It is again a pleasure to report on the projects and accomplishments of the Hawaii Department of Agriculture for the Fiscal Year 2001.

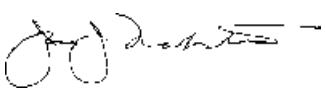
The department's top priority is to support and promote the expansion of diversified agriculture across the state. In pursuit of this goal, there are many different issues that our various branches are responsible for.

As the state moves from plantation-based agriculture to smaller diversified farms, we are pleased to report that the contributions of diversified agriculture have more than offset the decline in sugarcane production. The latest statistics show a continuing trend of measurable growth in diversified crops with record farm sales of several commodities, including flowers and nursery products, vegetables and melons, seed crop research and sales, aquaculture, bananas and ginger root.

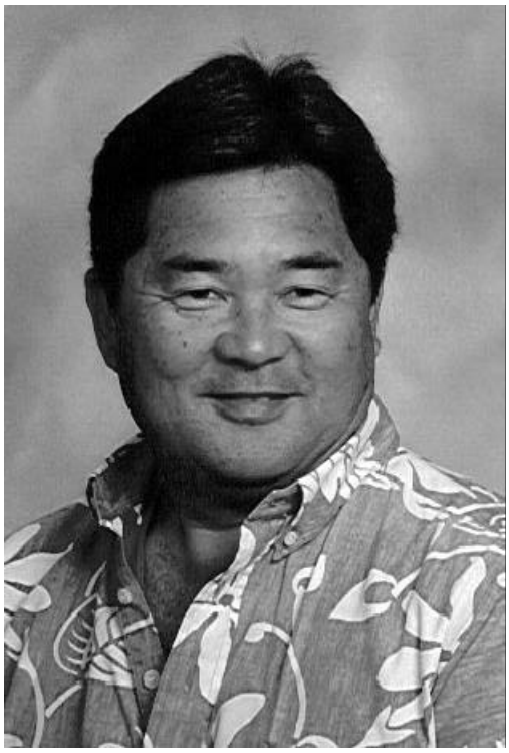
During FY 2001, there was also a need to focus our efforts on stopping the introduction and spread of various pests and plant diseases that threaten the health of Hawaii's environment and agricultural industries. Despite tough budgetary restraints and staffing shortages, personnel in our Plant Industry Division undertook major projects. The Maui Pest Risk Assessment was conducted in three phases at Kahului International Airport and was crucial in providing an accurate assessment of how alien plants and pests enter the state. The data collected will help to shape the state's plant quarantine policieS for years to come. On the Big Island, we successfully eradicated banana bunchy top disease from North Kona. In a community-wide effort that lasted two years, more than 175,000 banana plants were destroyed and monitoring efforts will continue until 2005. Efforts to battle coqui frogs continue to stop their spread to uninfested areas in Hawaii.

While FY2001 was a positive year for agriculture in Hawaii, we cannot overlook the impact of the events of September 11, 2001. Just as many sectors of our economy are suffering, segments of Hawaii agriculture have been hard hit. Agriculture in Hawaii has faced many challenges before, and if history provides any indication, the industry will not only recover, but flourish again. Never before has it been more important to support Hawaii's farmers and raising the public consciousness of buying produce grown in Hawaii. I am confident that with the support of the community and its leaders, we can get back on the track of building a stronger economic base through diversified agriculture.

With warmest Aloha,



James J. Nakatani
Chairperson, Board of Agriculture



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Editor/Desktop Publisher: Janelle Saneishi
Printer: Hawaii Hochi

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

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The mission of the Hawaii Department of Agriculture (HDOA) is to stimulate growth in agriculture with programs that provide the foundation for agricultural enterprises to build successful businesses. All tolled, agriculture-related businesses and industries contribute billions to Hawaii's economy. However, the impact of agriculture in Hawaii is far more than just economic. Historically, it has also shaped our culture, society and lifestyle.

In pursuit of our mission, the department's 330 employees statewide work to manage many diverse and complex issues, including maintaining Hawaii's rabies-free status, assuring affordable land and water resources to support farms, preventing the establishment of alien pests and plants in Hawaii, assisting in the promotion and marketing of Hawaii-grown products and much more.

The following is a list of highlights of the department's efforts in FY2001:

- Coordinated a reverse trade mission, bringing representatives from Japan's major coffee companies to Hawaii to tour Hawaii coffee operations and meet with Hawaii growers and processors. The reverse mission aimed to develop partnerships between the participants to promote greater import of Hawaii -grown coffee to the Japan market.
- The Market Analysis and News Branch published a study to assess the feasibility of establishing a world-class Hawaii's Farmers' Market to showcase the finest of Hawaii's homegrown produce.
- The Agricultural Loan Division approved 18 direct loans to farmers, disbursing about $1.4 million during FY2001. Five loans were emergency loans for damages caused during adverse weather conditions, including torrential rains, flooding and drought.
- In a multi-agency effort, the Hawaii Drought Plan was drafted and approved by the Governor. The plan defines levels of emergency and establishes procedures in the state's response to prolonged drought conditions. Establishment of this statewide plan paves the way for possible future federal emergency drought funding.
- Emergency repairs were conducted on the Lower Hamakua Ditch, which continues to deteriorate after the system was abandoned after sugar operations in the area ceased.
- The Hawaii Administrative Rules were amended to allow pets on cruise ships to remain with their owners under specified conditions; allow the purchase of electronic microchip from sources other than the state; simplify the process for issuing special permits for performing dogs and cats; remove the requirement for a 90-day post-quarantine observation period; and to expand certain other categories of service dogs for exemption from quarantine.
- Implemented a temporary quarantine fee reduction according to Act 278 passed by the Twentieth Legislature. The $500,000 general fund appropriation provided a quarantine fee reimbursement of either $120 or $220 per animal. During FY2001, 4,166 animals were quarantined, of which about 75 percent completed the 30-day quarantine program versus the standard 120-day program.
- Increased surveillance and detection efforts were instituted to prevent the entry and establishment of the deadly Foot and Mouth Disease in Hawaii. Swine health protection activities were also heightened to ensure that all foreign garbage arriving in the state is properly sterilized and disposed of.
- Facilitated the approval of the first aquaculture lease under the Ocean and Submerged Lands Leasing Law to Cates International, Inc., which is reportedly the first open-ocean aquaculture lease in the nation. Also, helped to secure a federal grant to evaluate open ocean aquaculture sites using Geographic Information System (GIS).
- Successfully applied to the Environmental Protection Agency for a special permit to use caffeine to eradicate and/or control coqui frog infestations. Commenced testing of various other toxicants to control coqui infestations.
- Bio-control agents were routinely released to combat invasive plant species such as miconia, ivy gourd, gorse, and Koster's Curse. Research continues on bio-control for fireweed. Bio-control agents were also released to reduce populations of plant pests including the silverleaf whitefly, citrus blackfly and citrus leafminer.
- Completed Phase I of "Project Eradication," a program to remove all banana plants within a 10-mile radius in North Kona to eradicate the Banana Bunchy Top Virus (BBTV) from the Big Island. In March 2001, Kona residents were allowed to replant banana plants. Also, introduced a management program for BBTV on Kauai after it was discovered to be widespread on the island.
- Conducted risk assessment of alien species movement from mainland and foreign sources into Hawaii through Kahului Airport. Through the risk assessment, it was determined that the is allow risk of importation of alien species through passenger baggage with the highest risk in the import of agricultural materials such as produce, cut flowers and propagative plant materials.
- Completed training of two staff to conduct food safety audits that would certify that farms are following food safety measures. Increasing numbers of markets are requiring such certification to protect consumers and reduce liability.
- Construction began to replace three wooden siphons of the Waiahole ditch. The $1.2 million project replaced the badly deteriorated siphons with high-density polyethelyne pipes, while continuing to provide an adequate supply of water to farms.

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 lead advocate for agriculture among state agencies, has 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.

Over the past few years, the department has reported on the progress of Hawaii farmers in achieving targeted farm-gate values of selected crops as described in "Hawaii's Agriculture: 2000 and Beyond." The crop value targets provided focus for activities, programs, and investment by the department, other agencies, and agricultural industries, primarily in the areas of important replacement and export development. According to 2000 statistics, Hawaii's agricultural industry attained 99.7 percent or $102.8 million of the $104.3 million increase in crop values targeted for this final year. This is an annual rate of growth of 4.33 percent. Five crops (fresh pineapple, coffee, seed crops, flowers and nursery, aquaculture) exceeded 100 percent of their target values while four others (vegetables/melons, other fruits, taro, other crops) exceeded 90 percent of their respective target values. It is of note that most of the 14 selected crops experienced ups and downs during the five-year period. This is testament to the overall strength of Hawaii's agricultural industry. While modest in comparison to the visitor industry's $11 billion in economic activity, the $459 million generated by diversified agriculture (including fresh pineapple) is solid, steadily increasing, and more than offsets the continuing decline in sugar production.

The following is a listing of activities for fiscal year (FY) 2000-2001 that supported the protection of agricultural resources, increased the use of former sugarcane lands and infrastructure, and expanded diversified agriculture development in general:

- Enabled timely transition of the irrigation system of the Kekaha Sugar Plantation to the Agribusiness Development Corporation to protect existing agricultural resources and uses.

- Submitted and supported proposed revisions to the 1996 Federal Agricultural Improvement and Reform Act that link on-farm conservation practices to the enhancement of broad environmental 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 is to offset the onerous economic burden being placed on Hawaii's many small farmers and agriculture-related activities who will have to comply with unfunded or underfunded federal environmental laws.

- Submitted extensive testimony before county councils and departments and community groups on agricultural issues including: City and County of Honolulu's proposed agricultural property tax and initiative to preserve prime agricultural lands; facilitating discussions between farmers and landowners on land tenure issues; and amendments to county agricultural zoning and community plan ordinances.

- Represented the department's and state's agriculture 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 60 land use applications, proposed legislation, and environmental rule-making that have significant impact on agricultural resources throughout the State such as establishment of Critical Habitats for wildlife, water quality standards for stream, and identifying and protecting important agricultural lands.

- Responded to more than 80 telephone, walk-in, and written requests from citizens, government agencies, legislators, consultants, and out-of-state organizations for information and limited analysis of issues pertaining to agricultural resources.

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 2001:

- **Control of Flowering of Pineapple ($10,000)**
  This is the second year of a three-year project that will determine practices to inhibit natural flowering during the months of November to January when it is most likely to occur. Natural flowering is much higher for some of the new low-acid pineapple cultivars resulting in increased cost of production and large amounts of fruit loss. This project has shifted its focus to determining if ACC can be used as a predictor of natural induction.

- **Detection, Characterization and Management of a New Closterovirus Associated with Mealybug Wilt of Pineapple ($67,275)**
  The mealybug wilt of pineapple has posed a significant threat to the pineapple industry for more than 80 years. This is the second year of a two-year project designed to understand the nature of the mealybug wilt of pineapple and to use the information to develop strategy and management options to control this disease.

- **Post-harvest Quality of New Low-Acid Pineapple Varieties ($25,833)**
  Hawaii's pineapple industry is moving from the higher acid Smooth Cayenne canning-type pineapple to low-acid fresh fruit cultivars. The fruit profiles and post-harvest handling of the low-acid cultivars are very different from those of Smooth Cayenne. This is the first year of a two-year project that will develop basic data on the occurrence and extent of fruit diseases and basic information on post-harvest handling that can often affect the marketing of the pineapple.

- **Search and Evaluation of New Insecticides for Mealybug Control and Ant Control ($26,320)**
  The control of mealybug wilt begins with an effective ant control program. This is the first year of a two-year project that will evaluate three insecticides for mealybug control and to evaluate new ant baits in the event Amdroä does not receive a permanent label.

- **Collection and Evaluation of Coffee Germplasm for Resistance to the Kona Coffee Root-Knot Nematode for the Potential Use as Rootstocks ($6,000)**
  There are several species of plant-parasitic nematodes associated with Hawaii coffee, but the Kona coffee root-knot nematode has been determined the most important because it has severely damaged the coffee industry by causing entire fields to be abandoned or destroyed. This project will evaluate coffee germplasm for resistance to the Kona coffee root-knot nematode and determine grafting compatibility of resistant rootsocks and Coffea arabica cv Typica.

- **Beneficial Reuse of Waste Water from Coffee Processing ($10,000)**
  With the increase of coffee processing, the waste water and pulp resulted from the pulping process is also increasing. The most viable alternative is to apply this waste water to the orchard. The purpose of this project is to help coffee growers in the state to legally and economically reuse the coffee processing water for irrigation.

- **Updating Macadamia Nutrient Recommendations: Implementing Crop Logging and Correcting the Apparent Root Inefficiency ($30,000)**
  This is the second year of a three-year project that will lead to more efficient uses of applied nutrients which will reduce the amounts of fertilizer costs and the amounts of applied nutrients that are susceptible to surface runoff. This project will continue to update the current database system (FACS2) to include the crop logging approach used for macadamia nut recommendations and to develop a management practice to correct the frequent low nutrient levels of foliar phosphorus while soil phosphorus is high. Additional tissue for sampling will also be identified.

- **Control of Powdery Mildew and Other Disease in Tropical Ornamentals ($25,000)**
  In the near future, fungicides commonly used on ornamental plants may be lost due to regulation changes that seek to reduce pesticide exposure to humans. This is the second year of a two-year project that will continue to determine the effectiveness of reduced risk compounds and other standard fungicides. This project will also evaluate the effectiveness of alternating compounds.

- **Rambutan Flowering, Fruit Set and Production in Hawaii ($30,000)**
  The native environment for rambutan is vastly different from Hawaii's growing areas. As a result, production in some areas in Hawaii can be erratic due to inconsistent flowering and poor fruit set. This is the first year of a three-year project designed to develop culture and management information relating to flowering and fruit set and to identify varieties that produce consistently.

- **Burrowing Nematode Control in Anthurium-Chemical and Cultural Alternatives ($45,273)**
  The burrowing nematode is a chronic problem in the industry which can reduce yields by 50 percent. Furthermore, the burrowing nematode is a quarantined pest which prohibits the export of infected plants. This is the second year of a two-year project that will continue to evaluate biological-based nematicides and different hot water treatments against burrowing nematode.

- **Anthurium Genetic Studies ($29,727)**
  Developing new and improved varieties of anthuriums will keep the industry competitive in the cut flower market. The objectives of this project is to assess the breeding behavior of selected parent anthurium varieties in order to develop new red varieties, new color varieties and modified spathe orientation varieties for ease of packing.

- **Coconut Phytophthora Heart Rot Control ($10,000)**
  Coconut palms are a major element in creating the tropical paradise ambiance in Hawaii's hotels and resorts. The current epidemic of coconut heart rot is in its fourth year and has become a major disease of coconut in Hawaii. This project will research systemic fungicides and supporting nutrients for efficacy in controlling coconut heart rot.

- **Emulsifiable Telone II and DiTera for Control of Nematodes in Pineapple ($57,985)**
  Telone II, re-registered by the U.S Environmental Protection Agency in January 1999, and fenamiphos are the only two remaining nematode control products available to pineapple growers. In order to reduce potential worker exposure risks as required by Re-registration Eligibility Documents, this project will develop economically viable alternatives to organophosphate and carbamate pesticides for postplant nematode control.

- **Fertility and Disease Control Studies of Taro ($20,000)**
  Previous taro studies on Kauai conducted field experiments of calcium, potassium and phosphorus, but it is crucial to repeat these experiments on the other islands because of the different environment and soil types. One of the objectives of this project will determine the effect of increased calcium and potassium rates on growth and disease suppression in taro. This project will also determine the effect of alternative spray applications for effective microorganisms and phosphorus acid.

- **Humuula Gorse Project ($10,000)**
  Mature koa trees in the Humuula koa forest suffer root damage from cattle grazing and the spread of weeds, especially gorse. Gorse has invaded about 5,000 acres which has made the land less productive. The goal of this project is to conduct an environmental assessment and create a management plan for koa salvage, gorse control.

ADMINISTRATIVE SERVICES OFFICE

Elaine Abe
Administrator

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

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

- Developed and disseminated to programs procedures for calculating and completing time travel requests.
- Updated the inventory reporting and disposal policies and guidelines.
- Conducted Workplace Violence and Bridging your Brain Gap sessions for departmental personnel.
- Received certification from Department of Human Resource and Development for department personnel staff to conduct Frontline Leadership training program for supervisors and managers, and Working training program for non-supervisory personnel.
- Developed and implemented program to allocate costs of garage supplies to appropriate programs on a quarterly basis.
- Developed and implemented new procedures to reconcile the billings from private shipping companies to actual payroll and other charges incurred by Plant Quarantine inspectors.
- Developed procedures and assumed the delegation of authority from Department of Accounting and General Services for the pre-auditing of payments up to $1,000.
- Implemented local area network server for the Plant Quarantine and Measurement Standards programs.
- Compiled and coordinated the submittal of space and personnel assignments on all Oahu personnel for the Department of Accounting and General Services' review.
- Compiled and coordinated the submittal of financial data for all special and revolving funds being reviewed by the Legislative Auditor's Office.

Major projects still in progress are:

- Participating 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).
- Continuing work on updating Department's record and retention control schedule in coordination with the Department of Accounting and General Services.
- Implementing on-line system for frequently used forms such as the G-1, Transfer of Property, Detail Inventory, and Telecom Requests, for department personnel use.
- Establishing a repair and maintenance schedule for Animal Quarantine and Plant Quarantine electric carts.
- Identifying departments' fixed assets and its value for recordation on department's property inventory as part of the new financial reporting standards mandated by the Governmental Accounting Standards Board Statement No. 34.
- Continuing work on updating information on Department's web site.
- Continuing work on implementing Lotus Notes department-wide.
- Migrating applications from the Wang VS to local area network based system.
- Continuing various capital improvement projects to correct safety concerns and other deficiencies at Department facilities including repairs to the necropsy roof, improvements needed to upgrade existing fire systems, improvements needed to make reasonable accommodations for individuals with disabilities.
- Continuing capital improvement project to construct a training facility for the Department's Plant Quarantine detector dog teams.
- Establishing a 10-year replacement schedule for the department's motor vehicles.
- Updating the department's telephone directory.
- Participating in the development of new receipting procedures for the Pesticides Registration program.
- Consulting with the Union of Public Workers and Hawaii Government Employees' Association on a Workplace Violence Plan for the Department of Agriculture.
- Reviewing exempt positions Section under 76-16(17), Hawaii Revised Statutes, for possible conversion to civil service.

Other future projects include implementing a modernized civil service system, implementing a personal computer based application system for the Measurement Standards program, establishing an on-line printing and supply request system, implementing in-house printing capabilities for summary warrant vouchers, and networking neighbor island offices for access to local area network applications.

AGRICULTURAL DEVELOPMENT DIVISION

Robert Gerber, *Administrator*
(July 2000 – January 2001)

Not pictured:
Samuel Camp, Acting Administrator
(February – June 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 2001 were:

Matching Funds Promotional Contracts

- Hawaii Food Manufacturers Association's $200,000 matching funds promotional program executed this year consisted of activities that included participation in eight local trade and consumer fairs and one Mainland tradeshow.

- Hawaii Export Nursery Association with a $49,000 matching funds promotional program will continue with the Mid-Pacific Horticulture Expo in Hilo as its main project to promote the export of locally produced flowers, plants, and foliage.

- Pineapple Growers Association of Hawaii $90,000 matching funds promotional program, targeting the local and tourist markets has been implemented. Highlight of this program was the First Annual Pineapple Festival held at McCoy Pavilion in Ala Moana Park this summer.

- Hawaii Macadamia Nut Association $150,000 matching funds promotional program to develop a 100% Grown in Hawaii Brand Macadamia Nut has been implemented. During the promotion 17,000 promotional brochures were distributed, 3.3 million media impressions were made, and 40,000 boxes of Girl Scout 100 percent Hawaii Macadamia cookies were sold.

- Hawaii Tropical Flower Council entered into a $49,000 matching funds promotional program targeting the Mainland market. Activities consist of participation in tradeshows and design seminars, the development and distribution of posters and brochures, advertising in trade publications, and the development of a Website to encourage e commerce.

- Hawaii Coffee Association entered into a $49,000 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. Hawaii is the only state that grows coffee, which is now available from several islands. Activities include participation in the Specialty Coffee Association of American Trade Show, coordinating and implementing the Hawaii Coffee Association Conference and Trade Show, consumer advertising, and the design and updating of a Hawaiian coffee website.

- Papaya Administrative Committee entered into a $130,000 matching funds promotional program to promote fresh Hawaiian papayas locally and on the Mainland. Low cost imported papayas from South American have contributed to the growth in the Mainland market during the past five years. The development of new transgenic varieties has enabled Hawaii farmers to dramatically increase production, and now the industry's objective is to increase its Mainland market share through targeted promotional efforts.

Local Market Promotions and Activities

- Produced and distributed Island Fresh point-of-purchase materials to promote the sales of local produce in Hawaii retail outlets.

- Participated in agricultural 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.

- Sponsored an Island Fresh pork promotion with the Hawaii Pork Industry Association. Two hundred seventy two thousand Hawaii Pork-Island Fresh labels were designed and placed on Hawaii pork sold in supermarkets to differentiate the Hawaii product from the imported one.

- 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.
- Organized the Department of Agriculture participation in the Hawaii State Farm Fair including:
- 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 the 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 contests that entertained the fairgoers and rewarded contest winners with prizes.
- Organized cooking demonstrations by chefs such as Sam Choy that featured "Island Fresh" vegetables and seafood. The audience was invited to sample the dishes while recipes were distributed.
- Scheduled educational events and special commodity trade demonstrations by experts in the fields of tropical fruits, macadamia nuts, and apiary.
- Prepared the Department of Agriculture's letter response in favor of the continuation of the Seniors Farmers' Market Nutrition Pilot Program (SFMNPP), a federally funded program that serves weekly about 1000 low-income seniors' nutritional needs in collaboration with the Food Bank and the local farmers in Kauai. The program is still in place.
- 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. Updated the listing of funding sources for agriculture and food industries.

Mainland and International Market Promotions and Activities

- Sponsored the Hawaii Tropical Fruit Growers Association exhibit at the Produce Marketing Association Exposition at Anaheim, California.
- Sponsored and coordinated three separate trade mission/suitcase shows to Hiroshima, Fukuoka, and Sapporo Japan for the purpose of developing markets for Hawaiian valued added products in targeted niche markets.
- Participated in developing, coordinating, and implementing the third Governor's Exporter of the Year program.
- Promoted the use of the export logos, "Made In Hawaii with Aloha" and "Grown in Hawaii with Aloha" among Hawaii companies through direct mail solicitation, advertising in trade publications, production and distribution of brochures, presentations at commodity association meetings and trade fairs, and via the internet.
- Coordinated and administered the Western United States Agricultural Trade Association Market Access Program of the USDA, Foreign Agricultural Service (FAS) which consists of 1) a generic program; 2) a branded program: and 3) an export readiness program.

HAWAII AGRICULTURAL STATISTICS SERVICE BRANCH
Donald Martin, *Manager*

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 $531 million during FY 2000. Most HASS data collection efforts were in the diversified agriculture sector that was valued at $357 million in FY 2000.

Activities during FY 2000 included the following:

- Initiated survey and published results for the emerging kava industry.
- 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.

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. Towards 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 2001 included the following:

- Awarded a competitive $64,000 Federal-State Marketing Improvement Program (FSMIP) grant from the USDA to develop an agricultural information system for small farm decision-making in Hawaii.
- 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.
- Conducted a program review to evaluate the importance and usefulness of market news reports to wholesalers, farmers and other subscribers on the islands of Maui and Kauai. The response was highly positive and encouraging.
- Continued to collect, compile, publish and disseminate weekly reports on a timely basis despite the departure of two key staff members. 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.
- Published a study to assess the feasibility of establishing a world-class Hawaii Farmers' Market as an economic strategy to showcase the state's high quality agricultural products. This study was prepared for the Hawaii State, Twenty-First Legislature 2001.
- Revised format of various MANB market news reports, including a "news-flash" feature, and upgraded fax software program to ensure more reliable and timely transmission of market news.
- Reviewed and reconfigured commodities in-shipment database and updated reports to support the functions of the Hawaii Agricultural Statistical Services (HASS).

AGRICULTURAL LOAN DIVISION

Doreen K. Shishido
Administrator

The Agricultural Loan Division administers the Agricultural Loan Program and the Aquaculture Loan Program. These programs are intended to provide a foundation of support for agriculture and aquaculture entrepreneurs. As a lender of last resort, the program provides funding to qualifying entities that are unable to obtain financing through conventional sources. In this role, the division contributes toward the growth, development, and well being of the industries.

During the last decade, Hawaii's agriculture has transitioned from large-scale mono-crop plantations to smaller diversified operations. Today's agricultural scene encompasses many farmers owned and operated by a variety of business entities. While the agricultural industry has transitioned, agriculture continues to provide jobs and income to residents and reduces dependence on imports. Indirectly, agriculture enhances our visitor industry providing tropical flowers, foliages, and "Island Fresh" foods. Agriculture and aquaculture also keep Hawaii's landscape green and open.

As in the past, the division continues to position itself toward the facilitation of the promotion, development and maturity of these industries. While diversified agriculture continues to expand, agriculture is often seen as a relatively risky industry. These risks include natural disasters such as drought, floods, and winds, as well as diseases and pest infestations. These risks often times preclude loans from conventional commercial sources. One of the Agricultural Loan Division's role in addressing this situation is to bridge the 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 for applicants that have been denied credit from conventional lending sources that meet the program's eligibility and underwriting criteria.

As agriculture has transitioned, the division has sought to be proactive and adaptive to accommodate these changes. For example, the division has found that an increasing number of farming operations are being formed under new allowable legal structures such as limited liability companies and limited liability partnerships. In response, a bill was passed to allow these new types of farming entities to qualify for loans from the program. With the changing needs of agriculture, the program was also made more flexible by raising the maximum loan ceilings. Along with the transitioning of agriculture, the commercial lending sector has undergone tremendous changes as many local institutions in the state have restructured, consolidated, or merged involving changes in personnel and in the way loans are processed and approved. With these changes in agriculture and commercial lending, the division has initiated an outreach program with potential applicants as well as commercial lenders. As part of the effort, a broad spectrum of informational materials about the program and loan offerings has been developed. In addition, personnel at commercial lending institutions have been contacted for visits and presentations. This outreach educates prospective borrowers and commercial lenders on the various loan facilities and program changes.

The program also remains as a "safety net" for emergency situations. During FY01, 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 island of Hawaii and Maui. Under these emergency situations conventional lenders are often reluctant to provide financing due to the uncertainties and risks.

A self-sustaining entity, the Agricultural Loan Division operates from its own revolving fund and does not require annual general 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 help those that can not obtain financing from conventional sources.

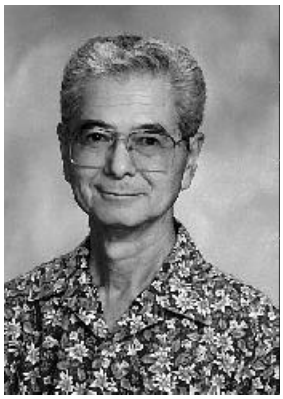
The division assisted D & J Ocean Farms, Inc. to expand their shrimp and ogo operation on Molokai.

Kaiwahine Farms, a taro and plumeria operation owned by the Hicks family in Waianae, received a working capital loan from the division in cooperation with the Department of Hawaiian Homes Lands

The major accomplishments of FY 2001 were the following:

- Act 141 (House Bill (HB) 869) was signed into law on May 24, 2001. This bill broadened the reach of the agricultural loan program by enabling new legal forms of business in Hawaii to qualify for loans including limited liability companies, limited liability partnerships, and trusts.
- Act 267 (HB 1556) was signed into law on June 22, 2001. The bill increases the loan limit ceilings for the Class A (Ownership and Improvement) loan and Class C (Operating) loan from $400,000 to $800,000. The legislature found that with the changing needs of agriculture, farm ownership and operating costs were approaching or exceeding loan ceilings.
- Act 177 (Senate Bill (SB) 986) was signed on May 29, 2001. This bill expanded the reach of the Aquaculture Loan Program by allowing individuals or entities that lease parts of the ocean under the jurisdiction of the State to apply for loans from the program.
- Acts 78 and 266 were passed and appropriated $5 million for economic development on the island of Kauai. The legislature has found that as AMFAC-JMB closed their sugar operation on Kauai that there is a need to provide economic stimulus to agriculture and aquaculture operations on Kauai.
- Successfully converted the division's loan reporting system from a Wang system to a newer operating system. The newer operating system is more user friendly and allows for faster reporting allowing staff to more quickly respond to the program's clientele.
- Revised and updated Facts Sheets describing the various loan facility offerings for distribution to the general public.
- Held roundtable discussions and various presentations to the community lenders to help generate interest and leads for potential joint lending ventures.
- Approved 18 direct loans and disbursed $1.4 million during FY2001. Of this, five emergency loans were approved to help operations recover from torrential rains and flooding and one emergency loan was approved to help a cattle ranch recover from drought.
- The division's loan portfolio as of June 30, 2001 was valued at $20.2 million with 217 loans booked. FY20001 collections yielded $$5.179 million. Of the collected amount, $1.117 million was in interest and $4.061 million in principal.

AGRICULTURAL RESOURCE MANAGEMENT DIVISION



Paul Matsuo, 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 conducted during fiscal year 2001 include the following:

- The division prepared documentation for the disposition of vacant and cancelled lots in its agricultural park system. The Board of Agriculture authorized the first lease disposition to use bidding as a basis for lease awards. Previously, all lease dispositions were awarded by qualified drawing. Results of the bidding indicate that this form of award may not be in the best interests of small farmers and is currently under review by staff. Dispositions are reported on page 45.

- The Honokaa-Paauilo Irrigation System Water User Advisory Board was established under Chapter 4-156, Hawaii Administrative Rules, and members were appointed by the Governor. The board organized and elected a chairperson and vice chairperson.

- The Molokai Irrigation System Water Users Advisory Board initiated a community ad hoc water resource committee to explore the potential for new water sources for the system. The committee held a series of community forums and meetings to develop an acceptable solution for additional or new water. Several draft proposals with various options were developed and are under review by community organizations. No decisions have been made.

- The Hawaii Drought Plan was drafted and accepted by the Governor. The plan was submitted for public comment and hearings were held on each major island. The final Hawaii Drought Plan, Phase I, was approved by the Governor and pursuant to Public Law 102-250, submitted to the U.S. Bureau of Reclamation for transmission to the U. S. Congress. The plan was held by the Bureau of Reclamation while it conducted an internal investigation on a civil rights violation complaint by an individual from the Ka'u District.

- The U.S. Congress enacted a new statute entitled, "Hawaii Water Resources Act of 2000" and the President signed the bill into law as Public Law 106-566 before leaving office in January. This Act amended certain statutory authority by adding Hawaii to the list of reclamation states for drought planning, wastewater reclamation and reuse, and water resources study. It also provided a $300,000 appropriation of matching federal funding.

- The division participated in the appeal of the Waiahole Irrigation System contested case decision and subsequent remand from the Hawaii Supreme Court of the Commission on Water Resource Management's decision and order. The division provided testimony during the remand hearings.

- The division provided project management assistance to the Agribusiness Development Corporation (ADC) to replace three inverted wooden siphons on the Waiahole Ditch and called for bids to award the construction contract. The division entered into a design agreement with the U.S. Army Corp of Engineers to prepare engineering drawings and construction specifications for the siphon replacement project. The Corps was also hired to provide construction management services for the project.

- The environmental assessment to breach the Kailua Reservoir was distributed for public review and upon receiving comments, the project was placed on hold until funding for a full Environmental Impact Statement could be secured from the legislature.

- The division became the custodian of the abandoned Wing King Reservoir through its Waimanalo Irrigation System due to Unisyn's bankruptcy and operation shutdown. In order to comply with concerns expressed by the Waimanalo community and neighborhood board to eliminate odor and unsanitary stagnant water conditions, the division arranged to carry out planned improvements of the Waimanalo Watershed Project. The first step was to test and remove as necessary the remaining sludge from the reservoir's bottom and the second was to fill the reservoir so it could be replaced by a new twin-celled reservoir at the same site.

- The division negotiated a memorandum of understanding between the County of Maui's Board of Water Supply and the Department of Agriculture for the operation and maintenance of the Upcountry Maui agricultural water pipeline. The first phase of the dual pipeline is scheduled to be completed in late 2001 and design work is being coordinated for the next phase of the watershed project, pending federal appropriation in the new federal fiscal year beginning October 1, 2001.

Emergency repair work on the Oshiro Flume, part of the Lower Hamakua Irrigation Ditch on the Big Island. Workers install a 12-inch pipe to replace the old wooden flume, which has deteriorated over the years.

- Drought continues and the Molokai Irrigation System's Kualapuu Reservoir has experienced very critical water levels. The water supply is now supported by the pumping of dike waters in Waikolu Valley because surface stream flows are insufficient to meet the daily water use demand. This has caused an increase in pumping power costs far beyond the budgeted appropriation, requiring emergency funding legislation and a general fund supplement.

- The Board of Agriculture delegated authority to its Chairperson to negotiate: (1) a settlement for delinquent rent owed by Kukui (Molokai), Inc. due to the closure of its resort operations; and (2) amendments to the terms of Maui Produce Processing Cooperative's lease, allowing the property to qualify for a federal grant from the Economic Development Administration.

- The division instituted several measures to reduce its state irrigation program costs by: 1) closing the Waimanalo field office; 2) consolidating bookkeeping functions in the Honolulu office; and 3) conducting a Reduction-in-Force (RIF), eliminating five positions. These measures were necessary to conform to legislative mandate requiring self-sufficiency of the Irrigation Revolving Fund. However, revenue from irrigation water sales experienced a decline due to drought and an economic slowdown. The only avenue to self-sufficiency was through the reduction of operational costs and salary overhead.

- The Lower Hamakua Ditch continued to deteriorate, resulting in two flume failures during the fiscal year. Flume Nos. 37 and 30 collapsed due to the overstress and failure of individual flume members as a result of heavy ditch flows. Both flumes were being replaced under emergency procurement procedures; however, water flow in the ditch was interrupted during the emergency construction period. The division, with assistance from the State Procurement Office, opened bids for a new three-year operation and maintenance contract. The bid was awarded to the successful low bidder, Wai Engineering, Inc.

- Under the Planning Assistance to States authority, the division entered into an agreement with the U.S. Army Corps of Engineers to conduct two reconnaissance studies for abandoned former plantation irrigation systems in Ka'u, Hawaii and Waiahole, Oahu. The Corps also provided a Phase I dam safety assessment for the Waiahole Reservoir as part of the study.

- The division prepared a response for the Agribusiness Development Corporation (ADC) to a Request for Proposal (RFP) by the U.S. Navy, Pacific Missile Range. The RFP included the preparation of construction costs for improvements to the former Kekaha Sugar Company's drainage system and the defining of the scope of services to be delivered under the RFP. The division provided technical advice during pre-submission negotiations with the Navy and developed contractual terms and conditions for the management of the construction of improvements as outlined in the RFP contract.

- The division conducted site visits to two sugar plantation irrigation systems upon the announcement of their closure to assess the potential of converting the systems to diversified agricultural use and determine the feasibility of establishing an irrigation district for the continued operation and maintenance of these abandoned irrigation systems during the interim.

- Although funds were not appropriated for the Agricultural Water Use and Development Plan (AWUD Plan), the division continued to coordinate the gathering of information on existing plantation irrigation systems. It is coordinating with other state and federal agencies to obtain data and studies conducted by these agencies on irrigation systems. With the enactment of the federal Water Resources Act of 2000, the division is now empowered to seek local matching funding to prepare the initial phase of the AWUD Plan, which is the assessment and inventory of existing irrigation systems throughout the state. Work in the next fiscal year will concentrate on the preparation of an evaluation report on the conversion of irrigation systems for diversified agricultural uses. The AWUD Plan will begin upon the receipt of funding from the next legislature, and matching of federal funds authorized under PL 106-566. The AWUD Plan is critical as many existing irrigation systems are now being used in the transformation out of sugar cane cultivation into diversified crop farms.

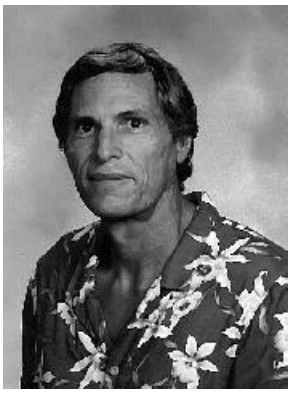
Capital Improvement Program (CIP) - Ongoing

- Upcountry Maui Watershed Project,
  - Phase I Pipeline
  - Phase II, Kimo Road Lateral Pipeline
- Lower Hamakua Ditch Watershed Project,
  - Hiilawe By-Pass Tunnel
  - Honokaia Reservoir
  - Paauilo Reservoir Lining
  - Phase II, Flume Replacement
  - Paauilo Distribution Pipeline
- Waimea-Paauilo Watershed Project, Kaauhi Reservoir
- Waimanalo Watershed Project,
  - Outlet Channel Improvements
  - Twin-Cell Reservoir
- Waimanalo Irrigation System,
  - Maunawili Ditch Improvements
  - Kailua Reservoir (Breach) Improvements
- Waimea Irrigation System, Asbestos Lined Pipe Replacement
- Waianae Agricultural Park, Punana'ula Heiau Access Road
- Waiahole Ditch, Wooden Siphon Pipe Improvements (for ADC)
- Molokai Irrigation System, Replacement of Waikolu Valley Pumps

Above: Dendrobium farm in Waianae Agricultural Park

Below: Y. Soukaseum soybean farm in Waimanalo.

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 and poultry industries. 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.

The Livestock Disease Control Branch has been particularly active during the last several years in implementing voluntary disease control programs such as Scrapie in sheep and goats and Johne's disease in dairy cattle, evaluating swine herds statewide for the presence of porcine reproductive and respiratory disease virus, 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.

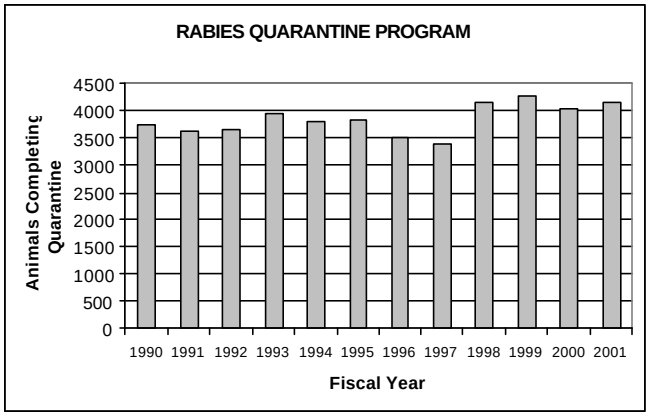
ANIMAL QUARANTINE BRANCH
Dewey Sturges, D.V.M., Ph.D., ***Program Manager***

During FY01, Chapter 4-29, Hawaii Administrative Rules entitled "Dogs, Cats, and Other Carnivores" was amended on two occasions. Early in the fiscal year, amendments were implemented to: accommodate people who wish to have their pets with them on cruise ships in Hawaiian waters; give dog and cat owners the option to purchase an electronic microchip from the State or from some other source; simplify the process for issuing special purpose performance permits for dogs and cats; remove the requirement for a 90-day post-quarantine observation period; and make changes in the guide dog program including its expansion to include certain other categories of service dogs. A second rule change was implemented late in FY01 to provide a temporary quarantine fee reduction. 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.

This was the fourth fiscal year for the 30-day quarantine program. As shown in the accompanying figure (bottom of page), the total number of animals completing quarantine (4,166) increased slightly compared to FY00. The slight increase may be attributed to the anticipated fee reduction. In addition to 4,166 animals completing quarantine, 503 dogs and cats spent varying lengths of time at the quarantine station while transiting to other destinations.

The portion of quarantined dogs and cats undergoing 30-day quarantine during FY01 was 75.5 percent similar to FY99 and FY00. A significant increase in 30-day quarantine qualification for active duty military from 78.6 percent in FY00 to 83.5 percent during FY01 offset the decline in 30-day quarantine qualification for civilian-owned animals. The average daily population was 725 animals with a range of 525 to 975 animals occupying the quarantine station at any given time during FY01. Cats represented 37 percent of incoming animals. Active duty military pets comprised 38 percent of quarantined dogs and cats, similar to past fiscal years.

The transition to the 30-day quarantine program continues to progress without significant difficulties. 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's website contains all information and forms relating to quarantine for review or downloading and pet owners can access pre-arrival rabies test results and 30-day quarantine-eligible entry dates at the DOA website.



Animal Caretaker George Kalauokalani handles a dog that has arrived from the mainland at the Import and Compliance Section at Honolulu International Airport. The office receives animals that arrive for inspection and processing.

The quarantine program continues to monitor dogs carefully for ticks exotic to Hawaii. No exotic ticks of medical importance were discovered during FY01. Currently, the only tick established in Hawaii associated with dogs is the brown dog tick, Rhipicephalus sanguineus.

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 state and nation's 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 (BT)**
Bovine Tuberculosis Free Status maintained
Bovine tuberculosis a chronic, debilitating disease of cattle, bison and goats, which can also cause a serious disease in man, is caused by the bacteria Mycobacterium bovis.

The state continues to maintain its bovine tuberculosis free status. No cattle affected with bovine tuberculosis have been detected since a single bovine tuberculosis infected cow was discovered from Ualapue, Molokai in 1997. In response to the 1997 incident, surveillance of cattle herds on the eastern half of Molokai continues. Herds on the eastern half of Molokai are required to be tested annually or have any cattle moving from the area tested within 30 days of movement. All cattle slaughtered from the area are examined for signs of bovine tuberculosis. In addition, a wildlife surveillance program, initiated in FY 99, continues with hunters being provided a stipend for presenting heads and thoracic viscera for gross and laboratory examinations. To date, only two feral swine collected in the spring of 1999 were found to be infected. Both feral swine were located on the Eastern end of the island, one at Ualapue where the 1997 infected cow was located and the other on an adjacent property at Kaluaaha. By the close of FY 2001, hunters submitted tissues from 435 axis deer, 333 feral swine, 72 feral goats and 208 mongooses for Mycobacterium bovis testing by the USDA's National Veterinary Services Laboratories. USDA is preparing data collected, for evaluation for the purpose of conducting a risk assessment. This assessment will then be used to reevaluate the bovine tuberculosis management plan now in place on Molokai.

The current bovine tuberculosis management plan in place includes:

- Quarantine and restricted movement of feral swine from East Molokai.
- Evaluation of the TB status of cattle herds with complete herd tests, from areas where infected wildlife are detected.
- Requirement for cattle from historically high-risk locations, the eastern end of Molokai, to test negative for bovine tuberculosis within 30 days before movement or require cattle originate from a herd having a negative complete herd test within twelve months prior to movement.
- Continued surveillance of Molokai livestock at slaughter for signs of bovine tuberculosis.
- Continued monitoring of wildlife species for evidence of bovine tuberculosis.
- Assessment of the risk for transmission of Mycobacterium bovis from affected wildlife species to livestock.
- Planning for measures to further reduce the risk of reinfection of livestock by wildlife and reduce the risk of spread amongst susceptible wildlife species.

During the fiscal year 6,382 live cattle tested negative statewide for bovine tuberculosis with the caudal fold and the comparative cervical skin tests. An additional 14,964 cattle were slaughtered throughout the state and received postmortem examinations to detect bovine tuberculosis. No evidence of bovine tuberculosis was found.

❖ **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 is infectious to man.

Routine surveillance testing of 11,987 adult cattle at slaughter plants throughout the State and testing of 3,445 test eligible live cattle, generated eight brucellosis epidemiological investigations during the fiscal year.

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 18,420 live and slaughter cattle were tested for anaplasmosis. No suspects or reactors were discovered.

Hawaii's request to Canada to be recognized free for anaplasmosis, thereby removing test requirements to export to Canada remains pending as a result of Canada's rule amendment process.

❖ **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's domestic swineherds remain free of swine brucellosis and pseudorabies. Annually, 25 percent of the herds in the state are randomly selected and tested to determine their status. In addition, all swine over six months of age, at slaughter, are tested for surveillance purposes. During FY2001 no domestic swine were classified as brucellosis suspects or reactors.

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. A single sow from a domestic swine operation in Pearl City tested positive for pseudorabies. Quarantine, slaughter of the affected sow, testing and retesting of the affected herd resulted in finding no additional infected swine. The herd quarantine was rescinded after an approved herd plan was implemented and completed. This herd had a past history of exposure to feral swine.

Feral swine populations on the islands of Oahu, Maui and Hawaii are known to be infected with both brucellosis and pseudorabies. These infected 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 for feral swine. Historically, all domestic herds ever found infected in the State were traced to exposure with infected feral swine. During FY2001, 212 feral swine were tested for swine brucellosis, of which 63 (30 percent) were classified as reactors. In addition 235 feral swine were tested for pseudorabies with 96 (41 percent) testing positive.

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

A serological survey for PRRS was conducted on the State's swineherds during the fiscal year. PRRS a viral disease of swine can cause severe reproductive losses in its acute phase followed by a chronic phase characterized by chronic respiratory and other morbidities in affected herds. PRRS has been present in the U.S. since the late 1980s and entered Hawaii in infected pigs or semen sometime in the early 1990s when the disease was still characterized a "Mystery Pig Disease". In 1996 a severe outbreak of PRRS occurred on eighteen farms in Mikilua Valley, West Oahu. Vaccination and other control measures contained the outbreak to that area. However, other herds throughout the State were also known to be infected.

This survey funded by the 2000 Legislature began in September 2000 and was complete in July 2001. The survey was conducted to determine the distribution of PRRS, which would allow industry to determine the feasibility of conducting a voluntary PRRS free certification program for negative herds. In addition, individual farm data allows each farm to make biosecurity decisions to protect their negative status.

The survey found significant infection rates on Oahu, Maui and West Hawaii. A few farms infected on Molokai and East Hawaii and no farms infected on Kauai. (Survey data report on page 48)

Foreign Animal Disease Outbreaks

- **Foot and Mouth Disease**
  The U.S. was threatened by multiple Foot and Mouth Disease (FMD) outbreaks, most notably in England and multiple countries in South America. USDA, to preclude the introduction of FMD, put increased 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.

- **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.

- **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.

- **West Nile Virus (WNV)**
  During FY2001 new outbreaks of WNV occurred in the Southeast U.S. and Mississippi Valley States. Steps to create a working group of pertinent scientific personnel from DOA, DOH and DLNR were put in place near the end of the fiscal year to revaluate the risks associated with the potential introduction of this disease.

Importation/Exportation of Livestock, Poultry and Other Animals

There were no embargoes put in place during FY2001.

Inspected and approved for entry into the state: 21,484 head of livestock, 363,388 poultry and other birds, 1,945,800 hatching eggs, 6,856 dogs and cats and 12,746 other animals.

Conducted a total of 27 compliance investigations resulting in 20 citations being issued. Issued 194 written warnings and refused entry on six shipments.

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 2001 were:

- Continued the implementation of the amended Chapter 190D, HRS, Ocean and Submerged Lands Leasing law by facilitating the approval of the first aquaculture lease by the Department of Land and Natural Resources to Cates International, Inc. This was also reportedly the first open ocean aquaculture lease in the nation.

- Assisted the National Marine Fisheries Service, Department of Commerce to conduct a Hawaii workshop on the Draft National Code of Conduct for the Development of Aquaculture in the U.S. Exclusive Economic Zone (EEZ).

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

- Facilitated marketing for Phase II of a federally-funded research project to demonstrate open ocean cage culture of moi (Pacific threadfin) managed by the Oceanic Institute and the UH Sea Grant College Program.

- 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 multinational company to locate the first large-scale shrimp breeding center in the world in Hawaii.

- Edited Proceedings for Marine Ornamentals '99 for publication.

- Appointed co-chair of Marine Ornamentals 2001 Conference scheduled for November 2001 in Orlando, Florida. Also, became a member of the Organizing Committee and put in charge of developing conference recommendations.

- 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 conducted a media tour for travel writers in cooperation with the visitor industry and worked with television, radio and print media to promote the aquaculture industry.

- Developed and produced an informational brochure to market moi locally and for export.

- Conducted more than 101 field trips for aquatic animal health management and analyzed 402 case submissions. Also, provided animal health consultation services to producers and research organization, statewide, including conducting workshops on disease diagnosis and prevention.

- Assisted the Natural Energy Laboratory of Hawaii Authority to develop a Aquatic Species Health Management Program, Policies and Guidelines, for controlling the movement and health status of animals in and out of the facility.

- 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.
- Gave keynote address at annual conference of the Hawaii Aquaculture Association.
- 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 PTOFP.

The Aquaculture Development Program's progressive animal health services and marketing assistance helped the Hawaii shrimp industry to grow to more than $5 million dollars in the year 2000. The industry sells shrimp to local and national seafood markets and disease-free broodstock to overseas farms.

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.

Some of the major activities of the program in FY 2001 were:

- Entered into a contract with the University of Hawaii to demonstrate how plants and associated microbes can break down persistent chemicals. Approximately $600,000 in funding from the U.S. Environmental Protection Agency (EPA) has been awarded for this project. This funding was secured through the efforts of U.S. Senator Daniel K. Inouye.

- Applied in concert with the Department of Land and Natural Resources to the EPA to use caffeine to control tree frogs. Caffeine was identified as the most likely chemical to control these frogs. The frogs compete with endangered and threatened species for food and serve as prey for rats, mongoose and other predators, making these predators more numerous.

The Pesticides Branch successfully applied to the U.S. Environmental Protection Agency (EPA) to use caffeine to combat the coqui, a frog alien to Hawaii. The mating call of the male frog is a high-pitched bird-like whistle that sounds like "ko-kee." Noise levels in high density populations have been known to reach levels similar to a lawnmower and may continue from dusk to dawn.

- Completed an administrative hearing in a case where the applicator misused a pesticide on multiple occasions. This was only the third hearing in the history of the program.

- Issued two special local need registrations to support fruit fly control in Hawaii. A bait spray with spinosad was registered and dibrom with an attractant was registered. With these tools, researchers can assess the means to reduce fruit fly populations to acceptable levels.

PLANT PEST CONTROL BRANCH (PPC)

Larry M. Nakahara, *Manager*

The primary function of the Plant Pest Control Branch is to reduce infestations of plant pests that cause significant damage to agriculture and the environment. 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. The branch consists of the Biological Control and the Chemical/Mechanical Control Sections.

Some of the activities of the branch during FY 2001 included the following:

New Pest Detection and Identification

- Identified 156 samples of insects and other organisms from which 177 specimens were processed and added to the branch's Zoological Reference Collection. The collection now contains approximately 165,800 specimens.

- Recorded three immigrant insects and a fungus that were detected and determined to be new state records. Of these species, three are potential plant pests. Two other new immigrants, a thrips and a midge, were detected, but establishment has not been confirmed.

- **An ant**, Solenopsis sp. (Hymenoptera: Formicidae). Specimens of this ant were first collected at a golf course in Ewa, Oahu, in September 2000. This tiny, slow-moving, brownish ant is in the same genus as the locally established fire ant, S. geminata (Fabricius), and the red imported fire ant, S. invicta Buren, a serious pest throughout the southern United States, except Hawaii. While species determination of this Solenopsis cannot be made without the ant queen, it is definitely a new state record because it is neither S. geminata nor S. papuana Emery, both of which are present in Hawaii.

- **Black spot of papaya disease**. Samples of papaya leaves and fruit with unusual dark spots were first obtained from Haiku, Maui, in February 2001. This disease, caused by a fungus, is known as black spot of papaya. It is known to occur in the United States (Texas), Brazil, and South Africa. In Hawaii, it has been found on the islands of Maui, Hawaii, and Oahu. The only known host of this disease is papaya. Symptoms of this disease are irregular, dark brown to black fungal spots (1/16" to 1/4") on the lower surface of older leaves. On the upper leaf surface, the infection causes slightly sunken tan spots to occur. Black spots have also been observed on the surface of fruits, though not nearly as severe as those found on the foliage.

- **Persea mite**, Oligonychus perseae Tuttle, Baker and Abbatiello (Acari: Tetranychidae). The first indication of this mite in Hawaii occurred in February 2001 when specimens were detected by California plant quarantine inspectors on leaves of the horse-radish tree (marungai, kalamongai), Moringa oleifera Lam., that had been shipped from Hawaii. Later, specimens collected in Hawaii from avocado, cassava, madre de cacao (Gliricidia sepium), kolomona, wiliwili, and haole koa were identified as the persea mite. Native to Mexico, this mite is also found in Costa Rica and the USA (California). Persea mites live in colonies on the undersides of leaves under protective patches of webbing, usually along the midrib veins. Characteristic chlorotic spots result on the upper surfaces of the leaves.

- **Red gum lerp psyllid**, Glycaspis brimblecombei Moore (Homoptera: Psyllidae). Native to Australia, this psyllid was first collected in Hawaii at Ulupalakua, Maui, in March 2001. It constructs a white conical cover of crystallized honeydew, called a lerp, and feeds while concealed under this shelter. This psyllid feeds on plant fluids of a broad range of Eucalyptus species, but it prefers to colonize members of the red gum species group. Infested leaves are covered with the small, white, conical coverings along with sticky honeydew and black sooty mold. In California, high populations of this psyllid on susceptible Eucalyptus species have resulted in withering and dropping of leaves along with dieback and death of weakened trees.

- **A thrips**, Pezothrips (=Megalurothrips) kellyanus (Bagnall) (Thysanoptera: Thripidae). USDA inspectors at the Kona Airport collected several specimens of this thrips from tuberose flowers that were being carried to the mainland by a passenger. This species is not known to occur in Hawaii and the origin of the tuberose could not be determined. A survey conducted on Oahu at a large tuberose farm in Waialua disclosed infestations of other species of thrips, but specimens of Pezothrips were not found.

- **A biting midge**, Culicoides sp. (Diptera: Ceratopogonidae). A single female specimen of a midge, tentatively identified as Culicoides species, was collected at Kalaeloa (Barbers Point) on October 7, 2000. It was captured in a pan trap that was placed beneath a floodlight at the Barbers Point Memorial. Members of this family are commonly known as biting midges, punkies, and no-see-ums. Some species are known to bite people and animals. The specimen was submitted to the Bishop Museum for identification, but nothing more could be done without dissecting the lone specimen. A Bishop Museum specialist believes that it resembles C. arboricola Root and Hoffman, which feeds on birds and breeds in holes in trees. He feels strongly that it is neither of two common biting midges that are known to bite people in the Caribbean area and the Southwest Pacific, respectively. In response to the detection, surveys were initiated at Kalaeloa, Pearl Harbor, and Campbell Industrial Park in late October in an attempt to collect additional specimens. Yellow sticky traps were set up and samples were collected with a vacuum suction collector, but no Culicoides were captured. To date, there have been no reports of people or animals being bitten by very small flies.

Projects of the Branch's Biological Control Section included the following during FY 2001:

- **Yellow Sugarcane Aphid** [Sipha flava (Forbes)]. Routine surveys to monitor population densities of the yellow sugarcane aphid (YSA) were terminated in December 2000 due to no significant changes in YSA activity in pastures on the islands of Hawaii and Maui and a workload increase as a result of new pest problems. Continued drought conditions in leeward areas of the islands limited grass regrowth and YSA population densities. On the island of Hawaii, localized YSA upsurges occurred in some areas as limited seasonal rainfall, beginning in September, resulted in the greening of grass pastures.

Production of the Pakistan biotype of Lysiphlebus ambiguus (Haliday) continued in the Hilo insectary with a total of 60,320 L. ambiguus adults being produced. Eight releases of this YSA biocontrol agent, consisting of a total of 21,150 adults, were made on the island of Hawaii in kikuyugrass pastures at Kahua Ranch, South Point, and Waikii Ranch, and at the Hilo Arboretum. Nine shipments, totaling 34,020 adults, were sent to Maui for field release. This aphid parasitoid 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. Two recoveries of L. ambiguus, one in March and the other in June 2001, were made in kikuyugrass along the ironwood windbreak at the Kohala Ranch Subdivision and in a kikuyu pasture along the Kohala Mountain Road, north of Kahua Ranch, respectively. In the latter, mummified YSA, parasitized by L. ambiguus, were found in an open pasture three miles north of the closest release site in the area. The final release in this locality had been made several years ago, so L. ambiguus seems to be well-established.

- **Silverleaf Whitefly** [Bemisia argentifolii Bellows & Perring]. Propagation of the four whitefly parasitoids, Encarsia lutea (Masi) and E. mineoi Viggiani from Egypt and E. hispida De Santis and E. pergandiella Howard from Brazil, was terminated at the end of December 2000. Release sites for whitefly parasitoids had been difficult to find because most farms do not provide suitable habitats for long-term establishment of these whitefly natural enemies. Also, farmers rely heavily on pesticides that are not compatible with the parasitoids. From July through November 2000, final releases of adults of the four species were as follows: E. lutea, 555 (Waimanalo, Oahu); E. mineoi, 4,440 (Waimanalo), 1,250 (Mountain View, Hawaii); E. hispida, 1,590 (Waimanalo), 900 (Mountain View); E. pergandiella, 2,390 (Waimanalo), 1,050 (Mountain View).

- **Citrus blackfly** [Aleurocanthus woglumi Ashby]. An HDOA news release on the citrus blackfly (CBF) in July 2000 resulted in the publication of several news articles in local newspapers on the four major islands, and phone calls from residents. Heavy infestations were confirmed in West Hawaii at Puako, Holualoa, and Honaunau. On Maui, infestations were found during surveys at Wailuku, Waikapu, Kihei, Lahaina, and Napili. CBF infestations on Kauai had already been confirmed at Kilauea, Puhi, and Hanapepe. On Oahu, surveys of citrus plants at nurseries and residences in Waimanalo showed significant improvement in health. Limited CBF infestations that yielded adequate numbers of the parasitoid Encarsia opulenta (Silvestri) were found on citrus trees in some localities on Oahu. This enabled shipments of the parasitoid to be made to the neighbor islands for release and establishment on citrus trees from which subsequent collections could be made for distribution on each island.

The second recovery of E. opulenta on Kauai at the Kilauea citrus orchard was made on December 6, 2000. Releases at this site had been initiated in March 2000. Although only 60 adults were captured, it was a significant increase when compared to the one adult recovered in August. A total of 4,570 adults from Oahu had been routinely released during this period of nine months. E. opulenta was also recovered at the Hanapepe residence, less than seven months after releases began in May and where releases totaled 1,150 adults. A recovery was also made at Puhi, where no releases had ever been made. As a result of these establishments, numerous collections of CBF-infested citrus leaves with parasitized CBF pupae were made and thousands of E. opulenta adults were obtained for release in other localities on Kauai and also on Maui, Hawaii, and later on Molokai. Emergences of field-collected E. opulenta totaled 120,220 adults in FY 2001. Of this total, 17 releases totaling 14,870 adults were made on Kauai, 30 releases totaling 43,900 adults were made on Maui, 8 releases totaling 27,000 adults were made on Molokai, and 12 releases totaling 34,450 adults were made on Hawaii.

In May 2001, the Branch was informed of a name change for the CBF parasitoid, Encarsia opulenta (Silvestri). J. Heraty, a researcher at the University of California at Riverside, discovered the error in identification while conducting DNA analyses of various specimens of Encarsia sent to him by HDOA entomologists in September 1999. Heraty determined that the species represented by specimens of this parasitoid from Hawaii is Encarsia perplexa Huang and Polaszek. He based his determination on the publication by Huang, J. and Polaszek, A. (1998), "A revision of the Chinese species of Encarsia Forster (Hymenoptera: Aphelinidae): parasitoids of whiteflies, scale insects, and aphids (Hemiptera: Aleyrodidae, Diaspididae, Aphidoidea)," J. Nat. Hist. 32:1825-1996, pages 1934-1936. In this publication, E. perplexa is described as a new species and there is mention that it has been regularly misidentified as E. opulenta. The two species are referred to as sibling species and differences in their external morphology are said to be minimal. Specimens of E. opulenta sent to Heraty consisted of both the lab progeny of the Guatemalan biotype collected by M. Ramadan in Coatepeque on August 13, 1998 and those collected in Honolulu during field surveys in July and August 1999 from areas where the Guatemalan strain had not been released.

The other CBF parasitoid, Amitus hesperidum Silvestri, which was also introduced from Guatemala in 1998, was recovered for the first time on Kauai at the Kilauea citrus orchard. Adults were reared from CBF-infested leaves collected in May 2001. Three releases of this species, totaling 112 adults, had been mde at this site last year (March, June and August 2000). Previously, it was only detected on Oahu at Waimanalo. The only releases of this species in FY 2001 were made in August 2000. One release of 27 adults was made on Kauai at Kilauea, two releases of a total of 75 adults were made on Maui at Kihei (50) and Wailuku (25), and one release of 20 adults was made on Hawaii at Pepeekeo.

❖ **Citrus Leafminer** [Phyllocnistis citrella Stainton]. The citrus leafminer (CLM) was first detected in Hawaii at Waimanalo near the eastern end of Oahu in June 2000. Initial surveys to delineate the infestations disclosed CLM infestations in Waimanalo and Hawaii Kai. In October, just four months later, this new citrus pest was under excellent control by the parasitic wasp, Ageniaspis citricola Logvinovskaya (Encyrtidae), which was also detected in Waimanalo, shortly after the discovery of the CLM. Parasitism was very high in a section of unsprayed rootstock plants. In a sample of 40 damaged citrus leaves collected, 37 had A. citricola pupae present, while only three had CLM larvae or pupae that were not parasitized. The nursery owner was advised to avoid treating the rootstock plants with insecticides in order to maintain a reservoir of A. citricola. By January 2001, the CLM had extended its range of distribution to Waialua, at the opposite end of the island, but it never became a significant problem because there are only few large plantings of citrus on Oahu and A. citricola was so well established and effective.

During insect surveys on Maui in June 2000, CLM leaf mines were observed on potted citrus plants at a garden shop in Kahului. The plants came from a Waimanalo ornamental plant nursery on Oahu. Subsequent surveys on Oahu disclosed CLM-infested plants at garden shops in Mililani, Waikele, and Kunia. However, not even a trace of the CLM was detected in citrus plantings at the UH-CTAHR Poamoho Experiment Station and Pearl City Urban Garden Center, Dole Company nursery at Whitmore Village, and various residences in Whitmore Village, Wahiawa, and Waipahu. After the surveys, there was very little doubt that the CLM was being distributed throughout the islands on infested citrus plants by the ornamental plant nursery in Waimanalo. When the owner became aware of the problem, he immediately retrieved the citrus plants from the garden shops and treated all of his plants with an insecticide. Unfortunately, it was too late to prevent statewide infestations because the garden shops had sold the CLM-infested plants for quite some time.

The first sign of a CLM infestation on Kauai was found at a Kilauea citrus orchard on January 10, 2001 during the collection of citrus blackfly parasitoids. Several damaged leaves were detected following the initial discovery of a mined leaf. More CLM damage was found throughout the orchard at the end of the month. In February, establishment was confirmed when identification was made of adult specimens that emerged from a sample of infested leaves collected at the Kilauea orchard. On Maui, moderate CLM infestations on new flush growth were found on citrus trees at a Kihei residence on April 25, 2001, confirming CLM establishment on that island. No parasitoids were found in a sample of CLM-infested leaves.

HDOA Oahu Insectary Entomologist Walter Nagamine collecting citrus leaves with pupae of the citrus leafminer (CLM) biocontrol agent, A. citricola, for shipment to the neighbor islands.

On Kauai, the CLM population density continued to increase and, in March, all new flush growth was heavily attacked at the Kilauea citrus orchard. When the report was received on Oahu, HDOA personnel attempted to collect the CLM biocontrol agent, A. citricola. However, because A. citricola was extremely effective at controlling CLM on Oahu, it was not readily found. Fortunately, parasitized CLM were observed during an insect survey at a farm in Lualualei on the southwest coast of the island. Two visits to the farm early in April resulted in the collection of 584 parasitized CLM pupae. The first shipment of 117 parasitized CLM pupae was hand-carried to Kauai, while the second, consisting of 467 pupae, was shipped via air cargo. On April 11, 2001, the first 10 A. citricola adults that emerged en route were released in the Kilauea citrus orchard. The grower stored the rest of the pupae and released the adults after they emerged and mated. A total of 580 A. citricola adults were released in the Kilauea citrus orchard. During April, CLM infestations were found at Anahola, Kapahi, Wailua Homestead, Princeville, Puhi, Koloa, Omao, and Lawai.

In May 2001, A. citricola pupae were found in a sample of CLM-infested leaves submitted to the UH-CTAHR Cooperative Extension Service by a resident of Omao. Because Kilauea was the only locality on Kauai in which this CLM biocontrol agent was released, this discovery indicated that A. citricola probably became established on Kauai through the movement of CLM-infested citrus plants. In addition to the infestation at the Omao residence, the CLM and its parasitoid were also detected at another Omao residence and at the National Tropical Botanical Garden in neighboring Lawai. Subsequently, CLM infestations were found at Anahola (Aliomanu

Estates), Princeville, and Haena. A eulophid parasitoid similar to the species previously found at Kilauea was present at Anahola, but the desired parasitoid A. citricola was not detected at all three localities. In June, A. citricola was found at the UH-CTAHR Agricultural Experiment Station in Wailua, where no releases were ever made. Near the end of the month, CLM damage to new citrus growth at the Kilauea orchard was not as severe as in previous months and although most of the new leaves were still infested, the number of mines per leaf seemed to have lessened. The CLM crisis on Kauai appeared to be ending.

❖ **Koster's Curse** [Clidemia hirta (L.) D. Don]. Specimens of the clidemia defoliating caterpillar, Antiblemma acclinalis Hubner, were collected from clidemia foliage at Helemano in central Oahu on November 28, 2000. This recovery, the second of this species at this site, confirms establishment of this clidemia biocontrol agent. The initial detection of the caterpillar at Helemano was made on October 5, 1999.

A sample of clidemia shoot tips with berries that were collected at Kahana Valley on January 25, 2001 yielded six adult specimens of the clidemia fruit-feeding caterpillar, Mompha trithalama Meyrick. It was the third recovery of this species from this release site. The first was made on January 28, 2000 and the second was on October 24. The three detections, spanning a period of 12 months, confirms establishment of this clidemia biocontrol agent in Kahana Valley. M. trithalama has the potential to be a major contributor for suppression of clidemia because it attacks the fruits and, occasionally, the flowers, thereby reducing the reproductive potential of this forest weed. After confirmation of species identification, all six moths were released at a site in Hauula. On April 6, 2001, mature M. trithalama larvae were found in clidemia fruit at the Waiakea Forest Reserve release site on Hawaii. The larvae were readily identified by their distinct alternating red and white annulation. It was the first recovery of this species at this release site off Stainback Highway. The first release of this clidemia biocontrol agent was made at Pohoiki on February 24, 1999. Since then, this moth has dispersed up to 1,300 meters. In May and June 2001, 13 and 12 M. trithalama adults, respectively, that emerged from clidemia berries collected at various release sites in East Hawaii were released amid clidemia infestations in the Waiakea Forest Reserve.

In April, approximately 100 clidemia thrips, Liothrips urichi Karny, collected in the Waiakea Forest Reserve, were released on clidemia infestations in a South Kona mesic forest. During that release, larval mines and adults of the clidemia leafmining beetle, Lius poseidon Napp, were detected. This was a most promising indication of establishment of this buprestid beetle at this site. The first release of this species at this location was made on December 7, 2000. It consisted of 500 adults that had been collected from clidemia infestations in various localities on Oahu. During FY 2001, two releases of L. poseidon, consisting of a total of 1,159 adults, were made on clidemia infestations at Anakaluahine Gulch in the West Maui Mountains. These beetles were also collected on Oahu.

❖ **Gorse** [Ulex europaeus L.]. Most of the pupae of the gorse defoliating caterpillar, Agonopterix ulicetella (Stainton), collected at Humuula on the island of Hawaii in June 2000, had emerged by the end of July in the Hilo Insectary. From a total of 865 pupae collected, 573 moths had emerged. The emerging adults were exposed to the cooling process in environmental chambers to put them into diapause. Also emerging were two species of parasitoids, mostly Rubicundiella perturbatrix Heinrich [=Melanichneumon rubicundus (Cresson)], but also some Pimpla punicipes Cresson [=Coccygomimus punicipes (Cresson)]. On March 20, 2001, approximately 400 diapaused moths were shipped to Manaaki Whenua Landcare Research New Zealand in Lincoln (near Christchurch, South Island) to supplement their gorse control activities. The moths were received in excellent condition. They were out of diapause and already laying eggs. Progeny of these moths were shipped to Tasmania for biocontrol of gorse.

The gorse rust fungus, Uromyces pisi f. sp. europaei, failed to become established on the island of Hawaii. By the end of February 2000, eight rust-infected gorse plants had been transplanted at two sites near Humuula. These plants were shipped to Hilo from the Plant Pathology Greenhouse in Honolulu. This method of establishing rust diseases in the field has been successfully utilized in other rust release programs in Australia and the U.S. mainland. During the most recent survey at the end of September 2000, the gorse rust disease was found on only one of the eight original inoculated plants. Future releases will use different inoculation techniques and, hopefully, a new isolate of the rust fungus.

❖ **Ivy Gourd** [Coccinia grandis (L.) Voigt]. Routine releases of the ivy gourd biocontrol agents continued, mainly on Oahu, during FY 2001. A total of 69 releases, amounting to 16,272 adults, of the ivy gourd leafmining weevil, Acythopeus cocciniae O'Brien, were made on ivy gourd infestations at various sites on Oahu. Release localities included Waimanalo, Hawaii Kai, Kaimuki, Pauoa, Manoa, Tantalus, Aiea, Pearl City, Waipio Peninsula, Waiawa, Waikele, Waipahu, Honouliuli, Ewa, Kunia, Kapolei, Kahe Point, Waianae, Mokuleia, Waialua, Haleiwa, Kawailoa, Sunset Beach, Waialee, Kahuku, Laie, Kualoa, Waiahole, Kaaawa, Kaneohe, Kalaheo, Maunawili, Olomana, Kailua, and Lanikai.

After a slow start, this weevil is now established at nearly every release site throughout Oahu. Feeding holes made by the adults were very conspicuous on the leaves and there were numerous larval mines. A shipment of 600 adults was sent to the Hilo Insectary in September 2000 and subsequently transported to Kona. Releases of 200 adults each were made at three sites along Kaahumanu Highway, just south of Kailua. During a survey at Kailua-Kona in February 2001, this weevil appeared to be established at three of the four release sites along Kaahumanu Highway. Larvae were observed in their characteristic mines within the ivy gourd leaves. In May, 400 adults were hand-carried to Kona and released on ivy gourd infestations at Kailua. The first release of A. cocciniae on Kauai was made on January 31, 2001 when 300 adults were hand-carried from Oahu and released at a large residential property in Anahola. A second release of 324 adults was made in February at the same site, followed by releases of 400 adults each in April and May.

During a visit to Kauai by Oahu personnel, seven adults of the ivy gourd vine borer, Melittia oedipus Oberthur, were released at the Anahola site on February 22, 2001. It was the first release of this sesiid moth on Kauai and was followed by releases of 48 in April and 25 in May. The first release of this moth on the island of Hawaii was made on April 6 when 42 adults were released in Kailua-Kona. Previously, all releases, from August 1996 to August 1999, had been made on Oahu. This moth became well-established on Oahu, so this phase of the Ivy Gourd Biocontrol Project was terminated in favor of other projects. Insectary production of this moth was extremely labor-intensive. At that time, it was believed that this biocontrol agent could be field-collected for distribution to the neighbor islands when needed. However, this method did not prove to be practical for this moth. Insectary rearing was reactivated in November 2000 as a result of requests from Saipan and Guam for assistance with biocontrol of ivy gourd. This proved to be very fortuitous because ivy gourd infestations were increasing on the neighbor islands after unsuccessful attempts at eradication.

Liberation of the ivy gourd gall weevil, Acythopeus burkhartorum O'Brien, consisted of 13 releases, totaling 976 adults, during FY 2001. Nearly all of the releases were made at one site in Waimanalo because lab production of this weevil was very limited. Some recoveries have been made since this weevil was first released in August 1999, but establishment is still in doubt because field colonies have not been consistently observed at the release site. It is believed that this species is experiencing a great deal of predation by ants and birds. As a result of the inability of this species to become established at that site, releases are now planned for other localities. In June 2001, one release of 22 adults was made at Kapolei.

HDOA Plant Pathologist Eloise Killgore selecting potted miconia plants for use as host plants to culture and test potential biocontrol pathogens of this serious noxious weed.

❖ **Miconia** [Miconia calvescens DC]. The monitoring project to measure the effects of the miconia pathogen, Colletotrichum gloeosporioides f. sp. miconiae (CGM), on miconia plants at various sites in Onomea, on the island of Hawaii, was formally concluded at the end of Federal Fiscal Year 2000. The USDA Forest Service Forest Health Protection Program funded the project. In September 2000, surveys were conducted in streambeds above the highway from the miconia infestation sites at Onomea. The surveys disclosed that the fungus had traveled inland and had reached the upper limits of the miconia infestation, about one-half mile from the highway. At these limits, the miconia plants along three different streams were scattered and approximately one meter in height or less. The disease was incipient on the young miconia plants.

Professor R. Barreto of the University of Vicosa (Brazil) shipped three isolates of the fungus Pseudocercospora miconiae to the HDOA Plant Pathology Quarantine Facility (PPQF). The original isolate in the PPQF had lost its pathogenicity due to overculturing on artificial media. Additional testing of this potential biocontrol pathogen for miconia will be required because it also infected ohia (Metrosideros polymorpha) and mountain apple (Syzygium malaccense), as well as strawberry guava (Psidium cattleianum). Barreto also sent cultured tubes of various fungi that he collected during his exploration in Ecuador. Pathogenicity testing of these fungi has been initiated. Eight petri dishes containing a total of 400 Hawaiian miconia seedlings were sent to Barreto, who will be testing the fungus Coccodiella myconae and a leaf nematode for host specificity. Research with this obligate fungus in Hawaii has not been successful, so the work will be conducted in Brazil.

HDOA Plant Pathology personnel from Oahu and HDLNR-DOFAW Maui personnel collaborated to hand-spray the miconia biocontrol fungus (CGM) on miconia infestations in Hana on November 1, 2000. Because it was raining, all of the plants in the treatment zone were first covered with plastic bags, then sprayed from below. A total of 50 plants were sprayed at one site, before the supply of plastic bags was exhausted. The next day in pouring rain, two tarps were set up as umbrellas and the remainder of the fungus was sprayed onto the miconia plants at the second site. On November 30, a revisit of the spray sites revealed that the fungus had infected nearly all of the plants, causing numerous leaf spots. Some young plants had died. This is the first occasion on which positive results were observed in Hana. This success was due to the return of rainy weather conditions in Hana, which should favor the spread of the fungus. Despite the return of drought conditions in December, a survey of the treatment sites in March 2001 disclosed numerous leaf spots on the older leaves and on plants under the canopy of the new growth. On the other hand, there were no spots on the new growth. A second plan to prepare and release the fungus on miconia infestations in Hana was made in mid-April. At the site where the first release on Maui had been made in November 2000, the amount of disease was very impressive. Although some of the miconia plants grew new leaves that were unaffected by the fungus, many plants under the canopy were infected, including seedlings. During the second visit, some inoculum was sprayed to augment the disease already present.

Spraying of the fungus (CGM) onto miconia infestations in Hana by helicopter began on May 7, 2001, followed by another on June 28. More than 1,200 petri dishes containing CGM cultures were transported to Maui for each release. Each petri dish was scraped in distilled water to loosen the fungal spores and six gallons of concentrated spore solution were prepared. The solution was delivered to Windward Aviation's helicopter hangar and the inoculum was poured into the helicopter's tanks. Twenty gallons of distilled water were then added to dilute the spores to a proper inoculating level. The helicopter was equipped with a boom type of sprayer. In June, CGM release sites in Hana were monitored. Leaf spots were observed on many of the mature miconia trees at the site of the first aerial release. This confirmed that the fungus could be sprayed by helicopter with good results. Because the second release was made at a remote site, it will not be monitored. It was determined that future releases would be made in the remote main core area because the fungus can control the growth and spread of miconia, especially by killing young seedlings. Accessible sites are becoming rare in the aftermath of the eradication efforts. The major problem for the HDOA is the production of the fungus.

Fungal preparation is extremely time-consuming and expensive. A more efficient and economical method of fungal production will be developed.

In May 2001, CGM cultures were shipped to the HDOA Hilo Insectary and, after preparation, the fungus was released at Leilani Estates in Puna. The releases were

HDOA Oahu Plant Pathology personnel and Maui cooperators spray the spore solution of the miconia pathogen (CGM) onto miconia plants in Hana in the rain.

Inset: A miconia leaf with typical leafspot damage resulting from the CGM infection.

made in response to a request from the Operation Miconia staff because their field crew had so many other infestations to destroy that they have not been able to keep up with the regrowth of miconia at that locality. Miconia plants were treated at three sites. Rain measuring 0.15 inches fell that night and conditions remained humid the next day until about midday. Part of the inoculum was given to USDA Forest Service researchers to inoculate experimental plants in their greenhouse. The remaining inoculum was transported to Honolii Gulch along old Mamalahoa Highway to treat some large miconia trees. This site is isolated from the core infestation at Onomea. As the miconia was sprayed at this site, the characteristic leaf spots of the CGM fungus were commonly observed on the leaves. It appears that the fungus dispersed naturally to this site, a distance of about four kilometers from the closest treated miconia plants.

The HDOA Plant Pathologist visited Tahiti in April 2001 after receiving an invitation from the Government of French Polynesia to revisit and inspect sites where the miconia pathogen (CGM) was released. The government wanted to know if the fungus was still active and the level of control it had attained. When the Tahitian collaborator made observations of the fungus release sites six months after its initial release, he did not see the disease on any of the newly emerged leaves, so he assumed that the fungus was not reproducing, even though there were still leaf spots on the inoculated leaves. He had reported that the area experienced very little rainfall after they had sprayed the fungus in April 2000. The unusual lack of moisture during that period probably affected the spread of the disease. During the follow-up visit in April 2001, the level of disease was disappointingly very low. The recommendation made to French Polynesian officials was to attempt another release of the fungus at the beginning of the rainy season in November or December. They were also advised to get their government to establish a fungal propagation laboratory so that they will be able to mass rear and release the miconia fungus.

- **Fireweed** [Senecio madagascariensis Poiret]. Early in FY 2001, host specificity testing of seven of a total of eleven fireweed natural enemies colonized in the HDOA Insect Quarantine Facility was terminated and their lab colonies were destroyed because these biocontrol candidates had minimal impact on the target plant and lacked host specificity. All of the candidate insects being tested to determine their suitability for use as biocontrol agents to suppress fireweed infestations in Hawaii were introduced in 1999 from South Africa and Madagascar.

  The four remaining fireweed biocontrol candidates include two tephritid flies, a weevil, and an arctiid moth. The flies (Diptera: Tephritidae) were collected in South Africa and Madagascar. One species is Sphenella marginata (Fallén) and the other is still unidentified. The larvae of both are flower-head feeders. Their host range is restricted to fireweed and other members of the tribe Senecioneae. The weevil, Gasteroclisus tricostalis (Coleoptera: Curculionidae), was collected in the Kuazulu-Natal Region of South Africa in September 1999. The larva is a stem borer and the adult feeds on young leaves. Feeding is restricted to members of the tribe Senecioneae. Although highly specific to fireweed, its impact on the plant is still not clear. The moth, Secusio extensa (Butler) (Lepidoptera: Arctiidae), was collected in the southern region of Madagascar in October 1999. The larva is a voracious defoliator of fireweed. Studies on the biology, rearing techniques, and host plant specificity of this moth are in progress.

  For the past two years, host-range tests of S. extensa were conducted on 51 plant species in 10 tribes of Asteraceae. Adult females were not specific in their oviposition preference and laid their eggs away from the host plants. However, in no-choice tests, the larvae developed successfully only on plants belonging to the tribe Senecioneae. At the present time, S. madagascariensis and S. mikanioides are the only plants on which this moth completes development consistently. It has developed on other members of the Senecioneae, all of which are considered to be weeds in Hawaii, but the percentage of larvae completing development were much less than that of the two. A colony of this moth was transferred to the U.S. Forest Service Quarantine Facility at Hawaii Volcanoes National Park on the island of Hawaii, where it will be studied for possible use as a biocontrol agent of German ivy, S. mikanioides. This weed has become a serious pest in mamane forests on Mauna Kea. German ivy was favorably consumed by this arctiid.

Projects of the Branch's Chemical/Mechanical Control Section included the following during FY 2001:

- Completed Phase I of Project Eradication, an intensive campaign to remove all banana plants within a 10-square-mile area in North Kona District that were believed to be infected with the banana bunchy top virus (BBTV). Phase I ended in February 2001; on March 10 & 11, 2001, Kona residents were allowed to replant bananas in the Eradication Zone. Phase II of Project Eradication, monitoring for latent BBTV, will continue until 2005.

- Introduced a Management Program for BBTV to Kauai growers in July 2000 after BBTV was discovered in farms and residential lots in Kapahi during April 2000. Eradication was not feasible due to several factors, i.e. spread of the virus since October 1997 and the possibility of BBTV having spread to numerous host

plants in more than 500 square miles, or half of Kauai. BBTV was confirmed in areas from Hanalei to Lawai.

- Continued surveillance and rouging activities on Oahu where BBTV is widespread. HDOA efforts emphasized assistance to commercial farms impacted by the virus. Commercial growers were urged to continue to manage the virus on their farms by controlling the insect vector and chemically treating diseased plants by herbicide injection.

- Continued to assist papaya growers on Oahu and Hawaii by identifying papaya ringspot virus (PRV) in commercial field plantings. On Hawaii, remaining Papaya Project funds were transferred to the UH-CTAHR; funds were used for a private contractor to "bull-doze" more than 659 acres of land in Kapoho, Kalapana, Keeau and Olaa which had been abandoned by growers. Surveys identified more than 10,079 papaya plants infected with PRV in the Puna and Hamakua Districts on Hawaii.

- Continued to cooperate with DLNR, RC-UH, and Invasive Species Committee groups on Hawaii, Maui and Oahu involved with controlling miconia (Miconia calvescens). On Hawaii, miconia has been suppressed in areas of Hilo, Puna and Honaunau by DLNR and Operation Miconia; on Maui, miconia control is being carried out jointly by DLNR. RC-UH, Maui Invasive Species Committee, and Haleakala National Park in East and West Maui; on Oahu, Oahu Invasive Species Committee (OISC) and volunteer workers continue to suppress incipient populations of miconia in Manoa, Waimanalo, Kahaluu, Tantalus and Kalihi Valley.

- Commenced testing of various toxicants to control coqui frog infestations reportedly found on Hawaii, Maui, Oahu and Kauai; collaborated with USDA Wildlife Services and UH-CTHAR Hilo for technical assistance. On Oahu, HDOA collaborated with OISC volunteers to hand-collect coqui frogs from breeding colonies found in upper Wahiawa and in a commercial nursery in Kahaluu.

- Continued chemical and mechanical control for designated noxious weeds, such as gorse (Ulex europaeus) on Hawaii; turkeyberry (Solanum torvum) on Oahu; ivy gourd (Coccinia grandis) on Maui; fountaingrass (Pennisetum setaceum) on Maui, Lanai, and Oahu; fireweed (Senecio madagascariensis) on Hawaii, and Kauai; Tibouchina spp. on Oahu; and gorse (Ulex europaes) on Hawaii.

- Initiated a working relationship with the City & County of Honolulu's Parks and Road Maintenance Divisions to control thorny kiawe (Prosopis juliflora), a designated noxious weed found along coastal areas of South and West Oahu. Eleven tons of plant material were taken to Campbell Industrial Park and destroyed by composting.

- Continued to establish a working relationship with the Oahu Invasive Species Committee (OISC). Formerly known as the Fountaingrass Working Group, OISC was established in August 2000 and is composed of U.S. Army, Federal, State, University of Hawaii and various other non-profit agencies. OISC goals seek to detect and control invasive alien species that are deleterious to Hawaii's agriculture and natural resources.

- Continued to assist the Maui Cattlemen's Association in its efforts to obtain County of Maui funding for control of fireweed, (Senecio madagascariensis), which infests 300-500 acres of ranchlands, public lands and residential areas in East Maui areas of Haiku, Makawao, Pukalani, Kula, and Ulupalakua, and at Lahaina in West Maui.

- Continued fountaingrass control on Oahu by collaborating with the State Department of Transportation (DOT) to chemically treat 300 plants along Pali Highway and with Chaminade College volunteer students, mechanically removing 340 plants from vacant, upper campus areas.

- Conducted routine surveys of agricultural and vegetable seed vendors to ensure the quality and proper labeling of seed sold to consumers. Thirty-eight germination tests were also performed on vegetable and agricultural seed lots to ensure that minimum germination standards were met.

- Examined 72 foreign seed lots for noxious weed seeds under a cooperative agreement with USDA-APHIS-PPQ. Three lots were rejected due to noxious weed seed contamination.

- Examined and rejected one lot of 2,000 lbs. of rice contaminated with Indian jointvetch (Aeschynomene indica) noxious weed seeds that was consigned to the Hawaii School Lunch Program. The rice shipment was returned to the U.S. mainland.

- Continued to service the needs of the expanding Hawaii seed corn industry that has increased its plantings on former sugarcane lands on Kauai and Oahu, and onto fallow pineapple land on Maui. As a result of the increase in planting acreage, a total of 432 applications were received, and 210 reports were processed for seed corn weighing 2.6 million pounds in the Foundation and Certified Classes.

PLANT QUARANTINE BRANCH
Dennis Nagatani, *Acting 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 review, (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 2001 Highlights

- Actively participated with other state and federal agencies in planning for and implementing measures that will minimize the risk of introduction and establishment of alien species through the Kahului, Maui Airport.

- Interceptions of 1807 pests were identified by the Insect Specialist. Of these, 483 (27 percent) were species not known to occur in Hawaii. Another 1,005 (56 percent) were already present in the state, and 319 (17 percent) were either too immature or damaged to be identified to the species level.

- A risk assessment of alien species movement from mainland and foreign sources into Hawaii through Kahului Airport was conducted over four 3-week periods. The assessment involved intensive inspections of checked and carry-on baggage with detector dogs, inspections of cabins and cargo holds of mainland flights, and 100 percent inspection of all agricultural products shipped by air cargo. The project found a low risk of importation of alien species through baggage, carry-ons, aircraft cabins and aircraft cargo holds. The highest risk was with the import of agricultural materials such as produce, cut flowers, and propagative plant materials.

- Plant Quarantine Branch Specialists presented 30 talks and tours at the Plant Quarantine Station. There were 1,455 persons who attended the sessions, including children from various schools and senior citizens groups.

- White Rust, Puccinia horiana was found on chrysanthemum flowers arriving from Carpinteria, California. White Rust is a highly destructive fungus, which attacks chrysanthemum plants and makes them unmarketable. It was found in nurseries in California where eradication programs have been instituted.

- A total of 30 horned frogs (Ceratophrys ornatus) were turned in to the Honolulu Zoo on two separate occasions. The animals are being held at the Honolulu Zoo for shipment out of state.

- A two-foot-long ball python was discovered by a Pacific Palisades resident in his second-story bathroom in Pearl City. The homeowner had recently purchased the home, and had been living in the home for the past two months, previous to finding the snake. It is speculated that the previous owner may have had the snake, which may have escaped until it was found by the new owner of the home.

- A new pre-landing airline video, emphasizing the State of Hawaii Plants and Animals Declaration Form was created by the Department of Transportation, Airports Division, with the cooperation of the State Department of Agriculture and the airline industry. A number of airlines have started showing the video on their arriving domestic flights, most notably United, Delta. Continental, Northwest, Hawaiian, and Aloha Airlines.

Brown Tree Snake Program Highlights include:

- Filming was done by Northern Lights of a canine team inspecting for brown tree snakes on a commercial flight for Canadian television.

- Filming was done by Original Productions for the Discovery Channel. The episode titled Extreme Hawaii will show a canine team inspecting an aircraft and cargo from Guam for the presence of the brown tree snake.

- The Canine Instructor and an Inspector attended an Agricultural Detector Dog Conference held in Auckland, New Zealand from February 26 to March 2, 2001. Representatives from agricultural programs from New Zealand, Australia, Canada, and USDA-APHIS-PPQ also attended the conference whose focus was on the theories and techniques of scent association work.

- Two mobile trailers arrived in March 2001 to serve as a temporary training center for the Detector Dog Program until renovations are completed on the permanent structure. Renovation work began on the Detector Dog Program Training Center at the Animal Quarantine Station in Halawa in June 2001. The project is due for completion in January 2001.

QUALITY ASSURANCE DIVISION

Samuel Camp
Administrator

The Quality Assurance Division serves both the consumers and producers 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 practice, 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-trading and quality assurance of agricultural commodities. Much 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. The establishment of state grade standards for fruits and vegetables, nuts, coffee, flowers and foliage, processed foods, and shell eggs, fall 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, and sampling and testing of animal feed for label guarantee and adulteration.

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 is entirely self-funded through license fees assessed to milk producers and processors.

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-chemicals 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):

- Inspected and certified 980,000 cases of canned pineapple from Maui Pineapple Company, which continues to receive large government contracts.
- Completed training of two staff to conduct food safety audits. Six other staff are continuing training to become auditors. Farms passing food safety audits are issued certificates that the farm is following "Good Agricultural Practices." Supermarkets are beginning to require such certification before purchasing products from farmers. This is in an effort to protect consumers and reduce liability.
- Prepared for mandatory papaya quality inspections under a federal marketing order. This requirement did not materialize, mostly due to low papaya farm prices and the additional costs for the inspections.
- Assisted Measurement Standards Branch and Market Analysis and News Branch by "loaning" personnel to temporarily fill vacancies. Also provided branch staff on Big Island to assist Measurement Standards Branch with taximeter inspections.
- Hired two part-time Agricultural Commodity Aids in Kona and one in Kauai during the busy months of the coffee season, to assure faster coffee certification turn-around time.
- Attended meetings and made presentations to the coffee industry on updating the coffee grade standard rules. Conducted public hearings for the final rules.
- Obtained federal trademarks from the U.S. Patent and Trademark Office in partnership with the Hawaii Coffee Association. A total of six marks for green coffee beans were approved for "100% (location) Coffee" for "Hawaii" (state), "Oahu," "Kauai," "Molokai," "Maui," and "Kona."
- Attended papaya, coffee, Maui onion and tropical fruits industry meetings and conferences. Staff gave banana and papaya grading instructions to growers and packers on separate occasions, and conducted a grading demonstration for a University of Hawaii vegetable crops class.
- Attended mainland training sessions and conferences, which included: The Processed Products Branch National Supervisor's Conference, USDA/AMS; Pesticides Residue Workshop, EPA; The International Association of Milk Control Agencies 64th annual conference; and the National Association of State Departments of Agriculture Dairy Division annual conference.
- Collected fee assessments and penalties totaling $424,474; about 5 percent more than the previous year. In addition, the Branch provided clerical and professional support to the special funded Milk Control Section, and will be reimbursed approximately $18,000.

MEASUREMENT STANDARDS BRANCH
Jeri Kahana, *Acting 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.)

- Relocated the program to temporary facilities due to the demolition of the Measurement Standards office and laboratory and the widening of Ilalo Street as part of the Kakaako improvement district. The total office and laboratory space has been temporarily reduced from over 7,000 square feet to about 3,000 square feet.

- The metrology laboratory was not functional for the year due to the loss of laboratory certification due to the move to temporary facilities, the resignation of the Chief Metrologist, and the inability to find a replacement metrologist with the qualifications to re-establish the laboratory.

- Hired an entry-level metrologist in the third quarter of the year.

- Amended Hawaii Revised Statutes to allow calibration of enforcement measurement standards by the National Institute of Standards and Technology (NIST) accredited laboratories outside of the State. This was done to allow for continuation of enforcement until the new metrologist is trained and the metrology laboratory is re-certified.

- Received and investigated only nine odometer complaints; down from the 42 investigations last year. The reduction may be attributed to a cooperative effort from branch staff, the police department and the print media to inform consumers of precautions to take when buying a used vehicle.

- Visited 1072 establishments for the purpose of identifying those that are subject to the price verification inspection. As a result of this effort, 378 establishments were added to the list.

- Created a label analysis database and established a methodology to electronically file all records and documents relating to this activity.

- The compliance rate for stores inspected for price verification was 87percent, an increase over last year's 84 percent compliance rate.

AGRIBUSINESS DEVELOPMENT CORPORATION

Alfredo Lee
Executive Director

The Agribusiness Development Corporation (ADC) was established pursuant to Act 264, 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, multicrop 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 2001:

Kekaha
Amfac/JMB announced the closure of their Kauai sugar operations on November 17, 2000. Approximately 28,000 acres of land in the Kekaha area leased out by the Department of Land and Natural Resources (DLNR) and the Department of Hawaiian Homelands (DHHL) were returned. The state's immediate goal was 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. On March 1, 2001 ADC took over the operation and maintenance of the infrastructure abandoned by Amfac. The infrastructure components include the Kokee Ditch system, the Kekaha Ditch system, the Kawaiele pump station, the Nohili pump station, the Waimea hydro power plant, the Waiawa hydro power plant, a complex and integrated irrigation/drainage ditch system, and many miles of electrical distribution lines.

With help from U.S. Senator Daniel Inouye, the Navy received $3 million in the 2001 Department of Defense Appropriations Act to help alleviate the flooding threat and to keep the area in agriculture. ADC received financial assistance from the Navy in the form of a contract to keep the drainage pumps running. Funding for major repairs on the pumping stations and power generating equipment are planned with work to begin shortly. Similarly, the 2001 Hawaii State Legislature also appropriated ADC funds through Act 208 to help with initial costs associated with transitioning plantation agriculture to diversified agriculture on the island of Kauai.

Due to ADC's unique exemption from Chapter 171, ADC is looking to secure a master lease from the DLNR and the DHHL so that land in the area could be leased to farmers expeditiously.

Waiahole Siphon Replacement
Since taking over operation of the Waiahole ditch in July of 1999, the ADC has made progress in providing water to the farmers as well as reducing system loss. Replacement of the system's three badly deteriorated wooden siphons was identified as a high priority project.

With help from the Agricultural Resource Management Division and the U.S. Army Corp of Engineers, final design of the wooden siphon replacement project was completed and the $1.2 million project was subsequently awarded to Delta Construction Corporation. Construction got underway at the beginning of 2001. One of the major challenges is to continuously supply enough water to the farmers while construction is in progress. When all three wooden siphons are replaced with high-density polyethylene pipes the total system loss is expected to reduce between 2 to 2.5 million gallons daily. Anticipated completion of the repairs to the wooden siphons is in the fall of 2001.

Hamakua Agricultural Subdivision
A business plan was developed for the Hamakua agricultural subdivision project. This plan analyzed the type of crops suitable for the area as well as the market potential of the identified crops. The business plan also examined Hawaii county ordinance No. 95-136 for farm subdivisions and the long-term viability of the project.

As the ADC began to select a site for the project, Kamehameha Schools Bishop Estate (KSBE) suggested collaborative efforts to utilize some of the agriculture lands on the Hamakua coast more diversely. An educational and demonstration project was envisioned on a 110-acre site located on KSBE property. Memorandums of Understanding (MOU) are being developed between ADC, KSBE, the U.S. Department of Agriculture's Pacific Basin Agricultural Research Center (PBARC), the University of Hawaii's College of Tropical Agriculture and Human Resources (CTAHR) and the University of Hawaii Hilo's College of Agriculture, Forestry and Natural Resources Management. The project has also received a lot of positive input from the community.

Kauai Tropical Disinfestation Facility
ADC initiated negotiation with the Office of Technology Transfer and Economic Development of the University of Hawaii to take over management responsibility of the Kauai Tropical Fruit Disinfestation Facility. This facility, located strategically near the Lihue Airport, is currently the only plant on Kauai capable of treating papaya for export to the U.S. mainland. Recent modification of the vapor-heat treatment chambers allows treatments to conform to requirements for exporting fruits to Japan. Goal of the ADC is to keep this facility open as a means to assure the long-term viability of the papaya industry on Kauai. ADC is currently working towards obtaining a right-of-entry to utilize the facility and anticipates obtaining the right-of-entry in FY2001-2002.

Agribusiness Plan
The ADC was mandated by HRS Chapter 163D-5 to prepare the Hawaii Agribusiness Plan (HAP). Due to resource constraints, ADC was unable to prepare the plan as per mandate. Instead, the ADC Board of Directors developed an action plan on the basis of ADC's overview of Hawaii's agricultural industry. The goal of this action plan was to provide information and education to the public and private sectors on the latest developments, issues, and challenges facing Hawaii's agricultural industry, and to take direct action in a leadership or assisting role where a rapid response is merited. This plan was submitted to the legislature in March 2001.

Agriculture Training Survey
To ensure that a knowledgeable and trained workforce is available to support the growing diversified agriculture industry, the ADC conducted a comprehensive survey to identify the special training needs for workers employed in agriculture. One portion of the survey focused on the types of training desired by workers to upgrade their skills for career advancement. Another portion of the survey focused on management and business skills that could be useful for small farmers. The areas of training identified as being the most desirable were costs analysis, sales & marketing, and basic personal computer skills; areas directly related to management and business. The goal of this survey was to gather enough information to design training classes for agriculture workers and small farmers.

Other activities:
Together with the University of Hawaii and several private parties, the ADC explored the feasibility of setting up a consolidation, packing, and distribution facility for agriculture products on Oahu. The facility is intended to certify produce to meet the momentum gaining industry driven food safety practices requirements. This requirement, once accepted, will require producers and their produce be inspected to meet health and safety regulations.

In conjunction with the Hawaii Food Manufacturers Association, the ADC researched ways to increase the distribution and sales of Hawaii's value added produce grown in and made in Hawaii to the military commissaries in the state. ADC assisted in the coordination of a food/trade show in which local producers could share their products with the intent of creating business relationships with the military commissaries.

The ADC, as operator of the ditch system, was a witness in the Matter of Water Use Permit Applications, Petitions for Interim Instream Flow Standard Amendments, and Petitions for Water Reservations for the Waiahole Ditch Combined Contested Case Hearing.