrus orchard where the CBF was a major pest for some time, surveys confirmed that it was no longer a problem. CBF populations were still at moderate levels on citrus trees at a residence in Princeville, but E. perplexa was well-established and increasing in numbers. Because the CBF population density on Kauai decreased so rapidly during the latter part of FY 2002, this island, like Oahu previously, could no longer serve as a source of CBF parasitoids for other islands.

  During an insect survey on Maui in late-July 2001, CBF-infested citrus leaves were collected at residences in Kihei and Wailea. The samples later yielded the CBF parasitoid E. perplexa. The only releases of this biocontrol agent in the Kihei area were made at a residence in the summer of 2000 when a total of 2,250 adults were released. It is very likely that E. perplexa spread from this release site. In West Maui, CBF surveys conducted at Napili and Kahana indicated that this parasitoid was not established. Heavy CBF infestations were found on various citrus trees in those areas. To facilitate establishment at these localities, field-collected E. perplexa were released. In mid-November, a release of 200 adults was made on various citrus trees at a residence in Napili, followed by a release of 1,000 adults in December 2001. The citrus planting covered several acres at an elevation of 600 feet. The establishment of E. perplexa in East Maui was very fortuitous because it served as a parasitoid reservoir for subsequent releases in West Maui, Molokai, and West Hawaii.

  In early-December, a shipment of 5,400 E. perplexa adults obtained from collections of CBF-infested citrus

Mature larva of a nettle caterpillar feeding on a palm leaf. Note prominent stinging spines on body.

Nettle caterpillars were initially found on rhapis palms at a Panaewa nursery in September 2001.

leaves collected on Maui was sent to a Kona citrus orchard. After several substantial releases of the parasitoid, the citrus grower located above Kailua-Kona reported that the CBF infestation in his orchard was finally under control. The lime trees in the orchard, several of which had died during the infestations, were the most severely affected. Other citrus varieties were well on their way to recovery. In early April, 200 E. perplexa adults from Maui were released in an orchard of about 30 citrus trees in a nursery at Naalehu in Ka'u. This was the first report of a CBF infestation in this southern-most district of the island. In June, another parasitoid shipment from Maui, consisting of 700 E. perplexa adults, was released in a mango orchard at Napoopoo in South Kona.

- **Citrus Leafminer** [Phyllocnistis citrella Stainton]. The citrus leafminer (CLM), which showed great potential to devastate citrus in Hawaii when it was first found on Oahu at Waimanalo in June 2000, is steadily becoming a pest of little significance as a result of the fortuitous introduction of its primary natural enemy, Ageniaspis citricola Logvinovskaya. It is believed that this encyrtid wasp arrived in Hawaii in association with CLM infestations on potted citrus plants. Presently on Oahu, CLM damage is so rare that it has become very difficult to collect the parasitoid for shipment to neighbor islands where it is still needed to suppress CLM infestations.

  In February 2002, a Florida Department of Agriculture and Consumer Services (FDACS) insect systematist confirmed the identifications of specimens of two citrus leafminer parasitoids, Ageniaspis citricola Logvinovskaya and Zagrammosoma multilineatum (Ashmead), that were sent by the HDOA Insect Taxonomist. At the same time, another FDACS specialist confirmed the identification of the citrus leafminer (CLM), Phyllocnistis citrella Stainton (Lepidoptera: Gracillariidae). The CLM was first found in the United States in Florida in 1993. A. citricola (Hymenoptera: Encyrtidae) was imported into Florida in 1994 from Australia, which introduced it from Asia. By 1994, the CLM had spread to Texas, and then to California in 2000. Z. multilineatum (Hymenoptera: Eulophidae), a species indigenous to Texas, attacks CLM larvae and pupae and is the most abundant parasitoid attacking CLM in that state. In Hawaii, it was first found on Kauai at Princeville and Aliamanu Estates in July 2001 when adults emerged from CLM-infested citrus leaves held in the lab.

  In mid-July, A. citricola was detected on Kauai at the Kilauea citrus orchard where releases were made in April 2001. It was also found at two Princeville residences where none had ever been released. At sites where severe damage was observed on the older leaves of citrus trees, the new growth was only lightly infested. One sample of 40 leaves yielded a total of 61 pupal cells, of which 45 (73%) contained A. citricola parasitoid pupae, nine (15%) were empty, six (10%) contained eulophid parasitoid pupae, and only one (2%) contained a CLM pupa. It was very apparent that A. citricola was the dominant parasitoid and that the large number of empty mines indicated predation of CLM larvae. At another site, a sampling of 60 leaves yielded a total of 152 pupal cells, of which 67 (44%) contained CLM pupae, 65 (43%) contained A. citricola parasitoid pupae, 19 (12%) were empty, and one (<1%) contained a eulophid parasitoid pupa. A. citricola was also found at a Haena residence. The parasitoid became

established at this site on its own. The presence of A. citricola was confirmed at the UH Agricultural Experiment Station at Wailua, where the parasitoid was previously reported in June 2001. There was minimal damage to new growth on citrus. No releases of the parasitoid had ever been made at this locality.

In December 2001, the UH-CTAHR County Extension Specialist on Molokai discovered CLM infestations on citrus for a new island record. Identification was confirmed through photographs of distinctive CLM damage. The following month, a grower reported heavy infestations on 80 citrus trees in his orchard at Papohaku. He identified the pest and damage through information he found on the HDOA website. Samples were submitted to the HDOA Maui Entomologist in the Kahului Insectary. No parasitoids were detected in the sample of CLM-infested citrus leaves. A shipment of 250 A. citricola pupae, collected on Maui at Haiku, was sent to Molokai for release in the orchard at Papohaku.

❖ **Nettle Caterpillar** [Darna pallivitta Moore]. Propagation of the nettle caterpillar was initiated in the HDOA Insect Quarantine Facility in Honolulu in mid-March to conduct studies in preparation for a biocontrol project on this potentially serious pest of ornamental foliage plants. Based on rearing experience in the Hilo Insectary, host plants selected for nettle caterpillar propagation included Chrysalidocarpus lutescens (Bory) Wendl. (golden-fruited palm, commercially known as “areca”), and Cocos nucifera L. (coconut). Hilo personnel who supplied the rearing stock reported that the larvae are voracious feeders of both young and old leaves of coconut seedlings and that this species had an overall development period of almost four months.

While the nettle caterpillar remained under excellent control in the Panaewa nursery where an eradication had been attempted, it had nevertheless dispersed into the surrounding neighborhood. New host plants on which larvae were observed to be feeding included Neomarica gracilis (walking iris), Neolina recurvata (ponytail), Tillandsia cyanea (a bromeliad), and Dracaena compacta. Larvae were also present on some unidentified weeds. Two larvae, one on Dracaena fragrans ‘Massangeana’ and the other on green ti, were collected in an anthurium nursery adjacent to the original infestation site. In the lab, it was noted that mature larvae were able to finish out their life cycle on fishtail palm (Caryota sp.) and that second generation early instar larvae were feeding on the same plant. Other hosts on which larvae have been confirmed are Dracaena deremensis ‘Lisa’ and red ti. D. pallivitta eggs were placed in the field at Panaewa near the original infestation site in an attempt to document parasitism. Seven egg masses were placed on Rhapis palms over a two-week period but none of the eggs showed signs of parasitism and most of them hatched normally.

❖ **Koster’s Curse** [Clidemia hirta (L.) D. Don]. Routine collections of clidemia berries, infested by the clidemia fruit-feeding caterpillar, Mompha trithalama Meyrick, were initiated in East Hawaii in August 2001 after surveys confirmed that this clidemia biocontrol agent was very well established and dispersing. Collections were made from clidemia infestations near the University of Hawaii Geothermal Well at Pohoiki in Puna, where releases of this species had been made in late-February and throughout March 1999, and where the initial recovery had been made in April 2000. Another excellent collection site was along Stainback Highway in the Waiakea Forest Reserve Timber Management Area, where the first five releases were made in early-February 1999 and where all subsequent releases of this species was made during April and May 1999. The first recovery at this site was made in early-April 2001. Hilo Insectary personnel had maintained the informal clidemia berry collection surveys and redistribution of the emerging moths throughout FY 2001. With the confirmed establishment of this clidemia biocontrol agent and increased personnel support provided by the Emergency Environmental Workforce Crew beginning in January 2002, efforts to collect and distribute this species to clidemia infestations in new localities on the island of Hawaii and on neighbor islands were greatly increased. Beginning in October 2001 with a low of seven adults and ending in May 2002 with a high of 1,002 adults, a total of 3,654 M. trithalama adults were released on three islands. On Hawaii, five releases in the Waiakea Forest Reserve and Opihihale (South Kona) totaled 1,618 adults. Two releases on Maui at Hana amounted to 1,322 adults. On Kauai, two releases at Wailua totaled 714 adults.

During a survey for M. trithalama release sites on Maui, several clidemia biocontrol agents were found to be well established on clidemia in various areas along the Hana Highway in East Maui. Clidemia leaves infected by the clidemia pathogen, Colletotrichum gloeosporioides f. sp. clidemiae, were collected to provide inoculum for use in controlling clidemia in East Molokai. The clidemia thrips, Liothrips urichi Karny, and the buprestid beetle, Lius poseidon Napp, were also very noticeable on the clidemia plants at those Hana Highway localities. All three biocontrol agents appeared to be thriving despite the prolonged period of drought that was followed by torrential rainfall. The first release of M. trithalama on Maui was made amid a clidemia infestation at Mile Marker 7 along the Hana Highway on March 25, 2002. The three adults released were the first to emerge from infested clidemia berries that had been shipped from Hilo.

The establishment, proliferation, and dispersal of M. trithalama represent a major success for the Clidemia Biocontrol Project. This clidemia fruit-feeding moth species and Carposina bullata Meyrick, a clidemia flower-feeding moth species were two of the most

promising clidemia natural enemies that were introduced because they attack the reproductive parts of the plant. In addition to the part of the plant on which they normally feed, C. bullata also attacks the berries and M. trithalama may also attack the flowers. This should greatly reduce the reproductive potential of clidemia. In May 2002, another significant development occurred when C. bullata was recovered from clidemia berries collected in March from infestations along Stainback Highway in the lower section of the Waiakea Forest Reserve Timber Management Area. Specimens of the moth submitted to the Branch's Insect Taxonomist were confirmed as C. bullata, which was purposely introduced from Tobago, West Indies, along with M. trithalama for biocontrol of clidemia. Prospects for the establishment of C. bullata appeared extremely poor because of high mortality and very low release numbers, so the recent discovery is highly encouraging.

- **Gorse** [Ulex europaeus L.]. While participating in a gorse insect survey at Humuula on the slopes of Mauna Kea on February 25, 2002, the Hilo Insectary Technician detected dark, reddish fuzz on a green spine of a gorse plant. The gorse sprig was collected and sent to the Plant Pathology Quarantine Facility in Honolulu where the HDOA Plant Pathologist confirmed the fungus as Uromyces pisi f. sp. europaei. The rust pustule examined was a new infection locus and rust urediniospores were actively being produced. The collection site was in the same area where some infected gorse plants were transplanted from pots on February 29, 2000. This was the first and only release of the gorse rust in Hawaii. The collection confirms the establishment of the disease, but no additional rust pustules were found during a follow-up survey. According to the Plant Pathologist, all the disease needs now is a continued, conducive climate to reproduce and infect further. Cool and moist weather is ideal for the rust fungus.

- **Ivy Gourd** [Coccinia grandis (L.) Voigt]. Insectary propagation of the three ivy gourd biocontrol agents continued satisfactorily on Oahu during the early part of FY 2002. However in December 2001, Oahu Insectary personnel reported that it was becoming increasingly difficult to maintain the high level of production previously experienced. Excellent control of ivy gourd in most localities on Oahu by the ivy gourd vine borer, Melittia oedipus Oberthur, and the ivy gourd leafmining weevil, Acythopeus cocciniae O'Brien, along with dry weather conditions had reduced the availability of suitable ivy gourd plant material in the field for host plant propagation. Also, cooler seasonal temperatures beginning in mid-October had slowed the rate of growth of the plants and insects. Rearing of M. oedipus had been reactivated in November 2000 to provide Guam with propagating stock for colonization in quarantine to conduct host specificity studies. This enabled releases of this species on the neighbor islands where attempts at eradication had not been successful.

  Insectary production of the ivy gourd leafmining weevil was terminated in April 2002 to devote more resources to the propagation of the ivy gourd gall weevil, A. burkhartorum O'Brien. Despite several releases that were concentrated in Waimanalo and Kapolei, and the detection of some galls on ivy gourd vines, establishment of this species has not been confirmed. The leafmining weevil is so well established and widespread on ivy gourd infestations on Oahu that it can be readily collected for distribution if needed. It is also well established in Kailua-Kona on the island of Hawaii. In comparison to A. cocciniae, A. burkhartorum is larger in size, has a much longer life cycle, and its immature stages seem to be more vulnerable to predation by ants and birds. Lab production has been retarded by low fecundity. Attempts are being made to stabilize production and gradually increase numbers for release to improve chances for establishment. Liberation of A. burkhartorum consisted of seven releases, totaling 170 adults, made at Kapolei and Makiki Heights from December 2001 to May 2002.

  During FY 2002, a total of 36 releases, amounting to 9,872 adults, of A. cocciniae were made on ivy gourd infestations at various sites on Oahu. Release localities included Hawaii Kai, Niu Valley, Aina Haina, Kahala, Kaimuki, Palolo, Nuuanu, Halawa, Pearl Ridge, Waiau, Pearl City, Kapolei, Kahe Point, Makaha, Makua, Mokuleia, Waialua, Poamoho, Haleiwa, Kahuku, Hauula, Kahaluu, Kaneohe, Kalaheo, Kailua, Maunawili, Olomana, and Waimanalo. This weevil is now well established at every release site throughout Oahu and is dispersing to adjacent localities where no releases were made. The "shot holes" made by the adults and larval mines were very conspicuous on ivy gourd leaves.

  Periodic shipments of two ivy gourd biocontrol agents were sent to the neighbor islands for release during FY 2002. Five shipments, totaling 1,232 A. cocciniae adults, were sent to the Hilo Insectary or the Branch's office in Kona in September 2001 and in April to June 2002. Releases were made in West Hawaii at Kailua-Kona, Napoopoo, and Keei. One shipment each in March, May, and June 2002, totaling 1,097 A. cocciniae adults, was sent to the Kahului Insectary. Releases were made in West Maui at Kapalua, Lahaina, and Kihei. One shipment of 52 M. oedipus adults was sent to Kauai and released at Anahola in July 2001. One shipment of 47 M. oedipus adults was sent to West Hawaii and released in Kailua-Kona in September 2001. Three shipments, totaling 96 M. oedipus adults, were sent to the Kahului Insectary and released at Kapalua in West Maui in March 2002.

  On March 22, 2002, a box containing three ivy gourd biocontrol agents were turned over to University of Guam

researchers for transport to their quarantine facility in Mangilao, Guam. The contents of the box included 200 A. cocciniae adults in two plastic vials, 12 A. burkhartorum adults in a vial, and 47 larvae and 38 pupae of the ivy gourd vine borer, M. oedipus, wrapped in paper towels in plastic bags. The ivy gourd natural enemies will be colonized, studied, and tested on a native cucurbit in quarantine to determine suitability for future release to suppress ivy gourd infestations on Saipan and Guam.

❖ **Miconia** [Miconia calvescens DC]. Surveys of the three sites at Leilani Estates in Puna where the release of the miconia pathogen, Colletotrichum gloeosporioides f. sp. miconiae (CGM), had been made on miconia infestations revealed that the fungus was well established. Lesions were readily found on the leaves of most of the treated plants. The sites were originally treated in May 2001. The release area appeared to be ideal for the CGM because of the thick tree canopy and shrub growth and the high humidity in the understory.

Two aerial sprayings of the miconia pathogen were made on Maui in October 2001. HDOA Plant Pathology personnel from Oahu made two trips to Kahului on October 2 and 30 to prepare the inoculum for helicopter spraying of the miconia pathogen. For each spraying, 1,200 V8 juice agar culture plates were prepared and inoculated with the CGM in the Plant Pathology Quarantine Facility in Honolulu. A final spore spray solution of 25 gallons was prepared in the HDOA Kahului Insectary with assistance from Maui personnel. November 2001 was a record-breaking month for preparing and pouring V8 agar media into a total of 2,800 petri plates and inoculating them with the miconia pathogen in the PPQF. Several volunteers assisted by pouring solution or inoculating plates. These plates provided inoculum for two helicopter spray flights during the month. The HDOA-HDLNR Maui Miconia Project was concluded with a survey trip to Hana on December 12, 2001, to assess the disease level at the inoculated sites. This project had been initiated in November 2000 during a rainstorm and subsequent flood when the CGM was sprayed for the first time in Hana. The project ended in the same way with another wind and rain storm. The disease was observed at all nine sites at which the CGM fungus was released. The miconia plants at the helicopter release sites appeared to be heavily infected and with more defoliation than sites that were sprayed from the ground. The objective of this project was to establish the CGM fungus in the miconia infestation at Hana. This goal was achieved. The prospects for the biological control success of this fungus will depend on rain, driven by high winds, and time.

Two more aerial spraying of miconia were conducted on Maui in April 2002. On each occasion, 1,200 culture plates inoculated with the miconia fungus were transported from the PPQF in Honolulu. With assistance from the Maui staff and volunteers from the Maui Invasive Species Committee, the plates were scraped and rinsed to prepare the inoculum. MISC paid for the helicopter time and DLNR paid for the supplies. Fifteen culture plates of the miconia biocontrol fungus were shipped to the USDA Forest Service in Hilo for work on determining the effects of the fungus on miconia plants in the greenhouse and in the field.

During a visit to the fungal release sites at Onomea and Leilani Estates in mid-June 2002, the CGM appeared to be alive and well. The miconia plants adjacent to the parking lot at the Hawaii Tropical Botanical Garden at Onomea seemed to be “thinning out” in comparison to the flush of miconia foliage that was observed when the fungus was first released. Presently, leaf spots are observed on young seedlings in the understory. The HDOA Plant Pathologist believes that these plants will either die or will have difficulty in developing into thriving plants. Diseased plant material was collected and brought to Honolulu for isolation and culturing.

Right: Remains of giant whitefly nymphs with exit holes of parasitic wasps.

Left: Flocculence produced by giant whitefly nymphs infesting hibiscus leaves.

- **Fireweed** [Senecio madagascariensis Poiret]. A rust disease from England was introduced into the PPQF for testing as a potential fireweed biocontrol agent. It was collected from Senecio lautus in England by a UH-Manoa Professor of Botany Emeritus in mid-July 2001. In the PPQF, the urediniospores were collected and suspended in sterile, distilled water. The resulting inoculum was sprayed onto potted fireweed. The rust disease was not transmitted because rust pustules failed to develop. A fungal rust pathogen occurring on S. lautus has been identified as Puccinia lagenophorae, the same rust that was collected in Australia and South Africa by the HDOA Exploratory Entomologist. Perhaps the urediniospores were not viable, or the rust is a different race or form, not pathogenic to fireweed. Efforts to introduce this rust will continue.

- **Maile Pilau** [Paederia foetida L.]. Five shipments of phytophagous insects were received during June 2002 from Japan for colonization and host specificity testing to determine their suitability for use as biocontrol agents to suppress infestations of maile pilau (known as skunkvine in Florida), in Hawaii and Florida. This project is a collaborative effort between the HDOA Plant Pest Control Branch and the Invasive Plant Research Laboratory (IPRL), USDA-ARS, Ft. Lauderdale, Florida. The first three shipments contained chrysomelid beetles (Trachyaphthona sordida, Trachyaphthona sp., Aphthona sp.) that were collected from P. foetida infestations on the island of Kyushu in the Prefectures of Fukuoka, Kagoshima, and Nagasaki. The other two shipments contained a lace bug, Dulcinius sp., that was collected at different sites at Osaka Airport on the island of Honshu by the IPRL Research Leader and an associate researcher. The final collections were hand-carried to Hawaii. During a brief layover in Honolulu, a visit was made to the HDOA facilities for orientation and coordination of project activities. The final shipment also contained various insects associated with P. foetida that were collected from several localities in Japan. These insects were held in quarantine, reared to adults and killed, then mailed to the IPRL in Florida for addition to the reference collection.

Projects of the Branch's Chemical/Mechanical Control Section included the following during the FY 2002:

- Monitored Kona for latent banana bunchy top virus (BBTV) during Phase II of Project Eradication, an intensive campaign to remove all banana plants within a 10-square-mile area in North Kona. Phase I of the eradication ended in mid-December 2001. In mid-March 2001, Kona residents were allowed to replant indicator banana plants within the eradication zone. No BBTV was detected during this fiscal year.

- Provided assistance to commercial banana growers on Kauai for early BBTV detection in Kilauea and Lawai/Poipu areas as part of the department's Long Range Management Control Program. Island-wide surveys monitored BBTV spread since it was first detected in October 1997 at Kilauea Town. The eradication effort ended in July 1998, but BBTV resurfaced in commercial farms and residential lots in Kapahi in April 2000. A second eradication effort was deemed not feasible since all Musa species would have had to be removed from over half of Kauai. BBTV was confirmed in Hanalei, Kalihiwai, Kilauea Town, Lawai and Poipu.

- Assisted commercial banana growers on Oahu in early detection of BBTV and instructions on managing the virus by treating the insect vector and diseased plants.

- Assisted papaya growers on Hawaii by tagging trees with papaya ringspot virus (PRV) in commercial field plantings in an estimated 2,300 acres. The number of tagged trees increased by nearly 300% over that from the previous fiscal year; 40,216 infected papaya plants were tagged for destruction from over 210 farm lots in the Puna and Hamakua Districts on Hawaii. Papaya Project funds were transferred to the UH-CTAHR during FY 2001. Abandoned fields covering over 659 acres were bull-dozed by a private contractor in Kapoho, Kalapana, Keeau and Olaa.

- Cooperated with DLNR, RCUH, Operation Miconia, and Invasive Species Committees on Hawaii, Maui and Oahu involved with controlling miconia (Miconia calvescens.

- Conducted research on chemical toxicants to control coqui frog infestations found on Hawaii, Maui, Oahu and Kauai. A Section 18 Experimental Use Permit was granted by the EPA for the use of caffeine against frogs until September 27, 2002. Hydrated lime and natural pyrethrins were investigated as alternative control methods. Hydrated lime could not be registered as a pesticide and is available as a soil amendment only. Results using hydrated lime as a slurry were favorable in a one acre test plot conducted on May 30, 2002 on Hawaiian Home Lands property at Puainkao, Hawaii. Staff also collaborated with the Coqui Frog Working Group formed by UH-CTAHR in Hilo, and with various Invasive Species Committees in hand-collecting frogs to slow down their spread in new areas on Hawaii, Oahu, Maui, and Kauai.

- Chemically and mechanically controlled designated noxious weeds, such as thorny kiawe (Prosopis juliflora)on Oahu and Kauai; fountaingrass (Pennisetum setaceum) on Maui, Lanai, and Oahu; and fireweed (Senecio madagascariensis) on Kauai, where very favorable control has been obtained at the Half-Way Bridge site near Puhi.

HDOA personnel tackle a patch of thorny kiawe, an invasive weed with sharp thorns that may reach up to four inches long and can pierce automobile tires.

- Conducted noxious weed and coqui frog surveys and control work with Emergency Environmental Workforce employees on Hawaii, Maui, Kauai and Oahu from December 2001-March 2002. The workforce plan was established by the Research Corporation-University of Hawaii through special legislative funds to temporarily employ jobless individuals affected by the 911 disaster. The workforce was instrumental in conducting productive work in removal of thorny kiawe, miconia, and coqui frogs from the environment.

- Worked with the Oahu Invasive Species Committee (OISC), formerly known as the Fountaingrass Working Group, composed of U.S. Army, Federal, State, University of Hawaii and various other non-profit agencies whose goals are to detect and control invasive alien species that are deleterious to Hawaii's agriculture and natural resources.

- Chemically treated over 5,671 fountaingrass plants on Oahu and mechanically removed 150 fountaingrass plants at Kanepuu, Lanai and Kahakuloa, Maui with assistance from EEW and OISC workforce.

- Surveyed agricultural and vegetable seed vendors to ensure the quality and proper labeling of seeds sold to consumers. Twenty-five germination tests were performed on vegetable and agricultural seed lots to ensure that the minimum germination standards were met.

- Examined 76 foreign seed lots for noxious weed seeds under a cooperative agreement with USDA-APHIS-PPQ. One seed lot was rejected because of corn import regulations that prohibits the entry of foreign millet seeds in U.S. seed imports.

- Continued to service the needs of the expanding Hawaii seed corn industry that had increased its plantings on former sugarcane lands on Kauai and Oahu, and on fallow pineapple lands on Maui. A total of 459 new applications were processed during the fiscal year. With carry-over from FY 2001, 501 Foundation/Hybrid class certifications were issued to seed producers. Certified corn shipments weighed 3.46 million pounds.

PLANT QUARANTINE BRANCH
Neil Reimer, *Manager*

The branch administers Hawaii's plant and non-domestic animal quarantine program by preventing the introduction of harmful pests and diseases into the State and by facilitating plant exports. This is done through:

(1) permit reviews;
(2) air and sea ports-of-entry inspections;
(3) interisland inspections;
(4) investigating and enforcing State quarantine laws and regulations;
(5) educating travelers and the public; and
(6) inspecting and certifying plants for export.

FY 2002 Highlights

- Construction began on a new main office complex for the Plant Quarantine Branch on Oahu in the Kapalama area near Sand Island. The new facility will include more quarantine rooms for plant importers to hold confiscated animals, improved mist extraction equipment and a dedicated room for nematode extraction and identification, autoclave and freezer for commodity destruction, a loading dock to facilitate inspection of containers, and other improvements over the current site which will be the new location for the University of Hawaii Medical School complex. Plant Quarantine relocated to its new quarters in August of 2002.

- Plant Quarantine personnel conducted 54 talks on the state's pest prevention program and tours of the Plant Quarantine Station with a total of 3,478 individuals in attendance. The audiences consisted of preschool, elementary, middle, high school, and university level students, as well as senior citizen groups.

- During the first three weekends in August, an "Alien Species" display was maintained at the Hawaii State Farm Fair. The exhibit attracted a constant flow of fairgoers who were able to view various live animals, including Coqui frogs, iguana, gold dust day gecko, brown anole, Cuban knight anole, green and black poison dart frog, leopard gecko, hybrid skink, ball python, boa constrictor, and Madagascar hissing cockroach.

Land Vertebrate Specialist Lisa Nakayama handles a California king snake for local media. The snake was found in Kahuku.

In the clear case is a ball python that was turned in under the department's Amnesty Program which provides immunity from prosecution for those who voluntarily turn in illegal animals.

- The Hawaii Detector Dog Program (HDDP) witnessed the growth of the program with the addition of a new training facility equipped with a working conveyor belt system. The facility is fully operational and is located on the grounds of the Halawa Animal Quarantine Station. The relocation of the training area greatly facilitates the training procedure with the total elimination of time lost in the transport of the animals.

- To further facilitate operations, the HDDP relocated its staff to the Halawa Animal Quarantine Station to centralize operations. Previously, staff members were reporting to several different locations, which sometimes hindered communications and training.

- The program has acquired an active dog that is currently in training for the detection of the brown tree snake. The active dog will provide a more thorough search of incoming cargo. The dog was obtained through a donation from the general public.

- Effective November 30, 2001, the microorganism import requirements in Subchapter 3, Chapter 4-71, Hawaii Administrative Rules (HAR), was repealed to establish the new microorganism import requirements in chapter 4-71A, HAR, entitled, "Microorganism Import Rules". Chapter 4-71A, HAR, implements a new framework for facilitating import of microorganisms without comprising plant, animal or public health and the environment of Hawaii.

- While moderate-risk and high-risk microorganism species require a permit to enter the state, changes were made so that low-risk species may be allowed entry into state without permits. All microorganism species still require at a minimum, a request for import, approval for the import in advance of shipment, and compliance with the notification, labeling, and inspection requirements specified by rules.

- Low-risk microorganism species contained in products used for bioremediation or bioaugmentation including products that are biopesticides require registration with the Plant Quarantine Branch. A microbial product containing a moderate or high-risk microorganism requires a permit to enter the state. Registration is valid for two years and allows the product to be imported into Hawaii by any user. A permit is valid for one year and are restricted to an approved end user.

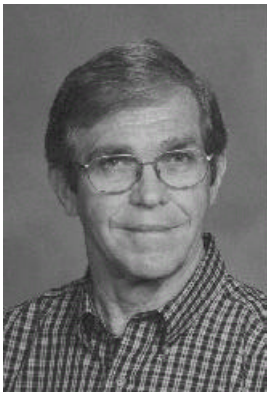
- Certain high-risk human pathogens with oversight from the Centers for Disease Control and Prevention may enter Hawaii without permits, provided that the importer meet the requirements specified by rules.

- Effective May 23, 2002, the requirements for issuing an emergency permit pursuant to Chapter 150A, Hawaii Revised Statutes, were broadened to include emergency preparedness. The Board of Agriculture, without Advisory Committee review and after obtaining advice from qualified persons, may issue an emergency permit to a state or federal agency or the University of Hawaii to prepare for an emergency.

- A 15-inch ball python was abandoned in one of the program's Amnesty Bins at the Honolulu International Airport by an arriving passenger.

- A total of 337 containers of Christmas trees were shipped to Hawaii from Oregon and Washington. Washington and Oregon Departments of Agriculture witnessed the shaking and cleaning of 100 percent of the trees in 78 percent of the containers. The other 22 percent of the containers were spot checked by the two mainland agriculture departments. Six containers from Oregon were found by HDOA inspectors to be infested with yellowjackets. Three of these containers were fumigated and the other three were brought to the Plant Inspection Office for treatment, which consisted of the cleaning of each tree in the container.

QUALITY ASSURANCE DIVISION



Samuel Camp
Administrator

The Quality Assurance Division serves both the consumer and producer of agricultural and other products by providing services and enforcing laws and rules designed to improve the market quality of agricultural commodities, promote fair trade and honest business practices, and maintain stability in the dairy industry.

COMMODITIES BRANCH
Walter Mitsui, *Manager*

The Commodities Branch provides certification services for various agricultural commodities on a fee-for-service basis, to ensure fair trade and quality assurance of agricultural commodities. Most of these certification services are conducted under federal-state agreements in which the Branch provides federal certification, which may not otherwise be available to local clients. Major products certified include fresh fruits and vegetables, eggs, processed products, seafood, coffee, and meat. The establishment of state grade standards for fruits and vegetables, nuts, coffee, flowers and foliage, processed foods, and shell eggs, falls within the jurisdiction of the Branch. In addition the Branch administers laws and rules pertaining to fresh fruits and vegetables and egg labeling, minimum export quality, advertising of agricultural commodities, licensing of dealers in agricultural products, prevention of agricultural theft, and sampling and testing of animal feed for label guarantee and adulteration. The branch also conducts food safety audits for a fee, upon request.

The Milk Control Section regulates the dairy industry in the Honolulu and Hawaii milk sheds by licensing all producers and distributors of milk, establishing milk production quotas, setting minimum class 1 price paid to dairy producers, and conducting retail milk surveys and inspections. This special funded section consists of two employees and is entirely self-funded through license fees assessed to milk producers and processors. The branch provides clerical and marketing specialist support to this section and is reimbursed through the special fund.

The Chemical Analysis Section provides chemical analysis services to both the Commodities and Pesticides Branches. Animal feed samples are analyzed for adulteration from agri-chemicals and mycotoxins. Environmental samples are analyzed for contamination from agri-chemical and other substances and pesticides are tested for ingredients.
Listed below are brief overviews of developments that have impacted the branch's activities (See page 52 for a detailed table of activities):

- Planned and prepared to move to a new building in lower Kalihi at Auiki Street, along with the Measurement Standards Branch and Division Administration.
- Filled four Agricultural Commodities Marketing Specialist position vacancies on Oahu (2 positions), Maui and Kauai. Activity levels were reduced as emphasis was placed on training the new marketing specialists. Lost Clerk Typist and Oahu District Supervisor positions due to budget restrictions.
- Inspected and certified 845,000 cases of canned pineapple from Maui Pineapple Company, which continues to receive large federal government contracts and assessed a total of $167,655 in fees.
- Established a fee-for-service papaya transgenic testing program at the request of the Papaya Administrative Committee and three exporters. Papayas are tested to assure that only non-transgenic papayas are exported to Japan.
- Observed the closing of Kaanapali Coffee Company, Waialua Coffee Company, Wayne's Dairy, and Meadow Gold Dairy Farm in Waimanalo.
- Distributed informational flyers on agricultural theft, and cooperated with police in investigating agricultural theft cases.
- Continued to assist the Market Analysis and News Branch by "loaning" an experienced person to temporarily fill a vacancy.

Commodities Inspectors Keith Otsuka (left) and Albert Louie (right) demonstrate how eggs are graded at the Hawaii State Farm Fair

- Hired two part-time Agricultural Commodity Aides in Kona and one in Kauai during the coffee "season", to assure a rapid coffee certification turn-around time.
- Attended papaya and coffee industry meetings and conferences. Staff made a presentation on proposed new standards for grades of coffee at the annual Hawaii Coffee Association Conference, and conducted a grading class for a University of Hawaii vegetable crops class.
- Attended mainland training sessions and conferences, which included: The Processed Products Branch National Supervisor's Conference sponsored by USDA/ AMS; A Laboratory Food Safety Counter-Terrorism Workshop sponsored by the FDA; A Pesticides Workshop sponsored by the EPA, the National Egg Regulatory Officials Conference, and the International Association of Milk Control Agencies annual conference. The costs to attend these conferences were mostly paid by federal agencies and the milk special fund, at minimal or no cost to the state.
- Kept close watch on federal organic regulations. The federal government stated that whenever a state government creates any additional organic requirements, that State shall be responsible for the entire organic program, including all costs of administering the program. The branch therefore is reluctant to develop any state organic rules or regulations, as may be desired by the local organic trade.
- Branch fee assessments and penalties collected totaled more than $424,000; about the same as the previous year.

MEASUREMENT STANDARDS BRANCH
William Pierpont, *Manager*

- The Measurement Standards Branch works to protect consumers, businesses, and manufacturers from unfair practices, which are based on a measurement process or subject to a standard of quality. The goal is to minimize losses and inaccuracies due to incorrect or fraudulent measuring equipment, processes, or substandard products.
- The Standards and Technical Services Section assures that state measurement standards conform to national standards. It performs metrological calibration of the enforcement standards used by the branch and the standards used by registered service agencies in repairing commercial devices.
- The Standards and Trade Practices Enforcement Section has the responsibility of assuring the consumer that transactions involving measuring instruments, labeling, content of packaged commodities, and pricing are accurate and fair to all parties.

Listed below are brief overviews of developments that have impacted the branch's activities (See page 53 for a detailed table of activities.)

- The State Metrologist received formal training and certification from the National Institute of Standards and Technology (NIST).
- The metrology laboratory received re-certification of the States enforcement standards and was awarded temporary certification by NIST.
- The metrology laboratory inspected and calibrated 522 enforcement mass standards, 75 test standards, and 436 field standards for service agencies conducting business in the State of Hawaii.
- The metrology laboratory inspected and calibrated one volumetric test standard and 10 volumetric field standards for service agencies conducting business in the State of Hawaii.
- The Branch worked with the Hawaii Coffee Association to introduce legislation that amended Hawaii Revised Statute §486-120.6 which helps to promote truth in labeling and advertising of Hawaii-grown coffee.
- The branch supported the passing of legislation which became Act 18 that helps to promote the accurate advertisement of products made of Acacia Koa. The Hawaiian Forest Industry introduced this legislation.
- Received and investigated four odometer complaints; down from nine investigations last year.
- Visited 685 establishments to identifying businesses that are subject to the price verification inspection. As a result of this effort, 149 establishments were added to the list.
- The compliance rate for stores inspected for price verification was 93 percent, an increase over last year's compliance rate of 87 percent.
- Hired a clerk typist for the Oahu office and completed the interview process for a Measurement Standards Inspector I for the Captain Cook office.
- Prepared the program for a move into a new facility located near Sand Island.

AGRIBUSINESS DEVELOPMENT CORPORATION

Alfredo Lee
Executive Director

The Agribusiness Development Corporation (ADC) was established pursuant to Act 164, SLH 1994 to coordinate the development of Hawaii's agricultural industry and to facilitate its transition from a dual-crop (sugar and pineapple) industry to a diversified, multi-crop and animal industry. More specifically, it is responsible for devising means by which arable sugar and pineapple lands and their production infrastructure can be used again by a diversified agricultural industry and for providing marketing assistance that can lead to the development of local, national, and international markets for Hawaii-grown products.

Mission Statement: The Agribusiness Development Corporation (ADC) is a vehicle and process to make the optimal use of agricultural assets for the economic, environmental, and social benefit of the people of Hawaii. It is a risk-taking advocate for agriculture.

Major activities in FY 2002:

Kekaha
Approximately 28,000 acres of Kekaha agricultural land became available for diversified agriculture when Amfac/ JMB (Kekaha Sugar Company) ceased its sugar operations in November 2000. The ADC has been charged to keep the land productive in agriculture and prevent flooding of the area since a good portion of the Mana plain, including the Pacific Missile Range Facility (PMRF), is at or below sea level.

Working together with the farmers, the ADC provides operation and maintenance services to irrigation systems, drainage systems, pump stations, and electrical systems. Also funds from the 2001 Department of Defense Appropriations Act were awarded in forms of contracts to the ADC for the repair and maintenance of infrastructures identified as critical to the PMRF base operation. Repair and maintenance work included bringing the Kawaiele and Nohili pump stations up to OSHA safety standards, repairing the fire-damaged Mauka hydroelectric plant, and awarding design and construction contracts for drainage pump replacements. In addition the ADC also dredged approximately 10 miles of drainage canals to alleviate the threat of flooding. The ADC anticipates the awarding of additional contracts from the Navy for infrastructure improvement in the fall of 2002.

In early 2002, two major rainstorms on Kauai threatened flooding in the Mana plain. ADC subcontractors followed emergency procedures and opened up several special drainage outlets, which allowed the accumulated storm water to flow into the ocean. As a result of these actions, no major flooding issues were noted during this period.

The ADC is in the process of securing a master lease of the Kekaha agricultural lands from the Department of Land and Natural Resources (DLNR) with intention to sublease land parcels to farmers. The ADC continues to work closely with the farmers on operational issues of the infrastructure and long-term land/water lease issues in anticipation that the ADC would acquire the master lease from the DLNR in the near future.

East Kauai
The 2001 Hawaii State Legislature appropriated the ADC funds through Act 208 to help with the initial costs associated with transitioning plantation agriculture to diversified agriculture on the island of Kauai. Of the $300,000 appropriated, a $100,000 grant was awarded to the East Kauai Water Users' Cooperative (Cooperative) for the operation and maintenance of the East Kauai Irrigation System (System) with the long-term objective for the system to become self-sufficient.

Waiahole Water System
The task of replacing three old, wooden siphons on the leeward side of the system was completed in November of 2001. Early water transmission figures indicate that replacement of the three siphons has reduced the average system loss by approximately three million gallons per day (mgd) as compared to figures recorded two years ago.

In December of 2001, the Commission on Water Resource Management (CWRM) through a Decision and Order for the Waiahole Ditch combined contested case hearing on remand assigned to ADC a Water Use Permit, which allows for 2.0 mgd of system losses. In addition, CWRM ordered the ADC:

1) to assess how water from the Waiahole Water System tunnel could be diverted into Waikane Stream and to develop a plan to accomplish the diversion, and

2) to construct the diversion mechanism. The assessment and plan shall be delivered to the CWRM within 90 days of the decision. The diversion of water from the tunnel system into

Waikane Stream shall be completed within 180 days after the plan is delivered to CWRM. Due to the complexity of easement and permit issues, the ADC was given an extension until June 2002 to complete the diversion plan. The diversion project is expected to be completed in the fall of 2002.

Hamakua Agricultural Subdivision
The ADC continues to work on the development of an agricultural subdivision project at the Hamakua coast on the Big Island. A 118-acre parcel of former sugar land on Kamehameha School property was identified as a potential site. The ADC initiated lease negotiation with Kamehameha Schools/Bishop Estate on the parcel.

Molokai Irrigation System
Senate Resolution No. 34 and Senate Concurrent Resolution No. 43 of the Twenty-First Legislature of the State of Hawaii directed the ADC to conduct an assessment of the Molokai Irrigation System and to recommend long-term solutions to chronic water shortages. The Hawaii Agriculture Research Center was contracted to conduct the study and a report was submitted to the legislature in December 2001.

Marketing of Maui Produce and Products
The Hawaii State Legislature, 2002 Session, passed a bill for an act relating to agricultural marketing to assist Maui farmers with marketing their products and produce. The ADC plans on seeking input from the Maui farmers, the County of Maui, and the University of Hawaii to come up with a comprehensive marketing plan with broad support.

Other activities:
Together with several private parties, the ADC continues to explore the feasibility of setting up a consolidation, packing, and distribution facility for agriculture products on Oahu.

The ADC also held informal meetings with several groups representing the University of Hawaii, Hawaii Agriculture Research Center, Oahu Work-Links, and other private entities to identify training needs for agricultural workers and to seek funding for potential programs.

The ADC explored the feasibility of constructing hydroelectric plants on irrigation systems managed by the ADC on Oahu and on Kauai. Initial assessment showed potential at several locations. However more in-depth studies need to be conducted to include concerns on cost of construction, return on investment, environmental impact and continued availability of water on these systems.

In May 2002 at the Hawaii Bioenergy Conference on Kauai, the ADC Chairperson Robert Sutherland, representing the J.T. Waterhouse Trust, presented a success story of using photovoltaic panels to replace diesel generators on a ranch. In attendance was also the ADC Executive Director, Alfredo Lee. The two-day conference was well attended by policy makers, business people, farmers, educators, and students. In June 2002, the ADC participated in the “Think Out of the Field” tour, with Board Member Diane Ley and Executive Director Alfredo Lee joining 26 other farmers, educators, journalists, and business people for a tour of large and small farms in the Napa Valley, Modesto, Fresno, and Salinas Valley, California area. Produce centers, farmers markets, grocery stores, and processing facilities were also visited. Focus of the trip was on food safety procedures and alternative marketing channels. There was tremendous amount of information being exchanged between Hawaii and California farmers. The trip also allowed Hawaii agriculture participants to network and share information amongst themselves.

The Nohili pumping station at the Pacific Missile Range Facility (PMRF) on Kauai keeps the Mana plain water table low. During major rain storms, the station helps prevent flooding at the PMRF and in the nearby town of Kekaha.

List of Tables and Charts