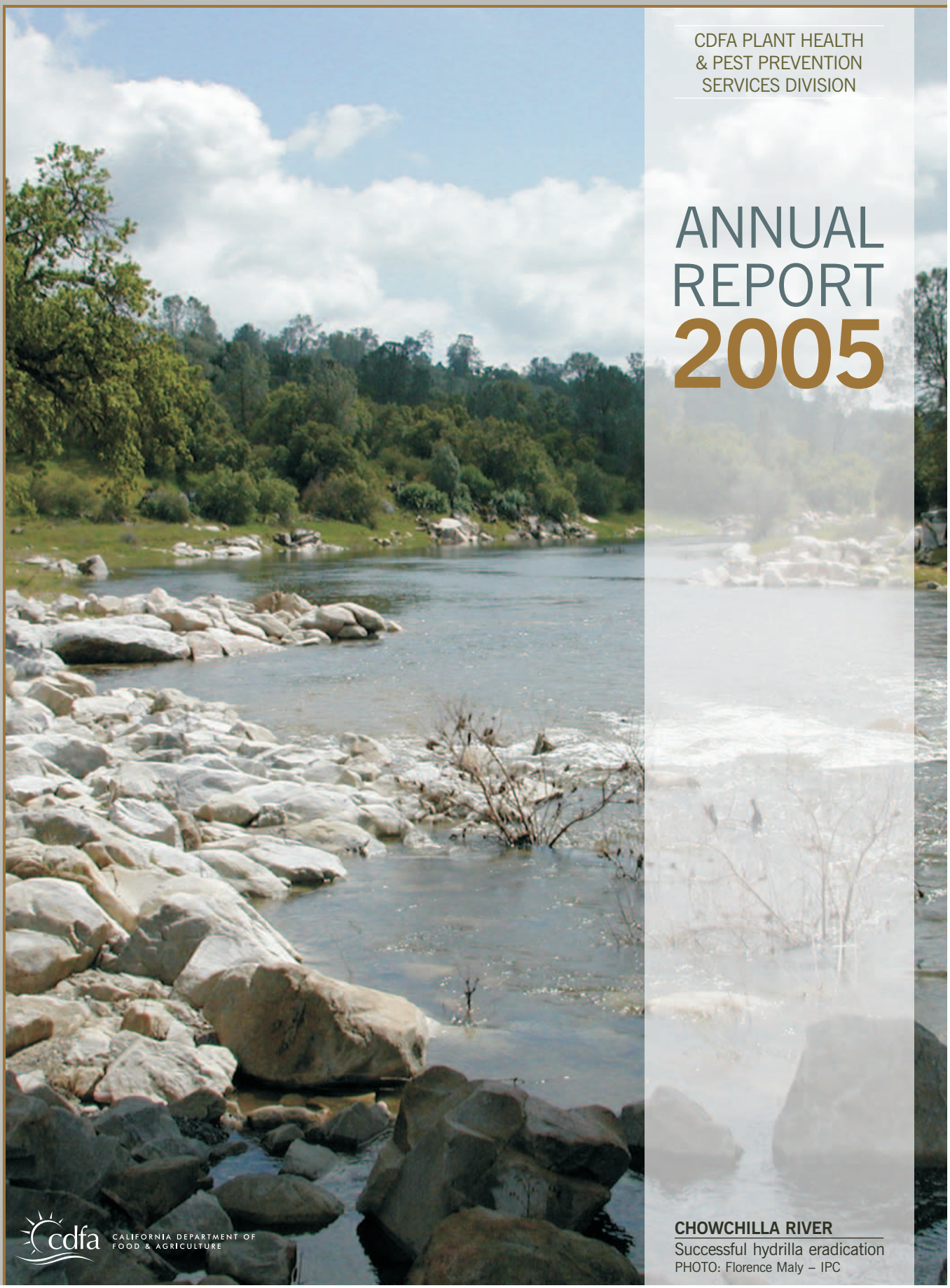


CDFA PLANT HEALTH
& PEST PREVENTION
SERVICES DIVISION

ANNUAL REPORT 2005

cdfa CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

CHOWCHILLA RIVER
Successful hydrilla eradication
PHOTO: Florence Maly – IPC

In Memoriam

2005

David Godfrey
Program Supervisor IV
Pest Exclusion
33 Years of Service

JULY 23, 1948 – APRIL 11, 2006

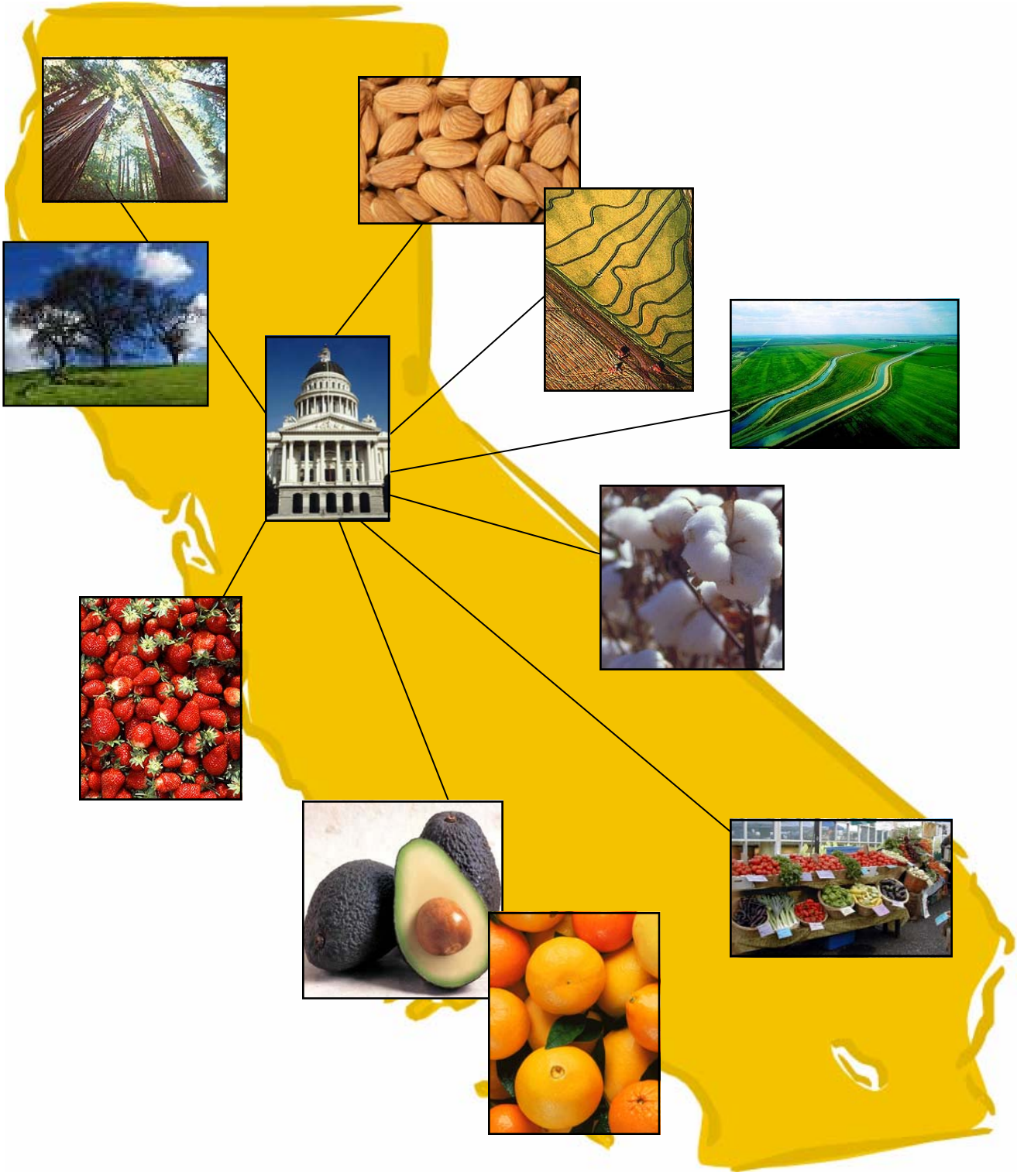
1986

Ross O'Connell
Associate Agricultural Biologist
Integrated Pest Control
27 Years of Service

SEPTEMBER 7, 1952 – OCTOBER 16, 2005

TABLE OF CONTENTS

Plant Health and Pest Prevention Services Administration



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PLANT HEALTH AND PEST PREVENTION SERVICES

ADMINISTRATION

The California Department of Food and Agriculture's (CDFA) Plant Health and Pest Prevention Services (PHPPS) mission is legislatively mandated and clearly articulated within the California Food and Agricultural Code. The California Legislature, in enacting this mandate, also recognizes that pest prevention is uniquely positioned to protect California's urban and natural environments as well as its agriculture. It specifically instructs the CDFA to protect ornamental and native plantings as well as agricultural crops from the harm caused by exotic pest invasions. These mandates serve as the basis for the pest prevention program's mission, vision, values, and goals statement:

Mission: *To protect California from the damage caused by the introduction or spread of harmful plant pests.* Source – California Food and Agricultural Code.

Vision: To provide leadership of pest prevention and management programs that effectively protects California's agriculture, horticulture, natural resources, and urban environments from invasive plant pests.

Values:

- Leadership: Provide clear direction, guidance and support.
- Communication: Open, constructive exchange of ideas, opinions and information.
- Decision: Decision-making based on the best available science, technology and common sense.
- Team Work: Accomplishing division goals through the cooperative efforts of each of our employees.
- Credibility: A team that maintains the division as a responsive, accountable and trusted organization.
- Development: Maintain a system that develops employees, expands capabilities, acquires and utilizes accurate information and new technologies, while employing innovative pest prevention strategies.

Goals: To prevent the entry, spread and establishment of invasive plant pests that could be detrimental to the State's agriculture, public or natural resources by:

- Accurate and timely pest identification
- External and internal exclusion activities designed to prevent pest entry or establishment
- Early detection of plant pests before they become well established
- Timely and effective eradication actions to eliminate new pest infestations
- Control and containment systems for plant pests that have become widely established
- Research, information technology and pest risk analysis systems to assure that the pest prevention program is relevant, scientifically based and continuously improved
- Maintain outreach programs to enlist public support of pest prevention activities through enhanced public awareness and education
- Development of division employees, foster teamwork and a sense of accomplishments and an enjoyable work place

In California, a series of federal and state plant quarantine laws and regulations are enforced to restrict the entry and movement of commodities capable of harboring targeted plant pests and enable our eradication and control efforts. This approach of prohibiting or restricting the movement of plants, plant products or other commodities, capable of harboring exotic plant pests, is done in the interest of food security. In this case, the public insurance of a safe and secure supply of food and fiber is based on the premise that it is more economically and environmentally sound to prevent the entry and establishment of dangerous plant pests than to live with them.

Along with the United States Department of Agriculture (USDA), PHPPS actively participates in the development of standards for pest prevention under the International Plant Protection Convention. The PHPPS Division is also a sustaining associate member of the North American Plant Protection Organization (NAPPO), a regional trade organization that develops pest prevention standards for the three country members—the U.S., Canada and Mexico. California industry representatives are active participants in NAPPO panel committees and its Industry Advisory Group.

PERMITS AND REGULATIONS

The permits and regulations program develops all regulations administered by the Division and develops associated legally-required documents such as notices, statements of reason, orders and certificates of compliance. The Special Assistant serves as regulatory coordinator for the Division and technical staff assistant to the Director.

This program issues state permits involving agricultural pests, approved laboratories, soil and quarantine commodities as authorized under administrative regulations and the Food and Agricultural Code. In addition, this program approves or disapproves applications for federal permits that are issued by the USDA. These permits concern movement into California of foreign and domestic plant pests, foreign soil, foreign post-entry quarantine plant material, genetically engineered organisms (biotechnology permits) and foreign plants and plant products normally with prohibited entry into the United States.

The primary activities of the permits and regulations program during the 2005 calendar year were:

State Permits - Two hundred sixty-five state permits were issued. Included were: 89 plant pest permits (49 for pathogens, 40 for arthropods), 163 quarantine commodities permits, three biotechnology movement authorizations and 10 approved laboratory permits.

Federal (USDA) Permits - A total of 684 applications for federal permits were reviewed and processed including 35 post-entry quarantine agreements, 44 soil permits, 209 plant pest permits (105 for pathogens, 104 for arthropods), 365 biotechnology permits and 31 permits for federally prohibited plant material.

Regulations - Seventy-two regulatory actions were completed in 2005. These included the adoption, repeal or amendment of 44 regulations, nine certificates of compliance, and 16 notices of changes in the regulations.

ENVIRONMENTAL COMPLIANCE

The Environmental Compliance program exists to ensure that all PHPPS pest prevention programs are in compliance with all applicable environmental protection laws and regulations. It does this by:

- Maintaining awareness of environmental mandates.
- Preparing and/or reviewing scientific and legal documents.
- Facilitating scientific debate of environmental issues.
- Developing and defending environmental compliance strategies.
- Representing PHPPS with other governmental agencies.
- Advising PHPPS division on environmental compliance mandates.

Environmental Compliance Reports and Projects

- Provided support for the Attorney General's office in defending against a lawsuit challenging the Pierce's Disease Control Program EIR and the subsequent appeal of the decision of the Superior Court in favor of CDFA.
- Began the process of developing a new EIR for the Exotic Pest Eradication Program; a proactive environmental review of all potential projects involving invasive pest infestations.
- Participated in regulatory compliance for various invasive weed control programs.
- Prepared environmental documentation for several exotic fruit fly eradication projects.
- Reviewed new and ongoing litigation on issues pertinent to the Division regarding pesticide use and water quality.
- Participated in the development and approval of various studies required by the U.S. Fish and Wildlife Service for the Division's Curly Top Virus Control Program.
- Revised and expanded the Division's ability to comply with endangered species laws.
- Provided information about environmental compliance and environmental law to individuals and groups in the Division.

Branches in Plant Health and Pest Prevention Services

The PHPPS Division is comprised of four branches and is responsible for protecting California's agriculture and natural resources against damage caused by exotic and recently introduced plant pests. It provides protection through a comprehensive pest prevention system. Three organizational branches administer the system: Pest Exclusion, Pest Detection/Emergency Projects, and Integrated Pest Control. These branches receive professional support by the scientists in the Plant Pest Diagnostics branch.

The Pest Exclusion Branch is considered the first line of defense. The mission of the Pest Exclusion Branch is to keep exotic agricultural and environmental pests out of the state and to prevent or limit the spread of newly discovered pests within the state. To accomplish this mission, the Branch has two roles: 1) quarantine regulatory compliance and enforcement and 2) service to the agriculture industry and the public. The Branch is divided into three program components: Interior Pest Exclusion (enforcement of quarantines, phytosanitary certification of exports), Exterior Pest Exclusion (border stations) and Nursery, Seed and Cotton (licensing, pest cleanliness, registration and certification, truth in labeling (seeds) and quality cotton).

The Pest Detection/Emergency Projects Branch is responsible for the early detection and prompt eradication of serious exotic agricultural pests. The Branch accomplishes its mission by conducting a statewide trapping program, staffed by county and state inspectors, for exotic insect pests, by implementing special surveys for significant agricultural pests and plant diseases for which traps are not available and by providing emergency eradication services using the best available technology.

This Branch also operates the CDFA Fruit Fly Rearing Facility, located in Waimanalo, Hawaii, which provides high-quality, sterile Mediterranean fruit flies for eradication projects in California. Maximum production can reach up to 136 million pupae per week.

The Integrated Pest Control Branch conducts a wide range of pest management and weed eradication projects in cooperation with growers, agricultural commissioners and federal agencies. The Branch manages biological control and vertebrate pest management functions. Assessments and fees are collected for some program activities and services. The Branch contracts with counties, federal agencies, other California state agencies, research agencies and private businesses for various program components. Activities of five projects are coordinated through recommendations of three boards: Pink Bollworm, Beet Curly Top Virus and Tristeza, and two committees: Noxious Weed Management Oversight Committee and Vertebrate Pest Control Research Advisory Committee.

The Plant Pest Diagnostics Branch provides professional plant pest diagnostics support for CDFA's agricultural plant pest prevention regulatory programs, the United States Department of Agriculture, county departments of agriculture, universities, phytosanitary certification of California export products, other state agencies and the general public. The branch consists of five laboratories including: botany, entomology, nematology, plant pathology and seed taxonomy and germination.

Pest Exclusion Branch


Quality Fresno Cotton

Prohibited Fruit

California Seed


Agriculture Inspection Station


Gilroy Nursery

PEST EXCLUSION BRANCH

Mission: *To serve the citizens of California by preventing the entry and spread of harmful pests and ensuring the availability of high-quality commodities for consumers worldwide.*

Vision: To be a dynamic organization and vital partner in protecting California's agriculture, citizens and environment.

Values:

- Effective leadership
- Mutual respect, cooperation and communication
- Professionalism and integrity
- Partnership and teamwork
- Dependability
- Decision-making using the best available information
- Empowerment and accountability

INTERIOR PEST EXCLUSION

The mission of the Interior Pest Exclusion Program is to prevent the introduction and spread of harmful and invasive plant pests and to maintain and expand market access for California agricultural products. Harmful and invasive exotic pests are a major threat to California's agricultural industry and pest exclusion is the cornerstone of pest prevention. In many instances, exclusion is the first, last and only means to keep exotic pests from invading California. Federal and state enacted quarantines, as well as county ordinances, help protect the state from exotic pests. Enforcement of these quarantines is accomplished through direct inspection of arriving commodities and by treatment, destruction or return to shipper when pests contaminate the commodity. Interior Pest Exclusion provides regulatory oversight, training and direction to County Agricultural Commissioners' offices according to the Pest Exclusion mission.

The Interior Pest Exclusion Program works cooperatively with the USDA to enforce federal plant pest quarantines. Interior Pest Exclusion also cooperates with the United States Department of the Interior, the United States Customs Service and the California Departments of Fish and Game, Forestry and Fire Protection, Public Health and Pesticide Regulation to enforce their respective regulations.

To promote California agricultural commodities in foreign and domestic markets, Interior Pest Exclusion maintains a close working relationship with the USDA to facilitate the export of California's products worldwide by providing up-to-date pest risk assessments on locally grown commodities. Additionally, Interior Pest Exclusion works cooperatively with agricultural officials in other states to determine the best pest mitigation measures that will allow the movement of pest-free commodities into California.

Interior Pest Exclusion activities include:

- Quarantine Response
    - Emergency response to a pest infestation
    - Quarantine response to a pest incident
- Quarantine Training, Direction, Oversight and Consultation
- Quarantine Enforcement
- Trade Facilitation
- Commodity Treatment Coordination and Consultation
- Data Collection and Information Management

Below are highlights for 2005.

QUARANTINE RESPONSE

Emergency Response to a Pest Infestation

When a reproductive population of a pest is discovered in California, an infestation is declared. Interior Pest Exclusion responds by enacting emergency pest abatement and control measures to contain the infestation and determine effective commodity host treatments that facilitate movement to market. Emergency regulatory responses are coordinated with USDA if the pest is a federal action pest. In 2005, emergency responses were conducted for infestations of Oriental fruit fly, sudden oak death, Mediterranean fruit fly and Diaprepes root weevil.

Oriental Fruit Fly, Santa Ana, Orange County. In the summer of 2004, an Oriental fruit fly quarantine was established in the Anaheim, Santa Ana, Tustin and Irvine areas of Orange County. The quarantine area was approximately 116 square miles, in primarily an urban area. Over 772 businesses/properties in the quarantined area were operating under compliance agreements. Affected businesses included: produce markets, fruit packing facilities, flea markets, swap meets, farmers' markets, landscaping companies and community gardens. Interior Pest Exclusion staff activities included: monitoring grower's treatments, site visits, public outreach and regulatory enforcement. A total of 218 acres of avocado, lemons, oranges and row crops were treated. Hold Notices were issued on 167 businesses/properties within the quarantined area to prevent movement of fruit fly host materials. The quarantine was lifted in April 2005 after three life cycles of the Oriental fruit fly were completed with no new fly detections.

Mediterranean Fruit Fly, Rancho Cucamonga, San Bernardino County and Pomona, Los Angeles County. In October 2005, a Mediterranean fruit fly quarantine was established in the Rancho Cucamonga area of San Bernardino County. An additional infestation was declared in the adjoining city of Pomona in Los Angeles County. The 204 square-mile quarantine area included the cities of Rancho Cucamonga, San Antonio Heights, San Bernardino, Upland, Montclair, La Verne, Pomona, San Dimas and San Gabriel. The quarantine area was primarily urban and included the Ontario International Airport (ONT). Affected businesses included: growers, produce markets, wholesale produce distributors, fruit packing facilities, swap meets, farmers' markets, nurseries, landscaping companies and yard maintenance gardeners. Over 400 businesses were affected and operating under program compliance agreements. 'Hold Notices' were issued to 51 businesses/properties within the quarantine area to prevent movement of fruit fly host material. Four growers and one nursery, within the quarantine area, were undergoing treatments. Program staff supervised the quarantine certification treatments.

At ONT, the quarantine was implemented with the Department of Homeland Security (DHS), Customs and Border Protection (CBP) and USDA/APHIS (Animal and Plant Health Inspection Services) Plant Protection and Quarantine (PPQ) Compliance. DHS, Transportation Security Administration and CBP cooperates and supports the program by asking outbound passengers from ONT to leave homegrown Mediterranean fruit fly host material that originated within the quarantine area. By the end of 2005, more than 1,814 pounds of Mediterranean fruit fly host material was collected from departing passengers and was disposed of in approved landfills.

Mediterranean Fruit Fly, San Jose, Santa Clara County. In October 2005, a Mediterranean fruit fly quarantine was established in the San Jose area of Santa Clara County. The quarantine was approximately 77 square-miles in a primarily urban area. Affected businesses included: produce markets, swap meets, farmer's markets, nurseries, landscaping companies and community gardens. Over 381 businesses were affected and operated under program compliance agreements. 'Hold Notices' were issued to 11 growers and seven nurseries within the quarantine area to prevent the movement of untreated fruit fly host materials. Notices of Violation were given to 20 establishments for non-compliance with the quarantine regulations.

Diaprepes Root Weevil, Newport Beach, Orange County. In September 2005, a Diaprepes root weevil quarantine was established in the Newport Beach area of Orange County. The quarantined area was approximately three square-miles and primarily in an urban area. Over 300 businesses/entities were affected and operated under program compliance agreements. Affected businesses included: landscape companies, yard maintenance operators, green waste haulers and/or processors, golf courses, homeowners, homeowner's associations and city parks. Interior Pest Exclusion staff ensured that all green waste leaving the quarantine area ran through a chipper/shredder or was double-bagged and delivered to an approved landfill, compost or biomass generation facility.

Diaprepes Root Weevil, Long Beach, Los Angeles County. In October 2005, a Diaprepes root weevil quarantine was established in the Long Beach area of Los Angeles County. The quarantine area was approximately two square-miles in a primarily urban area. Over 80 businesses/entities were affected and operated under program compliance agreements. Affected businesses included: landscape companies, yard maintenance operators, green waste haulers and/or processors, golf courses, homeowners, homeowner's associations and city parks. Interior Pest Exclusion staff ensured that all green waste leaving the quarantine area ran through a chipper/shredder or was double-bagged and delivered to an approved landfill, compost or biomass generation facility.

Sudden Oak Death. Interior Pest Exclusion has a lead role in administering the Cooperative *Phytophthora ramorum* Quarantine Project. The project is a cooperative effort between state, federal and county agencies for the purpose of enforcing state and federal regulations for the control of *P. ramorum*, the causal agent of sudden oak death. Interior Pest Exclusion developed project compliance agreements and individual exhibits for nine types of regulated establishments including nurseries, green waste facilities, compost facilities and firewood dealers. A total of 1,317 businesses were under program compliance (see Table 1 below) to ensure that regulated materials shipped within and out of California are free of *P. ramorum*.

Table 1. Number of Businesses Regulated for *P. ramorum* in 2005

Counties	Regulated Business	Count
Quarantined	Nursery Stock/Soil of Nursery Stock	154
	Non-host, Bare-root Nursery Stock	35
	Wood and Wood Products	30
	Greenery, Garland and Wreathes	11
	Green Waste Facility/Transporter	139
	Compost Facility	15
	Tree Farm	14
Regulated	Nurseries that produce host material	331
	Nurseries that do not produce host material	588
Total		**1,317**

A total of 1,108 nurseries were surveyed/inspected for *P. ramorum* in 2005. *P. ramorum* was detected at 53 (or 4.8 percent) of the surveyed/inspected nurseries. Interior Pest Exclusion activities associated with the detections are listed in Table 2 below.

Table 2. Interior Pest Exclusion Activities at Nurseries where *P. ramorum* was Detected in 2005

Survey/Inspection	Quarantined Counties	Regulated Counties	Total
Compliance Agreement	10	10	20
Nursery Stock Cleanliness	2	2	4
Trace Forward	6	21	27
Other/UC Research Trace Back	1	1	2
Total	**19**	**34**	**53**

Following detection of *P. ramorum* in a nursery, eradication is initiated by quarantine hold, delimitation and destruction of infected plant(s). The Federal (USDA/APHIS) Confirmed Nursery Protocol for *P. ramorum* is implemented at production/wholesale nurseries where infection is detected. Trace forward and trace back investigations are also completed to determine the source of infection and potential spread. In 2005, a total of 14 nurseries completed the protocol.

In 2005, County Agricultural Commissioners' staff submitted 21,233 samples from nurseries for *P. ramorum* testing at the CDFA's Plant Pest Diagnostics Laboratory. *P. ramorum* was detected in about one percent (or 243) of the samples. Approximately 93 percent of the detections in nursery samples were taken from two plant types, *Camellia spp.* and *Rhododendron* spp. Other positive host materials of *P. ramorum* in nurseries included: *Laurus nobilis, Pieris japonica, Pittosporum undulatum, Pyracantha koidzumii, Viburnum tinus* and soil.

The Emergency Federal Order of December 2004 regulates the interstate movement of nursery stock hosts and associated hosts of *P. ramorum* from 44 California counties not considered infested with the disease. The remaining 14 counties are not included in the federal order, because the movement of nursery stock and other commodities from these counties is regulated in the Federal Domestic Quarantine for *P. ramorum* (CFR 301.92). There were no changes in the regulation in 2005. Interior Pest Exclusion staff implemented both the Federal Domestic Quarantine and Emergency Federal Order for the control of *P. ramorum.*

In fulfillment of the Emergency Federal Order on *P. ramorum*, Interior Pest Exclusion regularly updated lists of "California Nurseries Approved for Shipping" on the CDFA public Web site. Other states receiving California nursery stock often use these lists to verify that a nursery has met federal *P. ramorum* regulations.

Quarantine Response to a Pest Incident

When pests are discovered in arriving commodities, Interior Pest Exclusion responds by taking immediate action to contain the pest and eliminate the risk of it escaping and becoming established in the state. The immediate action, conducted in cooperation with the local County Agricultural Commissioner's office, is to locate and dispose of the entire infested commodity. Additionally, investigations are conducted to determine the extent of distribution in the state of the infested commodity, to determine how the commodity became infested and to determine if certification or other pest cleanliness procedures must be implemented or corrected at origin to prevent similar incidents in the future. The following are some of the pest incidents in 2005.

Chrysanthemum White Rust, Santa Barbara County. First detected in December 2004, *Puccinia horiana,* the casual agent of chrysanthemum white rust (CWR), continued to be detected in 2005 in a cut-flower greenhouse production facility in Carpinteria, Santa Barbara County. The infestation was re-evaluated by the Interior Pest Exclusion Program, USDA/APHIS/PPQ and Santa Barbara County Agriculture Department. A determination was made to successfully eradicate the disease from the greenhouse; an eight-week, host-free period was required. Accordingly, involved CWR host plants were destroyed and the facility maintained host-free status for more than eight weeks. Interior Pest Exclusion implemented the CWR National Management Plan for Exclusion and Eradication at the greenhouse. The facility was released from quarantine hold in the summer of 2005.

Brown Marmorated Stink Bug, Solano County. In March 2005, brown marmorated stink bug (BMSB), *Halyomorpha halys*, was found among personal items shipped from Pennsylvania to a commercial storage facility in Solano County. The BMSB is a "Q"-rated pest, introduced to the eastern United States from Asia in the early 1990s. It attacks over 60 plant species including soybeans, green beans, stone and pome fruits, as well as many other commercial, ornamental and wild plants. Following the BMSB find, Interior Pest Exclusion, Pest Detection/Emergency Projects, and Solano County Department of Agriculture staff conducted trapping and inspections at the storage facility and surveyed the surrounding areas. No BMSB were detected. However, after repeated BMSB finds during re-inspections of the storage facility, Program staff supervised fumigation of the stored articles and treatment of buildings in the facility. Subsequent trapping and inspections were negative for BSMB.

Q-Biotype Whitefly, Nipomo, San Luis Obispo County. In April 2005, USDA/SITC received information that a Q-biotype whitefly (*Bemisia tabaci*), not known to occur in the United States, had been found on poinsettias from a nursery in Nipomo, San Luis Obispo County. The plants with Q-biotype whiteflies were found in Arizona and traced back to the Nipomo nursery location. Interior Pest Exclusion and San Luis Obispo County biologists inspected the nursery. A small infestation of whiteflies was found on the 'Winter Rose' variety. Five specimens were collected, sent for identification and determined to be the Q-biotype whitefly. Trace back information of unrooted cuttings indicated that the origin was a nursery in San Diego County that had received the un-rooted cuttings from offshore sources originating from Guatemala. The Q-biotype whitefly is pesticide-resistant and a serious pest of agricultural crops. The entire greenhouse

with poinsettia plants was treated with Safari (active ingredient: Dinotefuran*)* as foliar spray and drenching of individual pots. Post-treatment inspections were conducted, with negative results.

Asian Longhorn Beetle, Sacramento, Sacramento County. In June 2005, Asian longhorn beetle (*Anoplophora glabripennis*) was found in and around a warehouse in Sacramento, Sacramento County. An employee of the warehouse called Program staff after two live adult beetles were found crawling in the loading bay. The company using the warehouse imports slates, tiles and marble from China. The company has two other locations/warehouses in Lancaster, Los Angeles County and San Marcos, San Diego County that received shipments from the same manufacturer in China. CDFA and county staff inspected the warehouses and found fresh frass at the Sacramento warehouse. A Pest Exclusion biologist supervised a two-stage fumigation of the warehouse, which was first fumigated with ProFume (active ingredient: sulfural fluoride). Also, about 2,000 crates were 'tarped' and fumigated with methyl bromide. Interior Pest Exclusion coordinated with county agricultural commissioners on trace forward activities in the state and with USDA/APHIS for out-of-state shipments. A total of 237 crates were fumigated and released, while 132 crates that had been on-site for more than two years were inspected and released because no beetle was found. Another 84 crates were buried at approved landfills.

False Codling Moth from South Africa. In the summer of 2005, inspectors at two California border stations detected live, false codling moth (*Thaumatotibia leucotreta)* in clementine tangerines from three different sources in South Africa. False codling moth has never been detected in the United States, but causes major economic damage to a multitude of crops such as citrus, cotton, peach, avocado and persimmon in sub-Sahara Africa. Larval feeding causes damage, which leads to the complete destruction of fruit while showing little or no external signs of damage.

Although the infested shipments were accompanied by cold storage treatment documentation, and eligibility to enter the United States verified by the USDA, the presence of live larvae may have indicated a failure in the treatment system. As a result, CDFA prohibited the entry of South African clementines into California, and required the recall and destruction of all South African clementines already in the state. With participation from county agricultural inspectors, over 50,000 pounds of clemetines (packed in individual, five pound boxes) were confiscated from wholesale and retail locations and destroyed by freezing or deep burial.

Following an investigation of the production methods and treatment protocols, the USDA changed the entry requirements of South African clementines to include a reduced pest tolerance at origin, longer cold storage period and increased inspections at United States ports of entry. As a result of these changes, CDFA once again accepted South African clementines into California.

Japanese Dodder, Shasta and Yuba Counties. In the summer of 2005, CDFA's Plant Pest Diagnostics Laboratory identified samples from Shasta and Yuba Counties as Japanese dodder (*Cuscuta japonica*). Japanese dodder (see Figures 1 and 2) is exotic to the United States and highly aggressive, with a large host range. It is "Q"-rated and listed in both state and federal noxious weed lists. Once established, Japanese dodder is difficult to eradicate. It is also a potential vector of other plant pests/diseases such as citrus tristeza, citrus greening and various "yellowing" diseases.

Figure 1. Japanese dodder seeds

Figure 2. Infestation on plants in Yuba County

The source of infestation in Shasta County was determined to be a resident who purchased imported dodder seed from an herbal remedy shop and planted it. Imported dodder seeds must be accompanied by a declaration of devitalization. Shasta County Department of Agriculture germinated 100 percent of dodder seeds confiscated from the herbal store within the county. Infestations of Japanese dodder in other states have also been associated with the herbal medicine trade.

Exclusion actions taken to disseminate information about the Japanese dodder incidences include:

- Removal and destruction of Japanese dodder on infested properties in Yuba County. Dodder in Shasta County died off during summer drought.
- A Pest Exclusion Advisory was sent notifying all counties of the incidences and instructing them to monitor for the pest.
- Informational/educational brochures on the pest were developed.
- The USDA Smuggling, Interdiction and Trade Compliance Unit initiated a statewide market survey for dodder seed viability in collaboration with county departments of agriculture and CDFA's Plant Pest Diagnostics Laboratory.

QUARANTINE TRAINING, DIRECTION, OVERSIGHT AND CONSULTATION

Each county's agricultural department provides the necessary staff to perform pest exclusion inspections at many locations within California. Interior Pest Exclusion provides training, direction, oversight and consultation to each county's agricultural commissioner's office in order to ensure uniform inspection procedures throughout the state.

In 2005, Interior Pest Exclusion conducted 32 regional training sessions for 660 county staff from 39 different counties. Topics included: chrysanthemum white rust, sudden oak death, glassy-winged sharpshooter, nematology, quarantine certification examinations, County Procedural Training Manual update, Pest Damage Record training, exotic fruit identification, exotic fruit fly information, market inspection procedures, exotic fruit fly rapid response and new quarantine regulations established for new pests such as sapote fruit fly and emerald ash borer. During the year, Interior Pest Exclusion staff partnered with the University of California in conducting "First Detector Training" and certified over 300 county agricultural and CDFA staff. (See Table 3)

.

Table 3. Regional Training Sessions

Training Category	Sessions	Counties Served	Participants
Quarantine	14	25	452
Phytosanitary	18	14	208
Total	**32**	**39**	**660**

Interior Pest Exclusion provides direction and information to county agricultural departments by issuing documents such as Pest Alerts, Pest Exclusion Advisories and Phytosanitary Advisories. There were 62 of these documents issued in 2005 (see Table 4).

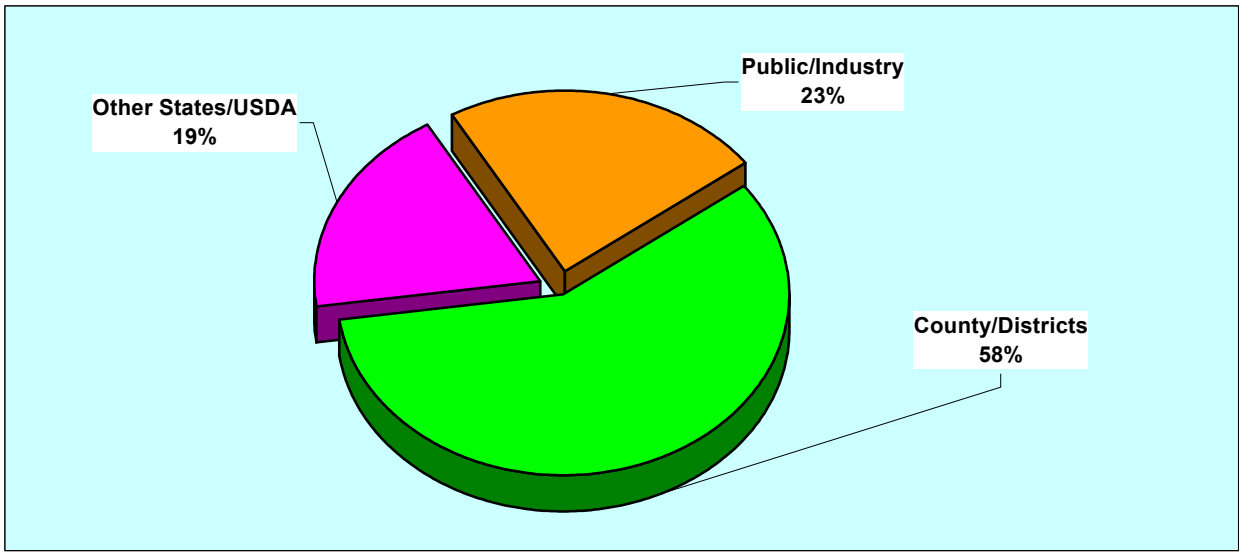
Table 4. Documents Issued by Interior Pest Exclusion

Document	Number Issued	Purpose
Pest Exclusion Advisories	32	To advise of specific handling, inspection, or treatment protocols for specific situations
Phytosanitary Advisories	30	To relay import information regarding the certification requirements of other states

Interior Pest Exclusion also provides consultation to agricultural officials in other states, the USDA, the agricultural industry and the general public. Interior Pest Exclusion advises on issues relating to quarantine enforcement, interpretation of regulations and methods of certification and inspection.

Most of the consultations performed by Interior Pest Exclusion biologists were through inquiries received via telephone or e-mail. The majority of the inquiries are from County Agricultural Commissioners' staff and CDFA district offices. Figure 3 illustrates the percentages of each type of consultation handled by Interior Pest Exclusion staff.

Figure 3. Quarantine Consultations Conducted by Interior Biologists in 2005



General Information on the Internet

Revision of Extranet Site. Interior Pest Exclusion utilizes the Internet to publish quarantine and pest prevention information. In 2005, the Interior Pest Exclusion extranet Web page was redesigned and updated to include the following sections:

- County/District maps with Interior Pest Exclusion field offices and headquarters
- Selected CDFA and USDA regulatory manuals
- Reports such as Weekly A & Q, Foreign Plant Shipments, etc.
- Advisories including Pest Alerts, Pest Exclusion and Phytosanitary Advisories
- CDFA pest ratings for invertebrates, pathogens/diseases, vertebrates, weeds, etc.
- Quarantine programs with selected resources on current programs such as *Phytophthora ramorum* quarantine
- Selection of regulatory forms

County Pest Exclusion Procedural Training Manual. In 2005, the County Pest Exclusion Training Manual and Pest Exclusion Quarantine Commissioners Circulars were updated and merged into one manual. The new manual is the County Pest Exclusion Procedural Training Manual (CPTM). The CPTM is a reference guide to Pest Exclusion staff and a training tool for new and permanent county inspectors. The CPTM is Web based at the Interior Pest Exclusion extranet Web site (http://phpps.cdfa.ca.gov) with interactive links to each section and selected regulatory forms (Figure 4).

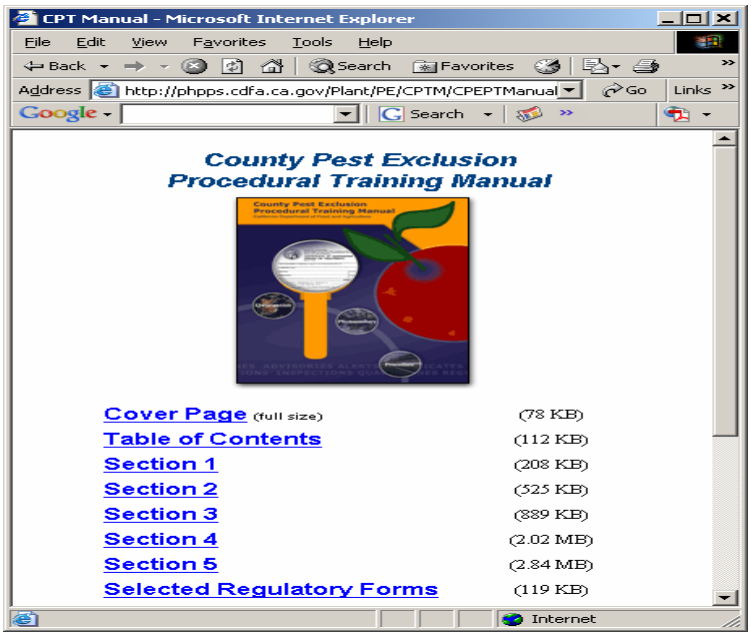


Figure 4. Overview of County Pest Exclusion Procedural Training Manual

The CPTM is divided into the following five key sections:

Section I: Introduction and plant pest quarantine administrative responsibilities
Section II: Legal authorities and quarantine regulations
Section III: Inspection procedures and policies
Section IV: Special commodity inspections
Section V: Training reference materials (e.g., life history of some pests, etc.)

Apiary and Other Updates. Information on bees and beehives, including small hive beetle regulations, was updated and posted on the Web site. Other information updated on the Web site includes current exotic fruit fly quarantines, sudden oak death regulations, frequently asked questions for travelers, pest ratings with current systematic nomenclatures and the Plant Quarantine Manual, a summary of all federal, state and county restrictions and quarantines affecting agricultural commodities entering the state. Additionally, a password-protected site is used to communicate important regulatory information to county and border station inspectors.

QUARANTINE ENFORCEMENT

Interior Pest Exclusion is responsible for the enforcement of California's plant pest quarantines by conducting routine inspections of all incoming shipments of agricultural commodities and all plant material. Commodity shipments arrive in the state via cargo ship, airplane, railcar and truck. Routine port and terminal point inspections help keep California pest-free. These inspections are done cooperatively with the USDA and with help from the local County Agricultural Commissioner's staff.

Port and Terminal Inspections. Interior Pest Exclusion is responsible for inspecting domestic aircraft, second port-of-call foreign and domestic vessels, crew quarters and passenger baggage and cargo shipments for pests detrimental to California agriculture at the ports of San Pedro, San Francisco and San Diego. Additional responsibilities are to enforce aircraft and vessel garbage regulations, issue permits to remove food stores from vessels, seal vessel stores where high pest-risk food items are contained on board to prevent crew members from taking these food items ashore while on leave, monitor shipments of commodities while transiting from California to foreign destinations, issue compliance agreements for aircraft owners/operators, catering facilities, vessel dry docks and vessel/aircraft garbage handling facilities and monitor them as needed and supervise quarantine treatments of commodities that are infested with exotic agricultural pests. All of this work is done in cooperation with DHS Customs and Border Protection, DHS/TSA, USDA, CDFA Animal Health Branch, county agricultural departments, agricultural officials in other states and representatives from the trucking, airline and shipping industries.

Vessel Inspections. In 2005, a total of 60 shipments were inspected on 10 vessels arriving at major California seaports. Twenty-five shipments were rejected (see Table 5).

Table 5. Exclusion Activities/Inspections

Port Area	Vessels	Shipments	Rejections	Total Pest Interceptions	Treatments Supervised
Northern California	10	60	25	0	3
Southern California	0	0	0	0	0
Total	**10**	**60**	**25**	**0**	**3**

Notable Inspections. Interior Pest Exclusion staff coordinated with the county agricultural offices to inspect other businesses such as high-risk ethnic markets, pet stores, etc. (see Table 6). Types of pests intercepted through these activities in 2005 include: false codling moth *(Thaumatotibia leucotreta*)*, Sinoxylon* sp. and *Sinoxylon anale* on religious wooden carvings

from Israel, Asian longhorn beetle in wooden crates from China, magnolia white scale on plants from Florida, etc.

Table 6. District Inspection Activities

Activities	Northern California	Southern California	Total
Warning/Hold Notices Issued by Port Inspector	131	532	**663**
Storage Facility	19	0	**19**
Export Transit Shipments	45	409	**454**
Port Operations Coordination Contacts	180	60	**240**
Steamship Line Manifests Read	40	137	**177**
Biotechnology/Soil Lab Inspection	9	7	**16**
Ethnic Market Inspection (Cooperation with Counties)	30	72	**102**
Hawaiian Vehicle Inspection	100	0	**100**
Dunnage Inspection	8	0	**8**

In 2005, Interior Pest Exclusion staff worked with USDA/APHIS/PPQ at the Port of Long Beach to gain compliance in the "Florida Citrus to Japan and Taiwan Program". This involved the renewal of the compliance agreement with six different trans-loading companies for the 2005 citrus season. A total of 852,000 pounds of Florida grapefruit trucked to the Port of Long Beach was loaded into containers and exported to Japan and Taiwan.

COUNTY HIGH RISK PROGRAM

Background

The County High Risk Pest Exclusion Program (CHRPEP) was established in December 1998, by urgency legislation, Senate Bill 2062, Rogers (Chapter 635, statutes of 1996), known as "the Roger's Bill," to augment county terminal point inspections. The CHRPEP is a cooperative program that provides funds to County Agricultural Commissioners to conduct high-risk pest exclusion activities under state oversight by CDFA.

The study found that conducting a statewide county high-risk pest exclusion program at optimal levels would cost approximately $14 million a year. In 1998, Section 2282.5 of the California Food and Agricultural Code and a state budget augmentation provided the County Agricultural Commissioners with $5 million to conduct an optimal level program for the latter portion (December-June) of fiscal year 1998/99. CDFA allocated funding by way of a negotiated work plan process with the County Agriculture Commissioners.

In 1999, Section 2282.5 was amended, providing for continuation of the program in fiscal year 1999/00 by extending the June 29, 1999 sunset date to June 30, 2000. In fiscal year 2002/03, the CHRPEP funding had been reduced to $5.5 million, with scientific evaluation trapping paid out of the Department's funds. For fiscal years 2004/05 and 2005/06 the county contracts for high-risk inspections were $977,000 per year.

High-Risk Inspections

The primary responsibility of the CHRPEP is to provide guidance and funding to county agricultural commissioners to conduct high-risk pest exclusion activities at first point-of-entry terminals within California. The CHRPEP is a vital component in the state's overall pest prevention efforts, and is a crucial part of the CDFA's mission to protect agriculture and the environment from the threat of newly introduced exotic pests.

In fiscal year 2004/05, $977,000 was disbursed to 48 counties for high-risk pest exclusion activities at airports, nurseries, United States postal and private parcel facilities, as well as high-risk destination points including specialty markets, swap meets, flea markets, locations where household goods from gypsy moth-infested areas were delivered and locations where material in post-entry quarantine was held.

In fiscal year 2005/06, $977,000 was disbursed to 12 counties based upon the pest risk of specific pathways and the volume of work associated with those pathways. The top priority pathways were airfreight, truck shipments of nursery stock and truck shipments of beehives from areas infested with red imported fire ant. Funds were directed to Los Angeles and San Mateo Counties for inspection of high-risk plant material shipped via air freight; San Diego, Alameda, San Joaquin, Orange, Ventura, Los Angeles and San Mateo Counties for inspection of nursery stock from the southeast and Hawaii; and Kern, Fresno, Madera, Stanislaus and Merced Counties for inspection of incoming beehives from areas of the United States that are infested with red imported fire ant.

As part of this important program, county agricultural inspectors/biologists assist with the retrieval of any infested lots (i.e., nursery stock that contains high-risk pests). Seizure of illegal fruit that may have already entered the state is also a vital part of this program.

A total of 3,684 shipments (see Table 7) were rejected from January to December 2005 due to the presence of "A" and "Q"-rated pests, or due to lack of origin or treatment certification (see Table 8). Figures 5 and 6 detail the pests most commonly intercepted. There were 354 seizures of foreign-origin plant pest and quarantine material that were brought into California illegally.

Table 7. Foreign Origin Materials Rejected in 2005

MATERIAL	ORIGIN	SHIPMENTS REJECTED
Dracaena Plants	Costa Rica, Guatemala	68
Cuttings	Brazil, Canada, Chile, Colombia, Costa Rica, Germany, Guatemala, India, Israel, Italy, Mexico, Netherlands, Portugal	44
Fruits	Chile, Costa Rica, Mexico, New Zealand, South Africa	37
Thyme	Colombia, Israel	21
Schefflera Plants	Costa Rica, Guatemala	19
Palm	Colombia, Costa Rica, Ecuador, Singapore	16
Cut Flowers	Canada, Colombia, Costa Rica, Ecuador, Israel, Netherlands	16
Wood Crates	China, Korea	9
Ti Leaves	Colombia, Costa Rica, Ecuador	6
Bulbs	Canada, Mexico, Netherlands	5
Processed Plant Products	Laos	4
Orchids	Canada	3
Meat Products	Mexico, Nigeria	2
Gerbera Plants	Canada	2
Pepper	Mexico, Thailand	2
Mixed Seeds	France, Laos	2
Straw Packing Material	United Kingdom	1
Truffle	Italy	1
Wheat	Italy	1
Miscellaneous	Canada, France, Guatemala, Laos, Mexico, South Africa	14

Note: NOR data source.

Table 8. Counties with Two or More "A"- and "Q"-Rated Pest Finds in 2005

County	Pest Finds	County	Pest Finds	County	Pest Finds
Los Angeles	681	Santa Clara	18	Tulare	6
San Mateo	460	Mendocino	13	Ventura	4
Orange	170	Fresno	11	Solano	3
San Joaquin	102	Sonoma	10	Humboldt	2
San Luis Obispo	81	Santa Barbara	9	Marin	2
Contra Costa	76	San Bernardino	8	Merced	2
Alameda	58	San Diego	7	Santa Cruz	2
Sacramento	27	San Francisco	7		
Riverside	21	Shasta	6		

Note: PDR data source.

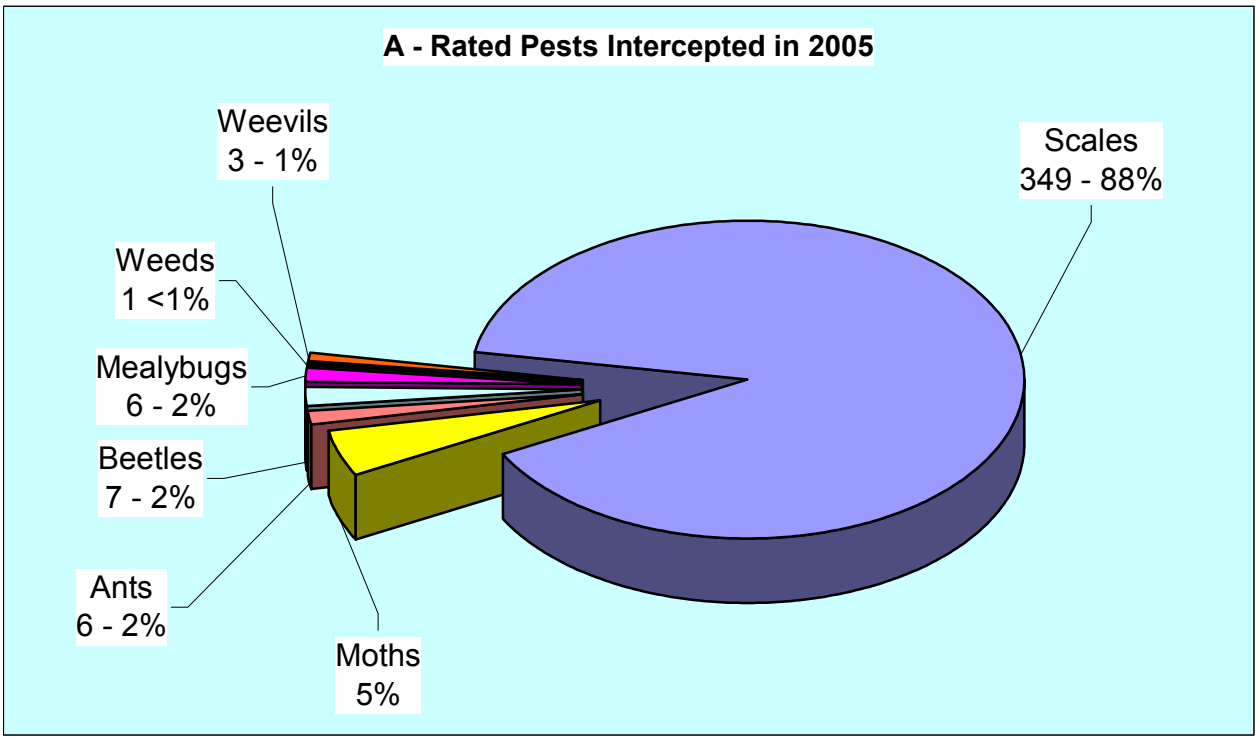


Figure 5. Frequently intercepted "A"-rated pests (number, percentage of total) in 2005

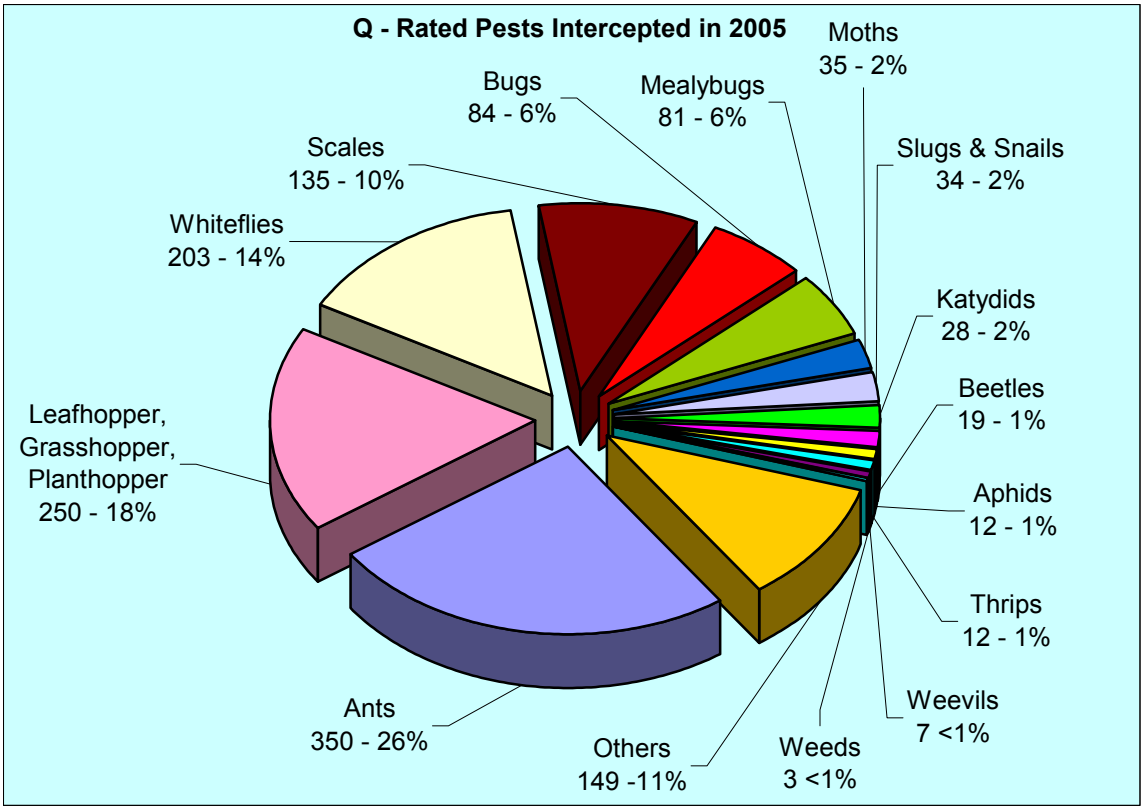


Figure 6. Frequently intercepted "Q"-rated pests (number, percentage of total) in 2005

Table 9. Statewide High Risk Pest Exclusion Activities in 2005

TERMINAL	REJECTIONS ISSUED	HOURS	SHIPMENTS INSPECTED	PREMISE VISITS
Post Office	231	2,678.2	18,664	3,401
United Parcel	345	8,554.1	51,517	6,235
Federal Express	580	12,836.8	108,285	7,672
DHL	16	2,868.6	1,746	684
Gypsy Moth	4	2,222.0	760	872
Air Freight	428	5,805.4	9,274	7,724
Air Freight – Forwarded	61	2,183.4	2,227	1,500
Truck – Plant Material	150	13,140.0	16,349	7,268
Truck – Other	30	3,564.9	4,197	3,291
Specialty Markets	2	697.3	1,119	1,162
Swap Meets	0	50.0	489	19
Post Entry	2	77.8	11	26
Other High-Risk	5	246.5	81	44
Total	**1,854**	**54,925**	**214,719**	**39,898**

NOTE: Report 4A data source. Not all Report 4As have been submitted for 2005.

Table 10. "A"- & "Q"-Rated Pests Intercepted in 2005

DESCRIPTION	TOTAL	TRUCK	AIRCRAFT	UPS	FEDEX	USPS	NURSERY SHIPMENTS INCOMING	OTHER
Alameda	58		4		45		3	5
Butte	1							1
Contra Costa	76	1		8	66		1	
Fresno	11		5		5			1
Glenn	1	1						
Humboldt	2	1		1				
Los Angeles	681	25	588	2	64		2	
Marin	2				2			
Mendocino	13				13			
Merced	2	2						
Monterey	1							1
Orange	170	25	51	3	90	1		
Riverside	21	19					2	
Sacramento	27	8			17		1	1
San Bernardino	8		4	1	3			
San Diego	7	1					6	
San Francisco	7	1	6				1	
San Joaquin	102		18		3	2	79	
San Luis Obispo	81	8	50	1	20	1	1	
San Mateo	460	18	431		1		10	
Santa Barbara	9		1		4		4	
Santa Clara	18		2					16
Santa Cruz	2	2						
Shasta	6				6			
Solano	3							3
Sonoma	10	1			8	1		
Tulare	6					6		
Ventura	4				4			1
Yolo	1						1	
Yuba	1	1						
Total	**1,791**	**114**	**1,160**	**16**	**352**	**11**	**100**	**38**

NOTE: PDR data source. (Program equals Int, HR, or Null; Activity equals 01 through 08; and Situation equals 05, 06, 10, 11, 12, 20, or 69).

Other Terminal Point Inspections. Each county's agricultural commissioner conducts routine terminal inspections of mail carriers, airfreight, sea freight, etc., with oversight by the Interior Pest Exclusion staff. Over 273,000 shipments were inspected in 2005. Table 11 shows the results of these terminal inspections.'s

Table 11. Terminal Point Inspections in 2005

Terminal	Shipments	Notices of Rejection	Pest Rejections
Post Office	49,174	443	13
UPS	46,622	377	165
Federal Express	122,847	847	310
Express Carrier	2,101	5	5
Air Freight	9,122	276	292
Sea Freight	583	31	39
Railroad	189	1	0
Gypsy Moth	760	3	4
Truck	34,503	221	160
Other	7,457	26	66
Total	**273,358**	**2,230**	**1,054**

NOTE: Report 4 data source. Not all report 4's have been submitted for 2005.

Facility and Property Inspections. Each County's Agricultural Commissioner conducts routine facility and property inspections with oversight by the Interior Pest Exclusion staff. These inspections include: feed grain/screening facilities, research facilities and destination properties of post-entry shipments. Over 1,400 facilities and properties were inspected in 2005. Table 12 shows the distribution of these inspections.

Table 12. Facility and Property Inspections in 2005

Facility/Property	Number of Inspections
Feed Grain/Screening	68
Post-Entry Property	31
Testing/Research	50
High-Risk Markets	1,108
Quarantine Enforcement/Monitoring, etc.	183
Total	**1440**

Smuggling Interdiction. Interior Pest Exclusion biologists and Agricultural Commodity Investigation Team (ACIT) investigators work cooperatively with other programs, agencies and industry groups that have vested interests in agricultural smuggling interdiction. The programs include Interior biologists, Border Station inspectors, USDA's Smuggling Interdiction and Trade Compliance (SITC) Program, County Agricultural Commissioners' offices, USDA's Office of Inspector General and USDA's Investigative Enforcement Services. Program investigators along with Interior/Exterior staff and USDA counterparts locate and seize agricultural commodities that have entered California illegally. Violators of the California Food and Agricultural Code are prosecuted administratively, criminally and/or civilly.

Working closely with USDA SITC and other government agencies in California enables ACIT investigators to network within the state and with other states. This networking provides information sharing, which has proven useful in interdicting, smuggled agricultural commodities. Much of California's produce makes its way to other states and information sharing becomes invaluable for all agricultural cooperators nationwide. Another important component of smuggling interdiction is public outreach and education. This includes identifying and inspecting local commercial and non-commercial sources of exotic produce and providing them with information and resource materials. The cooperative effort and information sharing between industry, agricultural agencies, inspection activities and the subsequent investigations and prosecutions of agricultural violators helps to ensure that produce enters California legally and free from exotic pests and diseases. All of this in turn protects California's agricultural industry.

In 2005, ACIT investigators conducted 13 investigations of alleged Food and Agricultural Code violations. These investigations resulted in civil and criminal prosecutions. The investigations involved a variety of prohibited commodities including camellias, satkara (infected with citrus canker), manzano peppers, palm trees, garlic stems and papayas.

Major Cases Settled in 2005

1) The owner of a San Marcos nursery imported 456 illegal palms from Florida in violation of State and Federal quarantines and the Unfair Competition law (Figure 7). Interior Pest Exclusion Program investigators worked the case in conjunction with the San Diego County Agricultural Commissioner's office. The nursery owner settled the case with the San Diego District Attorney's Office and was ordered to pay a fine of $175,000, which included $5,705 in investigative costs recovered by CDFA. The truck drivers who transported the palms were arrested and pled guilty to criminal misdemeanor charges. Both drivers paid a $2,000 fine each and were placed on three years informal probation.

Figure 7. Prohibited palms from Florida

2) The owner of a Ventura County orchard was investigated for smuggling citrus cuttings from Japan into California (Figure 8). The citrus cuttings were infected with citrus canker, a virus that destroys citrus crops. The smuggled citrus cuttings were grafted onto 4,000 plants at this orchard in Ventura County and were ultimately ordered destroyed. Exclusion ACIT investigators worked the case in conjunction with the United States Department of Homeland Security, Immigration and Customs Enforcement. The owner of the orchard pled guilty to a Federal felony count of smuggling goods into the United States, received a prison sentence of 30 days and was additionally ordered to pay a $5,000 fine and distribute brochures in Japan and the United States; warning farmers about citrus canker and the consequences of smuggling prohibited citrus cuttings into the United States. A civil case brought by the State Attorney General's Office is pending.

Figure 8. Prohibited citrus cuttings smuggled from Japan

3) The owner of a San Diego wholesale produce company purchased and sold approximately 1,400 pounds of prohibited starfruit (carambola) from Mexico (Figure 9). The civil case brought by the San Diego County District Attorney's Office, Consumer Protection Division was settled, and the owner was ordered to pay a fine of $14,047, including $3,955 in investigative costs recovered by CDFA.

Figure 9. Prohibited starfruit smuggled from Mexico

4) The owner of a Los Angeles wholesale produce company imported and sold approximately 200 pounds of prohibited burdock root from China (Figure 10). The owner pled no contest in a criminal case brought by the Los Angeles City Attorney's Office and was ordered to pay a fine of $4,615, including $1,300 in investigative costs recovered by CDFA.

Figure 10. Prohibited burdock root from China

5) The owners of a Riverside County nursery sold pygmy palms in violation of the State Interior Quarantine established to protect date palms in the Coachella Valley (Figure 11). The owners pled guilty in a criminal case brought by the Riverside County District Attorney's Office and were both ordered to pay a $1,000 fine. Both owners additionally received three years informal probation. A civil case brought by the Riverside County District Attorney's Office is pending.

Figure 11. Prohibited pygmy palm

TRADE FACILITATION

Interior Pest Exclusion works cooperatively with the USDA, agricultural officials from other states and the county agricultural departments to facilitate both domestic and foreign trade of agricultural products. This is accomplished by:

- Collaboration with other states
- Administrating Federal Phytosanitary Program

Collaboration with Other States

Interior Pest Exclusion works with agricultural officials in other states to coordinate certification and inspection procedures that will meet California entry requirements.

Origin Inspection Program (OIP). The Interior Pest Exclusion Program administers CDFA's Origin Inspection Program. This program facilitates the entry of pre-qualified and pre-cleared agricultural commodities from participating shippers in other states. Encouraging origin inspection activities with regulatory officials in other states is an integral part of California's pest prevention system. The OIP mitigates pest risk at origin by requiring commodities to be inspected by regulatory officials in the other states before being shipped, and consequently reducing the inspection workload in California. Ongoing negotiations with other regulatory agencies are required as shippers request new commodities be included in the program.

In 2005, 140 shippers in 10 states and Canada participated in the Origin Inspection Program (see Table 13). The commodities covered under the OIP include fruits and vegetables, cut flowers and cut greens, canola pellets, bulbs, seeds and nursery stock.

Table 13. Origin Inspection Program

State/Country	OIP Participants
Arizona	1
Canada	2
Colorado	1
Hawaii	30
Mississippi	1
Nevada	2
New Mexico	1
Ohio	1
Oregon	65
Utah	1
Washington	35
Total	**140**

Master Permits and Compliance Agreements. Interior Pest Exclusion worked with agricultural officials in Texas, Ohio, Mississippi and Arizona to develop compliance agreements that allowed shippers in those states to ship commodities to California. Compliance agreements were approved for the shipment of nursery stock, bulk produce and fresh fruit gift packages.

Administrating Federal Phytosanitary Program

Interior Pest Exclusion works cooperatively with the USDA, regulatory officials in other states and countries, private industry and the County Agricultural Commissioners, to provide quarantine consultations to facilitate trade to both foreign and domestic markets.

Phytosanitary Export Certification Administration. Phytosanitary certification is a service provided to industry to meet the plant quarantine requirements of foreign countries, other states, or California's own interior quarantines. This service helps facilitate domestic and foreign trade in agricultural commodities. The USDA is charged with nationwide implementation of the International Phytosanitary Certification Program. Interior Pest Exclusion administers both this federal program in California for the USDA and the domestic Phytosanitary Certification Program. Interior Pest Exclusion provides training to County Agricultural Commissioners' staff to issue phytosanitary certificates.

Phytosanitary inspections may include post-harvest inspections of agricultural commodities at packing sheds or terminal inspection points and/or growing season inspections of seed fields, nursery stock and fruit and vegetable stock.

The table below lists the number of inspections and certificates issued for various areas of responsibility:

Table 14. Inspections and Certificates Issued in 2005

County Certification Activities		
Type of Certificate	**Inspections**	**Certificates Issued**
Federal Phytosanitary	90,921	97,684
State Phytosanitary Certification	4,776	6,347
Compliance Certificates	18,313	32,934
Quick Decline Permits	1,304	1,427
Compliance Agreements	547	279
Other	6,403	3,068
Total	**122,264**	**141,739**

NOTE: Report 4 data source. Not all Report 4s have been submitted for 2005.

Phytosanitary Issues Management. Phytosanitary Issues Management (PIM) encompasses a range of activities that support export market access and maintenance of open export markets. The main PIM activities include: assisting the USDA in developing and implementing commodity export work plans; providing requested information to foreign plant protection officials regarding pests of their concern; and providing technical support to the USDA during in-state meetings with foreign plant protection officials.

The table below summarizes Interior Pest Exclusion PIM activities for 2005.

Table 15. Phytosanitary Issues Management

Commodity	Country/State	Action
All	All	Developed pest lists for 30+ commodities
All	All	Established Pest List database
All	All	Developed internet site for trade status
Nursery Stock	Canada	Collaborated with Canadian Food Inspection Agency (CIFA) to reduce restrictions on low-risk sudden oak death (SOD) materials
Cut Roses	Canada	Collaborated with CIFA to repel prohibition on cut roses because of SOD
Citrus	China	Met with Chinese and petitioned for termination of Mediterranean fruit fly (aka China) trapping based on negative trapping data
Cottonseed	Israel	Hosted Israeli specialists in California for field and facility inspections to formulate a trade agreement
Oranges	Korea	Negotiated work plan to maintain market Refined testing procedures *Septoria citri* for export clearance
Stone Fruits	Mexico	Implemented Oriental fruit moth work plan
Cherry and Nectarine	Japan	Implemented codling moth work plan
Plum	China	Developed codling moth work plan and export protocol

Phytosanitary Field Inspection of Seed Program Highlights. The Phytosanitary Field Inspection of Seed Program (PFISP) inspects crops during the growing season for diseases of concern to importing countries. The seed from the inspected crops may be certified for export depending on the results of the inspection and the importing country's phytosanitary concerns. Growers submitted 3,129 applications for crop inspections to the CDFA in 2005. The following tables (Table 16 and Table 17) indicate the top three crops entered into the program, and the top three counties where crops entered into the program were grown:

Table 16

Top Three Crops Inspected in 2005	
Sunflower	586
Watermelon	358
Bean	312

Table 17

Top Three Counties of Origin in 2005	
Yolo	679 applications
Colusa	551 applications
Solano	432 applications

California Pest Lists for USDA Phytosanitary Negotiations with Foreign Countries. Pest lists were created and warehoused in the USDA/CDFA "Pest List Database and Web site Project". This database is available to the CDFA and USDA staff on the PHPPS Extranet site. In 2005, a Web site with public access was developed for tracking the status of pest lists used in trade negotiations by USDA/APHIS. CDFA maintains version control. The tracking site (http://www.cdfa.ca.gov/phpps/pe/exportstatus/index.asp) allows commodity boards to review at a glance the progress of export requests.

Pest lists for the following California crops were completed in 2005:

Almond	Cabbage	Fig	Plum
Apple	Carrot	Kiwifruit	Pomegranate
Apricot	Cauliflower	Lettuce	Potato
Asparagus	Celery	Nectarine	Raspberry
Avocado	Cherry	Peach	Strawberry
Blackberry	Citrus	Peppers	Table grape
Broccoli	Date	Pistachio	Tomato
			Walnut

Pest lists are also being compiled for other California crops such as alfalfa, artichoke, Bermuda grass, bluegrass straw, calla, carnation, chrysanthemum, delphinium, Easter lily, fescue straw, Gerber daisy, gladiolus, iris, Klein grass, pear, prune, rose, ryegrass straw, snap bean, snapdragon, Timothy hay, etc.

Commodity Treatment Manual. Interior Pest Exclusion revised the CDFA Commodity Treatment Manual (CTM) and published it on the PHPPS Extranet site. The CTM document addresses pests of quarantine concern that are unique to California. Accordingly, the CTM is a companion document to the Federal Treatment Manual. The current revision of the CTM includes a major effort to create an intranet document as well as adding new treatment schedules. The intranet document is constructed to facilitate rapid information retrieval by presenting the user with a topical index from which content is accessed. The new e-version includes Internet links to the California Department of Pesticide Regulation for verification of current pesticide registrations. Other Web tools are provided for referencing product labels.

Electronic Registration of Staff Accredited as Authorized Certification Officials. The USDA/APHIS/PPQ maintains a Phytosanitary Issues Management office to address the export of domestic crops to foreign markets. California is responsible for approximately one-half of all the federal phytosanitary certificates completed in the United States. Interior Pest Exclusion coordinates the training and accreditation of California County Agricultural Commissioners' staff as Authorized Certification Officials (ACO) by the USDA. In 2005, Program staff established an electronic registration database to record active ACOs by California counties.

Pesticide Registrations. Interior Pest Exclusion facilitated the registrations, amendments and renewal of seven pesticides in 2005 (see Table 18).

Table 18. Pesticide Registrations, Amendments and Renewals in 2005

Pesticide	Registration	Target Pest(s)	Status
Safari	Research Authorization	Q-Strain *Bemisia tabaci* in greenhouse/quarantine	Registered
Safari	Regular Section 3	Q-Strain *Bemisia tabaci* in field crops	Registered
Diazinon	Special Local Needs	Tephritid fruit flies in nursery stock	Registered
Spinosad	Special Local Needs	Olive fruit fly	Registered
Malathion	Special Local Needs	Exotic fruit fly bait stations	Registered
Checkmite	Renewal – Emergency Section 18	Small hive beetle and Varroa in beehives	Ongoing
Diazinon	Special Local Needs	Immature nymphs and crawlers in nursery stock	Terminated

EXTERIOR PEST EXCLUSION

AGRICULTURAL INSPECTION STATIONS

The mission of the Exterior Program is to lower the risk of exotic pest introductions via overland highways at California's borders with other states. California established the first agricultural inspection station (AIS) in the early 1920s to monitor vehicles entering the state for prohibited or infested commodities. Currently, CDFA operates 16 AIS located on major highways throughout the state. The goal of the Program is to minimize the chance that vehicles entering the state are carrying commodities infested with pests that pose a serious threat to California agriculture. AIS personnel perform the following functions:

- Enforce CDFA codes, federal and state quarantines and county enforcement policies.
- Inspect commercial shipments to ensure quarantine compliance and intercept exotic pests transported in these shipments.
- Provide quarantine consultations to the agricultural industry and the public.
- Collect, analyze and disseminate data pertaining to commodity movement, pest interceptions and traffic flow.

Blythe Inspection Station c. 1927

Additionally, the AIS Program has cooperative working relationships with several other programs within the CDFA, including: Agricultural Statistics; Animal Health; Egg Quality Control; Feed, Fertilizer and Livestock Drugs; and Fruit and Vegetable Quality Control-Standardization. The AIS personnel also work closely with many other federal and state agencies (e.g., the USDA; the U.S. Bureau of Land Management; the U.S. Customs and Border Protection; and the California Departments of Parks and Recreation; Transportation; Fish and Game; Water Resources; Pesticide Regulation; Conservation; Board of Equalization; Highway Patrol; and the Public Utilities Commission) in the enforcement of laws pertinent to them.

At the local level, the AIS personnel assist county agricultural commissioners, county sheriffs, city police and fire departments with various issues and/or provide public assistance with emergencies that arise at or near the stations. Border station personnel provide information regarding quarantine regulatory activity to neighboring states and to the Oregon/Washington/Idaho Potato Commission.

Mission: *Protect California from the introduction of invasive pests via overland highways.*

Vision: We are California's first line of defense in an integrated pest prevention system. California's agricultural inspection stations enforce quarantine laws and regulations by using the best available technology and biologically sound methods.

Values:

- Consistency: Enforcement of laws and regulations is standardized throughout the program.
- Communication: Open, constructive exchange of ideas and information.
- Decision: Decision-making based on the best available science, technology and common sense.
- Team Work: Accomplishing program goals through the cooperative efforts of each of our employees.
- Integrity/Dependability: Our employees are committed to excellence in job performance.
- Credibility: We have a responsive, accountable and trusted program.
- Employee Development: Provide an environment that develops employee skills, potential and capabilities.

Goals: To accomplish our mission by:

- Inspecting all commercial vehicles based on pest risk profiling
- Educating and soliciting the cooperation of the affected industry and traveling public
- Maintaining an informed and well-trained workforce
- Continuously striving to expand and improve our service to the citizens of California

ACCOMPLISHMENTS

Commercial Shipment Inspection

Due to the volume and potential for wide dispersal of commercial commodity shipments, truck traffic presents the greatest risk of introducing exotic pests into California. In 2005, 6,058,835 commercial trucks entered California through the AIS. Inspectors opened more than seven percent of these and the commodities they were transporting were physically inspected. The rest were released after verifying the contents by inspection of paperwork accompanying the load.

Commercial Citrus Sampling: In 2005, 7,270 commercial shipments of citrus entered California from the regulated areas of the Bahamas, Mexico, Spain, South Africa, Florida and Texas. From these shipments, AIS personnel sampled 6,431 containers of fruit. Inspectors rejected 333 shipments due to pest infestations or lack of proper certification. Significant pest finds from citrus included Mexican fruit fly *(Anastrepha ludens)* larvae in grapefruit from Texas and false codling moth (*Thaumatotibia leucotreta)* larvae in oranges from South Africa. These pests do not occur in California naturally – false codling moth does not occur in North America naturally – and have the potential to wreck havoc on California's agriculture if introduced.

Commercial Mango Sampling: To ensure that mangos are free from exotic fruit flies and other pests, AIS inspectors sampled 118,387 containers from 37,894 commercial shipments in 2005. Mango shipments originated from Haiti, Mexico and other Central and South American

countries. During sampling, inspectors found dead fruit fly larvae in nine shipments. No live larvae were found, suggesting that hot water treatments were properly applied. However, 388 shipments were rejected due to the presence of significant surface pests (i.e., scale insects).

Truck Inspection at Needles

Cherry Fruit Fly Origin Sampling and Certification Program: Under special permit, shippers are allowed to ship unfumigated cherries to California. Fruit entering under this program is certified as being pest-free based on field treatments and fruit sampling, both at origin and upon arrival at the California border, eliminating the need for fumigation.

Ninety-four shippers participated in the 2005 permit program. This number included 63 from Washington, 13 from Oregon, two from Utah, and 16 from British Columbia, Canada.

This season, 3,377 commercial cherry shipments entered the state. Of these, 1,885 shipments came in under special permit and 1,492 were fumigated loads. The AIS personnel sampled all shipments that came in under special permit. No significant pests were found. One hundred thirty-five shipments failed to meet the special permit requirements (e.g., lacking either proper container markings or certification). Those shipments were either shipped out of state or released after the requirements were met.

Gypsy Moth Regulatory Activities: AIS personnel issued 69 citations for lack of proper certification to drivers carrying high-risk gypsy moth shipments. A total of 2,805 shipments (up 21 percent from 2004) of used household goods were quarantined and sent to destination for final inspection.

There were 531 inspections performed on recreational vehicles for various gypsy moth life stages. All of these private vehicles originated from gypsy moth quarantine areas. Of these, four were found to be infested with gypsy moth and were cleaned at the stations.

Other Quarantine Activities: Table 19 details miscellaneous plant quarantine work performed at the border stations during 2005.

Table 19. Summary of Commercial Shipments of Regulated Commodities

Commodity	Inspected and Released	Sent to Destination Under Hold Notice	Rejected Due to Lack of Certification or the Presence of a Pest
Feed Grain	3,746	7	6
Hay	46,838	143	46
Bee Colonies and Related Equipment	N/A	2600	62
Misc. Fruits, Vegetables, Nursery Stock and Seed	333,743	26,311	2,717
Total:	**384,327**	**29,061**	**2,831**

SIGNIFICANT PEST INTERCEPTIONS

AIS personnel intercepted significant ("A"- or "Q"-rated) pests on 1,258 occasions during 2005 (507 "A" pests, 751 "Q" pests). These interceptions are detailed in Tables 20 through 23.

Table 20. Insects

Genus	Species	Common Name	Rating	Times Found
Acutaspis	sp.	Armored scale	Q	2
Aethina	*Tumida*	Small hive beetle	Q	2
Aleurotrachelus	sp.	Whitefly	Q	1
Anastrepha	*Ludens*	Mexican fruit fly	A	7
Anastrepha	sp.	Exotic fruit fly	A	7
Anaxipha	sp.	Cricket	Q	1
Anisota	*stigma*	Spiny oakworm	Q	1
Aonidiella	*orientalis*	Oriental scale	A	1
Aonidiella	sp.	Armored scale	Q	1
Aspidiotus	*destructor*	Coconut scale	A	1
Asterolecanium	sp.	Pit scale	Q	7
Aulacaspis	*tubercularis*	White mango scale	Q	192
Aulacaspis	*yasumatsui*	Cycad aulacaspis scale	Q	2
Bactrocera	sp.	Exotic fruit fly	A	1
Brachymyrmex	*albipes*	Ant	Q	1
Bradysia	*zingiberis*	Gnat	Q	1
Camponotus	sp.	Carpenter ant	Q	32
Carya	*caryana*	Hickory shuckworm	A	1
Ceratitis	*capitata*	Mediterranean fruit fly	A	1
Ceroplastes	sp.	Wax scale	Q	1
Colladonus	sp.	Deltocephaline leafhopper	Q	1
Colobopsis	sp.	Ant	Q	1
Crypturgus	sp.	Wood borer	Q	1

Table 20. Insects (Continued)

Genus	Species	Common Name	Rating	Times Found
Cydia	*caryana*	Hickory shuckworm	A	4
Cylas	*formicarius*	Sweet potato weevil	A	1
Dasineura	sp.	Gall fly	Q	1
Diabrotica	*undecimpunctata*	Southern corn rootworm	A	3
Diaspidiotus	sp.	Armored scale	Q	1
Dicrooscytus	sp.	Plant bug	Q	1
Dysmicoccus	*grassii*	Mealybug	A	4
Dysmicoccus	*hurdi*	Mealybug	Q	2
Dysmicoccus	sp.	Mealybug	Q	8
Dysmicoccus	*texensis*	Mealybug	Q	1
Eremocoris	sp.	Lygaeid bug	Q	1
Ferrisia	sp.	Mealybug	Q	3
Frankliniella	sp.	Flower thrips	Q	1
Heliothrips	sp.	Thrips	Q	1
Hemiberlesia	*diffinis*	Diffinis armored scale	Q	1
Hemiberlesia	sp.	Armored scale	Q	1
Heraeus	sp.	Seed bug	Q	1
Hyalymenus	sp.	True bug	Q	1
Hypoponera	sp.	Ant	Q	4
Ischnaspis	*longirostris*	Black thread scale	A	18
Ischnodemus	*fulvipes*	Seed bug	Q	1
Lepidosaphes	sp.	Armored scale	Q	1
Libythaea	*bachmani*	Snout butterfly	Q	1
Liothrips	sp.	Thrips	Q	1
Loxa	*flavicollis*	True bug	Q	1
Lymantria	*dispar*	Gypsy moth	A	5
Maconellicoccus	*hirsutus*	Mealybug	A	2
Malacosoma	*americanum*	American tent caterpillar	A	1
Marmara	sp.	Gracilariid moth	Q	1
Metaleptea	*brevicorris*	Clippedwing grasshopper	Q	1
Milviscutulus	*mangiferae*	Mango shield scale	Q	3
Monomorium	sp.	Ant	Q	3
Montezumina	*modesta*	Modest katydid	Q	1
Moodna	*bisinuella*	Moth	Q	1
Mycetaspis	*personata*	Mask scale	Q	62
Mymicini	*tribe*	True bug	Q	7
Myodochini	sp.	True bug	Q	1
Myrmicini	sp.	Harvester ant	Q	16
Nysius	sp.	Seed bug	Q	11
Odontomachus	sp.	Ant	Q	1
Oncometopia	sp.	Leafhopper	Q	1

Table 20. Insects (Continued)

Genus	Species	Common Name	Rating	Times Found
Orchelimum	sp.	Katydid	Q	2
Orgyia	sp.	Moth	Q	1
Ormenaria	*rufofascia*	Flatid planthopper	Q	1
Ozophora	sp.	Seed bug	Q	2
Paracoccus	*maginatus*	Mealybug	Q	2
Parlatoria	*proteus*	Sansevieria scale	A	1
Parlatoria	*pseudaspidiotus*	Vanda orchid scale	A	226
Pheidole	*megacephala*	Bigheaded ant	Q	4
Pheidole	sp.	Ant	Q	48
Phenacoccus	sp.	Mealybug	Q	1
Phyllophaga	sp.	May beetle	Q	15
Pinnaspis	sp.	Armored scale	Q	7
Pinnaspis	*strachani*	Lesser snow scale	A	11
Planococcus	sp.	Mealybug	Q	1
Polyphylla	sp.	Tenlined June beetle	Q	1
Ponera	sp.	Ant	Q	3
Popillia	*japonica*	Japanese beetle	A	7
Prosapia	*bicincta*	Twolined spittlebug	Q	4
Pseudaonidia	*trilobitiformis*	Trilobe scale	Q	13
Pseudaulacaspis	*pentagona*	White peach scale	A	1
Pseudococcus	sp.	Mealybug	Q	1
Pseudopachybrachius	*basalis*	Seed bug	Q	17
Pseudoparlatoria	*parlatorioides*	False paralatoria scale	A	1
Ptochiomera	*nodosa*	Seed bug	Q	1
Radionaspis	*indica*	Mango scale	Q	8
Raglius	*alboacuminatus*	Lygaeid bug	Q	2
Rhagoletis	*indifferens*	Western cherry fruit fly	A	4
Selenaspidus	*articulatus*	Rufous scale	A	4
Solenopsis	*invicta*	Red imported fire ant	A	120
Solenopsis	sp.	Ant	Q	50
Sphenophorus	sp.	Weevil	Q	1
Tampa	*dimediatella*	Small carmine snout moth	Q	1
Technomyrmex	*albipes*	Ant	Q	1
Thaumatotibia	*leucotreta*	False codling moth	A	22
Thyridopteryx	sp.	Bag worm	Q	3
Trogoderma	sp.	Skin beetle	Q	1
Unaspis	*citri*	Citrus snow scale	A	24
Wasmania	sp.	Ant	Q	1
		Miscellaneous*	Q	148
			Total:	**1,258**

*Not keyed to genus but from a group known to be harmful to agriculture or wildlife.

Table 21. Weeds

Genus	Species	Common Name	Rating	Times Found
Centaurea	*diffusa*	Diffuse knapweed	A	3
Centaurea	*maculosa*	Spotted knapweed	A	12
Cirsium	*undulatum*	Wavy-leaf thistle	A	2
Onopordum	*acanthium*	Scotch thistle	A	8
Sonchus	*arvensis*	Perennial sow thistle	A	1
Salsola	*collina*	Spineless Russian thistle	Q	1
Sonchus	sp.	Sowthistle	Q	1
			Total:	**28**

Table 22. Mollusks

Genus	Species	Common Name	Rating	Times Found
Succinea	sp.	Snail	Q	2
Zachrysia	sp.	Snail	Q	2
Cepaia	*nemoralis*	Banded wood snail	Q	1
Dreissena	*polymorpha*	Zebra mussel	Q	8
			Total:	**13**

Table 23. Animals

Genus	Species	Common Name	Times Found
Mustela	*putorius*	Ferret	20
Meriones	*unguiculatus*	Gerbil	6
Myiopsitta	*minachus*	Quaker parrot	4
Petaurus	*breviceps*	Sugar glider	4
Chelydra	*serpentina*	Snapping turtle	2
Procyon	*lotor*	Raccoon	1
Erinaceus	sp.	Hedgehog	1
Capra	*caucasia*	Caucasian tur (a goat)	1
		Total:	**39**

DIGITAL IMAGING TECHNOLOGY

Pest Identification – Inspectors use a digital pest identification system (comprised of a digital camera/microscope and an e-mail account) to enable laboratory scientists to readily identify insect specimens. Systems are installed at the busier stations: Blythe, Dorris, Hornbrook, Needles, Truckee, Vidal, Winterhaven and Yermo. In 2005, inspectors used these systems to identify 1,329 pest specimens. This facilitated prompt quarantine action, with minimal delays, on trucks hauling infested commodities.

Using Digital Imaging System

INTRA AND INTER-AGENCY COOPERATIVE ACTIVITIES

Game Importation Declarations – In cooperation with the California Department of Fish and Game, AIS inspectors collected 232 game declarations from hunters returning to California. Fish and Game uses these forms to aid in identifying and prosecuting hunting and fishing regulation violations.

Livestock Tracking – During 2005, AIS inspectors recorded 38,287 shipments of livestock entering California. This information was forwarded to the Animal Health Branch for ownership and disease tracking.

Market Egg Shipments – AIS personnel recorded 10,463 shipments of market eggs entering through the border stations from other states. The Egg Quality Control Program uses this information to ensure all shipments meet quality standards and appropriate mill fees are paid.

NEW AIS FACILITY – TRUCKEE

The year 2005 saw groundbreaking at the construction site for the new Truckee Agricultural Inspection Station. By the end of the year most of the civil (earth moving and ground preparation) work was complete. Work on the new building and inspection canopies will begin in the spring of 2006 when weather permits. This state-of-the-art facility is expected to be operational by November 2006. Ample space will be included for both private and commercial vehicle inspection, as well as many technological advances not available in the current facility.

Rendering of the New Truckee Agricultural Inspection Station

NURSERY, SEED AND COTTON PROGRAM

NURSERY PROGRAM

The mission of the Nursery Program is to prevent the introduction and spread of agricultural pests through nursery stock and to protect agriculture and the consumer against economic losses resulting from the sale of inferior, defective or pest-infested nursery stock. In 2005, the value of nursery and floral products produced was $3.6 billion, an increase of 5.9 percent from the previous year. The nursery program budget for 2005 was $236,131 with 18.4 personnel years. Nursery program activities are funded entirely from revenue received in the form of license and acreage fees and registration and certification fees. Revenue received in 2005 totaling $2,081,602 was used to offset the costs of all program activities.

NURSERY REGULATORY AND INSPECTION ACTIVITIES

Financed primarily through license and acreage fees, nursery regulatory activities are conducted by the county agricultural commissioners and their staff and are an integral part of the state's agricultural pest prevention system. Nursery inspection and regulatory activities have prevented numerous pests from being disseminated throughout agricultural and suburban communities by preventing and/or eradicating pests at the nursery level. The quality of nursery stock has improved as a direct result of the regulation of nursery stock.

In 2005, there were 11,712 licensed sales locations with 826 production (growing grounds) locations. Since 2003, the budget for nursery inspection contracts has been set at $500,000. In addition, any disencumbered funds from the previous year's nursery contracts are added to the next annual allocation. The amount added to the allocation for this year was $44,208, resulting in a total of $544,208 to be divided among the counties for the 2004/05 fiscal year contracts.

REGISTRATION AND CERTIFICATION SERVICES FOR PLANT MATERIALS

CDFA Code authorizes the Department to establish plant registration and certification (R & C) programs (see Table 24). These programs are implemented by the California Code of Regulations and enforced by the Secretary. In 2005, CDFA staff performed over 500 inspections for R & C, including site approvals, growing season inspections, sampling for various purposes and harvest inspections. In addition to making inspections to meet R & C requirements, all nursery stock must also meet the general nursery regulatory standards for pest cleanliness.

R & C programs are voluntary programs developed at the request of various segments of the agricultural industry for the exclusion of specific plant pests that are not readily detected by ordinary inspections. These programs are the result of close working relationships between the University of California, USDA and the Department, with the added support of the agricultural

industry. Specific viruses, viroids, fungi, soil-borne pathogens and nematodes are the targeted pests of the nursery stock registration and certification programs.

The criteria for establishing these programs are: 1) there is an established need 2) sufficient technical information is available 3) a source of “clean” propagating stock has been established and 4) methods have been developed to assure the continued pest cleanliness of the stock.

California presently has nine “clean stock” (registration and certification) programs available for use by the various segments of the agricultural industry

Table 24. Registration and Certification Programs

PROGRAM	PLANTING TYPE (BLOCKS)	TARGET PEST	TESTING OR TREATMENT REQUIRED
Avocado Certification	Certified	*Phytophthora cinnamomi*	Hot water treatment of seed and soil fumigation
Avocado Registration	Registered (tree) Increase	Sun Blotch Viroid	Foundation tree index-testing for sun blotch viroid (UC)
Citrus Registration and Certification	Foundation, Scion, & Seed (tree) Increase Certified (nursery row)	Citrange stunt, concave gum exocortis, psorosis, tatterleaf, seedling yellow tristeza, tristeza vein enation and yellow vein viruses.	Index testing (UC) + individual tree identification index-testing (CDFA)
Deciduous Fruit and Nut Tree Registration and Certification	Foundation, Mother, Scion, & Seed (tree) Increase Seed (bed) Certified (nursery row)	Various virus diseases, including prunus ringspot virus (PRSV) and prune dwarf virus (PDV)	Index-testing (UC) + index-testing for PRSV and PDV (CDFA) (Participant)
Grapevine Registration and Certification	Foundation & Increase (vineyard) Certified (nursery row)	Fanleaf, fleck, asteriod mosaic, leafroll, yellow vein (Tomato ring-spot), corky bark virus	Nematode sampling (CDFA)
Seed Garlic Certification	Increase Certified	Stem and bulb nematode (*Ditylenchus dipsaci*) and white rot	Nematode sampling (CDFA)
Pome Fruit Tree Registration and Certification	Foundation & Mother (tree) Increase & Stool Certified (nursery row)	Various virus diseases	Index-testing (USDA & UC) fumigation
Strawberry Nursery Stock Certification	Foundation Increase Certified	Mottle, vein-banding, crinkle, mild yellow-edge, necrotic shock, pallidosis, tomato ring-spot, witches-broom, pseudo mild yellow-edge, latent "c," leafroll, and feather-leaf viruses.	Index-testing (UC & CDFA) Nematode sampling
Nematode Certification	Nursery plantings produced for on-farm planting	Various plant-parasitic nematodes	Nematode sampling, fumigation supervision, and commodity treatment (CAC & CDFA)

The primary tools developed for maintaining pest cleanliness of the stock in these programs are: 1) biological indexing (use of indicator plants which exhibit symptoms of virus or virus-like diseases) and enzyme-linked immunosorbent assay (ELISA) 2) laboratory techniques for the detection of nematodes 3) eradication treatments (thermotherapy, fumigation and hot water treatments) and 4) visual field inspections targeted to specific life cycles of the pests and plants.

The costs of services to carry out these programs are borne by the participants. Fees are charged for the inspections, testing and treatments. In addition, the Fruit Tree, Nut Tree and Grapevine Improvement Advisory Board (IAB) provides from full to partial funding for annual testing and inspections required by the Deciduous Fruit and Nut Tree R & C, Pome R & C and Grapevine R & C programs.

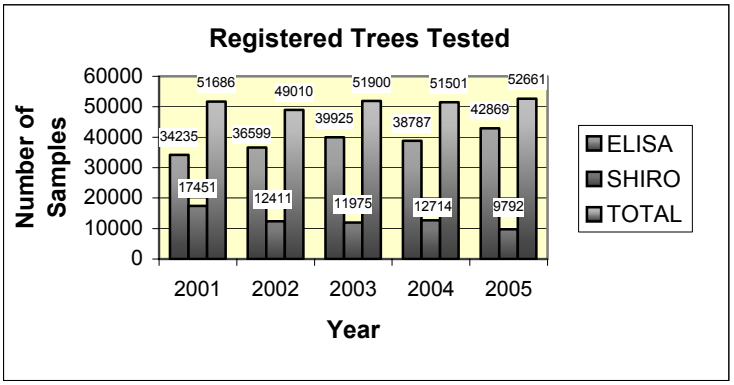
Avocado Registration and Certification Program

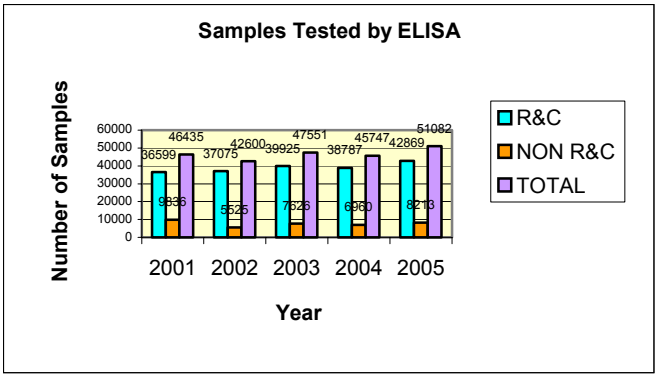
This program provides the registration of avocado rootstock and scion wood sources when inspected and tested for sun blotch virus. The Avocado Certification program provides the certification of avocado nursery stock when grown under specific guidelines and inspected for freedom from *Phytophthora cinnamomi*, avocado root rot. Currently, one nursery is participating in the registration program and three nurseries are participating in the certification program.

Deciduous Fruit Tree and Nut Tree Registration and Certification Program

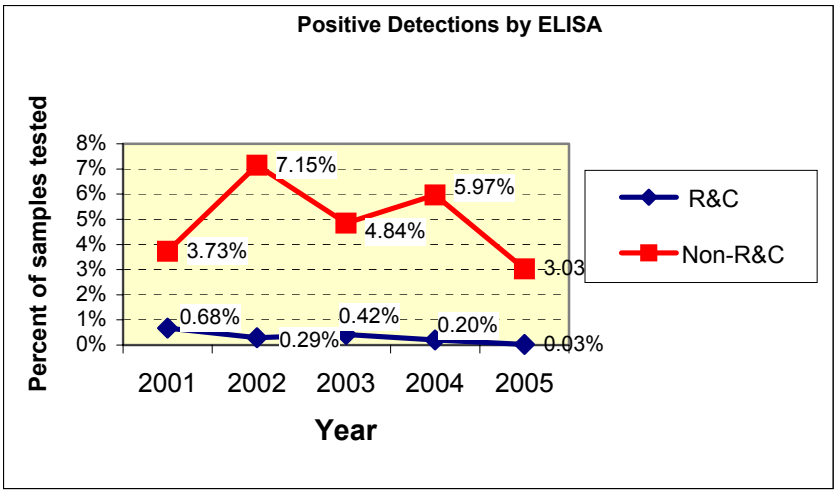
In the R & C program for deciduous fruit and nut trees, all trees in a Registered Mother Block, Registered Scion Block and Registered Seed Block are tested annually for viruses. Testing may be done by biological indexing using Shirofugen cherry as an indicator plant or by ELISA, an approved laboratory technique. Trees are tested for Prunus Necrotic Ring-Spot virus and Prune Dwarf Virus by biological indexing at least once every five years and by ELISA for these viruses and others in the other four years. Tested trees may be used as a source of certified propagative material in the year following testing.

In 2005, 17 nurseries participated in the program. The total number of registered trees tested was 52,661 (42,869 by ELISA and 9,792 by Shirofugen indexing), compared to an average of 51,119 per year for the 2001-2004 growing seasons.

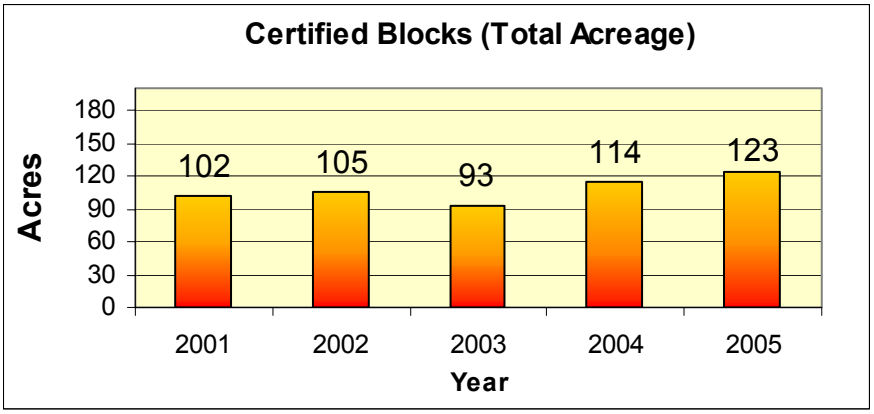




The total number of trees tested using the ELISA technique was 51,082 (42,869 Registered Trees and 8,213 service samples). The service samples are obtained from non-registered trees and tested as a service to the industry.



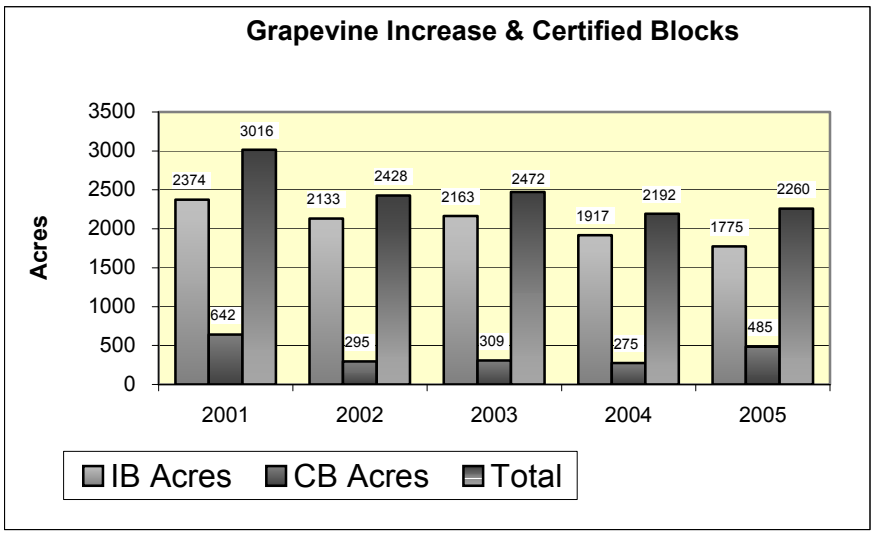
Of the 51,082 trees tested by ELISA, 380 (0.74 percent) were found positive for viruses. Only 131 (0.30 percent) of the registered samples tested positive for viruses, while 249 (3 percent) of the service samples tested positive for viruses. Of the samples taken from registered trees, 36 (0.36 percent) tested positive for viruses using the Shirofugen cherry biological indexing technique.



Certified nursery planting acreage totaled 123 acres in 2005, compared to an average of 103 acres over the previous four years.

Grapevine Registration and Certification Program

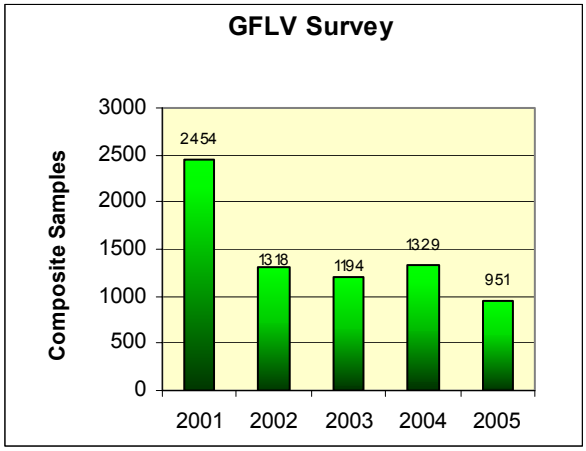
Thirty-four nurseries participated in the program in 2005. Grapevine Increase Block plantings totaled 1,775 acres, a decrease of 142 acres (8 percent) from the previous year. Grapevine certified blocks (nursery plantings) totaled 485 acres and four greenhouse blocks, a 210-acres increase over the previous year's 275-acres.

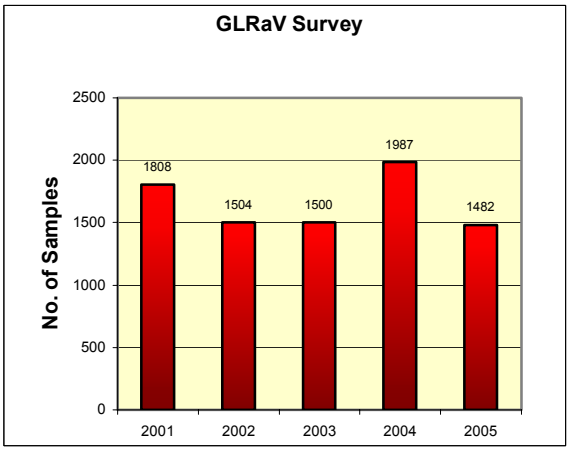


CDFA collected and tested 951 composite samples for grapevine fan leaf virus (GFLV), a 28 percent decrease from

the previous year. Plants were selected randomly for testing. However, if plants exhibiting typical GFLV symptoms were seen, those plants were also included in the survey. Of the total samples tested, none were positive for GFLV.

In 2005, 1,482 vines were sampled and tested for grapevine leafroll associated viruses (GLRaV). Only three samples tested positive (positive for leafroll virus-2: 0; positive for leafroll virus-3: 3) in compared with 47 that tested positive in 2004.





In 2004, the IAB began supporting trapping for vine mealybug (VMB). The shipment of grapevine nursery stock within California became a problem as some northern counties were contemplating ordinances. Traps were deployed in certified (both Increase and Certified Blocks) and in non-certified plantings. Ten counties assisted CDFA in trapping by doing non-certified plantings and in some cases, plantings in CDFA's Grapevine R & C Program. These counties will be reimbursed for their assistance. There were 1,372 acres and 11 greenhouses of non-certified plantings. This represented 145 traps deployed in late May and checked over the following six months. Male VMB's were found at four locations; no female VMB's were found by intense inspection and were associated with nearby vineyards. There were 2,383 acres and five greenhouses of plantings entered in the R & C programs for 322 traps deployed. Male VMB's were found at five locations due to association with nearby vineyards. However, one Increase Block was found positive for female VMB following an intense inspection.

Citrus Registration and Certification Program

The Citrus R & C program provides for the testing of propagative source trees for tristeza to meet the requirements of the Citrus Tristeza Quarantine. Other diseases of importance being tested as part of the registration and certification program include exocortis and psorosis. Thirty-four citrus nurseries participated in the program in 2005. Two thousand five hundred and forty-one citrus seed and scion source trees were sampled and tested for tristeza and other viroids, an increase of 85 trees from 2004.

Strawberry Nursery Stock Registration and Certification Program

Nine nurseries participated in the Strawberry Nursery Stock R & C Program in 2005. The strawberry program differs from other registration programs in that foundation stock is maintained by nurserymen in their isolated plantings rather than by the Foundation Plant Service of the University. Strawberry plants in foundation plantings are index-tested annually using *Fragaria vesca* and *Fragaria virginiana* strawberry indicator hosts for the following viruses: mottle, vein-banding, crinkle, mild yellow-edge, necrotic shock, pallidosis, tomato ringspot, witches broom, pseudo mild yellow-edge, latent C, leafroll and featherleaf. CDFA nursery staff index-tested 3,719 foundation plants at the Department's greenhouse facility in Sacramento; a six percent increase was seen over the previous year. Four plants that were indexed tested positive for viruses and were rejected from the program. CDFA staff visually inspected 620 acres of registered and certified strawberry nursery stock for the presence of virus diseases and other pests, an acreage decrease of 15 percent from the previous year, and collected and processed nematode samples.

Pome Fruit Registration and Certification Program

The Pome Fruit Tree R & C Program provides for the registration of rootstock and scion sources for the propagation of certified nursery stock when inspected and tested for virus diseases and other important pests. Three nurseries are currently participating in the program. In 2005, CDFA staff inspected and registered a total of 370 trees as propagative source trees. Four acres of nursery plantings were inspected and approved for sale as certified nursery stock.

Seed Garlic Registration and Certification Program

The Seed Garlic Certification Program provides for the registration of seed garlic for the propagation of certified nursery stock when found free from stem and bulb nematode, *Ditylenchus dipsaci*, and when inspected and found free of white rot fungus, *Sclerotium cepivorum*. Two nurseries participated in 2005. A total of 473 acres were inspected and registered, an increase of 55 acres (13 percent) from 2004.

FRUIT TREE, NUT TREE AND GRAPEVINE IMPROVEMENT ADVISORY BOARD

The Fruit Tree, Nut Tree and Grapevine Improvement Advisory Board (IAB) element of the Nursery Program administers an industry-requested assessment (Food and Agricultural Code, Section 6981) on the production of nursery plants such as deciduous pome and stone fruit trees, nut trees and grapevines. The mission of the IAB is to improve the quality and pest freedom fruit tree, nut tree and grapevine nursery stock offered for sale. The assessment is used to fund research on plant pests, breeding varieties that are resistant to plant pests, plant pest diagnostics, varietal identification and disease elimination; support of the University of California Foundation Plant Services, which serves as a source of clean planting stock and carries out activities related to the development of planting materials for pome and stone fruit trees, nut trees and grapevines;

and subvent the costs to carry out Department programs concerning the registration and certification of pome and stone fruit trees, nut trees and grapevines. The assessment is collected with the nursery license renewal. In 2005, the total assessment collected on gross sales of fruit trees, nut trees and grapevines was $984,268, a slight increase over the collection of $913,675 in 2004.

In 2005, the IAB approved funding for 11 research proposals totaling $300,000, funding of Foundation Plant Services in the amount of $453,397 and payment to the Nursery Program to subvent R & C activities in the amount of $322,676. Total budget approved was $1,287,794. As revenues still remain low relative to the past five years, the Board recommended a lower level of funding for research, the Foundation Plant Service (University of California, Davis) and the CDFA R & C program.

SEED SERVICES PROGRAM

The value of seed sold for planting in California exceeded $379 million in 2005, an all time high. The total number of firms registered to sell seed in California remains relatively unchanged at 397.

Seed Services administers the statewide seed law enforcement program that is funded entirely through an annual assessment on the value of seed sold in California by seed labelers and others. The county agricultural commissioners conduct the program, while the staff of CDFA evaluate the seed enforcement workload and provide information, assistance and training to the counties. Additionally, CDFA staff work with the seed industry to determine the effectiveness of the program and interact with other states, the USDA and with the California Crop Improvement Association, the state seed certification entity. An advisory board of nine seed industry members and two public members provides oversight to the Department.

Program expenditures for 2005 totaled $1,121,392. Significant program expenditures were the funding of the Department's Seed Laboratory ($347,003), the Seed Biotechnology Center ($150,000) at the University of California, Davis and the agricultural commissioners ($120,000). In order to cover these expenses, the Seed Advisory Board recommended that the assessment rate remain at $0.32 per $100 gross annual sales in California for the reporting period. The increased value of seed with new technologies has allowed the Board to maintain the assessment rate at the present level. The current assessment combined with program reserves will provide adequate funds to cover program expenditures in 2005/06.

The subvention to county agricultural commissioners for the enforcement of the California Seed Law remains at the maximum of $120,000 annually, as provided by law. The voluntary program has established annual performance measures as the basis of funding county seed law enforcement workload. By contract, the commissioners are required to maintain an 85 percent compliance level of all seed offered for sale or labeled in their respective counties. In 2004/05, county personnel collected 979 official samples from seed lots being offered for sale. In addition, a total of 32 "stop-sale" orders were written on approximately 731,750 pounds of seed in violation.

The Seed Services Program recognizes the vital role of county, state and industry personnel in providing the highest quality seed to the California agricultural industry and the public. The Program has traditionally offered annual training to county and industry personnel. The training includes reviewing the label requirements for agricultural and vegetable seed as well as the proper techniques for drawing official samples from various kinds of seeds and different sized lots. Training activities have currently been reduced while CDFA mobilizes district personnel to assist in nursery inspection efforts for sudden oak death. Workshops are available and will be provided upon request.

In addition to enforcement activities, the California Seed Law provides an alternative dispute resolution procedure that assists farmers and labelers to settle disputes through conciliation or mediation when seed fails to perform as represented. In 2005, one new complaint was filed with the Department. The investigation of that complaint will end with an Investigative Hearing scheduled in mid-February of 2006. Four complaints initiated in prior years, one that involved five growers was settled through mediation and one that involved 16 growers was released after mediation failed. Mediation services have been provided through the Department's Market Enforcement Branch, which is reimbursed for time and travel to conduct the mediation hearings. Except for an initial filing fee, the cost of these procedures is borne by the Seed Services Program. These seed dispute procedures, which are a mandatory prerequisite to pursuing the matter in court, provide an economical alternative to litigation when the dispute can be resolved.

QUALITY COTTON PROGRAM

The Quality Cotton Program has the primary responsibility of enforcing the San Joaquin Valley Cotton District laws and regulations. The Cotton District consists of all counties in the San Joaquin Valley. The 40-member San Joaquin Valley Cotton Board, composed of cotton growers, cotton industry representatives and public members, administers it. Cotton growers and industry members are elected to the Board by their peers. One of the Board's major duties is to establish quality standards for San Joaquin Valley Acala and Pima varieties. To accomplish this, the Board has an extensive multi-location cotton variety-testing program. The Board meets at least five times a year to review the progress of its variety-testing program and determines which new varieties meet or exceed existing quality standards and are superior in some meaningful respect, such as improved yield or resistance to disease. The exceptional quality and yield of the cottons in the District are a reflection of the Board's sound decisions. Throughout the year, Board committees examine major cotton issues in order to make well-researched recommendations to the full Board.

In 2005, Acala and Pima cotton grown within the San Joaquin Valley Quality Cotton District again had exceptional quality, including the highest fiber strength of any cotton grown in the nation. However, the cotton crop got off to a slower than normal start in 2005 due to cool temperatures and sporadic rains during the planting season. This combined with periods of extreme heat during mid-summer, caused yields to drop significantly lower than average.

The USDA estimated that Upland cotton yields (including Acala) in the San Joaquin Valley averaged 1,178 pounds of lint per acre, down more than 24 percent from last year's record-setting 1,525 pounds. Pima yields were also down with an average of 1,211 pounds of lint per acre, which is 16 percent less than last year's record-setting 1,438 pounds. CDFA's Pink Bollworm Program reported in 2005 there were 231,000 acres of Pima and 406,115 acres of Upland (including Acala) for a total of 637,115 acres of cotton planted in the District.

2005 is the sixth full season which cotton growers were allowed to plant any commercially available variety of cotton in the San Joaquin Valley. This was the result of the 1998 legislation allowing the planting of varieties not previously allowed under the Quality Cotton Law. Section 52981 was added to the Food and Agricultural Code to allow varieties not tested and approved by the San Joaquin Valley Cotton Board to be planted as "non-approved" varieties beginning in 1999. The new law also charged the Department with adopting regulations to ensure that the growing of non-approved varieties does not adversely affect the quality of Acala and Pima cotton varieties approved by the Board. Regulations to implement this law were developed by the Department in conjunction with the Board and cotton industry representatives

in the San Joaquin Valley. Program personnel are responsible for enforcing these regulations. Also, added to the law was the authority allowing the Secretary to increase the District assessment to meet additional regulatory costs of enforcing the law.

In 2005, approximately 105,000 acres of non-approved varieties were harvested in the District. Although this is less than last year's 139,354 acres, there were over twice as many growers that planted non-approved cotton in 2005. This increase can be attributed to seed companies commercially releasing varieties that are still in the Board's testing program, and cotton growers wanting to plant these new varieties and see how they perform. All non-approved cotton lint was identified at harvest and ginning with tags supplied by the Department; these tags designated them as "California Pima", "California Upland", or "SJV Experimental" cotton.

There is still considerable interest on the part of researchers to develop new cotton varieties in the District. In 2005, nine cotton breeders were approved to conduct research on non-approved cotton in the District. The most promising cotton varieties from private and public breeding programs are submitted to the Board for inclusion in its testing program. Genetically enhanced varieties were widely grown in researchers' test plots and for-seed increases. Program staff monitored the planting, harvesting, ginning, de-linting and marketing of all experimental cotton.

In 2005, one Acala variety and one Pima variety were approved by the Board to be marketed as SJV Acala and SJV Pima varieties. This increased the total number of approved varieties in the District to 61.

In 2005, the assessment rates for the San Joaquin Valley Cotton District were set by the Secretary, upon recommendation from the Board, at $5.00 per hundredweight of undelinted approved seed and at $9.00 per hundredweight of undelinted, non-approved seed sold or planted within the District. The assessments are the primary source of income for the Board's testing program and the enforcement of the San Joaquin Valley Quality Cotton District Laws and Regulations.

Pest Detection and Emergency Projects

PEST DETECTION AND EMERGENCY PROJECTS BRANCH

Mission: *To protect California from the damage caused by the introduction or spread of harmful plant pests.*

Vision: To initiate and operate programs designed to detect and eradication exotic pest infestations before the pest becomes established in California.

Values:

- Leadership in detection and response actions both nationally and internationally.
- Timeliness of decisions and actions.
- Reliance on scientific soundness in decision making.
- Integrity and transparency of policy-making process.
- Development and implementation of new technology.
- Teamwork, cooperation and communication with other governmental agencies, industry and the public.
- Enhancement of quality of life by preventing and eliminating new pest problems.
- Environmental stewardship in protecting California's natural resources from the ravages of invasive species.

The Pest Detection and Emergency Projects (PDEP) Branch performs services which are critical to the mission of California's Plant Health and Pest Prevention Service. This mission is to protect California from the damage caused by the introduction or spread of harmful plant pests. The PDEP Branch contributes to the fulfillment of this mission by initiating and operating programs designed to detect and eradicate exotic pest infestations before the pest becomes established in California. PDEP accomplishes its tasks by conducting ongoing detection programs for pests, likely to enter California each year, by conducting special targeted programs for newly emerging pests and by developing and implementing action plans and the infrastructure to carry them out, should eradication efforts be needed. The Branch works cooperatively with Federal and County officials in its efforts to achieve its goals.

The guiding principle behind the detection program is to discover potential pests as soon as possible after their introduction into the State. This allows the Branch to maximize the potential for eradication by limiting the area that needs to be treated, and allowing concentration of the Branch's resources. This approach also minimizes the impact on the public and the environment by avoiding large area treatment programs. In order to achieve this, the detection system is designed to find insect pests before they infest one square mile and plant diseases before they infest one-half of a square mile.

A variety of trapping and survey programs are used to reach the goal of detecting invasive pests early enough to allow for eradication. PDEP maintains a trapping network that employs over 130,000 traps statewide for various target pests, especially exotic fruit flies, gypsy moth and Japanese beetle. This statewide trapping program is detailed in the Insect Trapping Guide maintained by the Branch. The program is administered either via contracts with the county departments of agriculture or direct participation by the Branch in those counties that choose not to enter into a contract. PDEP biologists conduct a quality control program overseeing all of the Branch's trapping programs. Both County and State run programs are evaluated by this program to ensure that they are performing at the desired level. Trap placement, host choice, timeliness of servicings, record keeping and ability to identify target insects are all monitored.

The Branch conducts a number of different survey programs. Intensive aircraft inspections are performed to find and eliminate hitchhiking Japanese beetles before they can leave the aircraft and enter the surrounding environment. PDEP staff participates in ongoing red imported fire ant survey in parts of central and southern California. Other targeted insect surveys are conducted to detect a variety of potentially harmful insects, such as Asian longhorned beetle, cereal leaf beetle, etc. The Branch also performs annual surveys for plant diseases such as citrus canker, Karnal bunt and plum pox. PDEP staff also participates in inspecting plant shipments into California for diseases as part of the post-entry quarantine program.

Action plans for eradicating pest infestations outline the necessary steps for eliminating the most serious pests that may require regulatory action. The Branch typically conducts several exotic fruit fly eradication programs each year. In addition, PDEP has a proactive program which uses the continual release of sterilized Mediterranean fruit flies (Medfly) in the Los Angeles basin to prevent infestations of this pest from forming in the first place. This Medfly Exclusion Program (MEP) is the largest of its kind in the United States. The Branch oversees an ongoing eradication and quarantine program for red imported fire ant in several parts of California.

EXOTIC FRUIT FLY PROGRAMS

The California Fruit Fly Program is a multifaceted program designed to maintain California's fruit fly-free status through pest exclusion, detection, eradication, identification and public information efforts. The three primary Branch components include the fruit fly detection programs, treatment programs and a preventive sterile insect technique (SIT) program. The main target pests include various species belonging to five economically important genera: *Anastrepha* (Mexican fruit fly, West Indian fruit fly, etc.), *Bactrocera* (Oriental fruit fly complex, melon fly, guava fruit fly, etc.), *Ceratitis* (primarily Mediterranean fruit fly), *Dacus* (pumpkin fly, etc.) and *Rhagoletis* (Western cherry fruit fly, etc.).

Detection

The California exotic fruit fly detection program is a cooperative effort conducted by the CDFA, USDA and the California County Agricultural Commissions. The detection program is designed to detect new introductions of target flies as they occur, before they have the opportunity to become established breeding populations. The detection program also supports California's extensive trade markets, both international and domestic, by providing verifiable assurance that California's production areas are free from these economically damaging pests.

The program uses a variety of trap types in combination with several different attractants to target the different species of concern. Statewide, over 91,000 traps were deployed for detection monitoring during the peak warm weather months of April through October (Table 1). The Jackson trap is the most widely used (Figure 1). The various traps are distributed statewide in a manner that provides the most detection in areas at high-risk for introductions and those with a favorable environment for fruit fly reproduction (Figures 2 and 3). In addition, for delimitation trapping in response to Medfly finds, CDFA also deploys multi-lure traps baited with the three-component bio-lure.

Table 1. Numbers of Fruit Fly Traps by Trap Type and Lure

TRAP	Jackson	McPhail	Champ	Jackson	Jackson
LURE	Trimedlure	Yeast	Ammonium Bicarbonate	Methyl Eugenol	Cuelure
Number	23,495	19,323	20,581	21,746	6,467

Figure 1. Jackson Trap in Citrus

California is constantly at risk to the introduction and establishment of exotic pest fruit flies because of its unique factors: a favorable Mediterranean climate; extensive availability of host-plants due to agricultural and residential plantings; international trade patterns; and culturally diverse population demographics. The magnitude of the risks is well illustrated by the detection results of 2005. Sixty-three exotic pest fruit fly adults representing five species were captured in six California counties in 2005 (Table 2). These finds triggered 30 delimitation-trapping programs.

Table 2. Exotic Fruit Flies Detected in California During 2005

PEST (Fruit Fly)	**COUNTY**	**NUMBER FOUND**	**TOTAL BY SPECIES**
Anastrepha ludens Mexican Fruit Fly	Orange Los Angeles	1 2	3
Anastrepha obliqua West Indian Fruit Fly	Orange	1	1
Bactrocera correcta Guava Fruit Fly	Los Angeles Orange San Diego	9 2 1	12
Bactrocera dorsalis complex Oriental Fruit Fly complex	Alameda Los Angeles Orange San Bernardino San Diego	1 6 5 1 1	14
Ceratitis capitata Mediterranean Fruit Fly	Los Angeles San Bernardino Santa Clara	3 28 2	33
Total			**63**

Figure 2. Statewide Distribution of Medfly and General Purpose Fruit FlyTraps

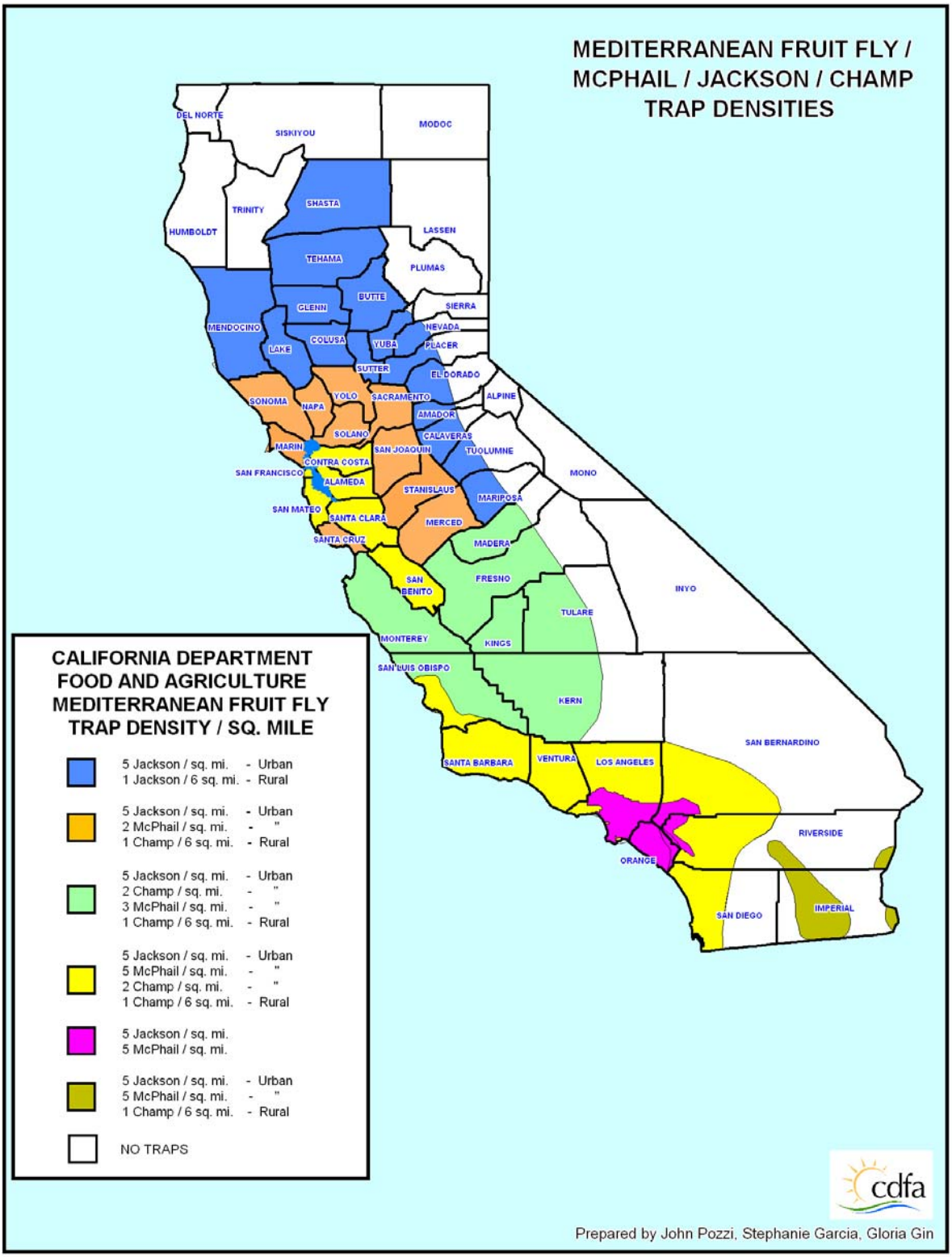
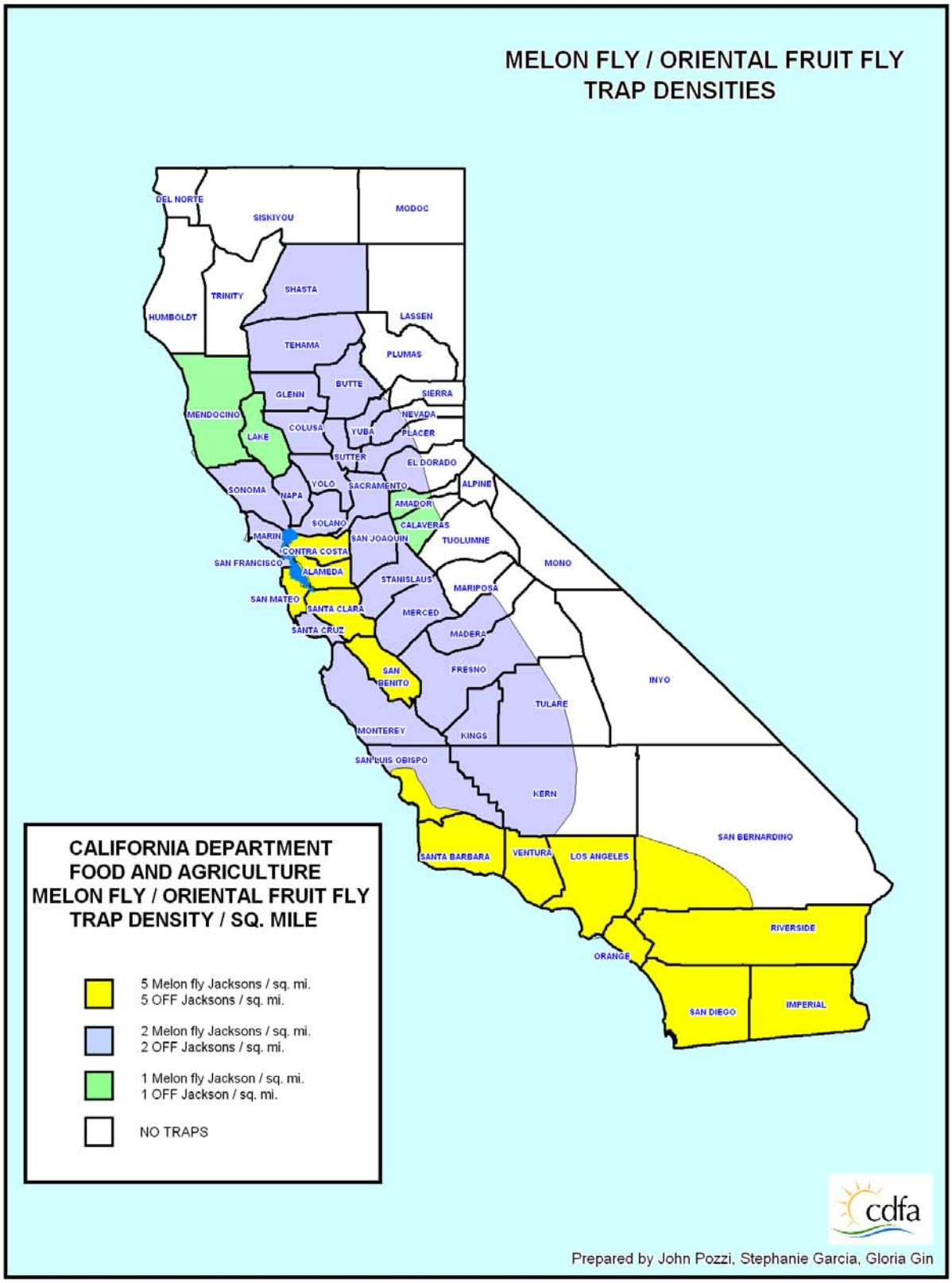


Figure 3. Statewide Distribution of Cuelure and Methyl Eugenol Fruit Fly Traps



Treatment

CDFA maintains action plans detailing the appropriate emergency responses for the major groups of exotic pest fruit flies. Accordingly, the CDFA's PDEP and Pest Exclusion (PE) Branches, USDA Emergency Projects and the MEP all have emergency response roles. PDEP staff initiates and conducts delimiting trapping and larval survey activities, the exclusion programs and USDA Emergency Projects initiate and enforce interior quarantines when needed, the MEP initiates and conducts SIT activities if appropriate to the particular fly species. CDFA staff from both the detection program and the MEP are trained to oversee and perform any required pesticide applications. The rapid response of this combined effort is instrumental to eradicate these flies. This action minimizes regulatory action to California agriculture and prevents economic loss to businesses and the public from quarantines. As an example of the effectiveness of these responses, seven of the 30 delimitations, in 2005, resulted in eradication programs, but only three of these (the Medfly programs) became severe enough to require the initiation of interior quarantines.

ERADICATION PROGRAMS

Guava Fruit Fly

Guava fruit fly, *Bactrocera correcta*, is a serious fruit pest of citrus, peach and several kinds of tropical and subtropical fruit hosts. It occurs in India, Pakistan, Nepal, Sri Lanka, Thailand, Myanmar and southern China.

In 2005, four eradication programs for guava fruit fly occurred in southern California (Table 3). The primary treatment method for guava fruit fly is male annihilation treatment (MAT), which combines a lure (methyl eugenol) with an insecticide to attract and eradicate sexually mature males. This mixture is applied via specially modified trucks to inanimate objects such as telephone poles, light poles, etc., along the roadside (Figure 4).

Eradication has been declared for all the infestations except for Garden Grove, Orange County.

Figure 4. Male Annihilation Treatment

Table 3. 2005 Guava Fruit Fly Eradication Information

County	City	Number Trapped	Last Find Date	Treatment Sq. Miles	Quarantine Sq. Miles*	Eradicated
Los Angeles	Whittier	2	05/19/05	9.2	NA	Yes
Los Angeles	Los Angeles	3	07/12/05	11	NA	Yes
Los Angeles	Long Beach/Signal Hill	2	08/11/05	14	NA	Yes
Orange	Garden Grove	1	11/17/05	15	NA	In Progress
San Diego	La Mesa	1	08/11/05	NA	NA	NA

* The triggers for establishing a quarantine were not met and therefore not needed.

STERILE INSECT RELEASE

CDFA employs a strategy termed the sterile insect technique (SIT) to prevent and eradicate populations of exotic fruit flies. The preventive release of sterile Medflies, over a 2,489 square mile area of the greater Los Angeles Basin, is a program crucial to the efforts to prevent the establishment of this pest in California. With a primary mission to prevent the Medfly from infesting the Los Angeles Basin, the Medfly Exclusion Program (MEP), is the largest fruit fly program using SIT in the United States. The MEP is a cooperatively funded and administered venture between USDA and CDFA.

The MEP began in July 1996, following a successful two year area-wide release of sterile Medflies to eradicate existing populations of Medflies in the Los Angeles basin. The MEP uses continuous releases of sterile Medflies to prevent Medfly colonization throughout the Los Angeles basin, including major portions of Los Angeles, Orange, Riverside and San Bernardino Counties.

CDFA maintains a contract with the Mexican government that guarantees California shipments of up to 50 million sterile Mexican fruit fly pupae per week for use in SIT programs. These pupae are reared at the Planta Moscafrut located in Tapachula, Mexico.

Hawaii Fruit Fly Rearing Facility

The Hawaii Fruit Fly Rearing Facility (HFFRF) provides the MEP with high-quality sterile Medflies for use in the SIT program. The facility, located on the windward side of the island of Oahu approximately 30 miles from Honolulu International Airport, operates seven days a week, 365 days a year.

The fly currently produced at the HFFRF is a male-only, *temperature sensitive lethal* strain known as “Vienna 7”. Pupae produced at the facility are gamma-irradiated at the nearby USDA facility with Cobalt 60 at a dose of 14.5 KRads. Irradiated pupae are double-inspected prior to shipment in a refrigerated van to the airport, where they are loaded onto a commercial jet in the

evening and delivered to Los Angeles International Airport, ready for pickup by MEP staff early the following morning.

The facility was designed to produce 100 million pupae per week. In 2005, the facility shipped 3,417 boxes of pupae to the MEP for an average of approximately 136 million pupae per week.

During the year, the HFFRF has consistently maintained the highest quality control ratings relative to other fruit fly producing facilities in the world. The three major tests to determine the fly's quality are: emergence (the percent of fully-formed, normal adults emerging from pupae), flight ability (the percent of emerged adult flies capable of flying out of a standardized container), and longevity (the percent of flies that survive a 48-hour period without food and water). Results compared to the Guatemala facility (which also supplies the MEP with pupae) for 2005 are as follows:

Test	CDFA	Guatemala
Emergence	88.6%	85.6%
Flight Ability	83.7%	79.5%
Longevity	73.3%	60.7%

The above tests were performed and measured at the MEP in Los Alamitos and reflect post-irradiated and post-handling quality.

David R. Rumsey Emergence and Release Facility

Each week, on average over the course of 2005, 363 million sterile Medfly pupae were delivered to the David R. Rumsey Emergence and Release Facility located on the Joint Forces Training Base in Los Alamitos. This resulted in 2,657 flight missions and 768,575 linear miles flown during 2005. The sterilized pupae are air freighted seven days a week, year-round from production facilities operated by CDFA and USDA in Hawaii and Guatemala, respectively. Four days after the sterile Medflies were received as pupae, they are released as adult flies from a fixed-wing aircraft over the Los Angeles Basin.

The basic release rate is 62,500 sterile male flies per square mile per week, with a rate of 110,000 sterile male flies per square mile per week, used in a historically high-risk area encompassing a 250 square mile region of central Los Angeles. The typical week features 56 missions flying over 15,000 linear miles to release 200 million sterile Medflies.

To date, the MEP has been highly successful, resulting in a 97 percent reduction in the number of Medfly infestations in the Los Angeles basin since the beginning of the preventive releases. After completing eight years of the program, a total of 118 billion sterile Medflies have been released during 21,000 flight missions traveling over 5 million linear miles.

In addition to the normal preventive releases, the program is tasked with conducting sterile release eradication programs for Medfly and for another pest species, the Mexican fruit fly, whenever infestations are found. This year the MEP participated in conducting a Medfly preventive release over 251 square miles of San Diego from September 22, 2004 until May 27, 2005 in response to a Medfly infestation in neighboring Tijuana, Mexico (see below for more details). The MEP participated in an international eradication SIT over the infested area of Tijuana from November 22, 2004 until January 27, 2005 at which time USDA International Services began releases from its Tijuana office. This year MEP has been conducting

eradication SIT over the infested areas of Rancho Cucamonga and San Jose (see below for more details). In addition, in September, MEP began participating in the technological innovation of incubation using the Worley Eclosion Tower to eventually replace the current incubation method using PARCs. As this operation demonstrates, the strategic location of the MEP's operation at the Joint Forces Training Base allows the program to respond swiftly and economically with sterile fruit flies to any infestation in California, southern Arizona and northwestern Mexico.

San Diego, Medfly Preventive Release

A total of 449 million sterile Medflies were released during 121 flight missions traveling over 30,000 linear miles during this year. Programs began on September 22, 2004 and terminated on May 27, 2005. A grand total of 1.1 billion flies were release during 208 flight missions traveling over 51,000 linear miles.

Tijuana, Mexico, Medfly Infestation

A Medfly infestation was found in Tijuana, Mexico, on September 16, 2004. In response, a preventive release of Medflies was initiated on September 22, 2004 covering 251 square miles of San Diego at a release rate of 100,000 flies per square mile. The release continued until eradication was declared in Tijuana. Additional traps were also placed along the border with Mexico. No fertile Medflies have been found in San Diego.

Since September 16, 2004, a total of 124 Medflies have been trapped at 34 sites in Tijuana, and the infestation is about 6.5 miles from the San Diego County border. There have been no additional adult detections since October 26, 2004. Medfly larvae were found at 31 sites. A release of sterile Medflies over the Tijuana infestation began on November 22, 2004. There were eight aerial applications of Spinosad/bait over an 11 square mile area, with the final treatment completed on November 24, 2004. The release area covered 110 square miles. Initially, MEP performed the release of sterile flies, but was discontinued on January 27, 2005 when USDA International Services based in Tijuana assumed those duties.

Rancho Cucamonga, Medfly Infestation

A Medfly infestation was found in Rancho Cucamonga on September 23, 2005. Since that first detection and last, on December 13, 2005, 31 Medflies were recovered. In response, eradication SIT over the infested area began on September 29, 2005 and by the end of the year, encompassed over 258 square miles. Release rate began at 250,000 flies per square mile and by December 20, 2005, based on the Medfly Science Advisory Panel recommendations; 79 out of 258 square mile eradication area was increased to a release rate of 500,000 flies per square mile. The area of infestation encompassed the communities surrounding Rancho Cucamonga, Pomona and Glendora. During 16 flight missions, 74 million sterile Medflies were released over 1,819 linear miles throughout the year.

San Jose, Medfly Infestation

A Medfly infestation was declared after the detection of two Medflies in San Jose, on October 5 and 9, 2005. In response, eradication SIT over the infested area began on October 13 in a 10 square mile area at a release rate of 250,000 flies per square mile. A total of 36 million sterile Medflies were released during 23 flight missions traveling over 798 linear miles during this year.

GYPSY MOTH PROGRAMS

The gypsy moth (GM), *Lymantria dispar* (Lepidoptera: Lymantriidae), is a serious forest and urban pest in Europe and eastern North America. GM is currently the most destructive insect attacking hardwood forest and shade trees in the United States. The Asian gypsy moth (AGM) and its "Siberian" mitotype, Siberian Gypsy Moth (SGM), are strains of this species occurring in eastern Europe and Asia. The AGM differs from the GM in its preference for coniferous trees, tolerance for cold and the female moth's ability to fly. Neither AGM nor SGM is known to be established in North America. CDFA exclusion efforts, pest detection and treatment programs have so far prevented the establishment of these pests in California.

Detection

During the 2005 season, 26,409 traps were deployed and monitored as part of California's program to detect and delimit new GM and/or AGM/SGM infestations. Trap density in the coastal California counties is three traps per square mile, while two traps per square mile are placed in the remaining counties (Figure 5). Traps are deployed in urban areas and in rural residential areas with 300 or more homes per square mile. California ports receiving shipments from Russia, the Far East, Japan and other ports at risk for AGM and SGM are trapped at 10 traps per square mile.

This season, seven moths were trapped (Table 4) at seven sites in five counties. All were single-moth catches. The specimens were analyzed for possible AGM or SGM identification using the Mitochondrial DNA test as well as the FS1 Nuclear DNA test. One moth was AGM (San Pedro) and another SGM (Santa Ana).

Table 4. 2005 Gypsy Moth Finds

COUNTY City	Adults Trapped		Total Adults	Properties w/Viable Egg Masses/Pupal Cases*
	Detection	Quarantine		
ALAMEDA Hayward Livermore	 1 1	0	2	N/A
LOS ANGELES Altadena San Pedro	 1 1 (AGM)	0	1	N/A Occurred in Fall 2005
ORANGE Santa Ana	1 (SGM)	0	1	Occurred in Fall 2005
SAN BENITO Paicines	1	0	1	N/A
SOLANO Vallejo	1	0	1	N/A
TOTALS	**7**	**0**	**7**	

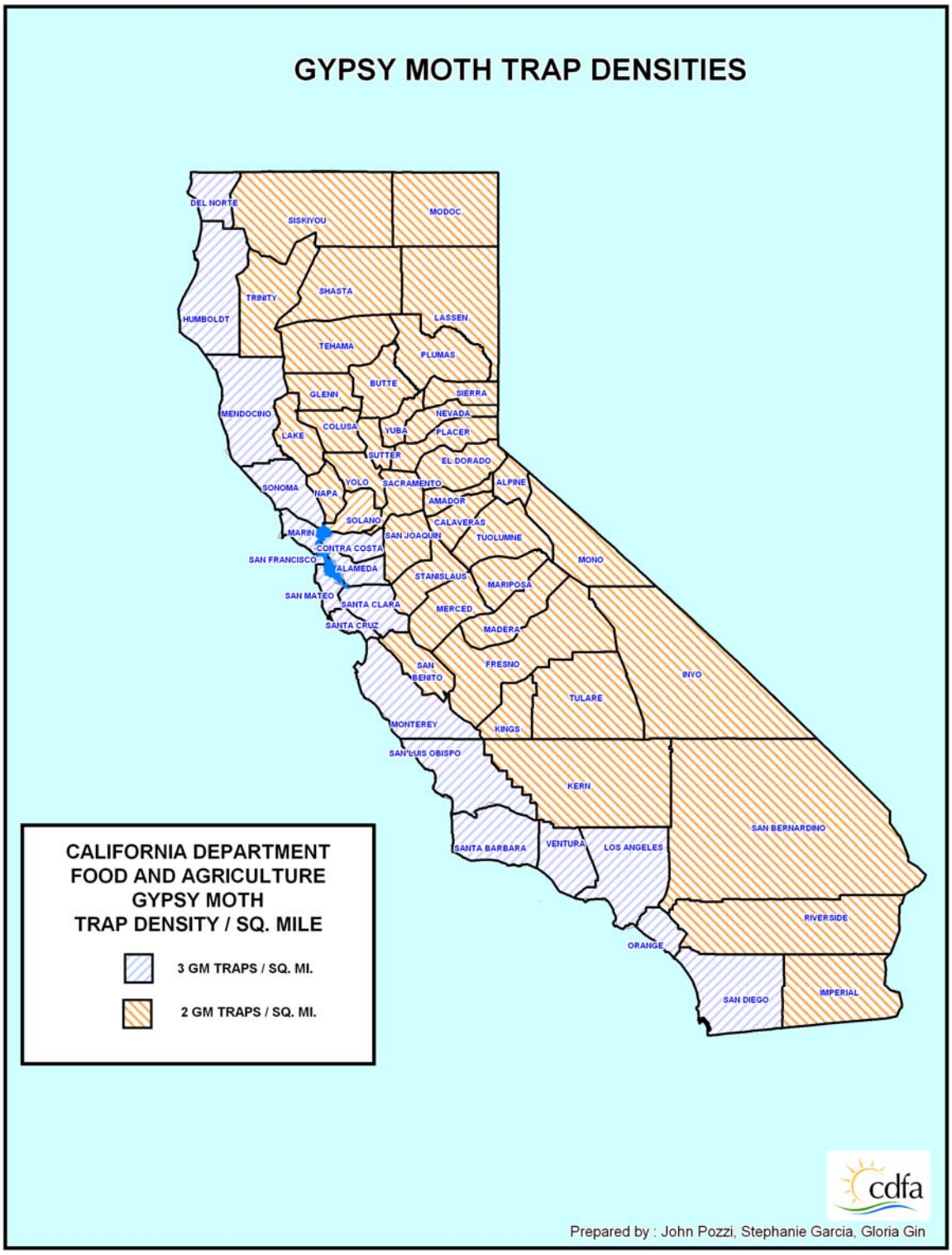


Figure 5. General Detection Gypsy Moth Trap Densities in California

ERADICATION TREATMENT

No eradication programs for gypsy moth (any type) occurred in 2005.

ASIAN GYPSY MOTH

High-Risk Port Trapping

In response to potential for introduction of AGM in California via deep water shipping ports, CDFA conducted high-risk trapping in seven locations statewide. Ten delta traps, baited with disparlure, were placed per square mile over a one mile buffer around identified locations in Oakland, Port Hueneme, Sacramento, San Diego, San Francisco, Stockton and Wilmington, resulting in 1,766 traps (including those for 2003 AGM delimitation in Wilmington).

Asian Gypsy Moth – San Pedro and Wilmington

One AGM was trapped in San Pedro on July 27, 2005. The moth was found in a Los Angeles County detection trap within the western side of the five mile radius of the 2003 Wilmington AGM find. An additional 277 traps were placed, matching the 25 traps per square mile density of the Wilmington AGM find. Additionally, within the core square mile of the San Pedro find, 240 gypsy moth traps were placed on host trees (Figure 6).

Larval and egg mass surveys are planned for 2006 in January and March.

Siberian Gypsy Moth – Santa Ana

One SGB was trapped in a general detection trap in Santa Ana on July 18, 2005. The trap density in that area was increased to 25 traps per square mile in a five mile radius around the find site. Egg mass survey was completed the week of December 5.

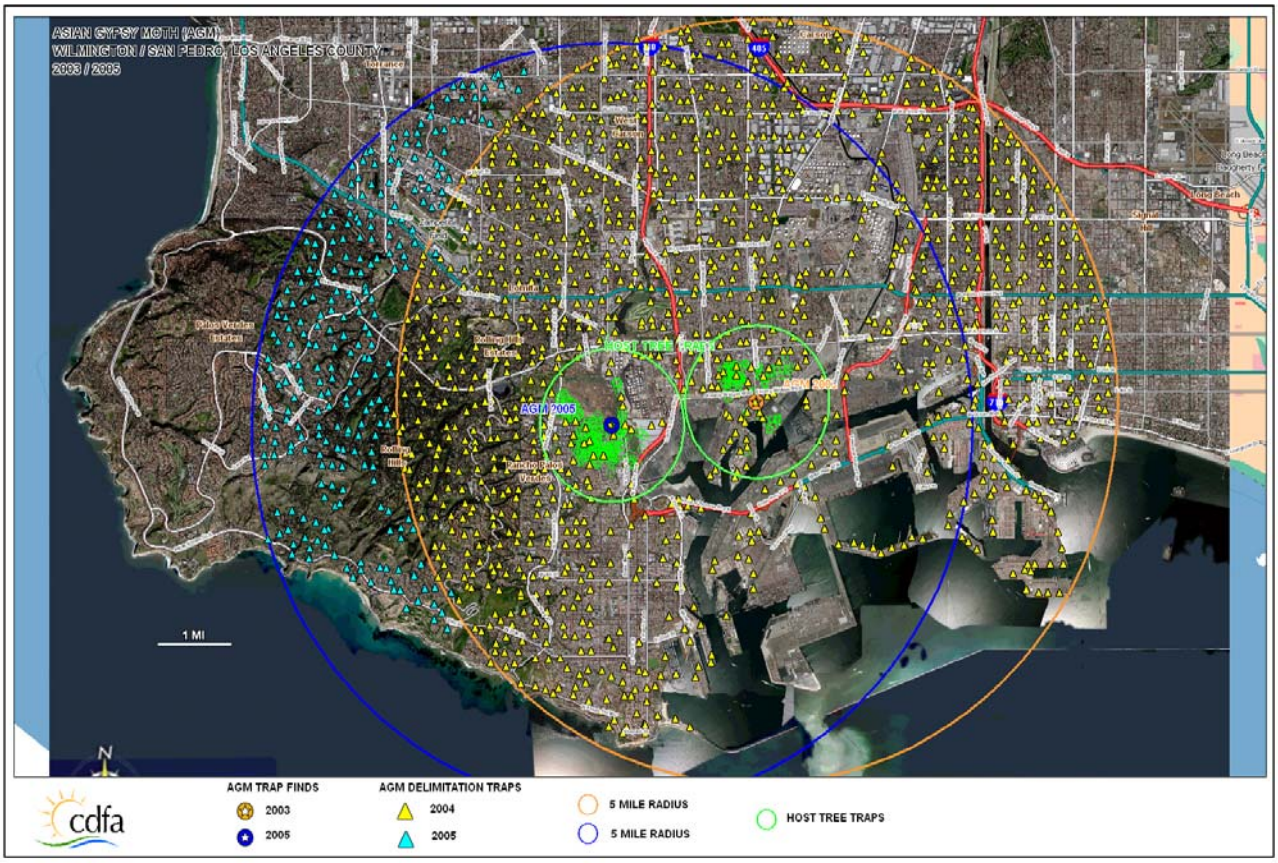


Figure 6. AGM Wilmington/San Pedro

- The 240 and 200 host tree traps within the core square miles of the San Pedro (west) and Wilmington (east) AGM finds are represented as green areas within the smaller green circles.

- Yellow triangles: The 1,392 traps placed in response to the two year delimitation of the 2003 Wilmington AGM find (five mile radius at 25 traps per square mile – large orange circle).

- Blue triangles: The 277additional traps placed west of the existing Wilmington trapping area to reach a density of 25 traps within the five miles around the San Pedro find (large blue circle).

JAPANESE BEETLE PROGRAMS

The Japanese beetle (JB), *Popillia japonica* (Coleoptera: Scarabaeidae), is a serious pest of turf, crops and ornamental plants in the eastern United States. It enters the state each year mostly as adult hitchhikers in airplanes originating from infested areas in the east. CDFA exclusion efforts and PDEP detection and treatment programs have so far prevented the establishment of this pest in California.

Detection

The JB detection program has two major components: statewide trapping and aircraft detection. During 2005, 13,169 JB traps were deployed throughout the urban and high-risk areas. The trap density for JB detection is two traps per square mile (Figure 7). A high-density trapping array is deployed in a one mile buffer area around each airport and transfer/sorting facility used by express mail carriers. A total of 18 JBs were trapped in proximity to airports used by express mail carriers or their transfer/sorting facilities located in urban areas (Table 5). Two other JBs were trapped in urban/residential areas.

Figure 7. General Detection Japanese Beetle Trap Densities

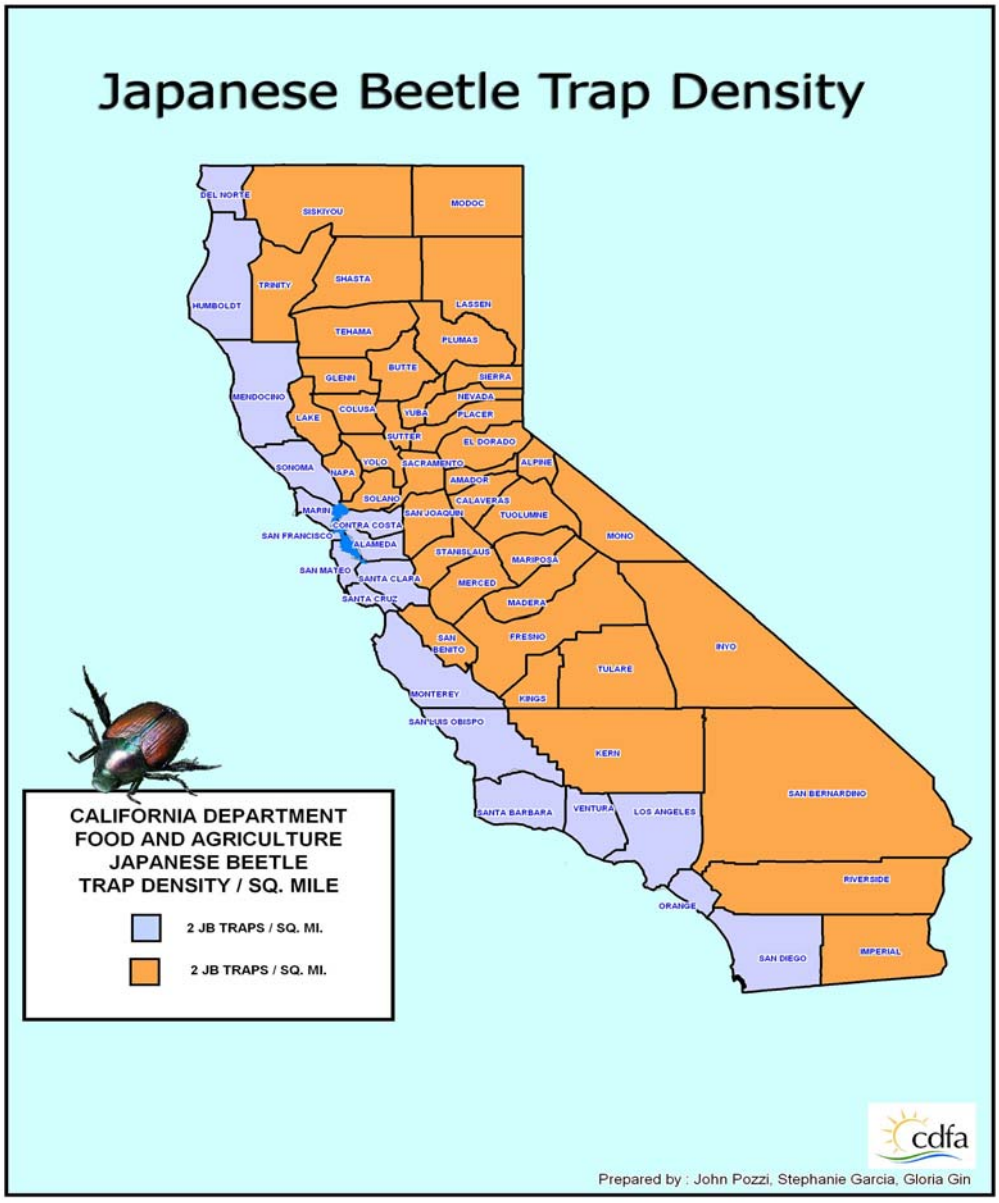


Table 5. Japanese Beetles Trapped in California in 2005

County	City	Beetles Trapped	Comments
Alameda	Oakland	1	Trapped at Oakland Int'l Airport
	Fremont	1	County detection trap
	Oakland	2	Trapped near Oakland Int'l Airport
Los Angeles	Los Angeles	1	Trapped at LA Int'l Airport
	Los Angeles	1	Trapped near LA Int'l Airport
	Long Beach	3	Trapped near Long Beach Airport
	Sun Valley	1	Trapped near Burbank Airport
Sacramento	Sacramento	1	Trapped at Sacramento Int'l Airport
San Bernardino	Ontario	2	Trapped at Ontario Int'l Airport
	Ontario	2	Trapped near Ontario Int'l Airport
San Diego	San Diego	1	Trapped near San Diego Int'l Airport
	San Diego	1	Trapped near San Diego Int'l Airport
Santa Clara	San Jose	1	County detection trap
	San Jose	2	Trapped near San Jose Int'l Airport

Airport/Aircraft Inspections

On-board inspections of aircraft from high-risk areas of the eastern United States resulted in the collection of 809 total specimens (101 live or moribund) (Table 6).

Table 6. Number of Aircraft Inspected and Beetles Collected - by Airport

County	Airport	Aircraft Inspected	Beetles Collected
Alameda	Oakland International	971	92:3 alive
Fresno	Fresno/Yosemite International	33	9:8 alive
Los Angeles	Burbank	101	9:0 alive
	Long Beach	121	10:2 alive
	Los Angeles International	3160	384:58 alive
Orange	John Wayne	295	33:0 alive
Sacramento	Mather	77	30:5 alive
	Sacramento International	110	14:0 alive
San Bernardino	Ontario International	1023	57:5 alive
San Diego	San Diego International	1727	127:14 alive
San Joaquin	Stockton	25	1:1 alive
San Mateo	San Francisco International	757	12:0 alive
Santa Clara	San Jose International	676	31:5 alive
TOTALS		**9176**	**809:101 alive**

Long Beach Airport

On July 18, a male JB was recovered from one of the 700 traps placed around the Long Beach Airport. The density of traps around the find site was increased to 50 traps in the core square mile, and 25 traps per square mile on each of the surrounding first buffer square miles. The traps deployed in this manner did not capture any additional beetles.

However, on August 8, 2005, two Japanese beetles were recovered from two traps that had been placed by the Los Angeles County Agricultural Commissioner's office in a golf course adjacent to the Long Beach Airport. These new finds triggered an increase of the detection efforts already in place. On August 10, the delimitation density around the three finds was elevated to a 100-50-25-trap array.

Additionally, the finds at the golf course were treated with Merit 0.5 G. The applications took place on August 22 through 24, 2005. No further finds occurred. The Merit application is not scheduled for resumption in 2006.

RED IMPORTED FIRE ANT PROGRAM

The red imported fire ant (RIFA), *Solenopsis invicta* (Hymenoptera: Formicidae), is a serious pest in both urban and rural environments in the southeastern United States. RIFA forms large colonies in soil that are composed of thousands of biting and stinging workers. This species displaces native ants and through its venom, can inflict severe toxic symptoms on both animals and people. The Branch maintains eradication and regulatory programs against infestations in both the Central Valley and parts of southern California.

Northern California – Fresno, Sacramento and Bay Area/Delta Districts

Survey Activities

The most prevalent pathway for entry of RIFA into the Central Valley appears to be via infested beehives which are brought into California for almond pollination. Survey plans for the Central Valley concentrate on sampling orchards using Spam® bait stations along paths through and around the orchards where beehives are normally placed in the early spring. Thirty-six infested sites in the Central Valley have been found since 1997. All have been eradicated or were under the three year post-treatment survey (PTS) in 2005.

Eight counties in the San Joaquin Valley have surveyed for RIFA at a variety of possible introduction points, such as nurseries, bee drop points, new commercial and urban developments, trucking facilities and general grid survey of urban areas. Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus and Tulare counties collected 10,475 ant samples from 637 of these sites. This data, along with CDFA RIFA activities, continues to indicate that RIFA is not established in areas other than agricultural crops.

TREATMENT

Treatment Activities – San Joaquin Valley

Once an infestation has been detected treatment begins at the earliest possibility. Usually three to four treatments per year are applied. All orchards or residential properties were treated with Amdro®, Clinch®, Esteem®, or Extinguish®. Approximately 5,176 acres were under treatment

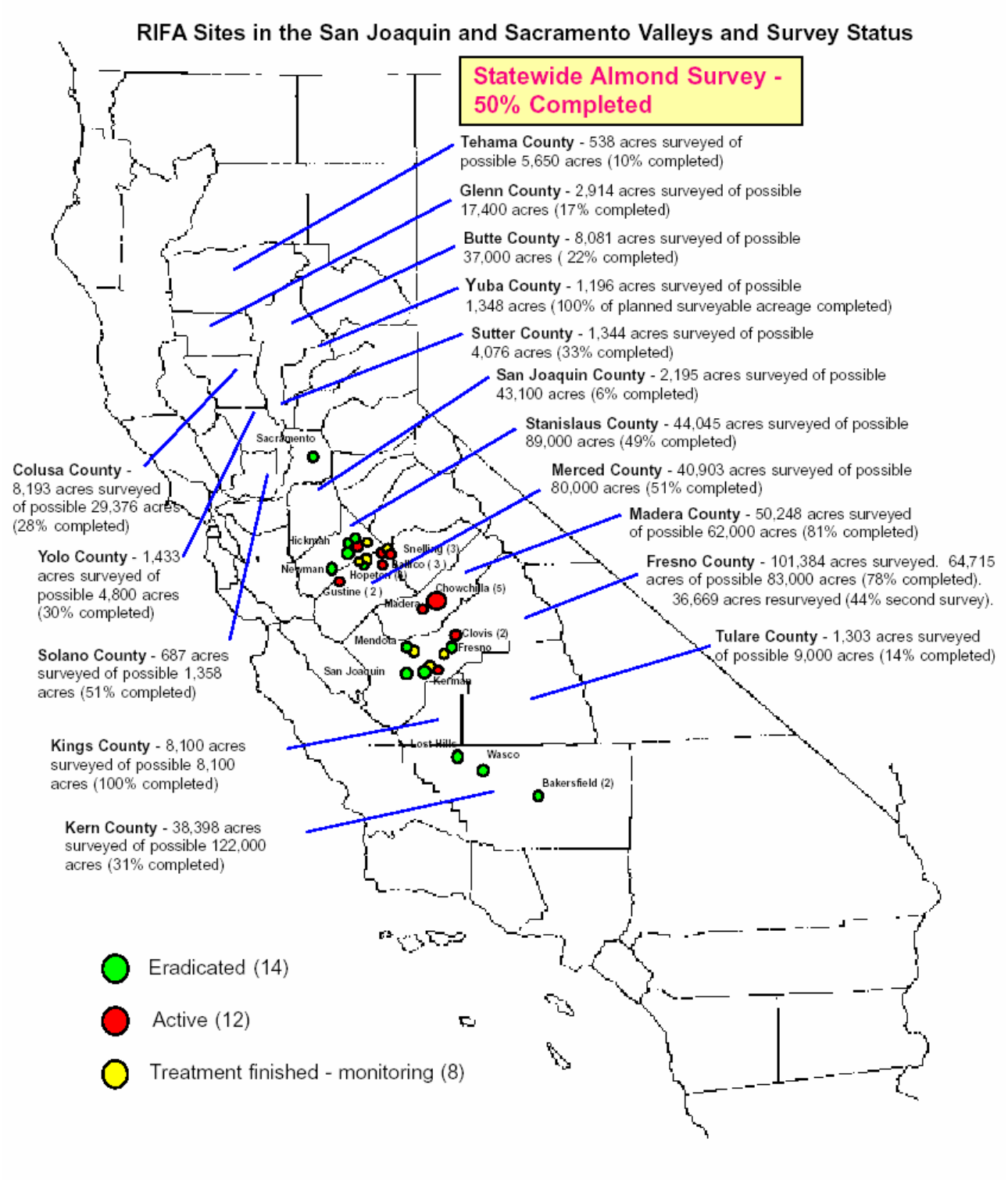
in 2005. This is a reduction from 6,473 acres under treatment in 2004. Considering multiple applications, a total of 14,994.25 acres were treated in 2005. By crop, pesticide baits were applied to 2,125 acres of almonds, 1,578 acres of pistachios, 880 acres of grapes, 259 acres of prunes, 225 acres of peaches, 60 acres of apricots and 49 acres miscellaneous. All infested properties found prior to 2000 have been eradicated or are under post-treatment survey monitoring. In 2006, only four sites will be under general treatment. See Table 7 and Figure 8.

Table 7. Status of All RIFA Infestations in Northern California in 2005

County	Location	Number	Original Acres Infested	Acres Currently Under Treatment	Status
Fresno	Kerman # 1 (1998)	2	1,160	0	Eradicated
	Kerman # 2 (1998)	5	106	0	Monitored
	Kerman # 3 (2002)	33	81	0	Monitored/ Treated 1 Colony
	Mendota # 1 (1999)	7	160	0	Monitored
	Mendota # 2 (1999)	8	80	0	Eradicated
	San Joaquin (1999)	11	276	0	Eradicated
	Fresno (1999)	9	Nursery	0	Eradicated
	Clovis (2000)	18	75	0	Monitored
	Fresno # 2 (2001)	20	260	0	Monitored
	Clovis # 2 (2002)	23	24	0	Monitored/ Found 1 Colony?
Kern	Lost Hills (1997)	1	464	0	Eradicated
	Wasco (1998)	4	40	0	Eradicated
	Bakersfield (1999)	6	Residence	0	Eradicated
	Bakersfield # 2 (1999)	10	Nursery	0	Eradicated
Madera	Chowchilla (1-5)		4,202	4,202	Treated
	Chowchilla # 1 (2000)	12			
	Chowchilla # 2 (2000)	13			
	Chowchilla # 3 (2003)	32			
	Chowchilla # 4 (2004)	37			
	Chowchilla # 5 (2004)	38			
	Madera # 1 (2002)	29	80	80	Treated
	Madera # 2 (2005)	40	120	120	Treated
Merced	Ballico # 1 (2004)	34	145	145	Treated
	Ballico # 2 (2004)	35	51	0	Monitored
	Ballico # 3 (2004)	36	1	0	Monitored
	Hopeton # 1 (2001)	19	6	0	Eradicated
	Hopeton # 2 (2002)	25	320	0	Monitored
	Hopeton # 3 (2002)	27	160	0	Monitored
	Snelling # 1 (2001)	22	2,673	348	Spot Treated
	Snelling # 2 (2002)	24	617	4	Spot Treated
	Snelling # 3 (2002)	30	8	0	Monitored
	Snelling # 4 (2005)	39	3	3	Treated
	Gustine (2002)	31	240	240	Treated
	Gustine # 2 (2003)	34	40	31	Treated
Sacramento	Cal Expo (2001)	21	24	0	Eradicated
Stanislaus	Newman (1998)	3	256	0	Eradicated
	Hickman # 1 (2000)	14	999	0	Monitored
	Hickman # 2 (2000)	15	311	0	Eradicated
	Hickman # 3 (2000)	16	145	0	Eradicated
	Hickman # 4 (2000)	17	15	0	Eradicated
	Hickman # 5 (2002)	28	262	0	Monitored
Totals*	**40***		**13,404**	**5,173**	
Percentage of Original Infested Acres Remaining Under Treatment					**39%**
Percentage of Original Infested Acres Eradicated or Being Monitored of RIFA					**61%**

*Smith River was number 26, but is doubtful that this was an infestation.

Figure 8. 2005 RIFA Site Status and Cumulative Survey Results in the Central Valley



Southern California – Orange, Riverside and Los Angeles Counties

The RIFA quarantine area remains unchanged in 2005 from its inception by CDFA in 1998. The established quarantine is 865.5 miles. This encompasses the entire county of Orange (790 sq. mi.) and parts of Riverside (67 sq. mi.) and Los Angeles (8.5 sq. mi.). The quarantines were designed to contain the spread of RIFA, by requiring inspection and treatment of articles which the ant can be spread such as nursery stock, soil, landscaping and beehives. Treatment activities are conducted in Orange County by the County Vector Control Districts.

Regulatory Approach

Regulatory enforcement of the RIFA quarantine was accomplished using compliance agreements with businesses and/or individuals within the quarantine areas that commercially grow, produce, propagate, handle, store, maintain, ship, transport or process regulated articles or commodities. Establishments that are in program-compliance followed specified treatment procedures necessary to ensure RIFA-free status for the articles or commodities intended for movement. Inspection surveys, treatment records and activities of these establishments were monitored in 2005 to ascertain that all applicable protocols of inspection surveys, treatment procedures and information records are done in accordance with the compliance agreement. The categories of compliance agreements include: production nurseries, non-production or retail nurseries, landscapers, yard maintenance, golf courses, sod farms, bee-keepers, soil movers, homeowners, hay dealers/handlers, green waste recyclers and landfills. Program staff signed 414 new compliance agreements in 2005, bringing total establishments monitored to 5,079. The number of compliance agreements for nurseries, sod farms and golf courses has leveled off, but there continues to be an increase in the numbers of new compliance agreements in other high-risk categories such as landscapers, yard maintenance, soil movers, etc. The number of businesses under compliance agreements varies due to new or failing businesses.

To ensure movement of RIFA-free nursery stock, the highest priority for quarantine enforcement is compliance of production nurseries. In 2005, 1,007 or 83.7 percent of SPAM-bait/visual inspection surveys by the program were conducted in production nurseries (Figure 8). An additional 2,625 soil site inspections for construction/swimming pool installation were conducted. To ensure compliance to program procedures, the goal of program staff is inspection of 100 percent of quarantined production nurseries in each quarter of the year (Table 8).

Table 8. Inspections of Production Nurseries for RIFA in 2005

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Goal	100.0%	100.0%	100.0%	100.0%
Actual	99.8%	99.8%	88.2%	92.14%

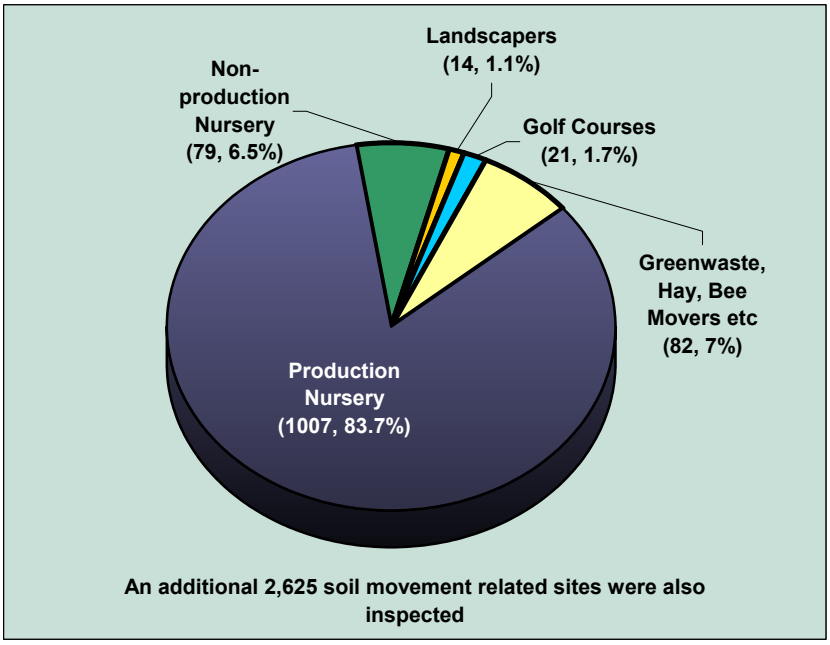


Figure 9. Number of Inspection Surveys for RIFA in 2005

RIFA has been found in 72 nurseries since the beginning of inspections in October 1998 and the end of 2005. Fifty-four or 75 percent of these nurseries completed treatment protocols and were taken out of positive nursery classification after four consecutive negative quarterly surveys (Figure 9). Eighteen nurseries were treating (broadcast bait) for RIFA. They are monitored and SPAM® bait-surveyed along with all other nurseries within the quarantine areas. All nurseries within the quarantine areas also continued soil drenching or incorporating pesticides in soil mixture in 2005 as a regulatory requirement.

In 2005, regulatory inspections of establishments found RIFA in 11 production nurseries and three soil-movement related sites. Each site was treated (broadcast bait) and put under monitoring according to program protocol.

Grid Survey

Grid surveys of southern California counties continued in 2005. Three SPAM® bait stations are set at each of four locations per square mile (one per quarter mile grid). This baiting survey has been repeated by CDFA in southern California counties at the same locations since 2000. The survey covered parts of 1,861 square miles in Los Angeles, Orange, Riverside and San Bernardino counties. Orange County had 11 positive sites, Riverside – 26, Los Angeles – seven and San Bernardino – zero.

The Arizona Department of Agriculture (ADA) and CDFA continued using a Master Permit Agreement for shipment of nursery stock from California to Arizona. This agreement allows RIFA-free nurseries, within the California quarantine, to ship nursery stock into Arizona without being held in a special ADA approved quarantine holding area. Sixteen nurseries of about 1,276.5 acres, participating under the terms of this master permit.

OTHER INVASIVE SPECIES SURVEYS

The Branch performs a variety of other surveys for invasive pest species statewide each year. Some of these are on an ongoing annual basis, while others are temporary and are in response to new invasive pest threats. PDEP staff may also conduct geographically limited surveys in response to specific questions concerning the presence and/or distribution of potentially invasive species.

ANNUAL INSECT SURVEYS

Africanized Honey Bee Monitoring

Africanized honeybee (AHB), *Apis mellifera* (Hymenoptera: Apidae), is a hybrid between one or more of the European honeybee sub-species (*Apis mellifera mellifera*, *Apis mellifera linguica*, etc.) and the African honeybee (*Apis mellifera scutellata*). Because of its aggressive nature, AHB can cause serious envenomation symptoms in animals and people from multiple sting incidents. It first migrated into California from Arizona during late 1994, arriving in Blythe, Riverside County. The total number of California square miles colonized with AHB is 63,303. The 2005 survey in Fresno, Merced, Monterey and San Luis Obispo counties resulted in 94 samples that were negative for AHB. Currently, AHB colonizes the entire counties of Imperial, Kern, Kings, Los Angeles, Madera, Orange, Riverside, San Bernardino, San Diego, Tulare, Ventura; and portions of Inyo, San Luis Obispo, and Santa Barbara counties.

Cereal Leaf Beetle Survey

Cereal leaf beetle (CLB), *Oulema melanopus* (Coleoptera: Chrysomelidae), is a serious pest of grains and grasses and occurs in the northeastern and northwestern United States, but has not yet become established in California. CLB feeds primarily on cultivated and escaped grains and grasses, such as oats, barley and wheat. The Branch conducted sweep net surveys at 2,935 sites in 51 counties to monitor for this pest. The 2005 survey was negative for the presence of CLB in California.

Citrus Pest Survey

Surveys were conducted for the following three citrus pests: Asiatic citrus psyllid, *Diaphorina citri* (Homoptera: Psyllidae), citrus leafminer, *Phyllocnistis citrellla* (Lepidoptera: Gracillariidae), and brown citrus aphid, *Toxoptera citricida* (Homoptera: Aphididae). All three pests currently occur in Florida, and citrus leafminer is known to be found in two counties in California. The Branch conducted visual surveys in 15 counties in conjunction with the citrus canker survey. The 2005 survey was negative for the presence of Asiatic citrus psyllid and brown citrus aphid in California. However, citrus leafminer was found at 10 sites in northern San Diego County.

European Corn Borer Trapping

European corn borer (ECB), *Ostrinia nubilalis* (Lepidoptera: Pyralidae), is a serious pest of corn and can infest a wide variety of herbaceous plants. In the U.S., it currently occurs in the eastern and midwestern states. The Branch operated 205 traps in 10 counties to guard against an introduction of this pest. The 2005 survey was negative for the presence of ECB in California.

European Pine Shoot Moth Trapping

European pine shoot moth, *Rhyacionia buoliana* (Lepidoptera: Tortricidae), is a serious pest of various species of pines. In the U.S., it currently occurs across the northern states. The Branch operated 274 traps in nine counties to guard against an introduction of this pest. The 2005, survey was negative for the presence of European pine shoot moth in California.

Khapra Beetle Trapping

Khapra beetle, *Trogoderma granarium* (Coleoptera: Dermestidae), is a serious pest of many stored grains and grain products. It is not known to occur in the United States. The Branch operated 2,871 traps in 21 counties to guard against an introduction of this pest. The 2005 survey was negative for the presence of Khapra beetle in California.

Nematode Survey

Fifteen nematode species were the targets of a new area-wide nematode survey. Ten crops were surveyed for these nematodes: alfalfa, almond, cotton, grape, pecan, potato, rice, tomato, walnut and zucchini. A total of 363 survey samples were processed and examined by the Plant Pest Diagnostics Branch. Fifty-eight percent of these samples contained plant parasitic nematodes belonging to 33 species. Only four of the 15 target species were detected in the survey, namely, *Ditylenchus dipsaci, Meloidogyne hapla, M. javanica* and *Paratrichodorus* spp. These species have been detected earlier by the State Laboratory and are rated by CDFA as C or D pests due to their common distribution in California. With the exception of *Xiphinema index,* dagger nematode, that is rated a B pest because of its limited distribution within California, the remaining species found in the survey are also commonly distributed in the State with either a C or D rating.

Non-Target Exotic Pest Survey

The Non-Target Exotic Pest Survey is designed as a general detection tool to look for potential new pests that are not targeted in the existing trapping and survey programs. The survey samples Pherocon®, apple maggot traps baited with ammonium acetate and protein hydrolysate and existing McPhails, in selected counties. These samples are submitted to the Plant Pest Diagnostics Center for screening. No significant pest finds occurred in 2005.

Woodboring Beetle Survey

This survey is designed to search for potentially harmful woodboring beetles. The Asian longhorn beetle, *Anoplophora glabripennis* (Coleoptera: Cerambycidae), is of particular concern because it attacks a wide variety of hardwoods and it is currently found in two urban areas in the eastern United States. Both traps and visual surveys were employed. The following three lures are used at each trap site, with each one in a separate Lindgren funnel trap: UHR ethanol, UHR ethanol with UHR alpha-pinene and cis-verbenol with Ipsdienol and methyl butenol (aka Exotic Ips Lure).

Nine species new to California have been discovered so far. One species represents a new North American record, namely Mediterranean pine engraver, *Orthotomicus erosus* (Coleoptera: Scolytidae), which was found in Fresno, Kern, Madera, Merced and Tulare counties. These were collected in 2004. No exotic woodborers new to California were detected during the 2005 survey.

SPECIAL INSECT SURVEYS

Avocado Lace Bug

Avocado lace bug, *Pseudacysta perseae* (Hemiptera: Tingidae), was discovered in August and September 2004 infesting avocado trees in the greater San Diego area. Subsequent surveys have delimited the infested area to be over 200 square miles. Chemical and biological control management options are being considered. In 2005, 1,991 sites – outside the infested area – in 3,831 miles of Orange, Riverside, San Diego, Santa Barbara and Ventura counties were surveyed for Avocado lace bug. No additional finds were made.

Brown Marmorated Stinkbug

Brown marmorated stinkbug, *Halyomorpha halys* (Heteroptera: Pentatomidae), was found in March 2005 when a resident new to California from New York, contacted CDFA and reported that they may have accidentally transported live brown marmorated stink bug in personal property that was stored in Allentown, Pennsylvania. Allentown is the town where this insect was first reported in the United States in1996. Upon visual survey, multiple brown marmorated stinkbugs were found in the furniture that was in storage in Vallejo and a relative's garage in Vacaville. All related items were fumigated; the area in and around the storage unit trapped using light traps and yellow panel traps; and the vegetation within the immediate vicinity of the storage unit was treated with a contact pesticide.

Asian Longhorned Beetle

Three live adults of Asian longhorned beetle (ALHB), *Anoplophora glabripennis*, were discovered June 16, 2005 inside and outside of a warehouse in Sacramento. ALHB occurs in China and Korea. The source of the captured beetles was wooden packing crates from China containing slate tiles. Larvae of this beetle bore into the trunks of maples, poplars, elms, willows and other hardwood trees and can cause rapid tree death. Ground crews surveyed a nine square mile of the area visually and tree climbers, from the United States Forest Service, surveyed host trees within the quarter-mile. Records of other locations in California that received material from the shippers in China were obtained and visual survey was conducted 200 meters around each location. Calls to the CDFA phone banks, regarding possible sightings of ALHB, were screened and credible locations were visually surveyed at 200 meters around each location.

Diaprepes Root Weevil

Diaprepes root weevil, *Diaprepes abbreviatus*, is an insect pest whose larvae, the citrus root weevil, damages both the leaves and roots of over 270 different plants from 59 plant families. The adults damage leaves by chewing semi-circular areas out of the leaf margin. Because of its broad host range, it is a serious pest to the citrus and ornamental nursery industries. Diaprepes was first detected on September 14 in Newport Beach (Orange County) and also on October 11 in Long Beach (Los Angeles County). Both regions were and continue to be surveyed visually and with traps using beat sheets to dislodge weevils from the foliage of host plants. An eradication program is planned for 2006.

ANNUAL PLANT PATHOGEN SURVEYS

During 2005, no significant plant diseases were discovered through annual detection activities. The Branch participated in three ongoing surveys for citrus canker, Karnal bunt and plum pox virus.

Citrus Canker

Citrus canker is a bacterial disease caused by *Xanthomonas axonopodis pv. citri*. It affects the leaves, twigs and the fruit of citrus trees and is a major threat to the citrus industry worldwide. In the United States it occurs in Florida where it is under active eradication. The Branch annually performs visual surveys in citrus producing regions with a goal to target 25 percent of the total citrus acreage each year on a rotational basis. This year 28,030 acres were surveyed in 15 counties. The 2005 survey was negative for the presence of citrus canker in California.

Karnal Bunt

Tilletia indica, the causal agent of Karnal bunt of wheat, is a fungal pathogen that infects the wheat seed at the time of flowering. In 1996, Karnal bunt was found in Riverside and Imperial counties of California shortly after having been discovered in Arizona, which resulted in Federal quarantines of the affected areas. Twenty-four of the wheat fields harvested within the regulated area of the Palo Verde Valley in Riverside County were tested for the presence of Karnal bunt. All samples were negative for Karnal bunt.

The National Karnal Bunt Survey was completed in California with the cooperation of various branches and County Agricultural Commissioners Offices. The California portion of the Karnal Bunt National Survey was performed according to the USDA protocol for CY 2005. Thirty-nine samples from 17 counties were collected; all were negative for Karnal bunt.

Plum Pox Virus

Plum Pox Virus, also known as Sharka, is considered to be the most devastating disease of stonefruit in the world. The disease was detected in the United States for the first time in 1999 in Pennsylvania, and shortly thereafter was found in Ontario, Canada. In the United States it is only known to occur in Pennsylvania where it is under active eradication. The Branch annually performs surveys in stonefruit producing regions by sampling 25 percent of the trees in each orchard, in accordance with USDA protocol. In addition, trees used as sources of budwood, seed or varietal development at the University of California, Davis Foundation Plant Material Foundation Block and at the Wolfskill Experimental Orchard in Winters, California, were sampled at the 100 percent level. A total of 1,333 acres were surveyed in 21 counties, resulting in the collection of 29,188 samples. The 2005 survey was negative for the presence of Plum Pox Virus in California.

STATEWIDE POST-ENTRY QUARANTINE PROGRAM

The statewide post-entry quarantine program is responsible for inspecting plant shipments that have already arrived in California for the presence of diseases. In 2005, PDEP staff visited 58 sites in 27 counties and inspected 550,082 plants from 147 shipments, releasing 112 of the shipments.

Integrated Pest Control Branch

INTEGRATED PEST CONTROL BRANCH

Mission: *To serve the citizens of the State by promoting California agriculture and fostering public confidence in the marketplace through development, implementation and communication of sound public policies on prevention of the damage exotic and harmful plants pests and disease can cause.*

Vision: To be recognized as leaders in the field of integrated pest control.

Values:

- Teamwork of all in achieving the Branch mission.
- Cooperative relationships among agricultural, public, federal, state, county and research groups or institutions.
- Support of research initiatives designed to develop pest control materials and methods.
- Constructive communications and exchange of ideas and information.
- Decision-making based on the best science, technology and common sense.
- Appropriate and timely response to pest problems.
- Effective leadership.

The Integrated Pest Control Branch conducts a wide range of pest management and weak eradication projects in cooperation with growers, agricultural commissioners and federal agencies. This branch manages the biological control and vertebrate pest management functions. Assessments and fees are collected for some program activities and services. The branch contracts with counties, federal agencies, other California state agencies, research agencies and private businesses for various program components. Activities of five projects are coordinated through recommendations of their boards: Pink Bollworm, Beet Curly Top Virus, Tristeza; and two committees: Noxious weed Management Oversight and Vertebrate Pest Control Advisory Committee.

BEET CURLY TOP VISRUS CONTROL PROGRAM

Beet curly top virus (BCTV) is an extremely serious plant virus affecting several hundred varieties of ornamental and commercial crops in California. The only known vector of this virus is the beet leafhopper (BLH), *Circulifer tenellus* (Baker).

BCTV is highly destructive to commercially produced sugar beets, tomatoes, peppers, cucumbers, muskmelons, watermelon, squash, pumpkins, green and dry beans, spinach and varieties of vine seed. Because of the threat to commercial crops, the growers of susceptible crops contribute 100 percent of the funds necessary to control BCTV in California. BCTV also infects backyard gardens upon which many people in California depend to provide fresh table vegetables.

The BLH is both resident and migratory. Populations develop in selected habitats within the San Joaquin, Imperial, Sacramento and intra-coastal valleys of California, as well as moving into California from contiguous states and Mexico.

The Curly Top Virus Control Program's (CTVCP) objective is to reduce the incidence of BCTV infection in susceptible crops, below a level of economic importance, through the use of integrated pest management techniques.

The Program utilizes intensive surveys to locate and monitor BLH populations throughout the year. Once the populations are located, they are evaluated by the amount of virus, potential for migration to susceptible crops in the area and feasibility of control, versus natural mortality due to parasites, predators or weather trends affecting host plants.

The general pest control strategy developed by the CTVCP is to:

1. Reduce the potential number of over-wintering female BLH's through the use of insecticide on selective Russian thistle stands in early fall.

2. Further reduce surviving gravid over-wintering BLH females, prior to egg deposition, once they have concentrated on winter host plants.

3. Selectively treat areas of habitats where a spring population has developed, to prevent migration to crops during late spring and early summer.

The goals of the CTVCP for 2005 were:

- Monitor and selectively suppress over-wintering female BLH populations on winter host plants prior to egg deposition.

- Locate, monitor and selectively suppress the spring hatch of BLH prior to maturation and migration into susceptible crops.

- Assess program success by surveying susceptible crops for BCTV.

- Map all Russian thistle acreage and suppress high BLH populations prior to dispersal in over-wintering areas.

- Continue to support and solicit research, which will improve the efficiency of BLH control, enabling the CTVCP to use less insecticide while maintaining BCTV damage below economic levels.

During 2005, a total of 23,021 acres of rangeland, fallow ground and oilfields were aerially treated with malathion to control BLH populations. Most areas on the west side of the San Joaquin Valley received above normal winter rainfall, which left unfavorable conditions for the BLH reproduction in the spring. The rangeland vegetation was so lush and unfavorable that BLH populations did not develop to treatment thresholds in Kings and Fresno County rangeland. BCTV infection in susceptible crops was observed with less frequency than in the spring of 2004. However, there was an increase in the observation of moisture related problems due to the late spring rains including fusarium, verticillium, bacterial speck and bacterial canker. The increase in precipitation was most likely responsible for a slight increase in fall treatment acreage for fall of 2004. Treatment periods are described below:

WINTER TREATMENT

Rains in October germinated winter host plants early in the fall. The BLH population was found to have dispersed, and by November, could not be found in very high numbers on any remaining summer host plants. Rains subsided somewhat during November and the first part of December 2004. The last week of December and first week of January were wet with numerous weather systems going through the state. Rains continued through January and February with damp fog persisting between rain events. Off-road travel and good survey conditions were rare due to the persistent wet conditions. Fresno rainfall totals were 150 percent of normal.

Rangeland vegetation became lush and dense. Plenty of filaree, *Plantago,* and peppergrass developed but most south facing slopes were lush and not as favorable as in normal rainfall years. Late in February, the largest over-wintering BLH counts averaged 2-3/10 net sweeps with only one good egg and several undeveloped eggs. Females never appeared to have gained a lot of body fat. These counts were consistent from Zapatos through Jacalitos and Warthan Canyons to the Coalinga rifle range. Over-wintering females were also found consistently on the front edge of the breeding ground rather than back in the canyons, indicating there was not a lot of searching needed to find host plants when migrating from cultivated areas.

With low BLH populations throughout the winter control area, the winter treatment was eliminated.

SPRING TREATMENT

San Joaquin Valley

A total of 6,921 acres of rangeland was treated In Kern County to control BLH populations between April 1 and 2. The area treated during the spring treatment campaign was much smaller than most springs due to the heavy rangeland vegetation, above normal rainfall and the lack of significant BLH development. No treatments were performed on the west side of Kings and Fresno counties.

Approximately 528 acres of land, administered by the California Department of Fish and Game, adjacent to the Buena Vista Golf Course, was left untreated. Request for treatment was denied by California Department of Fish and Game due to the “Fully Protected” status of species potentially found in the parcel.

Consistent rains in winter and spring of 2005 influenced the development of heavy vegetation in Kings and Fresno counties. BLH populations never exceeded 3-4/10 net sweeps in areas where sparse host plant conditions were favorable for development. The growth of a larger, second generation was considered if the first generation matured, and was sufficient vegetation available in a wet year. However, a second generation did not develop due to the drying of host plants as the first generation matured.

BLH development was almost normal in Kern County. Rainfall was not as high as rainfall to the north. While there was more vegetative cover on the flats than have been seen in many years, favorable sparse host plant conditions were present on the slopes. A larger, more consistent, over-wintering population was also observed in Kern County through the winter. With abundant host plants, the first generation was also found in areas where overwintering females had been observed all winter.

Imperial and Palo Verde Valleys

Above normal rains, in January and February, were sufficient enough to produce significant germination and develop BLH host plants over the entire desert. *Plantago* and *Oligomeris* were the most dominant host plants. General vegetative development was heavy including many species of wild flowers. BLH counts were low, averaging only 1-2/10 net sweeps; however, these counts were spread out over entire townships. Aerial treatment was not considered to be cost effective, as the BLH population remained low and scattered across the entire desert.

By May, BLH populations were increasing in roadside host plants and ground-rig spot treatments were deemed necessary to control roadside populations. Approximately 2,270 acres of roadsides and ditch banks were treated with ground-rigs in the Imperial Valley and 160 acres were treated in the Palo Verde Valley.

FALL TREATMENT

A total of 16,100 acres were treated by CTVCP from October 15 to 22, to control BLH populations developing on the west side of Kern, Kings and Fresno Counties. The weather conditions most mornings were conducive for treatment activities but the winds increased in the late morning on several days.

The above normal precipitation during the winter appeared to have elevated the Russian thistle germination above the previous year's acreage. By the middle of August 2005, 50,000 acres had been mapped as compared to the 30,000 acres mapped during the summer of 2004. One hundred and seventy-five waivers were sent to property owners to notify and obtain permission for survey and treatment if necessary.

During the summer, BLH counts remained low and consistent in Kern, Kings and Fresno Counties. Counts averaged less than one/sweep on Russian thistle, *Bassia* and goosefoot. In July and August, the best counts could be found on goosefoot, followed by *Bassia* and last was Russian thistle. Goosefoot was the least common of the three host plants. By October, the *Bassia* in the Belridge Oil Fields were building large populations. Over 50 percent of the properties mapped did not develop BLH counts of sufficient size to require treatment. Grazing and disking accounted for some of the reduction in potential acreage.

The spray campaign began on Saturday, October 15 in the Belridge Oil Fields. Due to a series of mechanical problems with the aerial contractor's equipment, only 2,150 acres were treated in the Belridge Oil Fields that weekend, leaving the rest of the "weekend only" treatments for the following Saturday.

On Monday, October 17, approximately 3,400 acres were treated in the vicinity of the Coalinga Nose, Fresno County. On October 18 and 19, treatment activities moved to Kings County where 5,650 acres were treated near Devils Den, along Utica Avenue and east of Kettleman City.

On October 20, several stands of Russian thistle were treated between Kamm and Manning Avenues in Fresno County. Program staff moved back to Lost Hills on October 22 to complete the remaining "weekend only" areas. An additional 3,600 acres were treated in Belridge, Lost Hills and the Holloway Gyp Pits.

Post-treatment surveys showed a population reduction above 90 percent in most locations.

RESEARCH CONTRACTS AWARDED

Research began on the two contracts awarded in 2004. Both research projects were funded to fulfill Terms and Conditions of the CTCVP's five year Federal Pesticide Use Permit.

Dermal Toxicity of Malathion to the Western Fence Lizard

Fulfill condition of the biological opinion for the CTVP's effects of malathion on the blunt-nosed leopard lizard.

Insect Biomass Study

A contract was also awarded to the University of California, Riverside to assess the non-target effects of BLH control on invertebrate prey species of the blunt-nosed leopard lizard.

BIOLOGICAL CONTROL

Key Highlights for the Biological Control Program for 2005 include:

- A rust pathogen of yellow starthistle was released in 74 new sites in 37 counties.
- Recoveries of Lygus parasitoids from wild vegetation and commercial strawberries on the central coast suggest they are becoming established and spreading.
- Recovery of weevils on Mediterranean sage released in 2002 & 2003 at several northern California sites suggests the weevil is established there.
- High levels of attack by three beneficial insects on squarrose knapweed have effectively stopped seed production by the noxious weed in northern California.
- Olive fly parasites have been brought into California for testing against native and other exotic fruit flies, as a prelude to their being released. Release of the first permitted biological control agent, *Psytallia lounsburyi*, was made in October at two northern California sites.

The primary objective of the Biological Control Program is to implement self-sustaining biological controls for serious insect and weed pests in California. The Biological Control Program is divided into two working groups: insect pests and invasive weeds.

INSECT PESTS

Olive Fruit Fly

The Biological Control Program has formed a research team consisting of USDA Animal and Plant Health Inspection Service (APHIS), Plant Pest Quarantine (USDA-APHIS-PPQ) Western Region; USDA Agricultural Research Service (ARS), European Biological Laboratory; University of California; and Texas A&M University to implement a biological control program against the olive fruit fly. USDA-ARS scientist Alan Kirk and CDFA scientist Charles Pickett, collected parasitoids in South Africa and Namibia during the spring of 2005, and from China in fall of the same year. Peris Machera of International Center for Insect Physiology and Ecology (ICIPE) in East Africa and Vaughn Walters, University of Stellenbosch, South Africa, helped with collections in respective regions of this continent. These collection efforts resulted in several promising candidates for use as biological control agents in California. Parasitoids were shipped to the USDA-ARS European Biological Control Laboratory in France and to the quarantine facility at the University of California, Berkeley. Cooperators Kent Daane and Karen Sime, University of California, Berkeley, continued their host range testing of several olive fruit fly parasitoids in quarantine. Based on the set of host range studies in 2004, the parasitoid, *Psytallia lounsburyi*, was approved for field release by USDA-APHIS and CDFA. A total of 200 *P. loundsburyi* adults were released in Butte and Alameda counties in October.

Lygus Bug

Lygus bug, also known as the Western Tarnished Plant Bug, is a serious pest of cotton, strawberries and most other crops grown for seed in California. It has developed resistance to traditional insecticides and newer, effective products cause outbreaks of other pests. Field surveys showed that lygus bug in California lacks nymphal parasitoids. The exotic nymphal parasitoids, *Peristenus stygicus* and *P. digoneutis*, were produced in laboratory cultures and in a field insectary and released at several locations in 2005. Within season and between season recoveries of lygus bug nymphs parasitized by *Peristenus* spp. collected from commercial strawberries and nearby wild vegetation suggest this parasitoid is becoming established on the central coast, a major strawberry growing region. This is the first time parasitoids have ever been reported attacking the nymphal stage of lygus infesting strawberries in California.

Avocado Lace Bug

Found in San Diego County in late summer of 2004, the avocado lace bug has been found solely in urban landscapes and has not been detected in commercial orchards. This pest has been found in devastating numbers in commercial orchards in the Caribbean and reached pest status in its native region of Florida in the 1990s. However, the Florida outbreak may have been a secondary pest outbreak resulting from mortality of its natural enemies by pesticides applied against other avocado pests at the time. In San Diego, high population densities were observed to cause significant leaf damage and leaf drop. A cooperative project has been initiated between CDFA, University of California, Riverside and the County of San Diego. Facilities in Chula Vista will be used as an insectary where a colony of the lace bug will be reared to support production of potential biological control agents. Foreign exploration efforts are now underway to obtain parasitoids in its native range of Florida, Mexico and the Caribbean. Also, plans were coordinated with a University of Florida cooperator to periodically monitor the lace bug and parasitoid activity in Florida.

Cotton Aphid

Two introduced parasites, *Aphelinus* near paramali, and *Aphelinus gossypii* (Hymenoptera: Aphelinidae), have been released at nursery sites in Kern County, California, since 2000. One of the parasites, *Aph.* nr *paramali*, has begun to establish and is recovered occasionally in areas adjacent to the nursery sites. The other parasite, *Aph. gossypii*, has only been recovered shortly after releases in the nursery sites. From data collected in other studies, it appears that hyper-parasites attack *Aph. gossypii* more readily than *Aph.* nr. p*aramali* and may limit the persistence of *Aph. gossypii*. Therefore, a study was conducted at the Shafter Research and Extension Center in Kern County to determine if the hyper-parasites are attacking the introduced parasites in greater proportions than the native parasites. Plants containing aphids, that had been exposed to the two introduced parasites and a native parasite, (*Aphidius colemani*, Hymenoptera: Aphidiidae) were placed in the field for varying lengths of time. The aphids and/or mummies were collected and held for parasite emergence. The results are pending.

In addition to the study on hyperparasitism, efforts continue on obtaining new cotton aphid parasites. Arrangements have been made to import *Lipolexis oregmae* (Mackauer) from Guam, through Hawaii and into California. This importation should occur in late spring or early summer of 2006. Also, the parasite *Binodoxys communis* Gahan will be brought into California from a lab colony at the University of Minnesota in late spring or early summer of 2006. Attempts will be made to establish lab colonies and to test the suitability of these two parasites for use in California.

Vine Mealybug

The vine mealybug, *Planococcus ficus* (Signoret), is a serious pest of grape vineyards throughout the grape-growing regions of California. It causes direct damage to the berries, decline in grapevines and may vector leafroll viruses. Distribution of pheromone traps has continued. In 2005, 18 counties had at least one vineyard with vine mealybug females, three counties had a vineyard where only vine mealybug males were found, and two counties showed great progress in eradicating vine mealybug from their vineyards. In addition, a colony of the vine mealybug parasite, *Anagyrus pseudococci* (Girault) was initiated, so that parasite releases could be made within the state in future years.

Gill's Mealybug

Gill's mealybug (*Ferrisia gilli* Gullan) was found infesting two vineyards in 2004 and one additional vineyard in 2005 in El Dorado County. In response to the latter infestation, an eradication program was initiated. Monitoring of the eradication program using sticky tape traps and visual searches revealed that the insecticide treatments were very effective at eliminating this mealybug. Monitoring of all sites will continue in 2006. In addition, this mealybug is known to infest pistachios in the San Joaquin Valley. Therefore, monitoring of grapes and other crops near known infested pistachio orchards was conducted in Tulare County. Gill's mealybug was found in persimmons and in one table grape vineyard. It appears that Gill's mealybug prefers to feed in tree crops such as pistachios and persimmons and feeds on grapes when other hosts are not available. Two species of parasites were also found during this sampling, *Pseduaphycus* near *meracus* Gahan and *Chrysoplatycerus* sp. Working in cooperation with UCCE personnel, educational information is being developed for this mealybug.

Red Gum Lerp Psyllid

After its introduction in the late 1990s, red gum lerp psyllid quickly built up high populations on red gum eucalyptus trees throughout the state. A parasitoid (*Psyllaephagus bliteus*) for this pest was collected in Australia by Dr. Don Dahlsten, University of California, Berkeley. The CDFA initiated a parasitoid-rearing program in cooperation with University of California, Berkeley to release and establish the parasitoid statewide. From 2001 to March 2003, the insectary in Sacramento was the primary producer of this parasitoid, producing over 48,000 parasitoids for release statewide. In 2003, a survey was conducted from August through October of over 50 locations to determine the status of the parasitoid populations. The results showed that parasitoid was well on its way toward establishment at all but two locations. These sites were sampled again in 2004 and 2005 and parasitoid activity was detected at all locations both years. Excellent control was noted at several sites in southern California and moderate control at numerous other sites. Unfortunately, a satisfactory reduction in psyllid numbers has not been achieved at a number of hot interior valley regions and in some northern California coastal areas. This may be due to a climate miss-match between the bio-control agent and these regions.

Pink Hibiscus Mealybug

In August 1999, the pink hibiscus mealybug was found in North America for the first time in the communities of Calexico and El Centro, California, and in the northern portion of the city of Mexicali, Mexico. Shortly thereafter, an insectary was setup in El Centro, CA, in cooperation with USDA-APHIS and Imperial County Agricultural Commissioner's Office, during the winter of 1999. From this insectary, three species of parasitoids were reared and released throughout the infested area during the next five years.

The impact of the parasitoid complex upon the density of the pink hibiscus mealybug is being monitored throughout the infested area in Imperial County, California. Mealybug population density counts and percent parasitism data were collected at regular intervals from 1999 to 2004. Following the introduction of parasitic wasps, mealybug densities declined greater than 98 percent and the risk of movement and establishment of the mealybug in new locations in California has been greatly minimized. The parasitoid, *Anagyrus kamali*, has persisted at each release site and parasitism commonly exceeds 50 percent. The parasitoid, *Gyranusoidea indica*, has seldom been recovered during the summer and early fall, but is common in mealybugs collected in late fall, tree-band samples. *Allotropa* nr. *mecrida* was the last biological control agent to be released (2003-04). Field samples collected in August and September of 2005 failed to recover any *A.* nr. *mecrida*. It appears, then, that this species has not established despite release of over 300,000 individuals in the infested area. Nonetheless, very satisfactory control by the two previously released parasitoids continues to date.

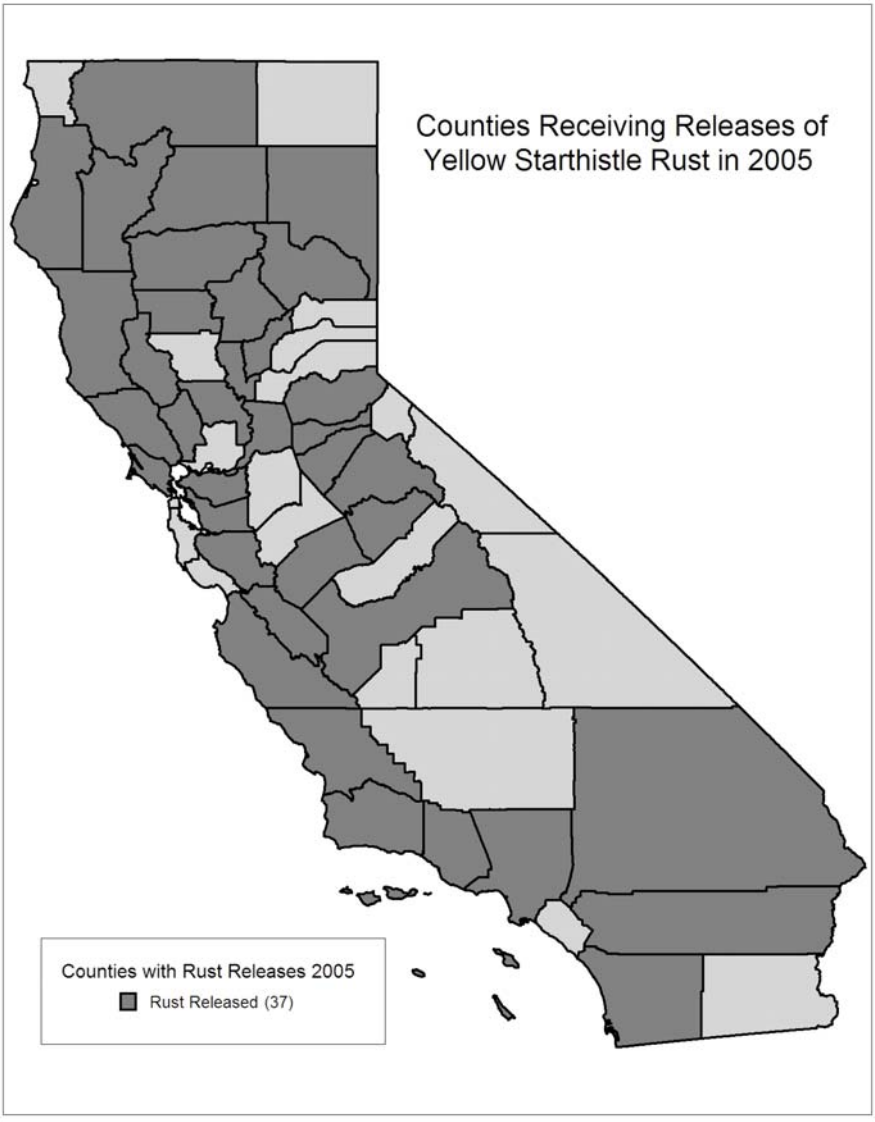
WEED PESTS

Squarrose Knapweed

Three species of knapweed insects have been widely distributed as biological controls on squarrose knapweed in Northern California. In combination with a fourth insect that naturally migrated from Oregon, the insects are virtually eliminating seed production within four years of establishment. Surveys completed in 2005 showed at 23 of the 26 sites where the insects had been present four years or more, over 90 percent of the seeds were being destroyed. As the current mature squarrose plants mature and die, there is almost no seed in the soil to replace

them. Without seedling recruitment, it is expected the squarrose populations will slowly decline over the next few years.

Yellow Starthistle: A second year of large scale release of the newly approved rust disease *Puccinia jaceae* var. *solstitialis* took place in 2005. Each release was made with the county agriculture commissioner officers at field sites heavily infested with starthistle. The total number of releases in 2005 doubled over the previous year so releases have now been made across the complete range of yellow starthistle in the state. Seventy-four releases were made in 37 counties in 2005. This rust is the newest of the biological control agents for California's most troublesome weed. Almost all of the releases were successful in establishing the rust that is now beginning to spread unaided.



Water Hyacinth

The water hyacinth weevil, *Neochetina bruchi*, is widespread in the Sacramento/San Joaquin River Delta, but it has not provided high levels of control of its host. A field study performed in 2003 and 2004, at two study sites, showed that while high numbers of all life stages of the weevil enter the winter, almost no eggs, larvae or pupae survived until the following spring. Most of the weevils that survived were adults, but their numbers decreased by nearly 98 percent by the beginning of the next growing season. In addition, a sizable proportion (10-30 percent) of the plants were not attacked by weevils (meaning they contained no larvae or eggs), and by winter's end, nearly all the surviving plants had no larvae or eggs. As a result, the weed came into the next growing season with a population of significant size and in good health and with only a small surviving population of weevils to challenge it. The weevil's life cycle takes nearly two months to complete, and during that time, the plant population can double several times. It appears that the plant population can outgrow the level of control the weevil can generate.

During 2004 and 2005 experiments were conducted to try and determine why winter is hard on weevil adults. Starvation in winter due to poor or limited food quantity was tested. During winter in the Delta, water hyacinth plants largely die back, so food supplies seem poor, although in general some green remains near the heart of a plant. In a greenhouse, weevils were fed through the winter on leaves that had come either from plants in the field or from a greenhouse culture. Several times during the course of the winter, the amount of feeding damage on leaves in the field was measured. The feeding experiment showed that the weevils survived better on the leaves from the field than leaves from the greenhouse. Apparently food quality was not a limiting factor. In addition, the weevils never ate more than about six percent of the available green leaf area in the field; the food supply seemed to exceed their demands. They do not starve over the winter. Second, the ability of adult weevils to tolerate the winter temperatures typical of the Delta was examined. Newly emerged weevils were held at different constant temperatures. This experiment is still running, but all the weevils died by 60 days when held at seven degrees Celsius (about 45 degrees F), while less than 25 percent have died at 24 or 32 degrees Celsius. The average temperature in Stockton is seven degrees Celsius for all of December and January. The hyacinth weevils come from the tropics in Brazil. They do not hibernate, and apparently cannot survive and develop at the temperatures that are typical of Sacramento/San Joaquin River Delta winters.

Puncturevine

The two puncturevine weevils, *Microlarinus lareynii* (seed weevil) (Figures 1 and 2) and *Microlarinus lypriformis* (stem weevil) (Figures 3 and 4), totaling some 2,700 weevils, were mass collected in July 2005 in Tulare, California and released at five sites in Lassen County for the biological control of puncturevine. The sites were pre-selected in order to assure the weevils could survive the cold winter temperatures common in the area. Lassen County Agricultural Inspector Lynne Turner, University of California Farm Advisor Rob Wilson and CDFA Biologist Carri Pirosko assisted in the site selection and in the releases of the puncturevine weevils.

Fall surveys of the release sites revealed live weevils, as well as, exit holes in both the seed heads and the stems at all the release sites. The sites will be surveyed again in 2006 to determine winter survival of the weevils.

Fig. 1: Microlarinus lareynii

Fig. 2: Seedhead damage

Fig. 1: Microlarinus lapriformis

Fig. 2: Stem damage

Purple Loosestrife

Releases of biological control insects were made at one purple loosestrife infestation in 2005. Approximately 3,200 *Galerucella* leaf beetles (consisting of *G. pusilla* and *G. calmariensis*) were released in a large infestation of purple loosestrife in Fresno County. The leaf beetles were collected near McArthur, California. Approximately 100 adults of the flower weevil, *Nanophyes marmoratus*, also collected near McArthur, were released in Fresno County. These releases were assisted by Dr. Norman Smith of the Fresno County Department of Agriculture.

Mediterranean Sage

Releases of the root weevil, *Phrydiuchus tau* Warner were made at six sites in northern California during 2005 with weevils collected in southern Oregon in early June. Approximately 1,500 weevils were released at two sites in Modoc County and some 3,000 weevils were released at four sites in Lassen County. Carolyn Gibbs from the United States Bureau of Land Management in Lassen County assisted in the collections and releases of the weevils.

Surveys of previous release sites during 2005 showed that the “med sage” root weevil has become established from the earliest releases made during October 2002 and November 2003. Releases at these sites were made with small numbers of weevils. The weevil population at each of the sites has not had a chance to build up in adequate numbers to see any impact of the weed at the sites.

Purple Starthistle

Two biological control insects, the seedhead weevils, *Larinus minutus* and *Bangasternus fausti*, were massed collected from squarrose knapweed in Lassen County and released at three sites located in Napa, Solano and Santa Clara Counties. Approximately 15,000 weevils were

released at each site in Napa and Solano and 2,000 weevils at a Santa Clara County site in late June 2005. Seedhead samples will be collected during winter to determine if these two weevils can become established on purple starthistle.

INVASIVE WEEDS

Hydrilla Eradication Program

The Hydrilla (*Hydrilla verticillata*) Eradication Program reached some success milestones in 2005. Two infestations, in Clear Lake and the Chowchilla River, are moving from the treatment phase to the follow-up monitoring phase. While program staff expect that hydrilla will likely re-appear, to a minor degree in Clear Lake, it is very satisfying to be reaching the end of treatments after many years of effort in these two infestations. However, two new infestations were found in Nevada County. While this is disconcerting, the fact that they were found after education and outreach efforts in the area, points out the value of those activities. This report begins with a brief review of the threat that this noxious, aquatic weed poses to the state's waterways, then gives a summary of the Departments authority and mandate to eradicate hydrilla, proceeds with a brief history and overview of the Hydrilla Eradication Program, and concludes with program highlights for 2005.

Key accomplishments for 2005 include:

- No hydrilla was detected in Clear Lake for the third season of treatment. Next seasons treatments will be suspended for hydrilla. This will clearly determine the full effects of the program's efforts to date.

- No hydrilla has been found in the Chowchilla River/Eastman Lake system since 2002. For the first time, no treatments are planned for this coming season.

- Surveys found no plants for the first time this year in the Hesseltine Pond/Bear Creek area of Calaveras County.

- Two new infestations of hydrilla were found, both in single ponds in Nevada County.

- The program began an eradication effort against an infestation of a new invader in California, South American spongeplant. The infestation is in Shasta County.

Hydrilla Threatens the State's Water Resources

Hydrilla is an invasive, submersed, non-native aquatic plant that is a threat to the water resources of the state. Hydrilla can reduce water storage capacity of lakes, ponds and reservoirs; impede movement in streams, canals and drains; jam water control structures and choke hydroelectric generators; impede navigation; degrade fish and wildlife habitat; and endanger public health by reducing water flow and producing mosquito breeding habitat. Hydrilla has been called the world's worst submersed aquatic weed. Annual control costs in highly infested states, such as Florida and Texas, are in the tens of millions of dollars.

Hydrilla Eradication Program

The CDFA is the lead agency in California for the eradication of hydrilla (California Food and Agricultural Code Sections 4068 and 7271). In 1977, after the first California hydrilla find, the California Legislature authorized the CDFA Secretary to initiate a survey and detection program for hydrilla, and to eradicate hydrilla wherever feasible (CFAC Section 4068). In 1985, after hydrilla was found in Redding near the Sacramento River, the Governor declared a "State of Emergency" to eradicate hydrilla. In 1994, the CDFA Secretary declared an "emergency situation" in regards to the hydrilla infestation discovered that year in Clear Lake. Similar declarations have been issued for most of the current hydrilla infestations. In 2004, CDFA Secretary Kawamura declared the latest emergency after hydrilla was detected in Nevada County. In addition, hydrilla is listed as an A-rated aquatic noxious weed by the CDFA.

Though the CDFA is the lead agency for hydrilla eradication, the CDFA administers the Hydrilla Eradication Program with the cooperation and support of the local county agricultural commissioners and other federal, state, county, city agencies, Native American tribes and private individuals and entities. In addition, the CDFA Hydrilla Eradication Program received financial and in-kind support in 2005 from the California Department of Boating and Waterways, California Department of Water Resources, United States Department of the Interior-Bureau of Reclamation, United States Army Corps of Engineers-Eastman Lake, Yolo County Flood Control and Water Conservation District, Lake County Department of Agriculture and Lake County Department of Public Works.

History and Overview of the Hydrilla Eradication Program

Hydrilla has been found in various places in the United States, including California. The dioecious (having male and female reproductive systems on separate plants) form of hydrilla was first identified in Florida in the 1960s, where it was possibly introduced in the 1950s. This infestation spread throughout the southeastern United States and Texas. It was first found in California in 1976 in a 31-acre man-made lake in Marysville, Yuba County (from which it has since been eradicated). The monoecious (having male and female reproductive systems on one plant) form of hydrilla was first detected in the Potomac River, near Washington, D.C. in the 1980s. It has since spread into a number of the southern states, into Washington State, and the first monoecious form was found in California in 1993 at an aquatic nursery in Visalia, Tulare County (from which it has since been eradicated).

Since 1976, hydrilla has been introduced into California waterways 31 separate times, in 18 counties (not counting detections in plant nurseries). Of these introductions, the Hydrilla Eradication Program has removed hydrilla from 19 sites in the following 12 counties: Los Angeles, Monterey, Riverside, San Bernardino, San Diego, San Francisco, Santa Barbara, Shasta, Sonoma, Sutter, Tulare and Yuba. The Hydrilla Eradication Program is currently eradicating hydrilla from the following nine counties: Calaveras, Imperial, Lake, Madera, Mariposa, Nevada, Shasta, Tulare and Yuba.

Every year, program crews repeatedly survey all known infested waterways. They also survey numerous other high-risk lakes, ponds, reservoirs, streams, canals and other water bodies in the state, including the Sacramento-San Joaquin Delta, to detect new infestations of hydrilla. The Hydrilla Eradication Program also investigates all reports from the public on potential new infestations. In 2005, two new hydrilla-infested sites were found in the main pond at the Nevada County Fairgrounds, and in a 0.1-acre private irrigation pond, also in Nevada County.

The Hydrilla Eradication Program uses an integrated pest management approach to eradicating hydrilla. In 2005, the program biologists used the following eradication methods: manual removal, biological control, small-scale dredging and fluridone and copper aquatic herbicides.

In addition to surveying and treating for hydrilla, the Hydrilla Eradication Program monitors aquatic herbicide concentrations in water, after applications, in order to confirm that the beneficial use of the state's waters are protected. This monitoring is done as a CDFA policy, and also to comply with the National Pollution Discharge Elimination System (NPDES) General Permit issued by the State Water Resources Control Board. To comply with the NPDES General Permit, the Hydrilla Eradication Program monitors fluridone water concentrations in Clear Lake and in the Riverview Golf Course Ponds in Shasta County.

2005 Highlights

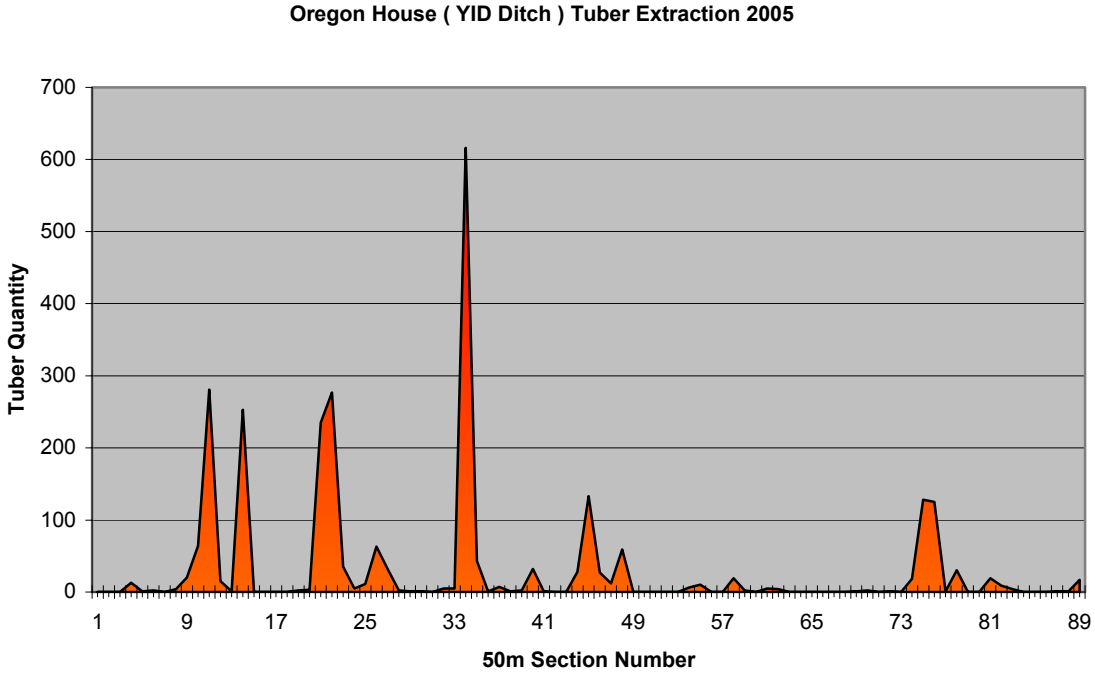
In Lake County, for the second year in a row, no hydrilla was detected in Clear Lake (Table 1). The last find in the lake was in June of 2003 before treatments began for the season. 2005 represented the third full treatment season with no finds. As a result, the program plans to suspend treatments for hydrilla in the 2006 season. Although program staff suspect that plants still exist in Clear Lake, this step represents an important milestone in the eradication effort. Because of the residual effectiveness of the herbicide used in the program, a break from treatment is necessary to give any remaining plants an opportunity to develop to the point where the surveys will have a nearly 100 percent chance of finding them. Only in this way can we clearly determine the full effectiveness of the efforts so far. Should plants be found, treatments will resume. In addition to the treatment efforts, the water-monitoring program showed that the aquatic herbicide applications made by the CDFA to eradicate hydrilla from Clear Lake did not, at any time, impair the beneficial use of the water from the lake.

Table 1. Level of Hydrilla Infestation in Clear Lake, Lake County by Number of Infested Management Units* and Number of Finds 2000 to 2005.

Year	2000	2001	2002	2003	2004	2005
Number of management units with "finds"	31	21	6	1	0	0
Number of hydrilla "finds"	67	41	12	1	0	0

In Yuba County in 2005, progress continued in eradicating hydrilla from infested ponds near Oregon House and from an infested section of the Yuba County Water District Canal. Of the 14 infested ponds, only one produced hydrilla this year. In the canal, CDFA biologists removed almost 2,700 tubers, down from just over 4,000 tubers in 2004. The hydrilla infestation in the canal has been reduced to several "hotspots" (Figure 1).

Figure 1. Number of tubers removed from the infested portion of the Yuba County Water District Canal (by 50-meter sections, beginning at the upstream end).



In Nevada County in 2005, CDFA and Nevada County biologists, following leads from the public, confirmed hydrilla in two more ponds in the County. One pond is in the County Fairgrounds and was found in March, and the other is an isolated 0.1-acre irrigation pond, found in late December. CDFA and USDA-ARS scientists made an initial assessment of the infestations. CDFA and Nevada County biologists responded rapidly and eradication plans were prepared within a few weeks. CDFA biologists treated the Fairground pond with fluridone, with excellent initial results. The infestation in the irrigation pond was discovered too late in the season to make treatments practical. Treatments will begin as soon as temperatures rise to appropriate levels. Treatments continued in the waste transfer pond infestation, which was found in 2004.

In Calaveras County, no hydrilla has been detected for seven years in all but one of the originally infested ponds and creek areas in the Bear Creek area. In the remaining infested pond area, no plants were detected in 2005, down from two plants in 2004, and 18 plants and five mats in 2002. In addition, no plants were detected in the isolated stock pond near Mokelumne Hill.

In Madera and Mariposa counties, there have been no hydrilla detections in the previously infested portion of the Chowchilla River for three years (Table 2). No hydrilla has been detected in Eastman Lake since 1993. Though recurrent drought in the area may be contributing to the results, CDFA and county biologists are hopeful that they will be able to declare eradication in this lake/river system within a few years. This coming season treatments will cease and the effort will shift to a monitoring phase, contingent on the continued absence of hydrilla.

Table 2. Number of Hydrilla Plants and Tubers Found and Removed from the Chowchilla River, Madera and Mariposa Counties 2000–2005

Year	2000	2001	2002	2003	2004	2005
Plants	19	5	2	0	0	0
Tubers	1,789	23	3	0	0	0

In Tulare County, CDFA biologists continue to survey and treat infested ponds at a private fishing resort near Springville. In the largest pond on the site, hydrilla has not been detected in three years, and no plants were found in any of the ponds in 2005. In addition, the hydrilla infestation has been contained to the original infested properties, and has not spread into adjacent rivers or ponds.

In Imperial County in 2004, the southeastern third of the previously infested area was removed from the quarantine zone. This area was never highly infested, and no hydrilla has been detected there in over 10 years. The only hydrilla detection in Imperial County in 2005 was in the Wildcat and Wisteria Drains. CDFA, Imperial County and Imperial Irrigation District (IID) biologists surveyed this drain in November of 2004 and found higher populations of hydrilla than previously thought. The decision was made to attempt to eradicate the plant from this troublesome area. In November of 2005 and continuing through the winter of 2006, while the flows in the drains were low enough to make working in them safe, CDFA and IID personnel manually removed all the plants, along with many tubers, throughout the areas of these two drains, leaving them completely free of visible plants. While staff believes that tubers remain and re-treatment will be necessary, this was a promising first effort under difficult conditions. In addition, the IID continued to produce and release the triploid grass carp in its canals for control of hydrilla and other aquatic vegetation.

In Shasta County in 2005, CDFA and Shasta County staff initiated an eradication program on a new invasive aquatic plant, South American spongeplant, which was found for the first time in California in a seven-acre pond in Redding. Spongeplant shares many characteristics with water hyacinth. CDFA staff treated the entire infested area of five acres. While the treatments were an excellent beginning, the infestation will probably need several years of follow-up treatment and monitoring to ensure its eradication.

In conclusion, the CDFA Hydrilla Eradication Program continues to protect California's waterways from this noxious weed. Though new infestations are being discovered, the overall population of hydrilla in the state continues to decline. Several previously infested areas were removed from quarantine zones in 2004, and project biologist's projects continued success in the future in eradicating hydrilla from remaining infested areas.

NOXIOUS WEEDS PROGRAM

Noxious Weed Eradication project's accomplishments in 2005 were:

- A total of 114 A-rated weed sites were treated and evaluated by program staff.
- A total of 12,453 miles of state, county and forest roads were surveyed for A-rated weeds.
- Program staff gave 40 educational, training and outreach presentations on Noxious Weed biology, identification and eradication. Over 1,250 people were in attendance at these presentations.
- Program staff attended meetings and gave presentations at all 47 Weed Management Areas in the state.

To date, Noxious Weed Eradication projects have eradicated 14 weeds from the state. These include: whitestem distaff thistle, dudaim melon, giant dodder, serrate spurge, Russian salttree, blueweed, tanglehead, creeping mesquite, meadowsage, heartleaf nightshade, Austrian peaweed, wild marigold, Syrian beancaper and perennial sowthistle. Weeds approaching eradication at the statewide level include camelthorn, golden thistle, smooth groundcherry, and Illyrian thistle.

Noxious Weed Eradication projects are a cooperative effort between the CDFA, the county agricultural commissioners and weed management areas. The objective of the projects is the early detection, containment and eradication of A-rated noxious weeds.

They are authorized according to CDFA Code, Section 403 where it states, "The Department shall prevent the introduction and spread of … noxious weeds." The term "noxious weed" is defined in the code, Section 5004 as "any species of plant which is, or is liable to be, detrimental or destructive and difficult to control or eradicate."

The CDFA has established, by way of policy, a noxious weeds rating system. Noxious weeds are classified as "A," "B," "C," or "Q." These ratings can be found in the following sources:

- "Pest Ratings of Noxious Weed Species and Noxious Weed Seed" (California Department of Food and Agriculture, Division of Plant Health and Pest Prevention Services, Integrated Pest Control Branch, 1220 "N" Street, Sacramento, CA 95814).
- Plant Quarantine Manual (http://www.cdfa.ca.gov/pqm).

The definition of an A-rated noxious weed, which is the targets of the Noxious Weed Eradication projects, is briefly described and summarized below:

"A" Eradication, quarantine or other holding action at the state-county level. Quarantine interceptions to be rejected or treated at any point in the state. Noxious weeds are rated as "A" if they are of limited distribution within the state and eradication efforts are likely to be successful.

In addition, Q-rated weeds are treated like A-rated weeds. The “Q” rating is a temporary rating pending more information.

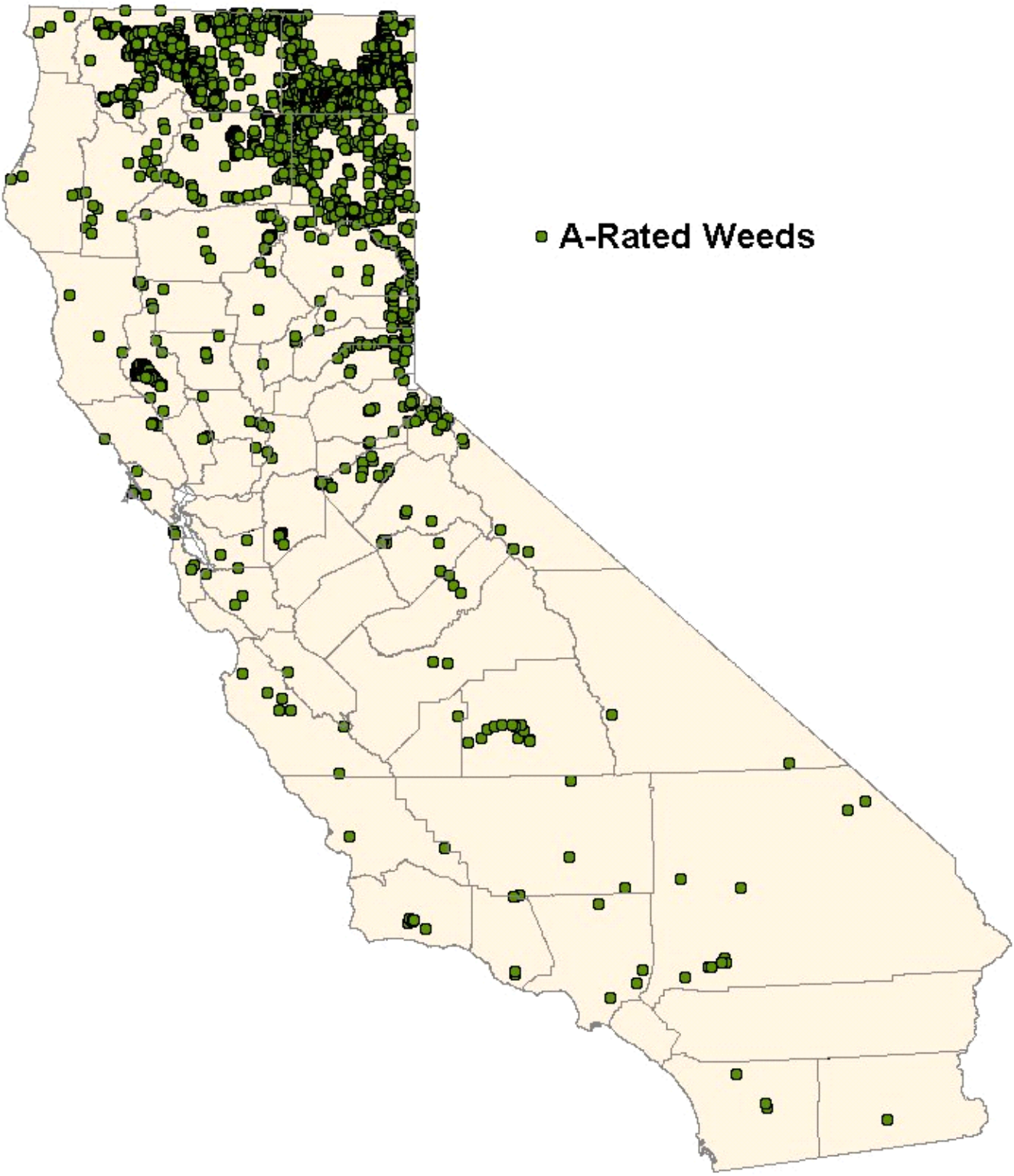
Currently, 22 A-rated weeds are under eradication, control or containment within California. These are:

1) Punagrass - *Achnatherum brachychaetum*
2) Camelthorn - *Alhagi maurorum*
3) Alligatorweed - *Alternanthera philoxeroides*
4) Fertile capeweed - *Arctotheca calendula*
5) Plumeless Thistle - *Carduus acanthoides*
6) Musk Thistle - *Carduus nutans*
7) Diffuse knapweed - *Centaurea diffusa*
8) Iberian starthistle - *Centaurea iberica*
9) Spotted knapweed - *Centaurea maculosa*
10) Squarrose knapweed - *Centaurea squarrosa*
11) Skeletonweed - *Chondrilla juncea*
12) Yellowspine Thistle - *Cirsium ochrocentrum*
13) Dudaim melon - *Cucumis melo* var. *dudaim*
14) Leafy spurge - *Euphorbia esula*
15) Halogeton - *Halogeton glomeratus*
16) Dalmatian toadflax - *Linaria genistifolia* spp. *dalmatica*
17) Scotch Thistle - *Monopodium acanthi*
18) Illyrian Thistle - *Monopodium illyricum*
19) Taurian Thistle - *Onopordum tauricum*
20) Harmel - *Peganum harmala*
21) Wormleaf salsola - *Salsola vermiculata*
22) Golden Thistle - *Scolymus hispanicus*

In addition, the State of California incorporates the federal noxious weeds as state noxious weeds, by regulation (CCR, Section 3161).

The statewide distribution of current A-rated noxious weed infestations can be seen on the following map (Figure 2). Note that a disproportionate number of the A-rated noxious weed infestations in California are found in the four most northeastern counties (Lassen, Modoc, Shasta, and Siskiyou). This distribution probably results partially from the large amount of open rangeland in these counties and the movement of cattle from out of state. It probably also results partially from the movement of weed seed and parts on vehicles from out of state into these counties.

Figure 2. Locations of A-Rated noxious weeds in California. Each point on the map is a centroid (center locator) which may represent multiple weed populations over a large area.



The Noxious Weed Eradication project's field activities in 2005 were approximately distributed as follows:

- Forty percent consisted of survey and detection of A-rated noxious weeds at known and historical find sites and defined "high-risk" corridors of entry into the state.

- Thirty-five percent consisted of eradication activities, such as physical removal, assistance to the Biological Control group in introducing and evaluating biological weed control agents, and chemical control.

- Twenty percent consisted of outreach and education to elicit the help of the County Agriculture Departments, Weed Management Areas, and public partners to report possible A-rated noxious weed finds.

- Five percent consisted of establishing and evaluating monitoring plots to measure the efficacy of the eradication effort and changed in A-rated noxious weed populations through time.

PINK BOLLWORM AND OTHER COTTON PESTS

Program personnel continue to utilize a risk-based management approach to maximize cost efficiencies without significantly sacrificing program detection and control objectives. The San Joaquin Valley was divided into bio-potential zones, based on climate data and native moth capture history. The program activities of sterile release, mapping and trapping were then coordinated within each zone using the pink bollworm (PBW) heat unit model.

A grand total of 666,340 acres of cotton was mapped in California during 2005. Southern California cotton acreage totaled 23,710 acres. The three cotton-growing counties of Northern California's Sacramento Valley had a total of 5,515 acres. PBW Program personnel mapped 637,115 acres of cotton in six counties of the San Joaquin Valley. The statewide acreage was down (~14.5 percent) from the 779,365 acres mapped in 2004. Pima cotton plantings in the San Joaquin Valley for 2005 amounted to 231,000 acres, an increase of 7.1 percent from the 215,635 acres in 2004.

Early detection trapping was done at selected San Joaquin Valley sites having native PBW moth catches in 2004 to detect possible over-wintering populations and monitor sterile release. The early detection trapping was conducted from April 18 through July 22. General detection trapping activities were matched to the bio-potential zones. The program also utilized different trapping ratios: 1) one trap per 60 acres, 2) one trap per 80 acres, and 3) one trap per 100 acres. The starting dates for each bio-potential zone were staggered to align with the PBW heat unit model. The earliest general detection trapping began in the southern San Joaquin Valley on June 20. The total number of traps deployed during the peak of the season was 8,863 traps. Traps were inspected weekly and removed by October 28.

A special desert trap line ran from Highway 58 into the Mojave Desert. This trap line monitors possible PBW moth migration from the southern desert cotton growing regions of Arizona, Mexico, Riverside and Imperial counties into the San Joaquin Valley. Zero PBW moths were detected in the Mojave Desert trap line in 2005. There was one PBW moth detected in the Mojave Desert trap line in 2003, most likely a "blow-in moth", resulting from hurricane "Marty".

The PBW Identification Lab in Visalia examined 13,166 traps containing suspect moths submitted by trappers. A total of 231,523 sterile moths and 160 native moths were identified in the San Joaquin Valley traps in 2005. Sixty-three native moths were caught in 2004 and 180 native moths in 2003. The breakdown of moths trapped per county in 2005 was 51 native moths trapped in Kern County, 26 in Kings County, 82 in Tulare County, and one in Merced County.

The sterile moth receipts from the PBW Rearing Facility in Phoenix, AZ were consistent throughout the entire release period. There was an average of 1.5 million sterile moths released per day. Approximately 231,649,268 sterile moths were released in the San Joaquin Valley.

A reduced tillage permit was issued by CDFA to the PBW regulated districts in the San Joaquin Valley. The Permit had several key requirements including grower notification to the local County Agricultural Commissioner, post harvest cotton plant shredding, tillage sufficient to prevent plant regrowth, regulatory inspection of cotton fields, and substantial prohibited or restricted areas based on PBW native finds. The most significant change was not requiring that roots, plant stubs, shredding debris and trash remaining from harvesting or clean–up operations be mixed with surface soil. This annual permit expires December 31, 2005.

Methods Development Trials

CDFA staff and Phoenix Rearing Facility personnel conducted two field trials. One trial was conducted to assess "same day" sterile release made in the early afternoon. Typically, sterile moth shipments are received and then "held over" (in the cold room) until early the next morning. This trial assessed SIT releases made immediately upon receipt of the SIT shipment. Sterile moth mortality and trap recapture was measured. A 2x recapture rate was observed above the standard shipping/release procedure. In the other trial, evaluation of three different aircraft release speeds; 110 mph, 120 mph, and 130 mph were conducted. Preliminary results indicate recapture was greatest at 130 mph, distribution was best at 120 mph, and 110 mph was lowest in both categories.

<u>*Bt* Resistance Monitoring</u>

PBW Program personnel conducted trapping and boll collection in the cotton-growing areas of Southern California. Cooperating with the USDA, the Arizona Cotton Research and Protection Council and the University of Arizona, PBW Program staff conducted trapping and boll survey designed to evaluate PBW resistance to *Bt* cotton. Monitoring was done in Riverside and Imperial counties. To date, no resistance has been observed.

<u>Silverleaf White Fly</u>

Cotton fields were monitored for the seasonal abundance and distribution of Silverleaf white fly (SLWF) in the San Joaquin Valley. Data was summarized in bi-weekly reports and provided to USDA, Agricultural Commissioners and University of California, Cooperative Extension. During 2005 only six percent of the leaves sampled from all counties were infested with SLWF compared to 26.5 percent in 2004. The overall percentage of sites infested with SLWF was 29.1 percent, down from 84.2 percent in 2004. The percentage of sites with honeydew was down 24.1 percent compared to 2004.

Cotton Boll Weevil

Since November 19, 1990, no boll weevils, *Anthonomus grandis*, have been trapped in California. The declaration of eradication of boll weevil was issued December 1993. Program efforts continue to help keep the state free of boll weevil. Traps are deployed in Southern California cotton-growing areas to monitor any post eradication boll weevil activity. The Imperial County Agricultural Commissioner, under contract with the CDFA, monitors boll weevil traps year round along the borders of Arizona and Mexico. CDFA traps each cotton field in Imperial and Blythe/Palo Verde Valleys. No cotton boll weevils were detected in California.

VERTEBRATE PEST CONTROL

The primary objectives of the Vertebrate Pest Control Research Program are to maintain the California Department of Food and Agriculture's (CDFA) field-use rodenticide registrations and to administer the Vertebrate Pest Control Research Program. The agricultural community and other stakeholders utilize the CDFA's rodenticides in order to prevent and control vertebrate pest damage to agricultural commodities, agricultural infrastructure, and water control and conveyance structures and to protect the public health and safety.

The Vertebrate Pest Control Research Program funds research studies to investigate experimental application. Strategies are employed to improve rodenticide efficacy, non-target hazard studies to reduce the potential hazard of secondary poisoning to non-target species and product chemistry and residue data to support the expanded use of rodenticides on crops. Since 1991, the Vertebrate Pest Control Research Program has funded 91 research projects on efficacy, product chemistry, crop residues and non-target hazards, totaling $6.1 million to support the CDFA's registrations and to expand the uses of the CDFA's rodenticides.

The key accomplishments for 2005 include:

- Legislative Reauthorization of the Vertebrate Pest Control Research Program
- Development of a Web site for the Vertebrate Pest Control Research Program
- Industrial Hygiene Surveys and Hazard Assessments of County Bait Manufacturing Facilities under the County Bait Manufacturing Compliance Agreements.

Legislative Reauthorization of the Vertebrate Pest Control Research Program

Senate Bill 872, co-authored by Senators Jeff Denham and Dean Florez. The bill was sponsored by CDFA. The bill was enacted during the 2005 legislative session. The California Farm Bureau Federation, California Cattleman's Association, California Alfalfa & Forage Association, California Beet Growers Association, Western Growers Association, California Association of Pest Control Advisors, California Agricultural Commissioners and Sealers Association, Northern California Water Association and other agricultural interests supported the bill.

Some of the important legislative changes to the program include:

- Extending the program sunset provision until January 1, 2016

- Expanding the purposes of the research program to address vertebrate pests, which pose a significant risk to the state's infrastructure
- Defining research to include both basic and applied research
- Restricting expenditure of funds from the Vertebrate Pest Control Research Account, to administrative and operational expenses, regulatory fees, basic and applied research funding and educational outreach expenses.

Vertebrate Pest Control Research Program Web site

The Vertebrate Pest Control Research Program has developed a Web site (www.vpcrac.org). The Web site includes: general information on the research program and the committee that recommends funding for the program; legislation that created the research program; background information on vertebrate pests and damage to agriculture in California; and public-friendly reports about the research projects funded by the program. There is also a newsletter and a calendar of events.

County Bait Manufacturing Compliance Agreements

Compliance agreements are in effect between the CDFA and eight county agricultural commissioners that formulate rodenticide baits on behalf of CDFA. The compliance agreements specify conditions of manufacture and are part of an overall Quality Assurance/Quality Control program CDFA has implemented. As part of this program the CDFA and counties conducted individual Industrial Hygiene Surveys and Hazard Assessments of the county bait manufacturing facilities. These were comprehensive surveys and assessment to determine compliance with federal, state and local regulations governing the manufacturing of rodenticides baits with an emphasis on employee health and safety.

Vertebrate Pest Control Research Advisory Committee

The Vertebrate Pest Control Research Advisory Committee held two meetings in 2005, the first was held on April 6, in Santa Barbara County and the second on October 19, in Monterey County.

The following research proposals were recommended for funding by the Committee, approved by the Secretary of CDFA, and initiated in 2005:

1. "Economic Assessments of Selected Benefits and Costs of Wildlife Damage Management Programs in Kings, Fresno, and Los Angeles Counties," Dr. Stephanie Shwiff, USDA, APHIS, Wildlife Services, National Wildlife Research Center.

2. "A Field Test of Jackrabbit Bait Station Strategies," Dr. Terrell Salmon, University of California, Davis.

3. "Identification of Attractants for the Coyote Lure Operative Device," Dr. John Johnston, USDA, APHIS, Wildlife Services, National Wildlife Research Center.

4. "Development of Natural Predator Control Toxicant," Dr. John Johnston, USDA, APHIS, Wildlife Services, National Wildlife Research Center.

5. "Tetracycline as a Synergist in Diphacinone Baits to Increase Efficacy, Reduce Residues and/or Lower Potential Secondary Hazards," Dr. Thomas Primus, USDA, APHIS, Wildlife Services, National Wildlife Research Center.

6. “CDFA Vertebrate Pest Control Handbook Revision and Internet-Development,” Dr. Terrell Salmon, University of California, Cooperative Extension, San Diego County.

WEED MANAGEMENT AREAS PROGRAM

The Weed Management Areas (WMA) are local working groups that bring together interested landowners, land managers (private, city, county, state, and federal), special districts and the public for the purpose of combining their actions and expertise to deal with common noxious weed control problems. This organizational concept was originated by the federal government in the Greater Yellowstone region, resulting in increased weed control across the boundaries of three states. This type of collaborative weed control is widely recognized as an ideal way to implement weed management programs locally.

WMA demonstrate the efficacy of local cooperative action in:

- Eradicating and controlling weeds in an integrated, strategic and prioritized fashion;
- Stopping the spread of noxious and invasive weeds on public and private lands; and
- Educating people at all levels about the need and opportunities to control weeds.

Legislation in 1999 (Assembly Bill 1168, Frusetta Chapter 961, Statutes of 1999) provided the CDFA sufficient funding to develop pilot weed management programs through local WMAs in several counties. The bill established a Noxious Weed Management Account in the CDFA, allocating $200,000 for each of three years to support work by WMAs. Senate Bill 1740, adopted in 2000, added $5 million to the Noxious Weed Management Account and extended the time funding will be available to WMAs throughout the state.

In 2005, there was no longer any funding from the original legislative bills.

The objective of this work proposal from the CDFA to the United States Forest Service (USFS), State and Private Forestry is for the CDFA to manage a funding program to prevent the spread of noxious and invasive weeds onto forested lands, including urban forests and USFS lands, from nearby non-federal public and private lands. These funded work plans would include survey and detection for noxious and invasive weed populations, control and eradication activities and public outreach and education to stop or slow the spread of noxious and invasive weed seed and plant parts.

COST-SHARE GRANT PROGRAM

The CDFA will solicit a two year grant proposal for the survey, control or eradication of noxious and invasive weeds that threaten to spread, by natural or human routes of transport, onto forested lands in Northern and Central California. Control and eradication methods can include physical, mechanical, biological, chemical or cultural methods, or any combination of these. Proposals may also include public education and awareness if coupled with recommendations to the public to practice weed prevention and to report any finds of noxious and invasive weeds to the appropriate authorities.

Proposals will be granted in the following categories:

1) Proposals with a clear direction toward eradication of small, pioneer infestations (less than five acres in size: less than 100 net acres of weed in county). Proposals can address brand new projects or continued support for previously funded projects. Project proposals in this priority area must include monitoring data (such as: estimate of plants killed after follow-up visits, number of plants treated each year, and/or other quantitative data from sampling techniques) kept over the lifetime of the project or proposed data that will be gathered for brand new projects. Ideal targets are A-rated noxious weeds, or other incipient invaders, as defined above.

2) Proposals addressing the leading edge containment of a noxious weed. Proposals must address why the infestation is currently not eradicable and thus justify why a containment strategy is being undertaken. A clear link to proposed containment activities preventing further spread towards USFS lands or other forested lands must be shown. Proposals must include a map clearly showing the total geographic area impacted by the infestation and proposed containment boundaries.

3) Proposals addressing survey of and subsequent clear direction toward the eradication of noxious weed infestations found in "source material" locations, such as: gravel pits, rock quarries, mulch sources, and the like, that have been or could potentially be linked to new weed infestations away from the source material site. Proposals addressing weed free forage will not be accepted. A distinction should clearly be drawn between government owned (County, State, or Federal) and privately operated source material locations. If the proposal addresses privately owned source material locations, a strong cost share (e.g. 75 percent private entity: 25 percent proposal funding) must be demonstrated. Proposals must also draw a clear tie of benefits to USFS lands.

The following highlights program progress in 2005:

- Over $453,583 was distributed to 24 WMAs in 2005.

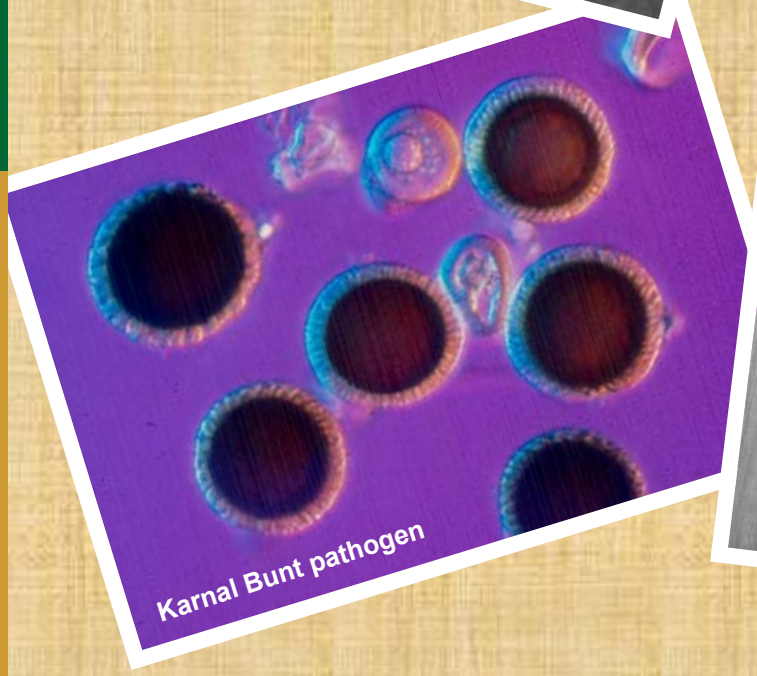
- This state seed money has been matched locally by a total of $453,583 of "in-kind" resources (donated equipment or services) and matching cash dollars.

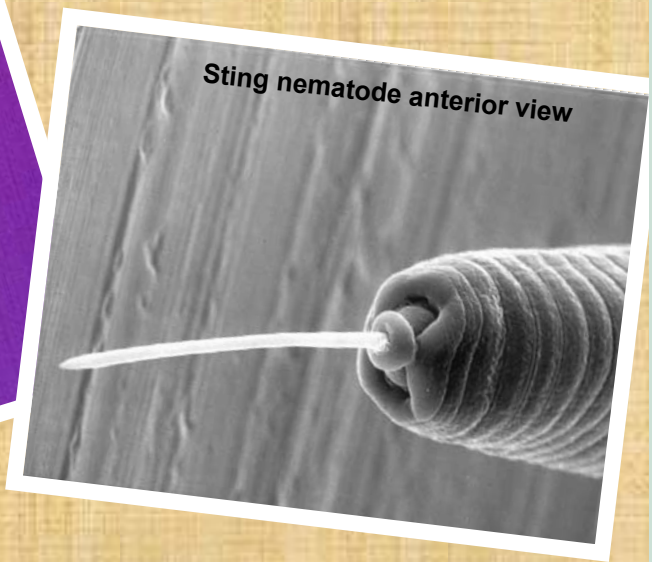
- The number of countywide WMAs in California has grown from seven in early 1998 to 48 in 2005. These groups represent all 58 counties in the state.

- An estimated 77,688 landowners and citizens have participated in noxious and invasive weed education statewide events.

- On September 19 and 20, 80 WMA members attended the seventh Annual Statewide WMA Meeting in Woodland, California for training, exchange of information, to hear panels on WMA success stories, and to network with WMAs throughout the state.

Plant Pest Diagnostics Branch





PLANT PEST DIAGNOSTICS BRANCH

Mission: *To serve as a scientific and professional resource, providing timely and accurate plant pest diagnostics to our clients, with the aim of protecting California's agriculture and environment.*

Vision: To continually enhance our professional expertise as an internationally recognized scientific service and research center committed to meeting future scientific challenges to California's agricultural and environmental needs.

Values:

- **Leadership** in the field of plant pest diagnostics.
- **Excellence and innovation** in science, technology, research, and service.
- **Professional integrity** in taking responsibility for the validity of work based on the best available and accepted scientific protocols.
- **Trust** established by practicing ethical conduct.
- **Empowerment** through an organizational culture that promotes delegation of authority, creativity, and celebration of accomplishments.
- **Mutual respect, cooperation and communication** through partnerships and teamwork and the constructive exchange of ideas.

The Plant Pest Diagnostics Branch (PPDB) also serves as a scientific resource and provides professional expertise to a number of clients including CDFA, the United States Department of Agriculture (USDA), other federal and state agencies, County Agricultural Commissioners, the University of California Cooperative Extension, the agriculture industry, and the public. Our scientists, technicians and support staff strive to provide excellence in service and leadership in plant pest diagnostics and biosystematics.

The staff of this Branch continues to provide leadership in plant pest diagnostics and excellence in scientific service and research.

Table 1. Sample Processed Data (4 Years)

Labs/Programs	2002	2003	2004	2005
Botany	4,150	3,284	1,008	1,000
Entomology*	41,529	36,146	45,000+	50,000+
Nematology	5,042	4,782	3,874	4,923
Plant Pathology*	88,402	88,233	109,398	103,451
Seed Science	3,861	3,067	6,923	3,166
Total	**142, 984**	**135,512**	**166,203**	**162,540**

* Includes special projects

Please note that the numbers cannot be compared among the different disciplines (labs/programs) as an accurate indication of workload.

The sample numbers listed are in no way representative of the amount of time or labor required to complete any given sample. Nor can sample numbers be compared among the different disciplines (labs) as a measure of workload. Note for example, that the number of plant taxonomy or seed samples does not reflect the number of actual identifications made for a given sample in these labs. It is common for a single plant or seed sample to require multiple identifications of all the material in a sample. Thus a more accurate representation of the true workload for plant taxonomy and seed taxonomy would be several times these numbers. In a similar way, sample numbers alone do not differentiate between an insect identification that is an immediate recognition and identification, from one requiring lengthy study, possibly collaboration with other experts, or even a new published description. Likewise sample numbers of plant pathology do not differentiate those requiring only a simple, quick serological test, from a sample requiring days to weeks of culturing, microscopy, greenhouse testing, etc. in order to arrive at a diagnosis. And, of course, the same line of reasoning is true for Nematology samples as well.

The California State Collection of Arthropods

The Entomology Laboratory's arthropod collection, a significant resource of more than 1.5 million specimens, is utilized for comparative specimens in diagnostics by our staff and as a resource for scientists worldwide. Our staff has added more than 30,000 specimens to the collection this year, and an inventory of the species held is about one-third completed. As far as specimen usage, 32 loans were issued in 2005, representing nearly 14,000 specimens, and more than 35 visitors from the local, national and international communities have come in to study our collections, including four who studied in our collection for extended periods of one to several weeks.

Seminar Series

The PPDC seminar series began in 2004 to enable scientists to present research data and discuss ongoing research and pest issues of general importance, and has continued throughout 2005 with participation by many from within and outside of the Branch. The speakers have included scientists from the PPDC, USDA, University of California, Davis and visiting scientists from other universities and agencies. The focus of the seminar series has been to share information on any aspect of basic or applied research or diagnostics and includes invited speakers from other institutions. Dr. Shaun Winterton, Associate Biosystematist, coordinates the seminar series.

Research

The scientists at the PPDC continue to do research and publish scientific papers as part of the mission of this branch. In the past year members of our branch published 48 scientific papers. In addition, 28 posters and/or presentations were given at various professional meetings, seminars and training workshops. A list of scientific publications and presentations are below.

2005 Publications

Bellamy, C. L. 2005. New synonymy in Buprestidae (Coleoptera). *The Coleopterists Bulletin* 59(1): 26.

Bellamy, C. L. 2005. Clarification of synonymy in three species of *Temognatha* Solier, 1833 (Coleoptera: Buprestidae). *The Pan-Pacific Entomologist* 81(1-2): 99 100.

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Chitambar, John J. and Howard Ferris. 2005. "*Geocenamus angelescresti* n. sp., a diagnostic key and compendium to the species of the genus *Geocenamus* Thorne & Malek, 1968 (Nematoda: Belonolaimidae)." Journal of Nematology, 37 (4): (In press).

Chitambar, John J. 2005. "Protocol for collecting and handling plant and soil samples for the detection of plant parasitic nematodes at the Nematology Laboratory, Plant Pest Diagnostics Branch, California Department of Food and Agriculture."
www.cdfa.ca.gov/phpps/ppd/SampleProcedures/Nematology/SamplingandHandlingProtocol.htm

Cline, A.R. and R.A.B. Leschen 2005. Coleoptera associated with the Oyster Mushroom, *Pleurotus ostreatus* Fries, in North America. Southeastern Naturalist 4(3): 409-420.

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Yang, D., & **S.D. Gaimari**. 2005. Review of the species of *Elaphropeza* Macquart (Diptera: Empididae: Tachydromiinae) from the Chinese mainland. *Proceedings of the Entomological Society of Washington* 107 (1): 49-54.

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2005 Presentations

Blomquist, C. "*Phythophthora* problems in California Nurseries." CDFA Seminar, Sacramento**.**

Buffington, M. "The phylogenetics and evolution of the Figitidae (Hymenoptera: Cynipoidea)." Invited speaker, "Lunch Bunch", Dept. of Biology, UC Riverside. 27 Jan 2005.

Buffington, M. "The phylogenetics and evolution of the Figitidae (Hymenoptera: Cynipoidea)." Invited speaker, CDFA, Plant Pest Diagnostics Lecture Series. 06 Oct 2005.

Buffington, M. "Uncle PEET appreciates Parasitoids: How the National Science Foundation is shaping the future of research on Parasitic Hymenoptera (Insecta)." Invited speaker, Australian Entomological Society Annual Meeting, Canberra, Australia 06 Dec 2005.

Buffington, M., Johan Nylander, and Fred Ronquist. "Phylogeny and Evolution of Cynipoids" Invited speaker(s), International Society of Hymenopterists 6th Congress, Sun City, South Africa, 22-27 Jan 2006.

Chitambar, John. "Sampling for California's Regulatory Plant Parasitic Nematodes". John Chitambar, guest speaker at four Plant Pest University Workshops organized by CDFA Pest Exclusion for County Agricultural Commissioner field inspectors and biologists. Los Angeles, Santa Maria, Modesto, Fresno.

Cline, A. R. "The Sap Beetles (Coleoptera: Nitidulidae) of Great Smoky Mountains National Park." Annual meeting of the Discover Life in America meeting for the Great Smoky Mountain National Park All Taxa Biodiversity Initiative.

Cline, A.R. Carlton, C. & Victoria Bayless. "The Sap Beetles (Coleoptera: Nitidulidae) of Great Smoky Mountains National Park." Annual meeting of the Entomological Society of America.

Effenberger, J. "Seed identification of *Brassica* and *Sinapis* (Brassicaceae); Floret identification of *Agropyron, Elymus, Elytrigia, Pascopyrum, Psathyrostachys*, and *Pseudoroegneria* (Poaceae). 2005 Annual CDFA Seed Workshop, Plant Pest Diagnostics Center, Sacramento.

Epstein, M. "Slug caterpillars of Costa Rica and Beyond." University of Minnesota, University of Hawaii, Hawaii Department of Agriculture, and CDFA Seminar, Sacramento.

Gaimari, S. CDFA Seminar, Sacramento. "Evolutionary relationships of the enigmatic superfamily Lauxanioidea (Insecta: Diptera)."

Milonas, Souliotis, and **S. Gaimari.** *Neoleucopis kartliana*, the major natural enemy of *Marchalina hellenica*: Morphology-Biology. Poster presented at the 11th Panhellenic Entomological Society, Plastira Lake, Greece.

Garrison, R. "An illustrated guide to some recent insect pests introduced into Southern California." California Department of Food and Agriculture Seminar Series, Sacramento.

Hauser, M. "Fossil Therevidae (Diptera, Asiloidea) – How the past can change our view of the present – Fossils X3" Poster presented at the 3rd International Congress of Palaeoentomology. Feb 2005 Pretoria, South Africa.

Hauser, M. "Flies, Fossils, and Phylogenies." Poster presented at North Carolina State University, Raleigh, NC.

Hauser, M. "The Basal Lineages of Stiletto-Flies (Diptera: Therevidae)"
Seminar, Department of Entomology, University of Illinois at Urbana-Champaign.

Hauser, M. "Fossils, Molecular Clocks, and Evolution of Therevidae." Entomological Society of America meeting, Fort Lauderdale, FL.

Hill, Barry L. Hashim-Buckey, Jennifer; and Peacock, William. 2005. "The Effect of Dormant Season Survival of Xylella fastidiosa in Grapevines on Pierce's Disease Epidemics in Temecula and Kern County." Proceedings, 2005 Pierce's Disease Research Symposium.

Hill, Barry L. Hashim-Buckey, Jennifer. 2005. "Dormant Season Survival of Xf and the Temecula and General Beale PD Epidemics." Presented at 2005 Pierce's Disease Research Symposium, San Diego, CA.

Kerr, Peter. February 4, 2004. "Evolutionary relationships Snipe-flies and their relatives (Insecta: Diptera: Rhagionidae)" presented to the Northern Californian Entomologist Club annual meeting, Fairfield, CA.

Meyer, D. J. L. and J. Effenberger, and J. Sher. "Demonstration of the LUCID computer-based seed key for the Federal Noxious Weed Disseminules of the U. S." Seed Issues Forum of the Annual meeting of the AOSA/SCST/CSAAC.

Meyer, D. J. L. "A virtual purity analysis: A review of the Association of Official Seed Analysts (AOSA) Rules for Testing Seeds; Seed and fruit identification of 27 species of the Brassicaceae 2005 Annual CDFA Seed Workshop, Plant Pest Diagnostics Center, Sacramento.

Meyer, D. J. L. "Seed and fruit morphology in the Fabaceae and the identification of 19 species of large-seed legume crops." Idaho Seed Analysts Association Seed Workshop, Idaho.

Meyer, D. J. L. & J. Hinke. "Comparison of the AOSA, ISTA (International Seed Testing Association) and CFIA (Canadian Food Inspection Agency) procedures for laboratory seed lot purity testing; How to use *AOSA Handbook 25 Uniform Classification of Weed and Crop Seeds* to determine classification of contaminating species in an AOSA purity test; AOSA procedures for reporting laboratory results; Testing seed mixtures – a review of the AOSA Rules and the CFIA Methods and Procedures. Association of Official Seed Analysts (AOSA)/ Society of Commercial Seed Technologists (SCST)/ Commercial Seed Analysts Association of Canada (CSAAC) Annual Meeting, Saskatoon Saskatchewan.

Peterson, P. "Cotyledon evaluation of Cucurbitaceae (*Cucumis, Cucurbita*, and *Citrullus*); Seedling evaluation of pepper (*Capsicum* spp.); Seedling evaluation of Asteraceae (*Lactuca, Cichorum, Carthamus tinctorius, Helianthus*); Seedling evaluation of radish (*Raphanus sativus*). 2005 Annual CDFA Seed Workshop, Plant Pest Diagnostics Center, Sacramento.

Tidwell, T.E. "*Phytophthora ramorum* in California Nurseries."
California, Florida, and Idaho Nurserymen and Regulatory Agricultural Officials, Anaheim, CA, January 2005.

Tidwell, T.E. "Sudden Oak Death." Annual meeting of California Agricultural Commissioners and Sealers Association, Redding, CA, May 2005.

Watson, G. "The FAO-EU IPM program for Cotton in Asia." Northern California Entomologists' Club, May 6, 2005.

Staffing Changes

Dr. Martin Hauser and Dr. Matt Buffington have joined our branch in the Entomology Laboratory as Post-Doctoral Researchers in 2005. Dr. Hauser's area of specialization is Diptera (Stratiomyidae, Tephritidae, Therevidae), and molecular systematics. Dr. Buffington's area of specialization is Hymenoptera (parasitoids). Both have been welcomed our laboratory and look forward to a productive year.

In addition, Erin Lovig and Monica Negrete joined the Plant Pathology Laboratory as Agricultural Biological Technicians. Likewise, Saraah Kantner and Randy Plant joined the Entomology Laboratory as Agricultural Biological Technicians.

Retirements

Four PPDB staff retired in 2005 after collectively serving nearly 100 years in the Laboratory.

Khiet Le retired after 20 years as Librarian. Khiet's career with CDFA was a real success story and an inspiration to many. One of the original Viet Nam refugees in the aftermath of the Vietnam War, i.e. one of the famous "boat refugees," Khiet came to America and eventually carved out a successful career as a librarian for the PPDB Laboratory. He now resides in the Sacramento area, and is an author, writing in both English and Vietnamese.

Librarian, Khiet Le

Dr. Marian Stephenson retired as a Senior Seed Botanist with the PPDB Seed Laboratory after 18 years of service. Marian was responsible for regulatory seed physiology testing, regulatory data system management, and seed physiology research. In recent years she served as a very active member of the Association of Official Seed Analysts (AOSA) Tetrazolium Testing Research Committee, as well as the AOSA Germination Testing Research Committee. Marian is a Registered Seed Technologist with the Society of Commercial Seed Technologists as well as an International Seed Technologist with the International Society of Seed Technologists. She contributed many hours in the training of other Registered Professional Seed Technologists as well as other seed testing professionals in the areas of her expertise. She also represented CDFA by serving on professional seed science committees with various national professional seed associations. Marian now resides in Davis, California.

Senior Seed Botanist, Marian Stephenson

Ms. Diana Fogle served the PPDB laboratory as a mycologist, identifying fungi, for over 20 years, after serving in a similar position at the Plant Pathology Department of the University of California, Davis (UCD). Ms. Fogle co-authored a number of scientific papers, trained several diagnosticians in the finer points of classical mycology, and served as an invaluable resource to CDFA, as well as to scientists of the University of California Cooperative Extension and the Department of Plant Pathology at UCD. Diana has a world-class reputation for expertise in several groups of fungi, particularly in the genus *Verticillium*. In fact, at one point Diana designed and validated a seed health testing procedure, including a special selective culture medium, for the detection of *Verticillium albo-atrum* in alfalfa seed. This method was ultimately adopted by the Agriculture Ministry of Australia as its standard method of testing alfalfa seed for this pathogen. Diana now makes her home in the Northern California mountain community of Weed, in the shadow of Mount Shasta.

Mycologist, Diana Fogle

Dr. Robert Hackney retired as a senior nematologist after 32 years of service. Bob specialized in the taxonomic identification of plant pathogenic nematodes. Bob also played a key role for many years in the annual California Nematology Workshop, sponsored by CDFA and UC Davis for professional nematologists. Bob now makes his home in Southern California.

(photo not available)

For a much more comprehensive and detailed version of the 2005 Plant Pest Diagnostics Branch (PPDB) Annual Report, visit the CDFA PPDB Web site at:

http://www.cdfa.ca.gov/phpps/ppd/

On the Web site, in addition to the 2005 annual report, you will find previous years' annual reports; the current and recent issues of the laboratory newsletter, *California Plant Pest Diagnostics Report;* and other information.

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