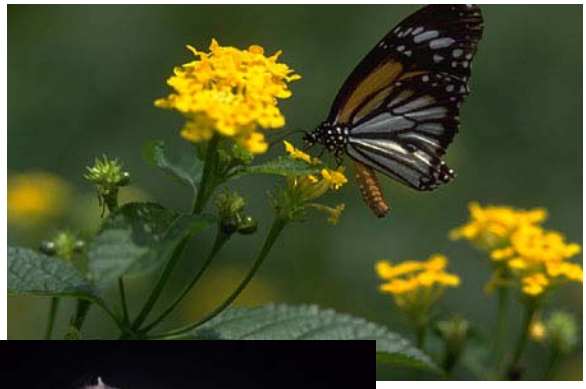
ANNUAL REPORT 2003

CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE



PLANT HEALTH AND PEST PREVENTION SERVICES

MAY 2004

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 recognized 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: *Protect California from the damage caused by the introduction or spread of harmful plant pests.*

Source – California Food and Agricultural Code, Sections 24.5, 403, 5006, 5301, 5322, 5761

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; and
- Development of division employees, foster teamwork and a sense of accomplishments and enjoy our work.

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 of Plant Health and Pest Prevention Services 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 United States Department of Agriculture (USDA). These permits concern movement into California of plant pests, foreign soil, foreign postentry quarantine plant material, genetically engineered organisms (biotechnology permits) and foreign plants and plant products normally prohibited entry into the United States.

The primary activities of the permits and regulations program during the 2003 calendar year were:

<u>State Permits</u>

There were 399 state permits issued including 110 plant pest permits (52 for pathogens, 58 for arthropods), 271 quarantine commodities permits, six biotechnology authorizations and 12 approved laboratory permits.

Federal (USDA) Permits

A total of 512 applications for federal permits were reviewed and processed including 46 postentry quarantine agreements, 36 soil permits, 163 plant pest permits (87 for pathogens, 76 for arthropods), 242 biotechnology permits and 25 permits for federally prohibited plant material.

Regulations

There were 70 regulatory actions completed which included the adoption, repeal or amendment of 38 regulations; 15 certificates of compliance; and 12 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:

- Keeping abreast 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

- Managed the preparation and circulation of a Final Environmental Impact Report (EIR) for the Pierce's Disease Control Program. This involved the assembly of responses to numerous comments received during the public review of the Draft EIR, as well as the preparation of documents necessary for the approving authority to certify the EIR.
- Compiled the administrative record of the Pierce's Disease Control Program EIR for the Attorney General's office, in response to a lawsuit challenging the EIR. Participated in meetings with the Attorney General's office and wine industry Intervenors and assisted in the response to Petitioners complaint.
- Prepared an addendum to an EIR for the Exotic Fruit Fly Eradication Program addressing the effects of using Spinosad, an insecticide not previously used by the Program.
- Obtained regulatory compliance from the San Diego Regional Water Control Board for application of pesticides for a Mexican Fruit Fly infestation in Valley Center, California.
- Prepared environmental documentation for several exotic fruit fly eradication projects.
- Reviewed new and ongoing litigation on issues pertinent to the Division and provided comments in support of U.S. Environmental Protection Agency rulings regarding pesticide use and water quality.
- Participated in negotiations with the U.S. Fish and Wildlife Service over conditions for the monitoring of endangered species, which were required by a permit issued for the Division's Curly Top Virus Control Program. .
- Provided information about environmental compliance and environmental law to individuals and groups in the Division.

PEST EXCLUSION BRANCH

INTERIOR PEST EXCLUSION PROGRAM

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 are found contaminating the commodity. Interior Pest Exclusion provides regulatory oversight, training, and direction to the county agricultural commissioner's office according to the Pest Exclusion mission.

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 the year 2003.

Quarantine Response

Emergency Response to a Pest Infestation

When a reproducing population of a pest is discovered in California, an infestation is declared. Interior Pest Exclusion responds by enacting emergency pest abatement and control measures

on pest host commodities to contain the infestation and determine effective commodity host treatments that facilitate continued movement to market. Emergency regulatory responses are coordinated with USDA if the pest is a federal action pest. In 2003, emergency responses were conducted for infestations of Mexican fruit fly, Oriental fruit fly, sudden oak death, and red imported fire ant.

Mexican fruit fly, Valley Center. In September 2003, a Mexican fruit fly quarantine, which had been in place since November 2002, was lifted in the Valley Center area of San Diego County. This project included Escondido, Valley Center, Pauma Valley, and Rainbow areas of North San Diego County. Initially, the Arizona Department of Agriculture informed the CDFA that Mexican fruit fly larvae, *Anastrepha ludens,* were found at an Arizona citrus juicing facility. The grapefruit was determined to have originated in California. The CDFA responded by immediately investigating the shipper, and traced the fruit to a grove in Valley Center, San Diego County. Immediately a Mexican fruit fly federal and state interior quarantine was declared. The quarantine area encompassed approximately 136 square miles, and 20 varieties of commercial crops, including grapefruit, oranges, avocados, and persimmons. Over 900 properties, producing over 18,000 acres of host material, entered into a treatment program to meet the federal and state quarantine requirements and to facilitate the movement of certified host material into foreign and domestic markets. This project posed many new challenges and new innovative methods for managing regulatory quarantine issues. This was the first time that the pesticide spinosad and irradiation were used as quarantine commodity treatments. This was also the first time that GPS technology was used to define quarantine boundaries.

Mexican fruit fly, Monterey Park/South Pasadena. In June 2003, a Mexican fruit fly quarantine, which had been in place since November 2002, was lifted in Monterey Park/South Pasadena area of Los Angeles County. The quarantine area was approximately 105 square miles in primarily an urban area. Affected businesses in urban quarantine situations can include produce markets, wholesale produce distributors, fruit packing facilities, flea markets, swap meets, farmers markets, landscaping companies, and community gardens. In the Monterey Park/South Pasadena area, over 300 businesses were affected and were operating under compliance agreements. Hold notices were issued on 22 properties in the area. Three nurseries were treated with a total of nine treatments. The quarantine was lifted after three life cycles of the Mexican fruit fly were completed with no new detections.

Oriental fruit fly, Upland/Ontario. In October 2003, an Oriental fruit fly quarantine was established in the Upland/Ontario area of Los Angeles and San Bernardino counties. The quarantine area includes both urban and agricultural areas. Over 100 nurseries are affected by this quarantine and have signed compliance agreements. There are eight growers of host material, consisting of guava and citrus, that are being treated. Direct economic impacts to agriculture within the quarantine area have been minor.

Oriental fruit fly, La Mirada. In June 2003, an Oriental fruit fly quarantine, which had been in place since December 2002, was lifted in the La Mirada area of Los Angeles and Orange counties. The quarantine area was approximately 59 square miles in primarily an urban area which affected over 120 businesses including fruit sellers, markets, grocery stores and nurseries. All businesses within the quarantine area were operating under compliance agreements. Hold notices were issued to ten properties in the area. Two nurseries were treated with a total of six treatments. The quarantine was lifted after three life cycles of the Oriental fruit fly were completed with no new detections.

Red imported fire ant. Federal and state quarantines regulate areas of California for the red imported fire ant (RIFA). Currently, there are 866 square miles in the quarantine area including the entire county of Orange and parts of Riverside and Los Angeles counties. RIFA has also been discovered in areas outside the regulated area. Here CDFA implemented regulatory actions and eradication treatment programs. Currently, RIFA has been found in the following counties:

Fresno	Merced	San Bernardino
Kern	Orange	San Diego
Los Angeles	Riverside	Santa Barbara
Madera	Sacramento	Stanislaus

Regulatory enforcement of the RIFA quarantine is accomplished through compliance agreements with businesses and/or individuals in the quarantine areas that commercially grow, produce, propagate, handle, store, maintain, ship, transport, or process regulated articles or commodities. Interior Pest Exclusion signed 349 new compliance agreements during 2003, bringing the total number of businesses being monitored to 3,816. Businesses operating under compliance agreements are production nurseries, non-production or retail nurseries, landscapers, golf courses, sod farms, beekeepers, soil movers, hay dealers/handlers, green waste recyclers, landfills and yard maintenances. A compliance agreement requires businesses to follow approved treatment procedures to ensure RIFA-free status when articles are moved outside the regulated area. Homeowners are also placed under a compliance agreement if regulated articles will be moved from their property.

Since the beginning of regulatory activities, the number of compliance agreements for nurseries, sod farms and golf courses has leveled off, but there continues to be an increase in new compliance agreements issued to other high-risk operations such as landscapers and soil movers.

The primary focus of RIFA quarantine enforcement is to ensure the movement of RIFA-free nursery stock by placing production nurseries under a compliance agreement. In 2003, Interior Pest Exclusion staff conducted 1,054 (89%) SPAM-bait inspection surveys in production nurseries, not including 2,965 soil inspections for construction/swimming pool installation sites (see Figure 1). Soil inspections increased 8.8% in 2003 over last year's inspections. This may be due to an increase in the outreach program conducted by county and city/municipal planning departments. To ensure compliance to RIFA program procedures, the goal is to inspect 100% of all production nurseries within the quarantined area during each quarter. This goal was accomplished in 2003.

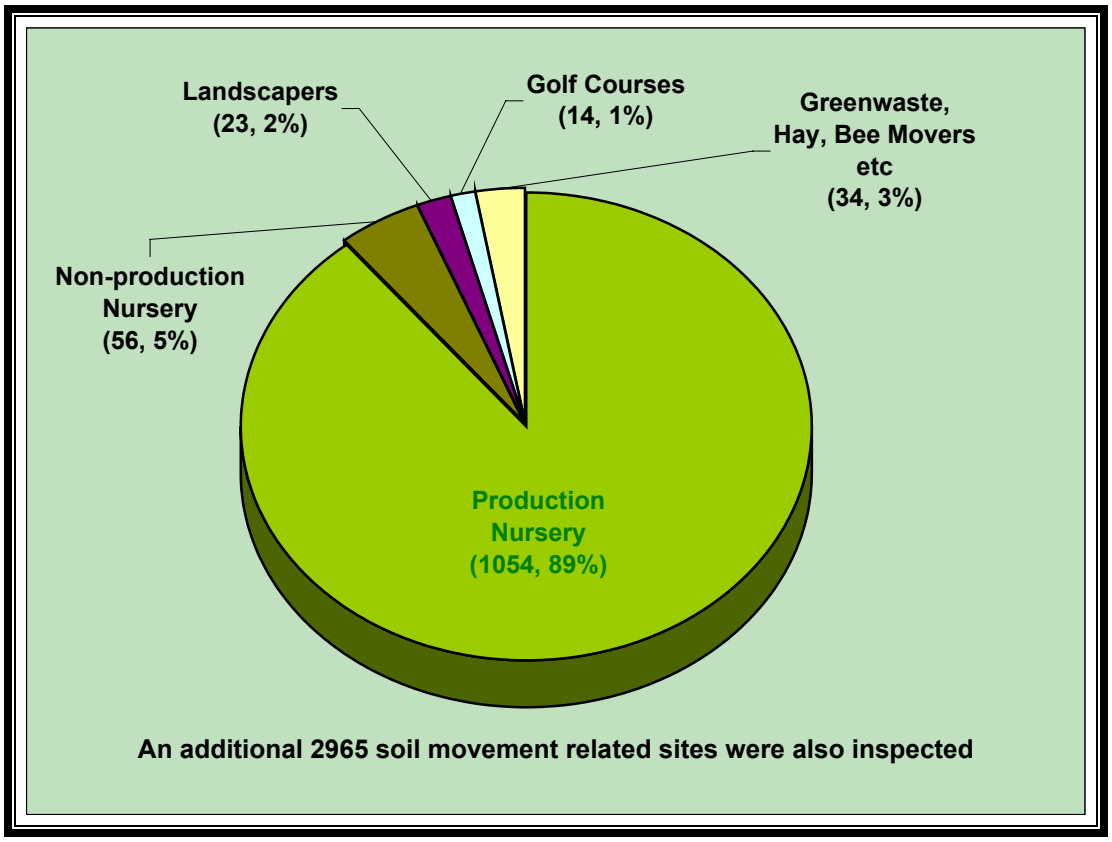


Figure 1. RIFA Inspection Surveys in 2003 (number, percentage of total)

Since inspections began in October 1998, RIFA has been found in 60 nurseries. Fifty-four (90%) of these nurseries completed the required four consecutive treatments and negative quarterly surveys and so were removed from the positive nursery classification (Figure 2). Currently only six nurseries (10% of the total infested nurseries) are under eradication bait treatment. All nurseries within the quarantined area are being monitored and surveyed using SPAM® bait traps. All nurseries within the quarantined area continue to treat all nursery stock by drenching or incorporating pesticides in the soil mixture to comply with federal domestic and California state interior RIFA quarantine requirements.

Regulatory inspections of establishments other than nurseries resulted in RIFA finds in seven soil-movement related sites, three landscape holding grounds, and eight golf courses. Each site was treated (broadcast bait) and was monitored according to program protocol.

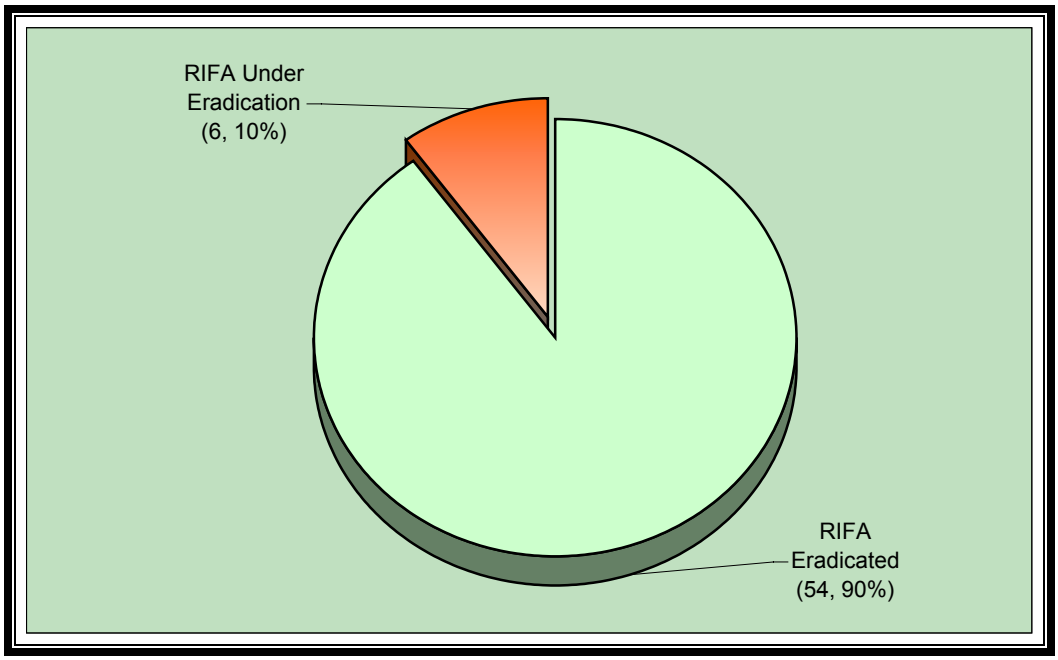


Figure 2. RIFA eradication in nurseries (number, percentage of total)

The Arizona Department of Agriculture (ADA) and the CDFA continue to use a Master Permit Agreement as authorization for the shipment of nursery stock from California to Arizona. This agreement allows RIFA-free nurseries located within the quarantine area to ship nursery stock into Arizona without being held in a special ADA approved quarantine holding area. There are 20 nurseries (approximately 1,817.5 acres) participating under the terms of this Master Permit. One nursery was suspended from shipping for violating the terms of the Master Permit after testing positive for RIFA.

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 the state and federal regulations for the control of *Phytophthora ramorum*, the causal agent of sudden oak death (SOD). Interior Pest Exclusion developed a Project compliance agreement and individual exhibits for nine types of regulated establishments including nurseries, green waste facilities, compost facilities, and firewood dealers. A total of 290 establishments in the regulated area were placed under compliance agreement by the Project. Thirteen new hosts were added to the regulation resulting in a total of 28 host plants under regulation. Fortunately, no additional counties were added to the regulation. A cooperative agreement was initiated with the USDA to reimburse CDFA for administrative, scientific, and diagnostic support costs associated with enforcing the regulations. Additionally, cooperative agreements were implemented with the twelve affected county agricultural commissioners to reimburse them for local enforcement costs.

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 the pest escaping and becoming established in the State. The immediate action, conducted in cooperation with the local county agricultural 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 at origin or corrected to prevent similar incidents in the future. The following are some of the pest incidents in 2003:

Mangos from fruit fly free areas of Mexico. In the summer of 2003, the USDA designated new regions of Mexico as fruit fly free areas. After the designation, mangos and other commodities originating in fruit fly free areas were no longer required to be hot-water treated for fruit flies as a condition of entry into the United States. As a result, untreated mangos from fruit fly free areas in Mexico were rejected at the California border stations when they were found infested with live, "A"-rated scale insect pests. The Pest Exclusion program, working with the primary state entomologist, determined that the hot-water treatment previously required for fruit flies may also have been efficacious to mitigate the risk of live surface pests on the mangos. Therefore, the USDA/IES was notified that the continued use of the hot-water treatment for mangos from all areas of Mexico would reduce the risk of live surface pest interceptions when entering California, and allow shipments of Mexican mangos to enter with fewer delays or rejections.

Mexican manzano peppers infested with Mexican fruit fly. In May 2003, the USDA found live *Anastrepha sp.* larvae in commercial shipments of manzano peppers from Mexico. The initial find was in Texas. Live larvae were also found in manzano peppers sold at retail markets in Georgia, Illinois, New Jersey, and New York. The USDA temporarily banned the importation of manzano peppers from Mexico and issued a national recall and destruction of all Mexican origin manzano peppers. The CDFA Agricultural Commodities Investigative Team Senior Investigators and Pest Exclusion Interior Biologists coordinated efforts with the counties and the USDA Safeguarding, Intervention and Trade Compliance (SITC) Program in California. Over 7,000 pounds of manzano peppers were seized from retail and wholesale markets, and distributors. Seized peppers were cut and examined for fruit fly larvae, then destroyed. There were no *Anastrepha sp.* larvae found in California.

Chinese Ya pear recall. On December 19, 2003, the USDA issued a national recall of all Ya pears from China due to the presence of *Alternaria* sp. fungus. In California, the USDA/SITC Officers concentrated their efforts on the importers, distributors, and large chain markets. The county agricultural commissioner's staff conducted inspections at the smaller markets and the larger independent markets. Due to the large volume of Chinese Ya pears in California commerce, and to minimize the impact to local landfills, the USDA and CDFA decided to allow re-export if the importers met USDA/CDFA specified criteria. Approximately 665,435 pounds were re-exported through the Port of Long Beach to China, Hong Kong, Indonesia, Malaysia, and Singapore. Approximately 83,540 pounds of Ya pears were destroyed by CDFA and 756,427 pounds were destroyed by the USDA. At the present time there are still 1,320,000 pounds of Ya pears currently on hold pending re-export by the USDA.

Indian pine cone recall. In early December 2003, the USDA issued a national recall of potpourri containing pine cones from India due to the detection of live Cerambycid beetle larvae, *Chlorophorus strobilicola.* Initially, it appeared that the infested lots were not shipped into California, however, by mid December, the USDA/SITC had found live Cerambycid larvae in Indian potpourri pine cones at retail establishments in Los Angeles and Imperial counties. The SITC Officers coordinated the recall effort with distributors identified as having received infested potpourri lots. The infested lots were identified and traced from UPC bar code numbers found on infested packages. CDFA Interior Pest Exclusion staff issued an advisory to all county agricultural commissioners asking for their cooperation in this recall effort. The county involvement resulted in finding additional infested lots. At this time, only infested packages

were destroyed. All other India origin potpourri containing pine cones is on hold pending further instructions from USDA. The USDA is evaluating all information received and will make a decision regarding possible treatment, destruction, or re-export options for known infested and possibly non-infested lots.

Guava and Oriental fruit flies in San Jose. Each year, for the past five years, guava and Oriental fruit flies have been trapped within a concentrated area of San Jose. Although there has not yet been a quarantine project, a definite pathway exists which must be identified and closed. In this endeavor, Pest Exclusion Interior biologists are coordinating efforts and exchanging information with the CDFA Agricultural Commodity Investigative Team, Pest Detection Emergency Projects, the Santa Clara County Agricultural Commissioner's Office, and the USDA Safeguarding, Intervention and Trade Compliance Program. All activities and establishments involved with fruits and vegetables (i.e. markets, mobile vendors, swap meets/flea markets, fairgrounds, package carriers) are being examined and randomly inspected. Neighborhoods where flies have been trapped are scouted for signs of fruit selling or packing activities. Another component is public outreach and education through community centers and temples.

***Anastrepha* sp. larvae in Texas citrus.** In May 2003, the Pest Exclusion Program was notified by the Arizona Department of Agriculture (ADA) of an interception of five, live *Anastrepha* sp. larvae in a shipment of Texas-origin Valencia oranges at the Arizona border station. The oranges were accompanied by a federal certificate indicating the shipment had been properly treated with a methyl bromide treatment and met the federal Mexican Fruit Fly quarantine requirements. Four other shipments from the same Texas shipper had previously entered California. Interior Pest Exclusion staff and the Agricultural Commodities Investigative Team located and inspected all four shipments. No additional larvae were found, and one of the four shipments was allowed to be treated with irradiation prior to release. The other three shipments were destroyed. As a result of the live pest interception in certified fruit, both the CDFA and ADA border stations refused the entry of all further shipments of Texas-origin citrus until the USDA conducted an investigation of the incident. The USDA and the Texas Department of Agriculture reviewed and revised all aspects of the citrus certification protocol, including the length of pre-harvest bait treatment applications, post-harvest fumigation procedures, and the procedures used by the packing houses to ensure that each truck contains only properly certified fruit. After reviewing the revisions to the certification protocol, CDFA re-opened the borders to properly certified Texas citrus in August 2003.

Southern bacterial wilt of geraniums (Ralstonia solanacearum, race 2, biovar 3). In February 2003, the Interior Pest Exclusion Program received notification from the USDA, Animal and Plant Health Inspection Service (APHIS) that geranium plants (*Pelargonium* sp.) imported from Kenya were found infected with southern bacterial wilt (*Ralstonia solanacearum, race 2, biovar 3*). Race 1 of this bacterium is endemic to the southeastern United States, but race 3, biovar 2 is not known to occur in the US and can result in economic damage to potato, tomato, and eggplant. The infected geraniums were imported to greenhouse facilities (rooting stations) in Michigan and Illinois and were then distributed to several other states, including California. Seven nurseries in six California counties received approximately 60,000 potentially infected geraniums from the rooting stations. The plants were held at each of the seven nurseries until adequate temperatures could be reached to achieve symptom expression if infection existed. No symptoms were observed, and samples sent to the USDA plant pathology laboratory tested negative. The plants were all released in April 2003. The USDA reported that *Ralstonia solanacearum race 3 biovar 2* was confirmed on geraniums at 103 nurseries in the United States that received cuttings from the contaminated rooting stations.

Chrysanthemum white rust, San Luis Obispo County. In October 2003, the USDA/SITC notified Interior Pest Exclusion that a nursery in Massachusetts was found positive for chrysanthemum white rust (CWR), *Puccinia horiana*, a federally regulated disease of chrysanthemums. The USDA/SITC investigators determined that the Massachusetts' nursery had received chrysanthemum cuttings from a propagative nursery in San Luis Obispo County.

Representatives of USDA, CDFA and county agricultural commissioner's office inspected seven greenhouses at the chrysanthemum propagative nursery in San Luis Obispo County. CWR symptoms were detected in one trial greenhouse (0.07 acre) containing 4,000 plants. A total of four pustules were detected and confirmed by the CDFA plant pathology laboratory. None of these plants were sold since it was a trial greenhouse. The infected chrysanthemum varieties were: *Paars, Espranto Happy and Covington.* The nursery opted to destroy all 4,000 plants in the greenhouse instead of the mandatory three treatments of myclobutanil fungicide. All plants were double bagged and buried in a landfill under CDFA/county supervision. The greenhouse was disinfected in an approved manner. Interior Pest Exclusion, USDA and San Luis Obispo County agricultural staff conducted two monthly CWR follow-up surveys with negative results.

In December 2003, the San Luis Obispo County agricultural staff notified CDFA of potted chrysanthemum plants showing CWR symptoms at another nursery. Suspect specimens were confirmed as CWR by CDFA plant pathology laboratory. Representatives of the USDA, CDFA and San Luis Obispo County agricultural commissioner's office inspected all four greenhouses (totaling approximately 11.5 acres). CWR was detected and confirmed in one of the greenhouses. CWR infection in potted mums in a 2.3-acre greenhouse was determined to be a localized infection. As per CWR National Management Plan for Exclusion and Eradication, all infected and uninfected plants within one-meter radius from the infected plants were destroyed. The remaining plants in the greenhouse are currently undergoing three myclobutanil treatments. The plants will only be released if all follow-up inspections show no symptoms of CWR.

Sudden Oak Death in Stanislaus County. In April 2003, a leaf sample from *Camellia sasanqua* 'Bonanza' at Garden Haven Nursery in Santa Cruz County tested positive for *Phytophthora ramorum*, the causal agent of Sudden Oak Death syndrome (SOD). The infected plants originated at Knudsen Nursery in Stanislaus County, outside of the regulated area. Prior to this detection, all surveys for *Phytophthora ramorum* in the San Joaquin Valley had been negative and *Camellia* was not known to be a host. Interior Pest Exclusion staff, federal, and county inspectors placed several lots of *Camellia* on hold at Knudsen's Nursery and submitted samples to the CDFA plant pathology laboratory. Samples from both one gallon and five gallon 'Bonanza' were found to be positive and the infected lots and other stock within 2 meters were ordered destroyed. Nursery stock within 10 meters was placed under hold for observation following federal/state SOD quarantine protocols. Trace forward and trace back investigations were conducted, and it was determined that the plants had been produced by Knudsen Nursery, and shipments of the *Camellia sasanqua* 'Bonanza' variety were traced to nurseries in California, Washington and Oregon. All shipments to California nurseries were destroyed by county inspectors wherever possible. Three nurseries in Oregon and Washington received the Bonanza variety, and in Oregon, asymptomatic leaves (collected from plants adjacent to infected plants) were tested and found positive for *Phytophthora ramorum*. Additional varieties of Camellia sasanqua (Showa-No-Sake', 'Jean May', 'Jordan's Pride', and 'Apple Blossom') were found positive for *Phytophthora ramorum* in June and July 2003 after increased inspections and sampling were conducted. A total of 256 samples were taken from the nursery and from hosts located within ¼ mile of the premises. All samples that tested positive were collected from a small area of the nursery that was under shade, sheltered from wind, sprinkler

irrigated and subject to standing water due to poor drainage. Water and soil tests of the area were negative. All host material from the area was removed, the nursery installed a drainage system, and disinfected the gravel and soil. Continued surveys of the nursery are planned for the spring of 2004.

Giant Salvinia *(Salvinia molesta)* in San Diego County. Interior Pest Exclusion staff worked with staff of the Integrated Pest Control (IPC) Branch and the county agricultural commissioner's office to regulate two properties in San Diego where *Salvinia molesta*, a federal noxious weed, was detected. The infestations were discovered in ponds on the grounds of a school and at a nursery. The ponds do not drain into any natural waterways. Eradication of the infestations has been coordinated by the IPC Branch, and Interior Pest Exclusion staff are continuing to monitor and oversee treatments at the locations until eradication is complete which is expected in the spring of 2004. Eradication efforts include draining the ponds, removal of plant debris, and the application of herbicides under regulatory supervision. Hold notices have been issued for each property to prevent the movement of any other plant material potentially contaminated with the weed.

Downey mildew on foxglove. In April 2003, a "Q"-rated downey mildew, *Peronospora digitalidis,* was found on foxgloves at a wholesale nursery in Carpinteria in Santa Barbara County. About 2,000 plants infected with this fungal disease were destroyed. Currently, this fungal disease is under review for downgrading since it is commonly found in Southern California.

Magnolia white scale. Coastal District biologists organized a statewide recall of *Phoenix roebelenii* palms infested with magnolia white scale, *Pseudaulacaspis cockerelli*, an 'A'-rated pest. Following up on an infested shipment found in San Luis Obispo County, District biologists traced the original shipment to a Los Angeles County nursery. The nursery provided invoices for trace forwards on the Florida origin plants. A total of ten counties were affected. Of the 34 nurseries inspected, 12 were discovered to have infested plants. The infested plants were safeguarded and destroyed by burying in landfills under CDFA/county supervision.

Quarantine Training, Direction, Oversight, and Consultation

Each county 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 agricultural department in order to ensure uniform inspection procedures throughout the State.

Interior Pest Exclusion conducted 31 regional training sessions for 454 county staff from 36 different counties during 2003. Topics included:

Chrysanthemum white rust	Sudden oak death
Glassy-winged sharpshooter	Nematology
Quarantine certification examinations	Pest Damage Record training
Exotic fruit identification	Exotic fruit fly information
Market inspection procedures	Exotic fruit fly rapid response

New quarantine regulations for new pests (i.e. Sapote fruit fly and Emerald ash borer.)

Regional Training Sessions

Training Category	Sessions	Counties Served	Participants
Quarantine	23	22	393
Phytosanitary	8	17	61
Totals	**31**	**36**	**454**

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 64 of these documents issued in 2003.

Documents Issued by Interior Pest Exclusion

Document	Number Issued	Purpose
Pest Alerts	9	To relay urgent information regarding infested shipments
Pest Exclusion Advisories	35	To advise of specific handling, inspection, or treatment protocols for specific situation
Phytosanitary Advisories	20	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 are performed by Interior Pest Exclusion biologists through inquiries received via telephone or electronic mail. The majority of the inquiries are from county agricultural commissioner's staff and CDFA district offices. Figure 3 illustrates the percentages of each type of consultation handled by Interior Pest Exclusion staff.

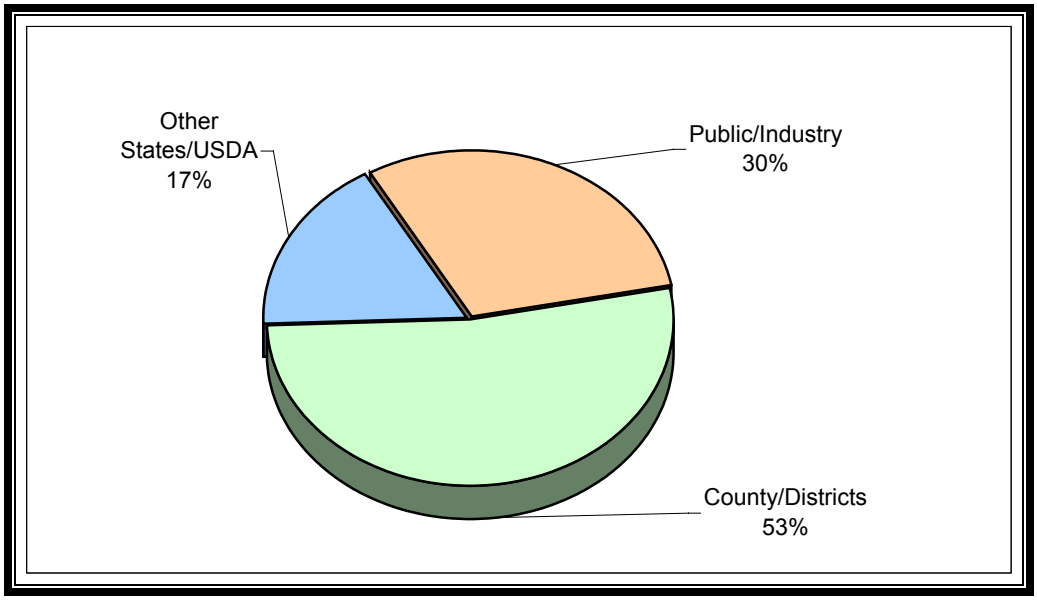


Figure 3. Quarantine Consultations Conducted by Interior Biologists

General information on the Internet. Interior Pest Exclusion utilizes the Internet to publish quarantine and pest prevention information. Information on the website includes current exotic fruit fly quarantines, frequently asked questions for travelers, and the Plant Quarantine Manual (a summary of all the state, federal, 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 our 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 and 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; to monitor shipments of commodities while transiting 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 U.S. Customs, USDA, U.S. Food and Drug Administration, CDFA Animal Health Branch, county agricultural departments, agricultural officials in other states, plus representatives from the trucking, airline and shipping industries.

Vessel inspections. In 2003, a total of 624 shipments were inspected on 102 vessels arriving at major California seaports. A total of 26 pests were intercepted and 54 shipments were rejected. A total of three rejected shipments were treated under CDFA supervision and released. Rejected shipments originated from foreign countries and Hawaii for quarantine violations or the presence of prohibited pests.

Exclusion Activities/Inspections

Port Area	Vessels	Shipments	Rejections	Total Pest Interceptions	Treatments Supervised
Northern California	100	113	51	23	0
Southern California	2	511	3	3	3
Totals	**102**	**624**	**54**	**26**	**3**

Notable inspections. Interior Pest Exclusion staff coordinate with the county agricultural offices to inspect other businesses such as high-risk ethnic markets, pet stores, etc. Types of pests intercepted through these activities include: *Colletotrichum crassipes* (fungus) on

Dracaena sp. from Thailand; *Puccinia horiana* (chrysanthemum white rust) on chrysanthemum from Guatemala; citrus canker on kaffir lime leaves from Thailand; and *Bostrichidae, Sinoxylon* sp. (False powder post beetle) on tile from India.

District Inspection Activities

Activities	Northern California	Southern California	Totals
Warning/Hold Notice Issued by Port Inspector	106	690	796
Storage Facility	5	22	27
Export Transit Shipments	50	532	582
Port Operations Coordination Contacts	1,320	340	1,660
Vessel Stores Sealed	0	5	5
Steamship Line Manifests Read	52	162	214
Lumber Inspection	0	0	0
Hawaiian Vehicle Inspection	400	0	400
Dunnage Inspection	10	0	10
Biotechnology/Soil Lab Inspection	16	3	19
Ethnic Market Inspection (Cooperation with Counties)	115	73	188

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 the 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, Food and Agricultural Code of California, and a state budget augmentation provided the county agricultural commissioners (CACs) with $5 million to conduct an optimal level program for the latter portion (December-June) of fiscal year 1998/99. The CDFA allocated funding by way of a negotiated work plan process with the CACs.

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 high-risk program's funding had been reduced to $5.5 million with Scientific Evaluation Trapping paid out of the Department's funds. For fiscal year 2003/04, the county contracts for high-risk remains at $5.5 million. In addition, the Scientific Evaluation Trapping Program has been funded by USDA via a cooperative agreement through Pest Detection and Emergency Projects Branch for $150,000.

High-Risk Inspections

The primary responsibility of the County High Risk Pest Exclusion Program (CHRPE) 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 CHRPE 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. Terminal points continue to include airports, nurseries, and U.S. postal and private parcel facilities, as well as high-risk destination points, including specialty markets, swap meets, and flea markets. Other high-risk entry points have also included locations where household goods from gypsy moth infested areas were delivered, and locations where material in post-entry quarantine is held. California's rapidly increasing population, coupled with expanding worldwide travel and trade opportunities, has increased the number of locations of infested areas, which continually test the State's pest prevention strategies and limited resources. A great number of high-risk exotic and invasive plant pests have become established in California because of human activities such as trade and commerce, tourism and travel, as well as illegal smuggling.

A large part of the administration of the program involves the contracting of services and goods logistically important to the success of this mission. The State budget allocation remains at $5.5 million from general funds for high-risk activities. The Scientific Evaluation program's purpose is to conduct inspection trapping for citrus and cherries to detect the presence of high-risk pests. Eleven counties are participating in this program and 49 counties are participating in high-risk exclusion activities, with contracts totaling $5,650,000.

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 (Figure 4). Seizure of illegal fruit that may have already entered the State is also a vital part of this program (Figure 5).

Figure 4. A county biologist inspects nursery stock

Figure 5. Seized guava fruit and rose apples from a Long Beach Specialty Market

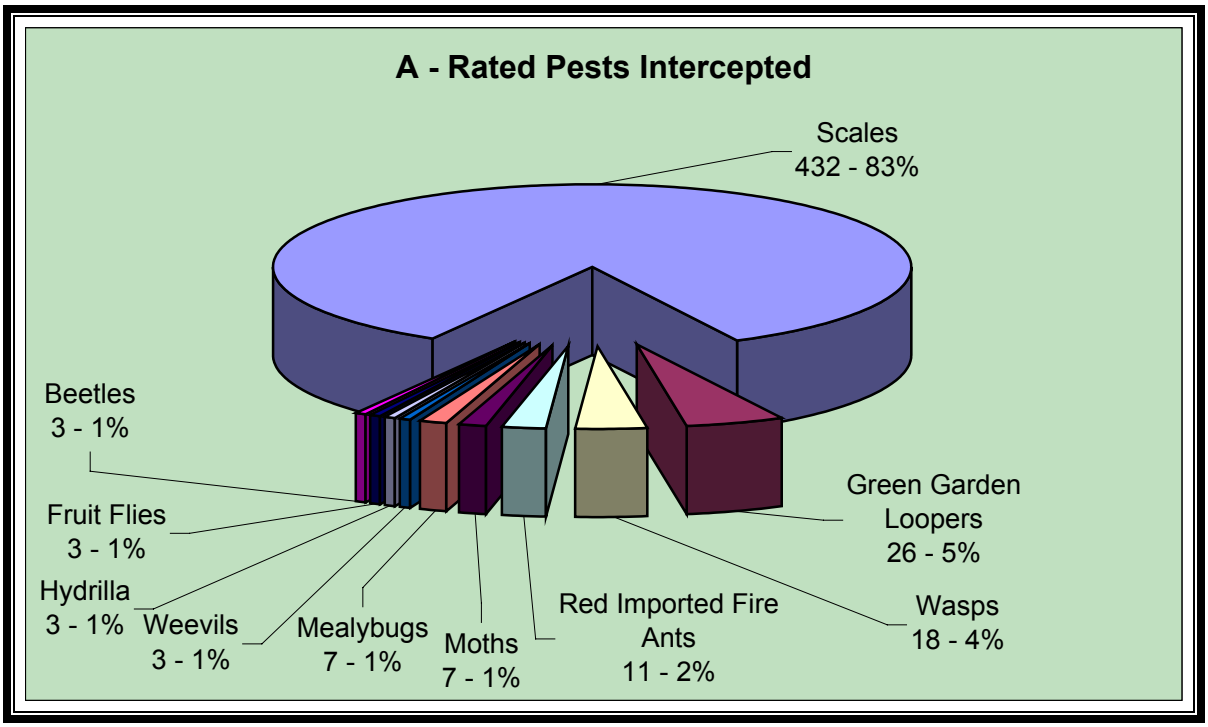


Figure 6. Frequently intercepted A-rated pests (number, percentage of total)

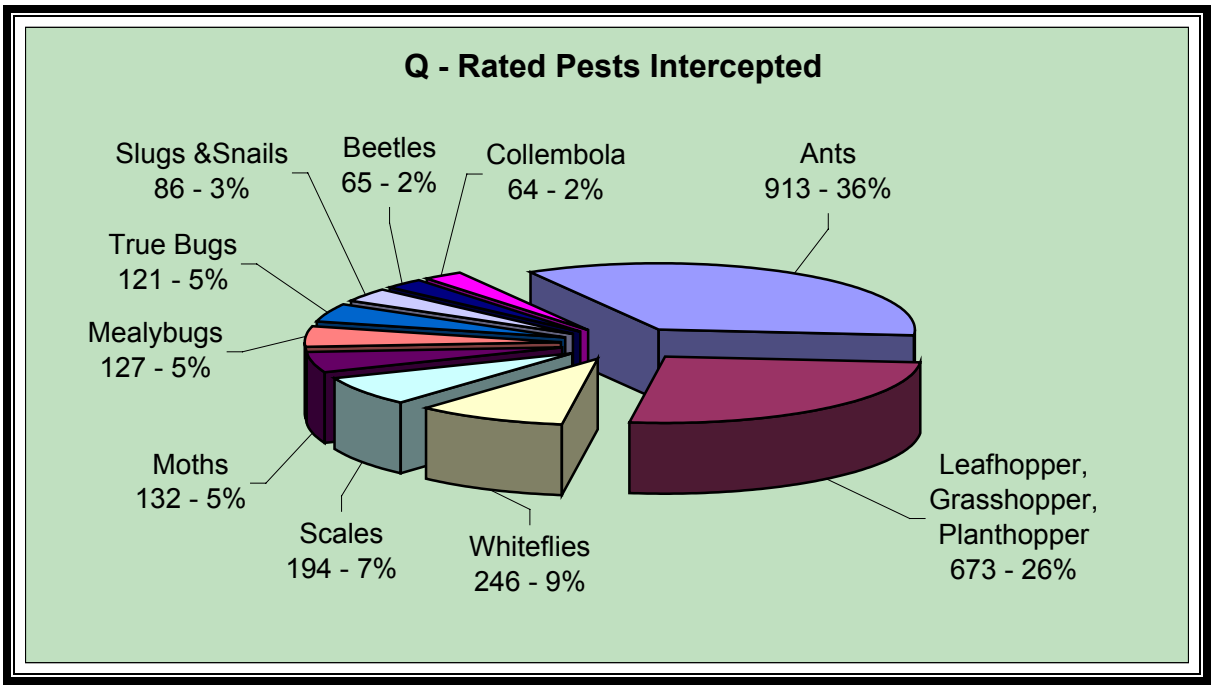


Figure 7. Frequently intercepted Q-rated pests (number, percentage of total)

Counties with Two or More A- and Q-Rated Pest Finds in 2003

COUNTY	PEST FINDS	COUNTY	PEST FINDS	COUNTY	PEST FINDS
San Mateo	2036	Sonoma	19	Santa Barbara	7
Los Angeles	592	Santa Clara	18	Merced	7
San Joaquin	181	Lassen	14	Fresno	6
Orange	149	Sacramento	13	Monterey	5
Contra Costa	121	San Bernardino	12	Humboldt	5
San Luis Obispo	56	Marin	11	Mariposa	2
Alameda	45	Riverside	10	Kern	2
San Diego	40	Ventura	9	Imperial	2
Shasta	23	Placer	7	Yolo	2
Mendocino	19	Tulare	7	Butte	2

Note: PDR data source.

A total of 4,970 shipments were rejected from January 2003 to December 2003 due to the presence of A- and Q-rated pests, or due to lack of origin or treatment certification. Figures 6 and 7 detail the pests most commonly intercepted. Two dead and one live, adult fruit flies (melon fly, Oriental fruit fly, and an exotic fruit fly (probably *Trupanea crassipes*) were intercepted on non-fruit fly host material from Hawaii. These flies were found in shipments of cut flowers, taro leaves, and fresh herbs.

There were 332 seizures of foreign-origin plant pest and quarantine material that were brought into California illegally. Some of these items were Mexican tangerines infested with fruit fly larvae and channeled apple snails at a pet store in San Francisco, which shows the wide diversity of pest and host material that is shipped into California.

Foreign Origin Materials Rejected in 2003

MATERIAL	ORIGIN	SHIPMENTS REJECTED
Dracaena Plants	Costa Rica	125
Peppers	Mexico	62
Ya Pears	China, Singapore	16
Pine Cones	India	6
Misc. Christmas Products	China, India	5
Lemon Grass	Mexico	5
Schefflera Plants	Costa Rica, Guatemala	5
Potpourri	India	5
Citrus	China, India, Mexico	4
Roses, Cut	Canada, Ecuador, South America	4
Ruda - Rue	Mexico	4

Note: NOR data source.

High Risk Pest Exclusion Activities in 2003 Statewide

TERMINAL	REJECTIONS ISSUED	HOURS	SHIPMENTS INSPECTED	PREMISE VISITS
Post Office	657	6007.9	35,547	6,615
United Parcel	725	14,977.65	61,561	12,271
Federal Express	1523	26,714.65	236,337	14,578
Gypsy Moth	11	3,343.68	1,262	1,342
Air Freight	1372	16,351.15	24,894	17,176
Air Freight - Fwd	94	2,198.8	3,570	1,584
Truck (008) plant	315	24,920.05	45,588	13,460
Truck (008) other	91	4,886.21	108,512	3,433
Specialty Markets	86	3,232.75	2,532	5,297
Swap Meets	3	180.75	1,309	85
Post Entry	0	261.5	27	67
Sci-Eval, Trapping Citrus	56	5,755.36	4,083	5,359
Other High Risk	37	4,405.4	1,506	8,274
Totals	**4970**	**113,235.85**	**526,728**	**89,541**

NOTE: Report 4A data source. Not all report 4As have been submitted for 2003.

A- and Q-Rated Pests Intercepted for Calendar Year 2003

DESCRIPTION	TOTAL	TRUCK	AIRCRAFT	UPS	FEDEX	USPS	NURSERY SHIPMENT INCOMING	OTHER
Alameda	45	1	3		27	1	12	1
Butte	2						1	1
Contra Costa	120	9		5	106			
Del Norte	2				2			
Fresno	6		1		1			4
Humboldt	5		1					4
Imperial	2							2
Kern	2		1		1			
Lassen	14	1	9		4			
Los Angeles	592	29	484		70		1	8
Madera	1	1						
Marin	11				11			
Mariposa	2				2			
Mendocino	19				19			
Merced	7	2		3	2			
Monterey	5						5	
Napa	1	1						
Orange	149	31	31	4	82		1	
Placer	7	2		1	3		1	
Riverside	10	2	2				6	
Sacramento	13	4	5		1		1	2
San Bernardino	12		4		4		3	1
San Diego	40	2		1	7		29	1
San Francisco	1						1	
San Joaquin	181	3	2	1	3		171	1
San Luis Obispo	56	20	26		5	2	3	
San Mateo	2,036	63	1,957	1	10			5
Santa Barbara	7				4		3	
Santa Clara	18	3	5		8		1	1
Santa Cruz	1						1	
Shasta	23		1		12	7		3
Sonoma	19			2	16		1	
Tulare	7			1		5		1
Ventura	9	3	1	3	1	1		
Yolo	2			2				
Yuba	2		1					
Totals	**3,428**	**177**	**2,534**	**24**	**401**	**16**	**241**	**35**

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. The county agricultural commissioner conducts routine terminal inspections of mail carriers, airfreight, sea freight, etc. with oversight by the Interior Pest Exclusion Program. Over 670,000 shipments were inspected in 2003. The following table shows the results of these terminal inspections:

Terminal Point Inspections

Terminal	Shipments	Notice of Rejection	Pest Rejections
Post Office	66,451	755	215
UPS	76,542	889	78
Federal Express	281,680	1,593	405
Express Carrier	5,631	61	16
Air Freight	26,936	1,508	1,911
Sea Freight	1,530	28	36
Railroad	120	1	0
Gypsy Moth	1,410	41	9
Truck	202,328	390	277
Other	10,329	120	42
Totals	**672,957**	**5,386**	**2,989**

NOTE: Report 4 data source. Not all report 4s have been submitted for 2003.

Facility and property inspections. The county 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 6,000 facilities and properties were inspected in 2003. The following table shows the distribution of these inspections:

Facility and Property Inspections

Facility/Property	Number of Inspections
Feed Grain/Screening	60
Post-Entry Property	166
Testing/Research	281
High Risk Markets	5,700
Q.C.C.211 Facility	242
Totals	**6,449**

Smuggling interdiction. Interior Pest Exclusion biologists work cooperatively with other programs, agencies and industry groups that have a vested interest in Agricultural Smuggling Interdiction. These include the CDFA Agricultural Commodity Investigative Team (ACIT), the CDFA Border Stations, the USDA's Safeguarding, Intervention and Trade Compliance Program (SITC) (formerly known as the Smuggling Interdiction and Trade Compliance Program), county agricultural commissioners, and the California Avocado Commission. Through industry and informant tips, routine market inspections and blitzes, referrals from other programs, agencies, and states, Interior Pest Exclusion biologists locate and seize agricultural commodities that have entered California illegally. Also, suspect agricultural commodities whose origin cannot be verified with receipts or other proof of ownership documentation are seized and destroyed.

Another important component of smuggling interdiction is public outreach and education. This includes identifying local commercial sources of exotic fruit and providing those to industry. Many homeowners (backyard growers) who produce too much fruit for their personal consumption sometimes sell the excess to their neighborhood markets. There are no regulations prohibiting this activity if it does not occur within a regulated exotic fruit fly quarantine area. When conducting market inspections, biologists will gather this information and later enter it into a database. This information can later be accessed the following year and provided to other programs or cooperating agencies.

Agricultural Commodity Investigative Team. The Agricultural Commodity Investigative Team (ACIT) works to identify and close pest introduction pathways statewide by stopping the smuggling of agricultural products into California. The investigators conduct training as well as investigations, prosecute identified smugglers, and collaborate with their counterparts in the USDA. The following is a summary of their activities for 2003:

Investigations 2003

Total Cases	Criminal Action	Administrative Action	No Action
16	1	1	14
Total Fines	**Pending**	**Pending**	

Summary of 2003 Investigations:

- Investigation: Wholesaler/Kaffir Lime Leaves. Leaves were collected from backyard growers. The seller was unable to provide information on the growers for verification. The individual stopped selling leaves due to lack of proof of origin.
  Action taken: None

- Investigation: Wholesaler/Guavas. Wholesaler was suspected of possessing foreign origin guavas. The grower information was verified. One grower was located inside the Mexican Fruit Fly Quarantine and the wholesaler confirmed she was not receiving guavas from that grower.
  Action taken: None

- Investigation: Mobile Vendor/Fruit Fly Host Material. Mexican Fruit Fly Project staff in Valley Center seized fruit fly host material from a mobile vendor for lack of receipts and safeguarding. The mobile vendor sold to labor camps in the core area of the quarantine. Confirmed vendor was purchasing the host material from California sources. The vendor signed a compliance agreement.
  Action taken: None

- Investigation: Valley Center Quarantine Project. Interviews were conducted with larval property owners, core area property owners and their entomological and agricultural consultants regarding possible causes of the infestation.
  Action taken: None

- Investigation: Nursery/Bonsai Plants. Prohibited Chinese elms were alleged to be imported without meeting proper postentry requirements.

Action taken: Pending

- Investigation: Retail Market/Kaffir Lime Leaves. A market was unable to provide receipts for Kaffir lime leaves. The origin of a portion of the leaves was verified from a California grower. The origin of the frozen leaves could not be verified and were seized and destroyed.
  Action taken: None

- Investigation: Grower/Avocados. The Mexican Fruit Fly Project in Valley Center requested the investigation of the harvest and movement of fruit in the quarantine area. The harvest and movement of avocados could not be substantiated.
  Action taken: None

- Investigation: Wholesaler/Avocados. USDA, Safeguarding, Intervention and Trade Compliance requested follow-up on the origin of avocados in watermelon bins found in a retail establishment in Arizona. Receipts provided traced to California. The origin of the avocados was confirmed from California and the wholesaler was notified about the watermelon bins and lack of certification stamps.
  Action taken: None

- Investigation: Grower/Avocados. The Mexican Fruit Fly Project in Valley Center requested an investigation regarding the harvest and movement of fruit from a core area property. The harvest and movement of fruit could not be substantiated.
  Action taken: None

- Investigation: Wholesalers/Manzano Peppers. The USDA found fruit fly larvae in Manzano peppers from Mexico and curtailed all shipments. Wholesalers were finding sources for peppers in Santa Barbara County. ACIT worked with the County to verify the growers and acreage.
  Action taken: None

- Investigation: Restaurant/Avocados. A tip by Avocado Inspection Services alleged Mexican avocados were being sold to a fast food Mexican restaurant. The allegation was investigated and the origin of the avocados was verified as California.
  Action taken: None

- Investigation: Wholesaler/Longans - Florida. USDA, Safeguarding, Intervention and Trade Compliance located longans with stem and leaves at a retail establishment. An approved Florida shipper shipped them in error.
  Action taken: None

- Investigation: Nursery/Uncertified Palms – Florida. CDFA received a tip that uncertified and un-manifested Florida palms were shipped to a nursery in San Diego County. San Diego County, with the assistance of CDFA, is pursuing criminal charges against the truck drivers and the owner of the nursery.
  Action taken: Criminal prosecution pending

- Investigation: Wholesaler/Green Onions – Florida. Wholesaler shipping green onions to Florida falsified a Certificate of Inspection.

Action taken: County administrative action pending

- Investigation: Retail Market/Valor Beans. USDA, Safeguarding, Intervention and Trade Compliance located valor beans of unknown origin. The origin of the beans was verified as California.

  Action taken: None

- Investigation: Retail Market/Breadnut – Dominican Republic. USDA located prohibited jackfruit from the Dominican Republic. Investigation into the origin and identity of the fruit was conducted. It was determined to be breadnut, which is enterable.

  Action taken: None

Trace Element Analysis Project. The Agricultural Commodity Investigative Team (ACIT) worked with Interior Pest Exclusion biologists in collecting and submitting fruit for the Trace Element Analysis Project. This project is designed to collect fruit grown in several different locations within the State of California for submission to the Center for Analytical Chemistry to conduct trace element analysis. The data collected will be used to differentiate illegal fruit from California grown fruit. Eight target fruits including guava, mango, longan, lychee and avocado have been selected for this project. Biologists also coordinated efforts with Florida-USDA to obtain Florida grown fruit for the project.

Trace Element Analysis Summary

Location	Longan	Lychee	Guava	Avocado	Mango	Sweet Lime	Sapote	Mamey
Camarillo			X	X				
Escondido			X					
Fallbrook			X	X		X		
Valley Center			X	X	X	X		

Other ACIT Activities

- ACIT investigated the possible pathway for the introduction of the Mexican fruit fly in Valley Center. This included interviewing property owners, Pest Control Advisors, and mobile vendors. Fruit was tracked from larval properties to end-users. ACIT conducted investigations into the reported harvest and movement of fruit from the quarantine area. They also conducted training for the project law liaisons with regard to violations and preliminary investigations.

- ACIT participated in a strategic planning session with James Morgan, President of Strategy Dynamics, Inc. The group addressed the possible development of a statewide smuggling interdiction program focused on identifying and closing fruit fly pathways in California.

- Fruit fly finds: ACIT investigated the possible pathways for reoccurring Oriental fruit fly finds in Ontario and El Segundo. They worked jointly with USDA, Safeguarding, Intervention and Trade Compliance officers collecting historical information through USDA, state and county databases. The historical information was correlated with inspection activity. ACIT conducted similar activity related to fruit fly finds in Yucaipa, Whittier, Valley Center, Santa Monica, and San Jose.

- Joint activity with USDA: ACIT participated in multi-agency inspection activity (Operation Freedom Bell) for the exotic fruit season during the month of July. They assisted USDA/IES

with several investigations at their request based on our knowledge of the parties involved and California regulations.

- USDA Treatment failure: ACIT conducted the distribution trace forward in California for Mexican tangerines and Texas citrus found to be infested with *Anastrepha* sp. larvae by the Arizona Department of Agriculture. The citrus originated from USDA facilities investigated for apparent failed treatments.

- Quarantine and Investigative Manual: ACIT developed uniform procedural protocol for violations and investigations during quarantines. The manual included standardized forms, step-by-step instructions, and consistent reporting and documentation. The training manual was reviewed and updated for investigators.

Facilitation of Trade

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. The Origin Inspection Program (OIP) is a cooperative program between the CDFA and regulatory officials in other states to inspect qualifying agricultural commodities and certify that all of California's entry requirements are met. Ongoing negotiations with other regulatory agencies is required, as shippers request new commodities to be included in the program. This program is an integral part of California's pest prevention system because it mitigates the pest risk at origin. Presently, the commodities covered under the OIP include fruits and vegetables, cut flowers and cut greens, canola pellets, bulbs, seed, and nursery stock.

There are 134 companies participating in the OIP. One new company was entered into the program in 2003. Seven nurseries in Oregon are no longer participants because host plant material for sudden oak death was removed from the OIP in 2003.

Origin Inspection Program

State/Country	OIP Participants
Arizona	1
Canada	2
Colorado	1
Florida	2
Hawaii	31
Mississippi	1
Nevada	1
New Mexico	1
Ohio	1
Oregon	57
Utah	1
Washington	35
Totals	**134**

Master permits and compliance agreements. Interior Pest Exclusion worked with agricultural officials in Texas, Georgia, Tennessee, and South Carolina to develop compliance agreements that allowed shippers in those states to ship commodities to California. Compliance agreements were approved for the shipment of cottonseed, nursery stock, 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 help them meet the plant quarantine requirements of foreign countries, other states, or California's own interior quarantines. This service helps facilitate the domestic and foreign trade in agricultural commodities. The USDA is the federal agency responsible for the overall 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 commissioner's 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 following chart lists the number of inspections and certificates issued for various areas of responsibility:

Inspections and Certificates Issued

County Certification Activities		
Type of Certificate	**Inspections**	**Certificates Issued**
Federal Phytos	111,382	140,230
State Phytos	7,346	11,378
Compliance Certificates	24,111	51,966
Quick Decline Permits	4,048	4,265
Compliance Agreements	8,681	2,340
Others	11,211	4,519
Totals	**166,779**	**214,698**

NOTE: Report 4 data source. Not all report 4s have been submitted for 2003.

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 of 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 chart below summarizes Interior Pest Exclusion PIM activities for 2003.

Phytosanitary Issues Management

Commodity	Country	Action
Bareroot strawberry nursery stock, and containerized nursery stock	Canada	Developed certification program, and reduced trade restrictions
Nectarine, Cherry, Fresh Prune	Japan	Meet with Japanese Ag Officials, implement work plans
Lettuce	Japan	Develop Work Plan and Export Protocol
Raspberry	Australia	Developed pest list
Cherry	Chile	Meet with Chilean Ag Officials, provide data on pests of concern
Apple, Stone Fruit	Mexico	Meet with Mexican Ag Officials, implement work plans, provide data on pests of concern
Pears	Cuba	Meet with Cuban Ag Officials, provide data on pests of concern
Grape	Australia	Implement work plan
Potato	Mexico	Develop inspection protocol
Apple	Taiwan	Develop and implement work plan
Citrus, Cherry, Grape, Plum	China	Meet with Chinese Ag Officials, develop and implement work plan, provide information on pests of concern

Commodity	Country	Action
Grape	New Zealand	Meet with NZ Ag Officials, develop work plan
Hosts of Pink Hibiscus Mealybug	Various	Provide information on pest status, distribution, mitigation

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 countries' phytosanitary concerns. Growers submitted 2,861 applications for crop inspections to the CDFA in 2003. The following tables indicate the top three crops entered into the program, and the top three counties where crops entered into the program were grown.

Top Three Crops Entered and the Top Three Counties

Top Three Crops in the PFISP	
Sunflower	309
Beans	309
Watermelon	227

Commodity Treatment Coordination and Consultation

Top Three Counties of Origin	
Yolo	442 applications
Colusa	395 applications
Monterey	273 applications

Commodity Treatment Manual. Interior Pest Exclusion has revised the 1991 edition of the CDFA Commodity Treatment Manual (CTM) for publication on the intranet. The CTM document is intended to address those pest quarantine concerns 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 Registration for verification of current pesticide registrations. In addition, web tools are provided for referencing product labels. The final draft is currently being shared with the CDFA legal department for formal review prior to public release.

Organic spinosad pre-harvest bait sprays. The 2003 Mexican fruit fly interior quarantine program in Valley Center, San Diego County, was unique in that for the first time, organic treatments were utilized by CDFA for both eradication and quarantine purposes. For commodity certification, growers were offered the option to treat commodities with the organic pesticide,

spinosad, as a pre-harvest bait treatment and thus retain their organic status. This was accomplished by two Special Local Need Registrations sponsored by CDFA for spinosad GF-120 conventional and organic spinosad GF-120 "NF" fruit fly baits. Dow AgroSciences cooperated by completing an organic product run, labeling, and registration approximately one year ahead of schedule on the condition that CDFA restrict the distribution of the new organic product to certified organic growers only in the Mexican fruit fly interior quarantine.

Irradiation of regulated commodities. The 2003 Mexican fruit fly quarantine in Valley Center also resulted in the establishment of new safeguarding protocols to facilitate the transport of regulated commodities out of the quarantine area in Valley Center to an approved facility (SureBeam) in Vernon, Los Angeles County, for irradiation treatments (Federal Register/Vol. 67, No. 205/Wednesday, October 23, 2002). A total of 17,850 pounds of citrus from the Valley Center quarantine area was irradiated at the Vernon facility (5,950 pounds of grapefruit, 4,000 pounds of oranges, and 7,900 pounds of tangerines).

Radio-frequency post harvest quarantine treatments. Radio-frequency (RF) treatments are basically heat treatments. RF heat treatments have the attribute of comparatively more rapid heating of the commodity (pest) as compared to heat treatments generated from alternative sources of energy. This rapid "ramp up" of heat results in an increased efficacy in pest mortality. The University of California, Davis has demonstrated applicability of RF treatments to California nut crops and is cooperating with USDA/ARS staff to test other fruits.

Other pesticide issues. In 2003, at the request of the citrus nursery industry, Pest Exclusion and Pest Detection/Emergency Projects supported the retention of a Lorsban Special Local Need Registration for use in California for treatment of red scale on citrus nursery stock destined for Arizona. CDFA paid the Special Local Need Registration fee to ensure that the registration will not be lost and will be reimbursed by the citrus nursery industry in 2004. In addition, after months of consultation with the U.S. Environmental Protection Agency (USEPA), CDFA gained approval to submit a request for two minor agricultural use exemption waivers for spinosad GF-120 conventional and spinosad GF-120 "NF" organic fruit fly bait sprays.

Data Collection and Information Management

New pest and damage record system. The new Pest and Damage Record (PDR) system is based on a single, centralized database with all data accessible via the Internet, lab specific submittal forms printed over the Internet, and a new application for the Plant Pest Diagnostics Lab, the Specimen Identification System. This new system was placed in full production on January 1, 2003 while the old system was still accepted. The old system's forms were discontinued as of October 1, 2003. A total of 17,418 PDRs were submitted to the lab using the Internet data entry form and lab specific submittal forms, printed from the web interface, which must accompany the samples that are sent to the lab.

This interface may be used by anyone submitting samples to our Plant Pest Diagnostics Lab. Oregon began submitting their Origin Inspection Program samples through this interface this year. Also, several Cooperative Extension offices have begun to use this interface.

Phytosanitary issuance and tracking system. During the past three years, the USDA has been working to analyze and develop a computer-based system for the issuance and tracking of federal and state phytosanitary certificates. The original Steering Committee, (comprised of USDA, area Plant Board representatives, and USDA members of the Working Group), has been

replaced by an Advisory Group. CDFA represents the Western Plant Board on the advisory committee for this project. The Phytosanitary Certificate Issuance and Tracking system is still in the developmental stages at USDA with functional testing to occur in early 2004.

Quarantine response. The Quarantine Response application is used by Interior Pest Exclusion staff to track, schedule, and report on quarantine activities. With the conclusion of the Valley Center Mexican Fruit Fly project, this application has now completed its re-work cycle and is being used to collect information for the Oriental Fruit Fly Project in the Ontario area. This database is currently stored on computer systems at each project. The next step would be to create a web interface with data stored on a central computer in Sacramento.

Pest Exclusion Information Management (PEIM) System. The PEIM system is used by county and state offices for issuing notices of rejection for shipments entering the state without the proper certification or containing pests of concern. The Pest Exclusion Exterior Program border inspection stations also use this system to issue Warning/Hold Notices and Gypsy Moth Warning/Hold Notices. This will allow the stations to utilize computer networks for input into a single database allowing multiple officers to input records simultaneously and a single point for data transfer to Sacramento. The NOR interface functions similar to the new PDR interface, reducing the time required for training. This system is now operational at all border stations and some counties.

EXTERIOR PEST EXCLUSION PROGRAM

The Exterior Program's mission is to mitigate the risk of actionable pest introductions, via the entry of private and commercial vehicles, at California's interstate land borders. To accomplish this goal, at 16 border agricultural inspection stations, Exterior Pest Exclusion personnel:

- Enforce the Food and Agricultural Code, federal and state quarantines, and county enforcement policies;
- Perform inspections on both commercial and private vehicles to ensure quarantine compliance and to intercept exotic pests transported by these vehicles;
- Provide quarantine consultations to the agricultural industry and the public; and
- Collect, analyze, and disseminate data.

Additionally, the program has cooperative working relationships with several other branches of the Department: Fruit and Vegetable Quality Control Standardization; Animal Health; Egg Quality Control; Feed, Fertilizer and Livestock Drugs; and Agricultural Statistics. It also cooperates with other federal and state agencies (e.g., United States Department of Agriculture, California Public Utilities Commission, Federal Immigration and Naturalization Service, California Parks and Recreation, California Fish and Game, California Department of Water Resources, California Department of Transportation, Department of Pesticide Regulation, California Board of Equalization, California Highway Patrol, California Department of Conservation, and the Bureau of Land Management) in the enforcement of laws pertinent to them.

At the local level, border station personnel assist the county agricultural commissioners, county sheriff/city police, and fire departments. They also provide information to the Arizona, Nevada, and Oregon Departments of Agriculture and the Oregon-Washington-Idaho Potato Commission. They provide public assistance with emergencies that arise at or in the vicinity of the stations.

Also, the California Travel Ideas Map (discontinued July 1, 2003) and other handouts are distributed.

MISSION STATEMENT

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

Vision: We are California's first line of defense in its pest prevention system. We enforce quarantine laws and regulations through the use of the best available technology and biologically sound methods at California's Agricultural Inspection Stations.

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 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

Private Vehicle Inspections

From January 1, 2003 through June 30, 2003, 12,690,466 private vehicles entered the state through California's agricultural inspection stations. This number includes 12,291,317 passenger vehicles and 399,149 recreational vehicles. Of these, 3.1% were identified as presenting a high risk of carrying prohibited materials and were physically inspected; the remainder were released with a cursory visual and verbal inspection. 16,225 lots of prohibited or pest infested plant material were intercepted from private vehicles and destroyed or returned out of state.

Due to staffing reductions, private vehicle inspection was cut back severely after June 30, 2003. Since this date, private high-risk vehicles were occasionally inspected as staffing permitted. From July 1, 2003 through December 31, 2003, 23,978 vehicles were physically inspected and 1,485 lots of prohibited material were found.

Significant Pest Finds from Private Vehicles – Border station personnel intercepted actionable ("A" or "Q" rated) pests on 82 occasions during 2003. These interceptions are outlined below:

"A" Rated Pests Intercepted From Private Vehicles – 2003			
Common Name	**Genus**	**Species**	**Times**
Western cherry fruit fly	*Rhagoletis*	*indifferens*	12
Gypsy moth	*Lymantria*	*dispar*	6
Red imported fire ant	*Solenopsis*	*invicta*	5
Fruit fly	*Rhagoletis*	*Sp.*	5
Hickory shuckworm	*Cydia*	*caryana*	3
Diffuse knapweed	*Centaurea*	*diffusa*	2
Gracillariid moth	*Conopomorpha*	*litchella*	1
Eastern tent caterpillar	*Malacosoma*	*americanum*	1
European corn borer	*Ostrinia*	*nubilalis*	1
Halogeton	*Halogeton*	*Glomeratus*	1
Magnolia white scale	*Pseudaulacaspis*	*cockerelli*	1

"Q" Rated Pests Intercepted From Private Vehicles – 2003			
Common Name	**Genus**	**Species**	**Times**
Zebra mussel	*Dreissena*	*polymorpha*	2
Chamber's dagger nematode	*Xiphinema*	*chambersi*	1
Moths (tiger moths, casebearing moths, tent caterpillars, bagworms, etc.)			21
Ants (white-footed ant, carpenter ants, bigheaded ants, etc.)			13
Scarab beetles (May beetles, June beetles, etc.)			5
True bugs (lygaeid bugs, seed bugs, plant bugs, etc.)			1
Scales (arrowhead scale, soft, etc.)			1

Commercial Vehicle Inspection

In 2003, 5,987,231 commercial trucks entered California through the inspection stations. Of these, approximately 8% were identified as presenting a high risk. These high-risk vehicles were opened and physically inspected. The remainder was released after verifying the contents by inspection of paperwork accompanying the load.

Due to the volume and potential for wide dispersal of a single shipment, commercial vehicles present the highest risk of introducing exotic pests into California. As of July 1, 2003, budget

and staffing reductions have required that the program focus most of its resources on commercial vehicle inspections.

Summary of Commercial Shipments of Regulated Commodities – 2003			
Commodity	**Inspected and Released**	**Sent to Destination Under Hold Notice**	**Rejected due to lack of certification or a pest being found**
Feed Grain	4,038	67	
Hay	34,983	171	
Misc. Fruits, Vegetables, Nursery Stock and Seed	307,571	25,908	1,641
House Hold Goods from Gypsy Moth Areas		2,721	

Significant Pest Finds from Commercial Vehicles - Border station personnel intercepted actionable ("A" or "Q" rated) pests on 366 occasions during 2003. These interceptions are outlined below:

"A" Rated Pests Intercepted From Commercial Vehicles – 2003			
Common Name	**Genus**	**Species**	**Times**
Red imported fire ant	*Solenopsis*	*invicta*	106
Vanda orchid scale	*Genaparlatoria*	*pseudaspidiotus*	31
Exotic fruit fly	*Anastrepha*	*sp.*	9
Mexican fruit fly	*Anastrepha*	*ludens*	3
Diffuse knapweed	*Centaurea*	*Diffusa*	3
Spotted knapweed	*Centaurea*	*maculosa*	3
Eastern tent caterpillar	*Malacosoma*	*Americanum*	2
Florida wax scale	*Ceroplastes*	*Floridensis*	1
Scotch thistle	*Onopordum*	*Acanthium*	1

"Q" Rated Pests Intercepted From Commercial Vehicles – 2003			
Common Name	**Genus**	**Species**	**Times**
Ants (white-footed ant, carpenter ants, bigheaded ants, etc.)			160
Moths (tiger moths, casebearing moths, tent caterpillars, bagworms, etc.)			21
Scales (mango shield scale, armored, etc)			8
True bugs (lygaeid bugs, seed bugs, plant bugs, etc.)			7
Scarab beetles (May beetles, June beetles, etc.)			4
Leafhopper/Planthoppers			3
Snails			2
Springtails			1
Flies (corn silk fly, crane fly, scuttle fly, picture wing flies, etc.)			1

Commercial Citrus Sampling – A total of 8,310 commercial shipments of citrus entered California in 2003 from the regulated areas of the Bahamas, Mexico, Spain, Florida, and Texas. From these shipments, border station personnel sampled 7,314 containers of fruit. There were 124 shipments rejected due to lack of proper certification.

Commercial Mango Sampling – To ensure mangoes are free from exotic fruit flies and other pests, a total of 17,925 containers from 6,135 commercial shipments of mangoes were sampled in 2003. Only dead fruit fly larvae were discovered, indicating that the hot-water treatments were properly applied. Shipments originated from Haiti, Mexico, and other Central and South American countries. Of these, 35 shipments were rejected for various entry requirement violations (usually lack of proper certification); the remainder were inspected and released.

Cherry Fruit Fly Origin Sampling and Certification Program – Under special permit, approved 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; thus eliminating the need for fumigation. There were 108 shippers who participated in the 2003 program. This number included 76 from Washington, 13 from Oregon, 12 from Idaho, and seven from Utah.

This season, a total of 3,074 commercial cherry shipments entered the State. Of these, 1,528 shipments were destined to California markets. The remainder was transiting the State to foreign destinations. Border station personnel sampled shipments entering California by special permit. There were 91 shipments that failed to meet the special permit requirements. Those shipments were either shipped out-of-state or released after the requirements were met.

Gypsy Moth Regulatory Activities – Border station personnel issued 62 citations for lack of proper certification to drivers carrying high-risk gypsy moth shipments. A total of 2,721 shipments of used household goods were quarantined and sent to destination for final inspection.

There were 1,328 inspections performed on recreational vehicles for various gypsy moth life stages. All these private vehicles originated from gypsy moth quarantine areas. Of these, six were found to be infested with gypsy moth and were cleaned at the stations.

Intra and Inter Agency Cooperative Activities

Game Importation Declarations – In cooperation with the California Department of Fish and Game, exclusion inspectors collected 282 game declarations from hunters returning to California. These declarations assist Fish and Game in identifying and prosecuting hunting and fishing regulation violations.

Livestock Tracking – During 2003, 38,602 shipments of livestock were recorded as entering California. This information was forwarded to the Animal Health Branch for ownership and disease tracking.

Animal Rejections – A total of 86 animals, which were prohibited under Department of Fish and Game Regulations, were intercepted during the course of the year.

Animal Rejections at Border Stations – 2003	
Common Name	Times Intercepted
Ferret	42
Monk Parrot	11
Gerbil	15
Sugar Glider	4
Hedgehog	1
Tree Climbing Frog	1

California Travel Ideas Magazine/Map (discontinued 7/1/2003) – Under an agreement with the California Department of Commerce, Division of Tourism, the border stations distributed 191,603 California Travel Ideas Maps, which provides a detailed map of California as well as a message on California's Pest Prevention System.

Digital Imaging Technology

Pest Identification – The digital pest identification system uses a digital microscope and the Internet to allow for laboratory personnel to readily identify insect specimens. In 2001 a system of this type was installed and successfully used at the Blythe Station. In 2002 an additional system was purchased for the Needles Station. A total of 340 insect specimens were identified using these two systems in 2003. This facilitated prompt quarantine action, with minimal delays, on trucks hauling insect infested commodities. Due to the success of the program six additional systems will be installed in 2004.

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. The value of nursery and floral products produced in 2003 was $3.3 billion, an increase of 3.2% from the previous year. The nursery program budget for 2003 was $2,299,271 with 17.6 personnel years. The nursery program's activities are funded entirely from revenue received in the form of license and acreage fees and registration and certification fees. Revenue received in 2003, totaling $2,080,287, was used to offset the costs of these activities.

A. NURSERY REGULATORY AND INSPECTION ACTIVITIES

This function is 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 2003, there were 11,066 licensed sales locations with 801 production (growing grounds) locations. At the request of the county agricultural commissioners, the Department agreed to increase the annual allocation for nursery inspection contracts to the counties from $400,000 to $500,000. In addition, any disencumbered funds from the previous year's nursery contracts will be added to the annual allocation. The amount added to the annual allocation for this year was $44,207.62, resulting in a total of $544,207.62 to be divided among the counties for the 2003/04 fiscal year contracts. Also as a result of an amendment to the California Code of Regulations, Section 3055.6, the existing fees for the California nursery stock nematode certification program increased from $35 per hour per site to $45 per hour per site. The regulation change went into effect on October 29, 2003. Counties with contracts for 2003/04 for the nematode certification program were contacted to amend their contracts to reflect the fee change.

B. REGISTRATION AND CERTIFICATION SERVICES FOR PLANT MATERIALS

The California Food and Agricultural Code authorizes the Department to establish plant registration and certification programs. These programs are established by the California Code of Regulations and enforced by the Secretary. The registration and certification service is provided by California Department of Food and Agriculture (CDFA) staff. In 2003 CDFA staff performed 541 inspections for registration and certification, including site approvals, growing season inspections, sampling for various purposes, and harvest inspections. In addition to

making inspections to meet the plant registration and certification requirements, all nursery stock must also meet the general nursery regulatory standards for pest cleanliness.

The registration and certification programs are voluntary programs developed at the request of various segments of the agricultural industry for the exclusion of specific plant pests which are not readily detected by ordinary inspections. These programs are the result of close working relationships between the University of California, the United States Department of Agriculture, 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 eight "clean stock" (registration and certification) programs and a nematode certification program available for use by the various segments of the agricultural industry.

Table 1. 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 and Increase block	Sun Blotch Viroid	Foundation tree index-testing for sun blotch viroid (UC)
Citrus Registration and Certification	Foundation, Increase and Certified	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, Registered, Certified, Increase, and seed	Various virus diseases, including prunus ring-spot virus (PRSV) and prune dwarf virus (PDV)	Index-testing (UC) + index-testing for PRSV and PDV (CDFA) (Participant)
Grapevine Registration and Certification	Foundation, Increase and Certified	Fanleaf, fleck, asteriod mosaic, leafroll, yellow vein (Tomato ring-spot), corky bark virus	Nematode sampling (CDFA)
Seed Garlic Certification	Increase and Certified	Stem and bulb nematode (*Ditylenchus dipsaci*) and white rot	Nematode sampling (CDFA)
Pome Fruit Tree Registration and Certification	Foundation, Mother, Increase and Certified	Various virus diseases	Index-testing (USDA & UC) fumigation

PROGRAM	PLANTING TYPE (BLOCKS)	TARGET PEST	TESTING OR TREATMENT REQUIRED
Strawberry Nursery Stock Certification	Foundation, Increase, and 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 the 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; and 3) eradication treatments (thermotherapy, fumigation, and hot-water treatments) and 4) visual field inspections targeted to specific life cycles of the pests and plants.

Avocado Registration and Certification Program

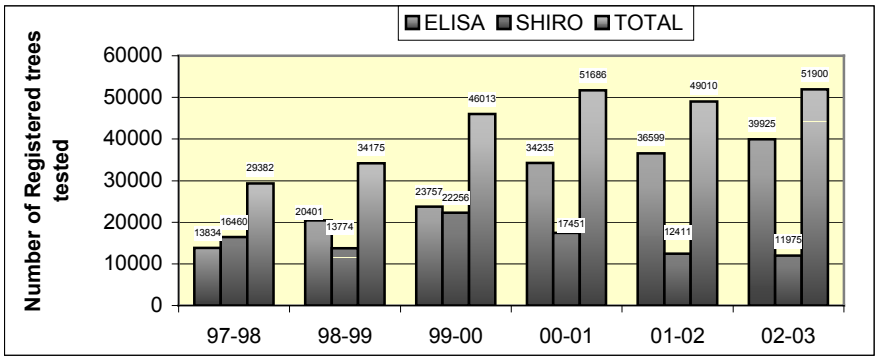
The Avocado Registration program provides for the registration of avocado rootstock and scion wood sources when inspected and tested for sunblotch virus. The Avocado Certification program provides for the certification of avocado nursery stock when grown under specific guidelines and inspected for freedom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

Deciduous Fruit Tree and Nut Tree Registration and Certification Program

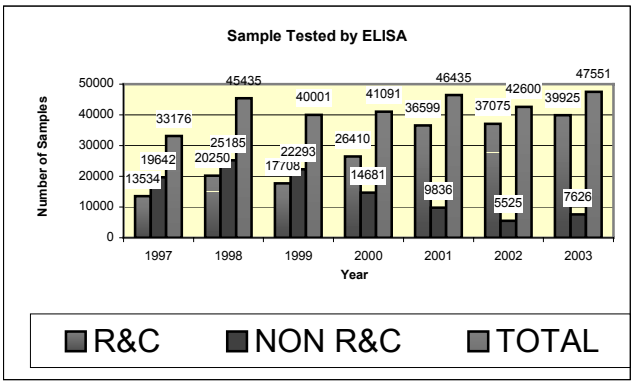
In the Registration and Certification (R & C) program for deciduous fruit and nut trees, all trees in a Registered Mother Block, Registered Scion Block and Registered Seed Block are tested annually for viruses. The testing may be done by biological indexing using Shirofugen cherry as an indicator plant or by ELISA, an approved laboratory technique. The 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. These tested trees may be used as a source

of certified propagative material in the year following testing.

In 2003, there were 20 participating nurseries. The total number of registered trees tested was 51,900 (39,925 by ELISA and 11,975 by Shirofugen indexing). This was 2,037 more trees than the previous year.



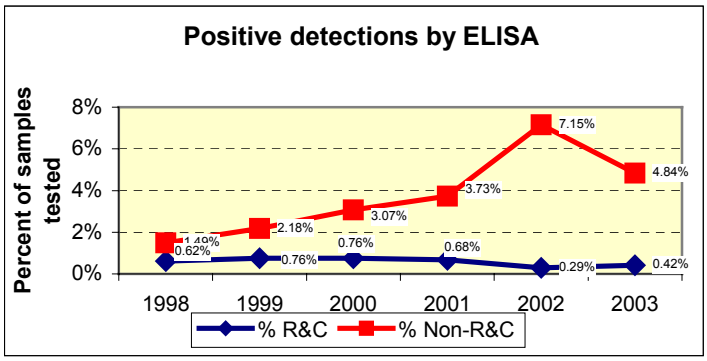
The total number of trees tested using the ELISA technique was 47,551 (39,925 Registered Trees and 7,626 service samples. This represents 4,951 more total trees tested by ELISA than the previous year. The service samples are obtained from non-registered trees and tested as a service to the industry. The Fruit Tree, Nut Tree and Grapevine Improvement Advisory Board (IAB) provides assessment fees to fund the annual testing.

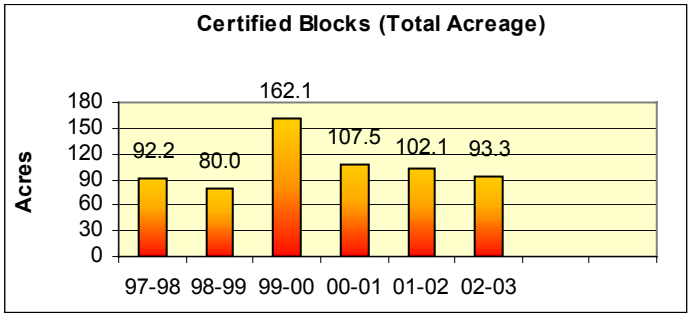


Of the 47,551 trees tested by ELISA, 529 (1.11%) were found positive for viruses. However, only 161 (0.4%) of the registered samples tested positive for viruses. From the service samples, 368 (4.8%) tested positive for viruses. Of the samples taken from registered trees, 41 (0.3%) were found positive for viruses using the Shirofugen cherry biological indexing technique.

Positive Detections:

	R&C(%)	Non-R&C(%)
1997	0.23%	2.66%
1998	0.62%	1.49%
1999	0.75%	2.18%
2000	0.76%	3.07%
2001	0.67%	3.73%
2002	0.29%	7.15%
2003	0.42%	4.84%

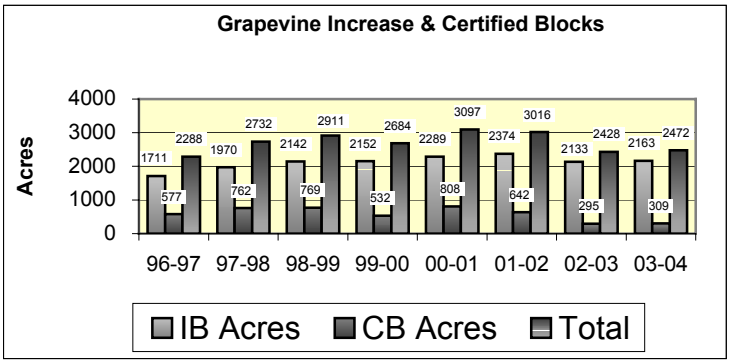




The number of acres of certified nursery plantings remained about the same as the previous year. In 2003, 93.3 acres were entered into the program for certification and inspected by CDFA nursery biologists. This is a decrease of 11.76 acres (down 1.2 %) from the previous year.

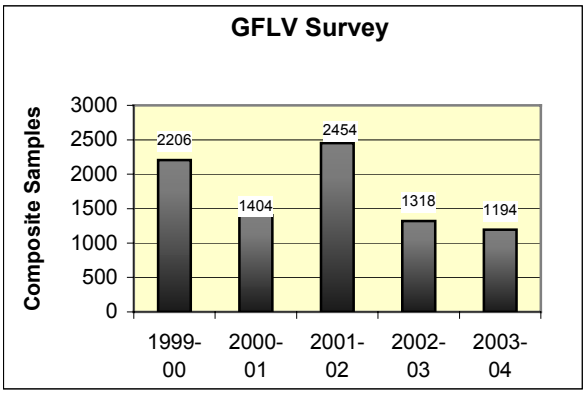
Grapevine Registration and Certification Program

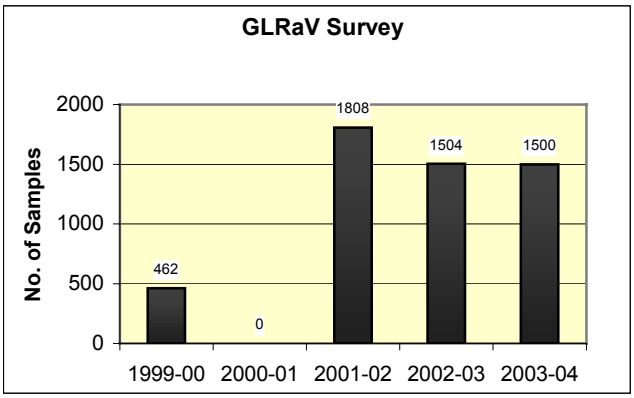
There were 43 nurseries participating in the program in 2003. The number of acres entered as Grapevine Increase Blocks was 2,163 acres, an increase of 105 acres (5.1%) from the previous year. The acreage of grapevine certified blocks (nursery plantings) was 309 acres and two greenhouse blocks, slightly higher from the previous year's 295 acres.



The nursery program has continued the survey for grapevine fan leaf virus (GFLV), and grapevine leafroll associated virus (GLRaV) as done in the last few years.

We collected and tested 1,194 composite samples, a 9.4% reduction from the previous year. Plants were selected randomly for testing. However, if plants exhibiting typical grapevine fan leaf virus symptoms were seen, those plants were also included in the survey. Of the total samples tested, none were positive for GFLV.





In 2003, 1,500 vines were sampled and tested for grapevine leafroll associated viruses (GLRaV). Seven (7) of the samples were positive.

Citrus Registration and Certification Program

Legislation enacted in 1992 and sponsored by the California citrus nursery industry established the California Citrus Nursery Advisory Board. The legislation provides for an assessment to be paid on citrus nursery stock produced and sold. The Board uses those funds to fund research projects to improve the quality of citrus trees. It also sponsors educational programs to increase the awareness and importance of the citrus nursery industry.

The citrus registration and certification 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 for as part of the registration and certification program include exocortis and psorosis. In 2003, there were 33 citrus nurseries participating in the program. A total of 2,568 citrus seed and scion source trees were sampled and tested for tristeza and other viroids.

This is an increase of 464 trees from the previous year, representing a 22% increase in the numbers of trees tested.

Strawberry Nursery Stock Registration and Certification Program

In 2003 there were 10 nurseries participating in the Strawberry Nursery Stock Registration and Certification program. 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 ring-spot, witches' broom, pseudo mild yellow-edge, latent C, leafroll and featherleaf. There were 2,912 foundation plants index-tested by CDFA nursery staff at the Department's greenhouse facility in Sacramento. This represents a decrease in the number of plants indexed by 1.8% compared to the previous year. Nine (9) plants were indexed tested positive for viruses and were rejected from the program. A total of 656.9 acres of registered and certified strawberry nursery stock were visually inspected for the presence of virus diseases and other pests and 792 nematode samples collected and processed. This represents an acreage increase of +5.4% from the previous year.

Pome Fruit

The pome fruit tree registration and certification 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, an increase of two over the previous year. In 2003 a total of 618 trees were inspected and registered as propagative source trees. A total of 7.8 acres of nursery plantings were inspected and approved to be sold as certified nursery stock.

Seed Garlic

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*. Four nurseries participated in 2003, the same as in 2002. A total of 655 acres was inspected and registered, 75 acres (12.0%) more than 2002.

SEED SERVICES

The value of seed sold for planting in California exceeded $339 million in 2003, an all-time high. The total number of firms registered to sell seed in California remains relatively unchanged at 393.

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. The CDFA staff evaluate the seed enforcement workload and provide

information, assistance and training on the program to the counties. Additionally, CDFA staff work with the seed industry to determine the effectiveness of the program and interact with other states, the United States Department of Agriculture, 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 2002/03 totaled $984,048. Significant program expenditures were the funding of the Department's Seed Laboratory ($308,100), Seed Biotechnology Center ($150,000) at the University of California in Davis, and the county agricultural commissioners ($120,000). In order to cover these expenditures, the Seed Advisory Board recommended that the assessment rate be increased from $0.28 to $0.30 per hundred dollars gross annual sales in California for the reporting period. The assessment has increased in the last few years in order to fund the Seed Biotechnology Center. The increased assessment combined with program reserves will provide adequate funds to cover program expenditures in 2003/2004.

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 for funding county seed law enforcement workload. By contract, the commissioners have to maintain an 85 percent compliance level of all seed offered for sale or labeled in their respective counties. The performance measures, which were introduced in 1999, resulted in a substantial increase in the number of official samples collected. In 2003, county personnel collected for analysis 1,069 official samples of seed lots being offered for sale. In addition, a total of 38 "stop-sale" orders were written on 433,240 lbs. of seed in violation. A majority (17) of the "stop-sale" orders were placed on lawn seed lots that were out of compliance at the time of inspection.

Program staff continued to promote TEAM SEED activities. The TEAM SEED concept, developed in 1997, recognizes the many groups that play a vital role in providing the highest quality seed to California agriculture and the public. As part of this effort, staff from Seed Services, the State Seed Laboratory, the California Crop Improvement Association, and the Seed Biotechnology Center presented eight workshops this year. Workshop participants included 79 county staff from 29 counties and 40 representatives from 25 seed companies. The workshops provide county personnel training on enforcement of the California Seed Law while providing valuable training to the industry on labeling requirements and on the county's role.

In addition to enforcement activities, the California Seed Law provides an alternative dispute resolution procedure to assist farmers and labelers to settle disputes through conciliation or mediation when seed planted in California fails to perform as represented. In 2003 one complaint was filed with the Department. This complaint, along with a complaint from a prior year, was subject to hearing and reviewed by appointed investigative committees. In both cases, the disputing parties were unable to resolve their differences; one mediation hearing was conducted but resulted without settlement. Of 36 complaints that were filed in 2002, 30 have been resolved through conciliation (withdrawal or settlement). The remaining six disputes are pending further investigation, appointment of investigational committees or assigning the disputes to mediators. Except for an initial filing fee, the cost of

these procedures is borne by the program. Such seed dispute procedures provide an economical alternative to litigation when the dispute can be resolved, but are a mandatory prerequisite to pursuing the matter in court.

In July 2003, California hosted the 17th Annual meeting of the Association of American Seed Control Officials in San Diego. Each year, seed control officials from around the United States and Canada meet to discuss regulatory problems. This organization's goal is to promote uniformity in seed laws, which helps in the orderly marketing of seed in North America. This year the main topics were seed biotechnology, seed health, organic seed, and the future of seed programs facing budgetary problems. Twenty member states attended the meeting, down from previous years due to travel limitations resulting from budget cuts in other states. Sixty-five attendees, members and their families, as well as others who attended, extended their thank-yous to the California Department of Food and Agriculture for an enjoyable five days in the San Diego area.

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. A 40-member San Joaquin Valley Cotton Board composed of cotton growers, cotton industry representatives, and public members administer 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, numerous Board committees examine major cotton issues in order to make well-researched recommendations to the full Board.

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. Cool, wet weather this spring caused many problems for cotton growers including some delays in planting and occasional replanting. Hot weather in July helped close the gap on how far the crop was behind normal. Defoliation had begun in a number of fields by late September, and harvesting was just underway during the first week of October in a few fields in the southern San Joaquin Valley. Harvest was essentially complete by the first week of December, with the exception of a few fields that were being second picked. Lygus and whiteflies came on strong toward the end of the season in some areas.

The USDA estimated that Upland cotton yields (including Acala) averaged 1,321 pounds of lint per acre, down 9% from last year's record harvest of 1,439 pounds. Pima yields were also down nearly 11%, averaging 1,192 pounds of lint per acre compared to 1,332 pounds last year.

Cotton acreage in the District was up approximately 4% from last year's record low acreage. CDFA's Pink Bollworm Program reported that in 2003 there were 134,820 acres of Pima and 536,735 acres of Upland (including Acala) cotton planted in the District.

The year 2003 is the fourth full season in 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 charges the Department with adopting regulations to ensure that the growing of non-approved varieties does not adversely affect the quality of Acala and Pima approved by the Board. Regulations to implement this law were developed by the Department in conjunction with the cotton industry. 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 2003, approximately 34,786 acres of non-approved varieties were harvested in the District. This is just slightly less that last year's 35,342. All non-approved cotton was marked at harvest and ginning with tags supplied by the Department with one of the following designations: California Pima, California Upland, or SJV Experimental. However, Non-Approved acreage is projected to significantly increase in 2004. This is due to the expansion of seed increases of varieties that are bred from areas outside of the District and across the cotton belt. It is also anticipated that some of the varieties that are still in the Board's cotton variety testing program will be sold and planted commercially in the District before they complete the three years testing and are approved by the Board.

There is still considerable interest on the part of researchers to develop new cotton varieties in the District. In 2003, eleven 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 researcher's test plots and for seed increases. Program staff monitored the planting, harvesting, ginning, delinting, and marketing of all experimental cotton.

The Board approved only one variety in 2003 to be marketed as an SJV Acala variety. This increased the number of approved varieties in the District to 52. No new Pima varieties were approved.

In 2003, the assessment rates for the San Joaquin Valley Cotton District were set by the Secretary, upon recommendation from the Board, at $4.00 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 BRANCH

EXOTIC FRUIT FLIES

2003 Detections

During 2003, the Detection Trapping Program found 106 individuals of three different fruit fly species. Almost half of these are Mexican fruit flies captured during the ongoing eradication program in San Diego County.

Table 1: Exotic Fruit Flies Detected in California During 2003

PEST (Fruit Fly)	**COUNTY**	**NUMBER FOUND**	**TOTAL BY SPECIES**
Guava Fruit Fly	Los Angeles San Diego Santa Clara	2 1 2	5
Mexican Fruit Fly	Los Angeles Riverside San Diego	1 2 50	53
Oriental Fruit Fly	Los Angeles Riverside Sacramento San Bernardino San Diego	17 1 2 23 5	48
Total			**106**

Fruit Fly Eradication Programs

Guava Fruit Fly

The first Western Hemisphere infestation of guava fruit fly (GFF) was detected in Garden Grove, Orange County, California in 1986. This and subsequent infestations have been successfully eradicated in the State.

On October 30, 2003, two male GFFs were found in a single trap resulting in an infestation being identified in the City of San Jose, Santa Clara County. As per protocol, an eradication program was implemented in an eight square mile area. This eradication program did not require the implementation of quarantine and was successfully eradicated.

Table 2: 2003 Guava Fruit Fly Eradication Information

County	City	Number Trapped	Last Find Date	Treatment Sq. Miles	Quarantine Sq. Miles	Eradicated
Santa Clara	San Jose	2	10/30/03	8	N/A	Yes

Oriental Fruit Fly

The Oriental fruit fly (OFF), first found in California in 1960, has been detected in the State every year since 1966. The first California outbreak occurred in San Diego in 1974, and since that time, numerous major infestations have been delimited and successfully eradicated.

The initial OFF detection for 2003 was on January 24, when a single unmated female OFF was trapped in a McPhail trap in La Mirada, Los Angeles County. This fly, in addition to an unmated female trapped in a McPhail trap on January 28, was trapped in an eight square mile ongoing male annihilation eradication area carried over from 2002. A second OFF infestation was detected on August 4 and 5 in El Segundo, Los Angeles County, when six male flies were detected on one property. The OFF eradication area was seven and one-half square miles. An additional unmated female OFF was trapped on August 18. No quarantine was implemented. A third OFF infestation was detected on September 12 and 15 in the community of Vista, San Diego County, when two male OFFs were detected on two nearby properties. The OFF eradication area was nine and one-half square miles. No quarantine was implemented. On September 25 and October 3, two male OFFs were trapped in Ontario, San Bernardino County. A total of 19 OFFs were subsequently trapped in Ontario and the nearby community of Chino. The OFF eradication area was 30 square miles. A quarantine area of 137 square miles was established around the finds. In each of the above infestations, a decision was made to conduct eradication programs consisting of the deployment of male annihilation bait stations and when warranted, diazinon soil drenches were utilized. With the exception of the Vista and Ontario infestations, which are still in progress, all the fore-mentioned eradication programs were successfully completed.

Table 3: 2003 Oriental Fruit Fly Eradication Information

County	City	Number Trapped	Last Find Date	Treatment Sq. Miles	Quarantine Sq. Miles	Eradicated
Los Angeles	El Segundo La Mirada	8 21	11/05/03 01/28/03	7.5 8	N/A 58	Yes Yes
San Bernardino	Chino/Ontario	19	12/15/03	30	130	In Progress
San Diego	Vista	5	10/28/03	9.5	N/A	In Progress

Mediterranean Fruit Fly

The Mediterranean fruit fly (Medfly) is widespread throughout Central and South America, Australia, Europe and Africa. Its distribution in the United States is restricted to the Hawaiian Islands, where it was discovered in 1910. This pest has been introduced into the State periodically since 1975. Several infestations have been eradicated successfully since that time.

Mediterranean Fruit Fly Preventative Release Program (PRP)

California's Medfly strategy shifted in 1996 to a proactive approach that emphasized prevention of Medfly infestation through the use of sterile Medflies. The PRP uses continuous release of sterile Medflies to interfere with Medfly colonization in 2,500 square miles of Los Angeles, Orange, Riverside and San Bernardino counties. The PRP is a major component of the joint California Department of Food and Agriculture (CDFA)/United States Department of Agriculture (USDA)) ongoing effort to prevent the establishment of this pest in California. In 2002, sterile Medfly releases were completely transitioned to the use of the highly effective male-only temperature sensitive lethal strain. The PRP is periodically reviewed by the Mediterranean Fruit Fly Science Advisory Panel (MedSAP), an independent panel comprised of international Medfly experts.

Mexican Fruit Fly

The Mexican fruit fly is an important agricultural pest in Mexico and parts of Central America where it readily attacks citrus, mango, avocado and a wide variety of other fruits. In 1927, the Mexican fruit fly was first discovered infesting the Rio Grande Valley of Texas and by the early 1950s, flies were found along the California-Mexico border. A large number of commercially grown crops in California would be threatened by the introduction of this pest, including peach, avocado, grapefruit, orange and pear. Mexican fruit fly adults have been trapped a number of times in California and two infestations have been eradicated from the State.

Valley Center, San Diego County

In response to a detection of Mexican fruit fly larvae in grapefruit juice at a juicing facility in Arizona, the shipment of grapefruit was traced back to a grove in Valley Center. In late 2002, both Mexican fruit fly adults and larvae were found in the grove. An eradication program was initiated using ground and aerial pesticide treatments, extensive fruit stripping and release of sterile flies.

Prior to the start of aerial applications, crews treated 200 meters around each find site using ULV malathion unless the grove/commodity was certified organic. The organic groves were stripped of fruit. Aerial applications over a 28 square mile area started on January 7, 2003 and were terminated on May 31, 2003. A total of 13 treatments of GF-120 NAF, a spinosad based organically certified pesticide, were applied. This was the first program where this material was used aerially in California. Sterile Mexican fruit flies were released after aerial treatments ended. Sterile release began on June 12, 2003 and ended on August 19, 2003. On September 23, 2003, the Mexican fruit fly was declared eradicated from Valley Center.

De Luz, San Diego County

Two Mexican fruit flies were trapped in proximity to one another in a commercial growing area in De Luz. These flies were treated by the release of sterile Mexican fruit flies over an eight square mile area surrounding the finds. The last release occurred on July 29, 2003. This infestation has been declared eradicated.

Temecula, Riverside County

Two Mexican fruit flies were trapped on September 8, 2003 in Temecula, on the same property in an area remote from Mexican fruit fly host commercial groves. In response, CDFA crews treated all host trees in a 200-meter radius around the find sites with spinosad from ground-based equipment. A total of three treatments were applied. No additional Mexican fruit flies have been trapped to date.

Table 4: 2003 Mexican Fruit Fly Eradication Information

County	City	Number Trapped	Last Find Date	Treatment Sq. Miles	Quarantine Sq. Miles	Eradicated
Riverside	Temecula	2	9/08/03	200 meter	N/A	In Progress
San Diego	Valley Center De Luz	50 2	5/20/03 4/08/03	28 8	130 N/A	Yes Yes

JAPANESE BEETLES

The Japanese beetle (JB) is an exotic insect which has a long history of being a serious pest of turf, crops and ornamental plants in the Eastern United States. First found in California in 1961, the JB has been detected periodically since then. The first California infestation occurred in Sacramento in 1961, and since that time two other infestations (1972 and 1983) have been delimited and successfully eradicated.

Detection

The Japanese beetle detection program has two major components: statewide trapping and aircraft detection. During 2003, over 12,000 JB traps were deployed throughout the urban and high-risk areas. The trap density for JB detection is two traps per square mile. A high-density trapping array is deployed in a one-mile buffer area around each airport and transfer/sorting facility utilized by express mail carriers. As a result, there were five JBs trapped in the urban/residential area of the State during the 2003 season. All of these detections were in proximity to either airports used by express mail carriers or their transfer/sorting facilities located in urban areas.

Table 5: Japanese Beetles Detected in California in 2003

County	City	Beetles Trapped	Comments
Los Angeles	Los Angeles	2	LA International Airport trap
Sacramento	Rancho Cordova	1	Mather Field, Express carrier airport
	Sacramento	1	Sacramento International Airport
Santa Clara	San Jose	1	Trapped in proximity to Airborne and Federal Express facilities.

Airport/Aircraft Inspections

On-board inspections of aircraft from high-risk areas of the eastern United States resulted in the collection of 165 total specimens (33 live). See Table 6 for a listing of beetle collections by

county/airport. Beetle exclusion techniques, combined with intensive effort by air cargo carriers and combined with a lower beetle population around Eastern United States origin airports, reduced JB interceptions considerably during 2003.

Table 6: Number of Aircraft Inspected and Beetles Collected by Airport

County	Airport	Aircraft Inspected	Beetles Collected
Alameda	Oakland International	514	12 : 3 alive
Fresno	Fresno/Yosemite International	30	5 : 1 alive
Los Angeles	Burbank	42	0 : 0 alive
	Long Beach	118	8 : 2 alive
	Los Angeles International	3261	87`: 21 alive
Orange	John Wayne	92	2 : 0 alive
Yolo	Sacramento International	63	0 : 0 alive
Sacramento	Mather Airport	140	7 : 2 alive
San Bernardino	Ontario International	910	3 : 0 alive
San Diego	San Diego International	1820	33 : 3 alive
San Mateo	San Francisco International	306	0 : 0 alive
Santa Clara	San Jose International	337	8 : 1 alive
	Moffett Federal Airfield	0	0 : 0 alive
Solano	Travis AFB	3	0 : 0 alive
TOTALS		7,636	165:33 alive

GYPSY MOTH

The gypsy moth (GM) is an exotic insect that has a long history of being a serious forest and urban pest in Europe and Eastern North America. The GM is currently the most destructive insect attacking hardwood forest and shade trees in the United States. First trapped in California in the early 1970's, the GM has been detected every year since 1977. The first California infestation occurred in San Jose in 1977, and since then at least 20 localized infestations have been detected and successfully eradicated.

Detection

During the 2003 season, over 19,000 traps were deployed and monitored as part of California's program to detect and delimit new GM and/or Asian gypsy moth (AGM) infestations. Trap density in the 19 coastal California counties is at three traps per square mile, and two traps per square mile in the remaining 39 counties. Traps are deployed in urban areas and in rural residential areas of 300 or more homes per square mile. California ports that receive shipments

from Russia, the Far East, Japan and other ports at risk for AGM are trapped at 10 traps per square mile around these ports. This season, a total of seven moths were trapped (Table 7) at six sites in five counties. Five of the finds were single-moth catches. A detection in Maywood, Los Angeles County, was a two-moth catch. One of the finds, at Long Beach Harbor in the community of Wilmington, was an AGM. This is the first detection of AGM in California. The AGM was trapped in a high-risk trap placed around the Long Beach Port as part of the statewide AGM high-risk detection program.

An egg mass survey was conducted in both Maywood and Wilmington. Results for both surveys were negative. A science advisory panel convened in early 2004 to develop recommendations for the Wilmington AGM find. Intensive trapping will occur at the sites where GM was trapped during 2002. Trap density for intensive trapping is 25 to 49 traps per square mile in a four square mile area around the find site. For AGM, the delimitation array for 2004 has yet to be determined.

All specimens were analyzed for possible AGM identification. The Mitochondrial DNA test, as well as the FS1 Nuclear DNA test, was utilized. Other than the Wilmington detection, the analyses of these specimens did not identify any AGM.

Eradication Programs

The eradication procedure for GM involves treating the foliage of susceptible hosts with an insecticide to kill the feeding caterpillars. Multiple treatments using the biological insecticide Bt (*Bacillus thurengiensis)* with ground or aerial application equipment are applied in the vicinity of GM finds. There were no GM or AGM eradication programs in California for 2003.

Table 7: 2003 GYPSY MOTH FINDS

COUNTY City	Adults Trapped		Total Adults	Properties w/Viable Egg Masses/Pupal Cases*
	Detection	Quarantine		
LOS ANGELES Maywood Wilmington*	 2 1	 0 0	 2 1	 0 0
RIVERSIDE Riverside	1	0	1	N/A
SAN BERNARDINO Fontana	1	0	1	N/A
SAN MATEO Redwood City	1	0	1	N/A
SANTA CRUZ Scotts Valley	1	0	1	N/A
TOTALS	**7**	**0**	**7**	**0**

*Denotes Asian Gypsy Moth

RED IMPORTED FIRE ANT

In 1997, red imported fire ant (RIFA) was discovered in an almond orchard in Kern County, arriving there on a shipment of honeybees from Texas. During 1998, RIFA was found infesting large urban areas of Orange County. Subsequent surveys and public notifications discovered a major infestation in Southern California with Orange County as the major infested area. A State quarantine was established to stop the spread of the pest while allowing the nurseries in the infested areas to ship plants that were treated and certified free of this pest. Currently, all of Orange County (790 square miles), parts of Riverside County (67 square miles), and Los Angeles County (nine square miles) are under quarantine. In October 2003, the survey and treatment portions of the RIFA program in Southern California were terminated due to budgetary cutbacks. The regulatory program remains active. The report on regulatory activities follows.

Red Imported Fire Ant Regulatory Activities

Introduction

The CDFA established a quarantine for RIFA in the entire county of Orange and parts of Riverside and Los Angeles counties following detection of RIFA in nurseries, landscaped areas, parks and residences in October 1998. The quarantine areas remained unchanged in 2003.

> Orange County - 790 sq. miles
> Parts of Los Angeles County (Azusa and Cerritos) - 8.5 sq. miles
> Parts of Riverside County (Bermuda Dunes, Indio, Moreno Valley, Palm Springs and Rancho Mirage) - 67 sq. miles

In 2003, Program staff also implemented quarantine actions around RIFA finds in:

> Fresno, Kern, Los Angeles, Madera, Merced, Riverside, Sacramento, San Bernardino, San Diego, Santa Barbara and Stanislaus counties

The quarantines were designed to contain spread of RIFA, by requiring inspection and treatment of articles through which the ant can be spread such as nursery stock, soil, landscaping, and beehives.

Regulatory Approach

Regulatory enforcement of the quarantine was accomplished using compliance agreements with businesses 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 2003 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, beekeepers, soil movers, homeowners, hay dealers/handlers, green waste recyclers, and landfills. Program staff signed 349 new compliance agreements in 2003 (Figure 1), bringing total establishments being monitored to 3,816. 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 as a result of some businesses beginning or failing.

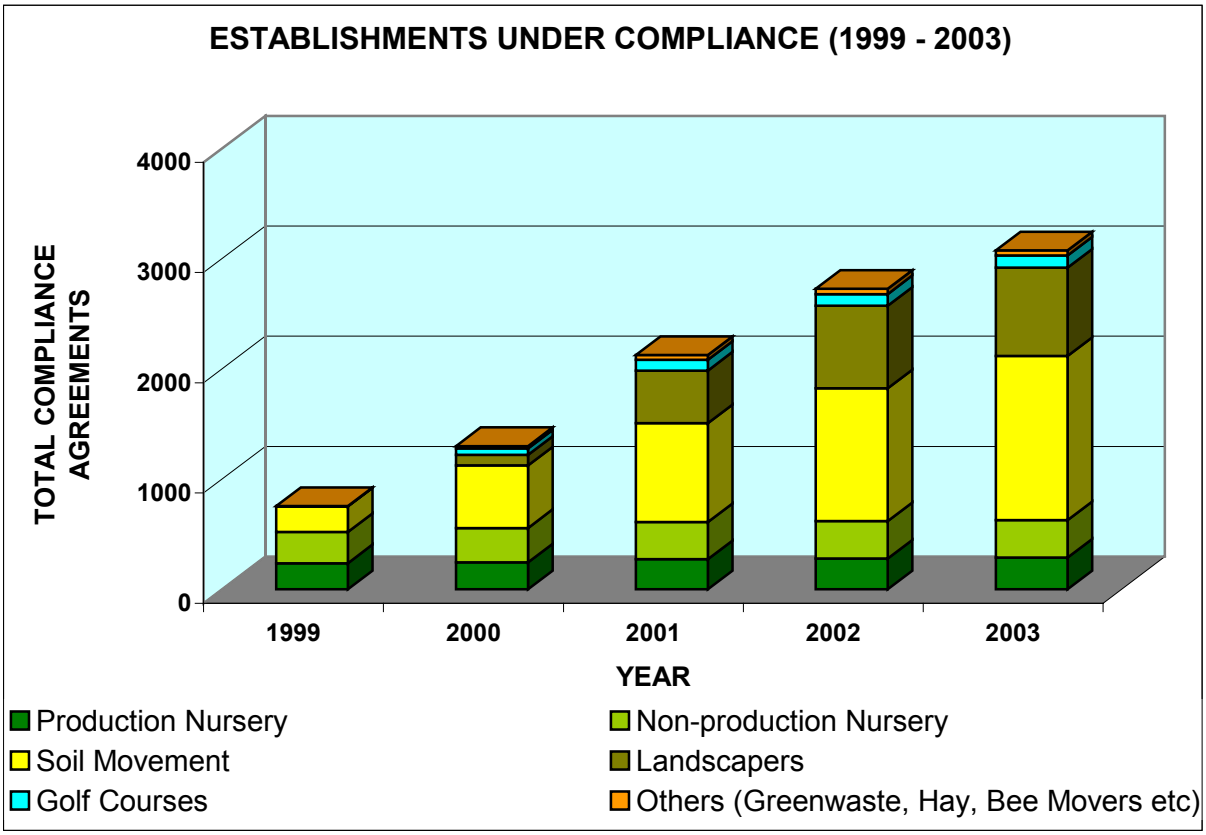


Figure 1: Total Establishments under RIFA Compliance (1999–2003)

The highest priority for quarantine enforcement is compliance of production nurseries, in order to ensure movement of RIFA-free nursery stock. In 2003, 1,054 or 89% of SPAM®-bait inspection surveys by the program were conducted in production nurseries (Figure 2). An additional 2,965 soil site inspections for construction/swimming pool installation were conducted during 2003. It is an 8.8% increase compared to 2002 inspections. This may be due to increased outreach of the program through county and city/municipal planning departments. To ensure compliance to program procedures, the goal of Program staff is to inspect 100% of quarantined production nurseries in each quarter. This goal was accomplished for each quarter in 2003.

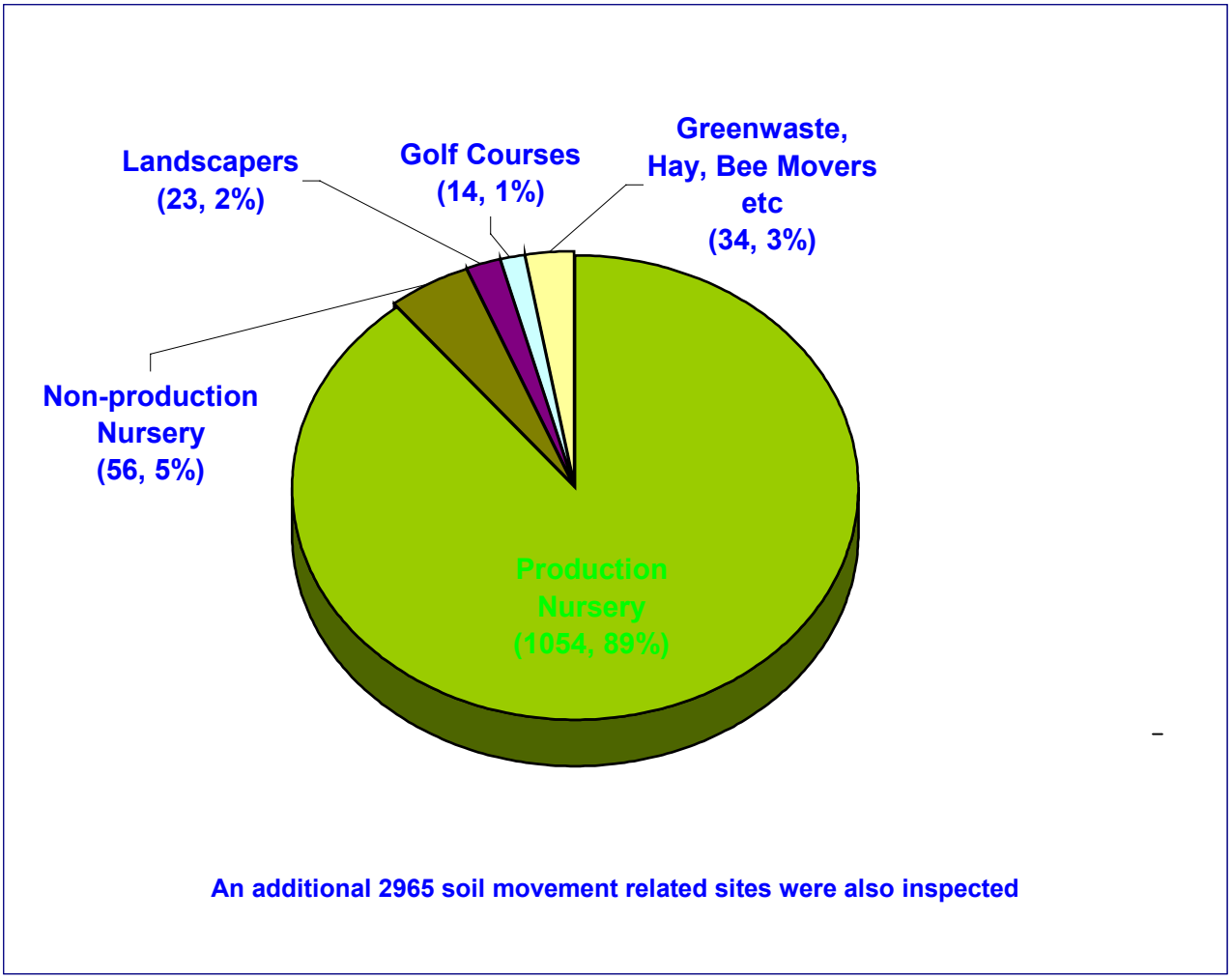


Figure 2: Number of Inspection Surveys for RIFA in 2003

At the end of 2003, RIFA had been found in 60 nurseries since the beginning of inspections in October 1998. Fifty-four or 90% of these nurseries had completed treatment protocols and taken out of positive nursery classification, after four consecutive negative quarterly surveys (Figure 3). Only six nurseries were treating (broadcast bait) for RIFA. They are being monitored and SPAM® bait surveyed along with all other nurseries within the quarantine areas. All nurseries within the quarantine areas also continued treatments (drenching or incorporating pesticides in soil mixture) in 2003 as a regulatory requirement.

In 2003, regulatory inspections of establishments resulted in RIFA finds in three production nurseries, seven soil-movement related sites, three landscape holding grounds, and eight golf courses. Each site was treated (broadcast bait) and being monitored according to program protocol.

Grid survey in Orange County was restarted in 2003, completing 312 square-mile grids (1,146 sub grids) using 3,529 SPAM® bait traps. Thirty-one out of 43 ant samples were positive for RIFA. Twenty-four sites were found positive for the first time.

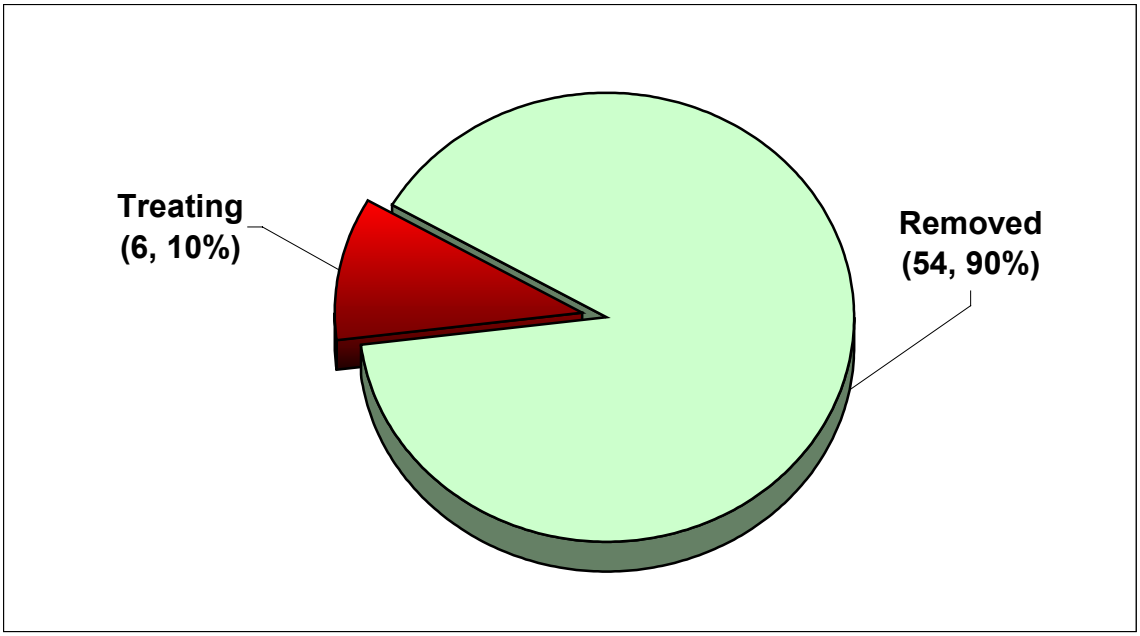


Figure 3: Number of Nurseries Found Positive for RIFA Since October 1998

The Arizona Department of Agriculture (ADA) and CDFA continued using a Master Permit Agreement within the year for the shipment of nursery stock from California to Arizona. The purpose of this agreement is to allow RIFA-free nurseries located within the quarantine area to be able to ship nursery stock into Arizona without being held in a special ADA approved quarantine holding area. There are 20 nurseries of about 1,817.5 acres, participating under the terms of this master permit. One nursery was suspended from the Master Permit after testing positive for RIFA.

San Joaquin and Sacramento Valley

In the San Joaquin Valley counties, almond orchards are the primary infested sites. In that area, eradication activities are being undertaken by the CDFA.

The CDFA, with the consultation of the RIFA SAP, developed survey and treatment protocols for all infested counties. Surveys are conducted both visually and by using SPAM® bait. Granular bait treatments using a metabolic inhibitor (MI) such as AmdroPro® (hydramethylnon) and an insect growth regulator (IGR) such as Distance® (pyriproxyfen) are the treatment methods of choice for RIFA.

Although additional RIFA sites continue to be found in the Central Valley, they are successfully being eradicated. The earliest infestations have been eradicated and work is continuing on the newest sites. The rate at which infestations are being discovered in the Fresno and Sacramento districts is declining. The Bay Area/Delta District has seen an increase in the number of infested orchard sites. This is due to the increase in the acres surveyed the past two years. Most of the high hazard orchards have been identified, treated, and eradicated. General survey of almonds is producing fewer infested properties. As the acreage of almonds remaining to be surveyed declines, the number of new infestations will approach zero. With the present sustained effort, RIFA should be eradicated from the Central Valley and since there is no

evidence that any other part of Northern California is infested, only parts of Southern California will be left with active RIFA infestations.

Survey Activities

General survey plans for the Fresno district and the rest of the San Joaquin Valley are to continue survey of almond orchards using Spam® bait stations placed at fifty-foot intervals along paths through and around the orchards. All of the potentially high-hazard orchards have been surveyed in previous years. The goal now is to systematically survey the remaining almond orchards. A media information blitz in 2001 resulted in 1,912 house calls. Although only one public call was positive for RIFA, and it was next to a known site, the large number of properties surveyed with negative results gave a good indication that RIFA is **not** generally spread over the urban population centers. House calls were not a part of the survey in 2002 or 2003.

Due to budgetary problems, survey was not initiated until late June 2003. The results of the almond orchard survey are summarized in the table below. In addition to new acreage surveyed, six previously infested orchards were intensively surveyed post-treatment with Spam® baits because RIFA was no longer visually evident. Three of these sites were RIFA free and will continue to be monitored next year. The other three sites had very minor RIFA activity and will receive treatment next year. Activity at one of these sites was limited to a single, very small RIFA colony. This colony was treated with a Lorsban® soil drench when found at the end of the season. Intensive survey involves bait stations placed on fifty-foot intervals throughout the entire orchard, not just around the perimeter.

The single "new" find in Madera County is across a two-lane road directly west of the infested almond orchard at Chowchilla #1. This area was surveyed at the time of the original discovery of the infestation at Chowchilla #1 and was RIFA free. Most likely, the original survey failed to discover a newly-mated queen and over the past two years the infestation grew to the point that it became a problem to the property owners. Madera County was notified in the fall and a positive determination was received during the winter. Treatment was started this spring. This site belongs to Agriland Farming. A portion of the land is used to grow replacement nursery stock for their farming operations. Hines Color Spot Nursery uses the rest of the land for their wholesale nursery operations. Only three acres used by Agriland Farming is infested. Hines Nursery has been treating their land prophylactically on a monthly basis with baits since the original Chowchilla #1 infestation was found in 2000. No RIFA has ever been found in the vicinity of the containerized nursery stock.

Table 8: Almond Orchard Survey – Fresno District

County	Acres Surveyed		Samples Taken		Orchards Found Positive for RIFA		Percent Almonds Surveyed
	Previous	2003	Previous	2003	Previous	2003	
Fresno	61,243	9,890	18,762	1,622	10	0	86
Kern	23,760	9,290	7,607	2,949	4	0	27
Kings	8,127	0	1,581	0	0	0	100
Madera	32,027	5,551	9,790	3,465	3	1	61
Tulare	160	0	904	0	0	0	2
Total	**125,317**	**24,731**	**38,644**	**8,036**	**17**	**1**	**53**

Note – "Orchards found positive for RIFA" includes the three nursery sites in Fresno, Kern and Madera counties and the one residential site in Kern County.

Almond Orchard Survey – Sacramento District

Money was not allotted for almond orchard RIFA survey in the Sacramento district in 2003. The single known RIFA infestation at Cal Expo, in Sacramento County, has been post-treatment surveyed for two seasons with no RIFA found and has been declared eradicated. The table below reflects the historical data for the district.

Table 9: Almond Orchard Survey – Sacramento District

County	Acres Surveyed		Samples Taken		Orchards Found Positive for RIFA		Percent Almonds Surveyed
	Previous	2003	Previous	2003	Previous	2003	
Butte	4,831	0	UNK	0	0	0	13
Colusa	6,558	0	UNK	0	0	0	22
Glenn	2,914	0	UNK	0	0	0	17
Solano	687	0	UNK	0	0	0	51
Sutter	1,344	0	UNK	0	0	0	33
Tehama	538	0	UNK	0	0	0	10
Yolo	1,433	0	>7	7	0	0	30
Yuba	1,196	0	UNK	0	0	0	100
Total	**19,501**	**0**	**>7**	**7**	***1**	**0**	**19**

*Sacramento County had one RIFA infested site (Cal Expo). Sacramento is not listed in the table, as there is no significant almond acreage.

Almond Orchard Survey – Bay Area/Delta District (Modesto Office)

After the discovery of five RIFA infestations in Merced County and one in Stanislaus County in 2002, only a single small infestation was found in 2003 in Merced County. This site, Gustine #2, is approximately 40 acres of almonds, cherries and pluots. The pluots have since been removed. A grid survey of one-quarter-mile radius was performed and the area around the site was RIFA free. In Stanislaus County, post-treatment survey of 471 acres at the Hickman #2, 3 and 4 sites was negative for RIFA. This is the second year for these sites and they have been declared eradicated. In Merced County, a post-treatment survey was conducted on sections of the Snelling #1, 2 and 3 sites. These sections were originally very lightly infested and included 1,381 acres. They were all found to be free of RIFA and will continue to be monitored post-treatment. Treatment in these areas has been suspended unless the survey discovers surviving RIFA.

At the largest infestation, Snelling #1, a delimitation survey of areas around the infested site yielded no new finds. There were concerns that fly-outs may have occurred from such a massive infestation. However, this appears not to be the case. An additional quarter-mile buffer was surveyed in the spring. All possible sites where RIFA could survive were Spam® bait surveyed. This included using a canoe to survey the edges of a waterway that passes through the area along the north edge of the infestation.

Table 10: Almond Orchard Survey – Bay Area/Delta District, Modesto Office

County	Acres Surveyed		Samples Taken		Orchards Found Positive for RIFA		Percent Almonds Surveyed
	Previous	2003	Previous	2003	Previous	2003	
Merced	24,632	7,212	6,529	2,226	7	1	40
San Joaquin	1,273	922	580	228	0	0	5
Stanislaus	29,533	4,411	8,216	993	6	0	38
Total	**55,438**	**12,545**	**15,325**	**3,447**	**13**	**1**	**32**

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A summary of the total number of infested properties, by year discovered, is outlined in the table below. They are listed as still active and under treatment or eradicated and under surveillance. This is as of December 2003. There is a total of 33 RIFA sites in the Central Valley, either active (15) or eradicated and/or under surveillance (18), including the sites for 2003. Twenty-eight sites are agricultural, three are nurseries, one is a residence and one is at Cal Expo. Only two new infestations were discovered in 2003. This is the lowest number of new finds since the inception of the program in 1997.

Table 11: Known RIFA Sites in the Central Valley and Their Status

Year Found														
County	**1997**		**1998**		**1999**		**2000**		**2001**		**2002**		**2003**	
	Erad.	Act.	Erad.	Act.	Erad.	Act.	Erad.	Act.	Erad.	Act.	Erad.	Act.	Erad.	Act.
Fresno	0	0	2	0	4	0	0	1	1	0	0	2	0	0
Kern	1	0	1	0	2	0	0	0	0	0	0	0	0	0
Madera	0	0	0	0	0	0	0	2	0	0	0	1	0	1
Merced	0	0	0	0	0	0	0	0	1	1	1	4	0	1
Sacramento	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Stanislaus	0	0	1	0	0	0	3	1	0	0	0	1	0	0
Total	1	0	4	0	6	0	3	4	3	1	1	8	0	2
Yearly Total	1		4		6		7		4		9		2	

In the case of most agricultural infestations, almond orchards remain the focal point for RIFA introductions in Northern California. However, other agricultural commodities have become infested as a result of proximity to an almond orchard. This includes apples, apricots, boysenberries, cherries, cotton, figs, grapes, oranges, peaches, pistachios, pluots, prunes, pastures and turkey ranches. Nurseries, honeybee drop sites, new residential common planting areas, and other sites were inspected by county personnel in Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus and Tulare counties. All sites surveyed were free of RIFA. If these inspections are continued, it is expected that eradication of RIFA from Northern California is possible.

Treatment Activities – San Joaquin Valley

The Fresno office has been responsible for the treatment of all RIFA sites with the exception of the Cal Expo infestation in Sacramento. Once an infestation has been detected, treatment begins at the earliest possibility. Usually three to four treatments per year are applied, if all goes well. In most cases, only two treatments were applied in 2003. Working out timetables

with homeowners, growers, and the weather, as well as dealing with the new infestations that emerge each year, can reduce the number of treatments that are applied. All almond orchards are treated with Esteem® (this product was previously known as Distance®) and Clinch®. All other types of crops, residential properties, and nurseries are treated with Extinguish®, Amdro®, and/or Advance®. A total of 5,945 acres were treated in 2003 by the Fresno RIFA team. A summary of treatment activities for 2003 is listed in the table below. Note that this figure represents the acres treated and not the acres infested. The current figure for acres infested is 4,116. This is down from the original infested acres of 9,544. The decline is due to the success of the treatment program. All infested properties found prior to 2000 have been eradicated (see table above). We are currently treating only properties found since 2000.

Table 12: Summary of Treatment Activities for the Central Valley - 2003

County	No. Sites Treated	Material Used Acres and Amount							
		Esteem/Distance		Clinch		Extinguish		Advance/Amdro-Pro	
		Ac.	Lbs.	Ac.	Lbs.	Ac.	Lbs.	Ac.	Lbs.
Fresno	3	160	277	87	87	86	126	0/10	0/12
Madera	4	9	13	124	124	7	11	2/0	2/0
Merced	6	2484	3803	1043	1043	1331	1995	0	0
Sacramento	0	0	0	0	0	0	0	0	0
Stanislaus	2	262	393	340	340	0	0	0	0
Total	**15**	**2915**	**4486**	**1594**	**1594**	**1424**	**2132**	**2/10**	**2/12**
2002 Totals	**15**	**5475**	**9525**	**5167**	**5151**	**2337**	**3454.5**	**1.5/46**	**1.5/68.5**

Table 13: Current Status of All RIFA Infestations in Northern California

County	Location	Number	Original Acres Infested	Acres Currently Treated	Status
Fresno	Kerman # 1 (1998)	2	1,160	0	Eradicated
	Kerman # 2 (1998)	5	106	0	Monitoring
	Kerman # 3 (2002)	33	81	81	Treating
	Mendota # 1 (1999)	7	160	0	Monitoring
	Mendota # 2 (1999)	8	80	0	Eradicated
	San Joaquin (1999)	11	276	0	Eradicated
	Fresno (1999)	9	Nursery	0	Eradicated
	Clovis (2000)	18	75	48	Treating
	Fresno # 2 (2001)	20	260	0	Monitoring
	Clovis # 2 (2002)	23	24	24	Treating
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 (2000)	12	590	8	Treating
	Chowchilla # 2 (2000)	13	152	75	Treating
	Chowchilla # 3 (2003)	32	Nursery	3	Treating
	Madera (2002)	29	40	20	Treating
Merced	Hopeton # 1 (2001)	19	6	0	Eradicated
	Hopeton # 2 (2002)	25	320	320	Treating
	Hopeton # 3 (2002)	27	160	160	Treating
	Snelling # 1 (2001)	22	2,673	2,258	Treating
	Snelling # 2 (2002)	24	617	577	Treating
	Snelling # 3 (2002)	30	8	0	Monitoring
	Gustine (2002)	31	200	200	Treating
	Gustine # 2 (2003)	34	40	40	Treating
Sacramento	Cal Expo (2001)	21	24	0	Eradicated
Stanislaus	Newman (1998)	3	256	0	Eradicated
	Hickman # 1 (2000)	14	999	40	Treating
	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	262	Treating
Totals*	**34**		**9,544**	**4,116**	

*Smith River was listed as number 26, but it is doubtful that this was an infestation. Baiting may have attracted lingering ants.

Summary and Conclusions

Although some additional RIFA sites continue to be found, they are successfully being eradicated. As noted in the tables above, the earliest infestations have been eradicated and work is continuing on the newest sites. The rate at which infestations are being discovered in the San Joaquin Valley is declining. Most of the high-hazard orchards have been identified,

treated and eradicated. General survey of almonds is producing fewer infested properties. As the acreage of almonds remaining to be surveyed declines, the number of new infestations will approach zero. With the present sustained effort, RIFA should be eradicated from the Central Valley and since there is no evidence that any other part of Northern California is infested, only parts of Southern California will be left with active RIFA infestations.

AFRICANIZED HONEYBEES

The Africanized honeybee (AHB) first migrated into California during 1994, arriving at Blythe, Riverside County. This year AHB found its way into Kings County for the first time. The total number of California square miles colonized with AHB is 61,220--an increase of 5,320 square miles from last year. The AHB currently colonizes the entire counties of Imperial, Riverside, San Diego, San Bernardino, Orange, Los Angeles, Kern, Kings, Tulare, Ventura, and portions of San Luis Obispo County.

DISEASE SURVEYS

During 2003, no significant plant diseases were discovered through detection activities. The CDFA participated in several surveys, including Citrus Canker, Karnal Bunt and Plum Pox.

Citrus Canker

The statewide canker survey for 2003 was conducted as a continuation of an annual survey, which targets 25 percent of the total citrus acreage present in the State on a rotation basis. This year, a total of 17 counties were surveyed. No citrus canker was found in California for 2003. The results for the 2003 survey are outlined in Table 9.

Table 14: Citrus Canker Survey Results

County	Acres Surveyed by Citrus Variety							Total Acres by County
	Grape	Orange	Lemon	Tangelo	Tangerine	Lime	Mix	
Northern Counties	0	88.5	0	0	23.75	0	163	**275.25**
Fresno	0	283.3	0	0	0	0	1790.9	**2074.2**
Tulare	203.8	3682.8	21.4	14.8	0	0	2725.2	**6648**
Kern	83	493	111	266	51	0	0	**1004**
Santa Barbara	0	36	662	0	1	0	0	**699**
Ventura	5	1416	3852	0	0	0	714	**5987**
Riverside	1711.6	344	10	0	3.6	0	670.4	**2739.6**
San Bernardino	112.5	549.7	0	0	0	0	257.8	**920**
Orange	0	50	0	0	0	0	0	**50**
San Diego	645.2	157.5	196	0	0	15	940.2	**1953.9**
Imperial	127	0	550	7	0	0	0	**684**
Totals	**2888.1**	**7100.8**	**5402.4**	**287.8**	**79.35**	**15**	**7261.5**	**23,034.95**

Karnal Bunt Survey

The California portion of the Karnal Bunt National Survey was run according to the USDA protocol for CY 2003. In California, there were samples taken from 14 counties.

Table 15: Karnal Bunt Survey Results

County	Samples Needed	Samples Taken	Results
Butte	1 Composite	1	Negative
Colusa	1 Composite	1	Negative
Contra Costa	1 Composite	1	Negative
Imperial	5	5	Negative
Kern	3	3	Negative
Lassen	1 Composite	1 Composite	Negative
Monterey	1 Composite	1 Composite	Negative
Riverside	2	2	Negative
San Benito	1 Composite	1 Composite	Negative
San Joaquin	3	3	Negative
Solano	2	2	Negative
Tulare	3	1	Negative
Yolo	4	3	Negative

Plum Pox Virus Survey

Survey

The 2003 Plum Pox Virus survey began on April 1 and was terminated on June 26, 2003. A rainy spring caused a few problems with access to orchards and illnesses plagued the crew members throughout the season, which hindered our ability to achieve our goal of 25,000 samples. The goal for this year's survey was to continue the sampling of commercial production stonefruit orchards in as many counties as possible throughout California. Stonefruit orchards were sampled in 20 counties (Table 16). Trees in the Foundation Block at the University of California were tested for the second time. Additionally we tested the trees located at the Wolfskill Experimental Orchard, also on University property, which are used by plant breeders for their development of new varieties.

Results

A total of 1218.95 acres were surveyed; 23,750 samples were collected (A sample is composed of two trees, resulting in two samples per quadrat). All tests were negative.

Sampling Levels

Commercial orchards and orchards used to produce common stock are sampled according to the 25 percent hierarchical survey plan. Trees in the University of California Foundation Plant Material Foundation Block, which are the source of budwood or seed used to produce registered nursery stock mother trees, were sampled at the 100 percent level. *Prunus* spp. located at the University of California Wolfskill Experimental Orchard in Winters, California were included in the survey and sampled at the 100 percent level.

Table 16: Plum Pox Survey Results

County	Varieties	# of Samples	# of Acres	Results
Butte	Peach, Prune	2024	82.25	Negative
Colusa	Almond, Prune	1030	65.20	Negative
Fresno	Peach, Nectarine	1226	54.30	Negative
Glenn	Prune	1412	83.60	Negative
King	Nectarine, Peach, Cherry	809	42.30	Negative
Los Angeles	Apricot, Nectarines, Peach, Various Prunus	1215	62.5	Negative
Madera	Peach	1080	61.40	Negative
Merced	Pluot, Peach	770	43.60	Negative
Placer	Peach, Plum	249	7.85	Negative
Sacramento	Various Prunus	143	7.24	Negative
San Benito	Apricot	768	57.81	Negative
San Joaquin	Peach	2183	60.70	Negative
Santa Clara	Apricot, Cherries	1195	81.40	Negative
Shasta	Prune	810	58.40	Negative
Solano	Apricot, Cherry, Peach, Plum, Plumcot, Prune	996	17.50	Negative
Stanislaus	Apricot, Peach, Plum Nectarine	2458	103.00	Negative
Sutter	Peach, Prune	1349	97.90	Negative
Tehama	Almond, Peach, Prune, Various Prunus	1035	90.45	Negative
Tulare	Plum	1579	90.60	Negative
Yolo	Various Prunus, Prune	1419	50.95	Negative

INTEGRATED PEST CONTROL BRANCH

Biological Control

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: one for insect pests and one for weeds.

Insect Pests

Olive Fruit Fly: The olive fruit fly is specific to olives and recently invaded Southern California and portions of Mexico. It quickly became widespread and is now found throughout all regions where olive production occurs. The Program received funding from USDA-APHIS to implement a biological control against this pestiferous fly. Partnerships were formed with USDA-ARS, European Biological Control Laboratory, to perform foreign exploration for olive fruit fly parasitoids in eastern and southern Africa and with the University of California to perform host specificity testing necessary for approval of these beneficial insects. In 2003, host testing was begun on *Psyttalia lounsburyi*, a promising natural enemy from eastern Africa. Beginning in 1999, the Biological Control Program released several thousand adults of the fruit fly parasitoid, *Psyttalia concolor*, in Southern California. This parasitoid was recovered within-season in low numbers in 2001. Limited data from 2002 and 2003 suggests this parasitoid has successfully established at a Santa Barbara release site.

Lygus Bug (Western tarnished plant bug): Lygus bug, *Lygus hesperus*, 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 this pest lacks nymphal parasitoids. The USDA-ARS imported two nymphal parasitoids into the east coast of the United States that were collected from a related *Lygus* species infesting alfalfa in Europe. One species became established and reductions in levels of lygus bug infesting alfalfa from Delaware north to New York are attributed to the introduction of this parasitoid. The CDFA has spent the last four years importing and releasing these two parasitoids into cotton and alfalfa production lands within the Central Valley of California and, more recently, into locations near the strawberry production lands along the central coast. Over 45,000 adults of two parasitoid species were reared and released at five locations in 2003. Both parasitoids have successfully overwintered at most of our release sites and are now permanently established at the original release site in Sacramento. Together parasitoid species have reached a maximum of 75 percent parasitism in 2003.

Silverleaf Whitefly: Until recently, the silverleaf whitefly caused widespread damage to a variety of field and vegetable crops in Imperial and San Joaquin valleys. During the 1990's, the Biological Control Program introduced several new parasitoids in an attempt to establish biological control for this serious pest. A total of six different species of exotic Aphelinidae (*Encarsia* spp. and *Eretmocerus* spp.) parasitoids were reared and released by the CDFA in conjunction with the USDA, APHIS, PPQ, and the county agricultural commissioners in the Imperial and San Joaquin valleys. Crops receiving these parasitoids included melons, cotton and a variety of cole crops. The last releases of exotic parasitoids were in summer 2000. Post-release monitoring in 2003 showed that at least three species of exotic parasitoids are persisting and spreading in the Imperial and San Joaquin valleys. One species of parasitoid, *Encarsia sophia*, has yet to be recovered in the San Joaquin Valley but has spread rapidly and

shows promise for regional impact in the Imperial Valley. The introduction of these biological control agents, along with changes in cultural practices and the use of highly specific insecticides, has greatly reduced the damage caused by this whitefly.

Red Gum Lerp Psyllid: The CDFA initiated a parasitoid-rearing program in cooperation with Dr. Donald Dahlsten of the University of California, Berkeley, to establish *Psyllaephagus bliteus*, a new, exotic parasitoid recently imported from Australia. Initial rearing attempts failed but success was achieved by preparing rearing facilities with improved environmental controls that provided long day length and better control of temperature and humidity. During 2002, the CDFA produced and released over 45,000 parasitoids at over 50 sites statewide. In 2003, a late summer and fall survey of 55 sites resulted in recoveries of the parasitoid at nearly all locations. At several locations, it is quite apparent that the parasitoid is playing a significant role in reducing the impact of this severe pest of red gum eucalyptus.

Pink Hibiscus Mealybug: The pink hibiscus mealybug, *Maconellicoccus hirsutus* (Green), is native to Southeast Asia and nearby Australia. Its host range is very large, exceeding over 200 plant species, but grapes and citrus are considered particularly vulnerable to attack. It was first discovered in Imperial County, California in 1999. In response to this pest infestation, a cooperative pink hibiscus mealybug management team was formed comprising of representatives from the USDA, APHIS and ARS, the University of California, CDFA, and the Imperial County Agricultural Commissioner. In addition, a close line of communication with neighboring Mexico was facilitated by the attendance of officials from *Secretaria de Agricultura Ganaderia, Desarrollo Rural, Pesca*, Alimentacion (SAGARPA) and *Instituto Nacional de Investigaciones Forestales Y Agropecuarias* (INIFAP) at all workshops and at each meeting. Staff from the Arizona Department of Agriculture also attended meetings. Following training by USDA-APHIS, a parasitoid insectary was established and two parasitoid species, *Anagyrus kamali* and *Gyranusoidea indica* were mass-reared and released. In all, over 390,000 parasitoids were produced and released in 2000 and well over 200,000 in 2001 and 2002. A significant part of the production in 2001 and 2002 was provided to Mexico for release in the Mexicali Valley and to the State of Florida in response to their infestation in 2002. To date, *A. kamali* is well established in the Imperial Valley, commonly reaching levels of parasitism exceeding 50 percent. *Gyranusoidea indica* is established as well; however, its percentage of parasitism is generally much lower. Mealybug densities are a fraction of those found in 1999, and no evidence of its spread has been observed since 2000. For 2003, the program reared and released a third parasitoid species (*Allotropa* sp. nr. *mecrida*, family Platygastridae). By early November 2003, 160,800 *Allotropa* had been released at 178 locations in Imperial Valley and 88,000 were provided to Mexico for release in Mexicali Valley. Establishment and impact are under evaluation.

Cotton Aphid: Enhancement of the biological control of cotton aphid was initiated in 1996 with the establishment of a cooperative project involving the CDFA, USDA-ARS, and the University of California Cooperative Extension Service. The long-term goal of this project is to reduce densities of the cotton aphid by constructing a natural enemy complex that has more species richness than currently exists in the San Joaquin Valley. After extensive field-testing of five natural enemies at the USDA Shafter Research and Extension Center, two parasites, *Aphelinus* near paramali, and *Aphelinus gossypii*, showed promise as potential biological control agents. During 2003, three parasite nurseries were established in the San Joaquin Valley, and releases of the two parasite species were made. Recovery of one of the parasites occurred at one nursery over a two-year period and at a second nursery for one year, suggesting that the parasite is slowly becoming established at these locations. Maintenance of the parasite nurseries will continue. In 2004, efforts will be directed at obtaining two new parasites, *Lipolexis*

oregmae (Mackauer) and *Trioxys indicus (*Subba Rao and Sharma), 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 new 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. Working cooperatively with the University of California Cooperative Extension Service and county agricultural commissioners, CDFA assisted with the distribution of pheromone traps to county biologists and other interested parties to monitor the spread of the mealybug into new grape-growing areas and to provide information on the biology and management of this insect.

Weed Pests

Squarrose Knapweed: Three biological control insects have shown very encouraging results by rapidly achieving high population densities and inflicting heavy damage on squarrose knapweed plants in release areas. In 2003, approximately 28,000 seedhead-feeding weevils, *Bangasternus fausti* and *Larinus minutus*, were collected in southern Oregon and from Pittville, California, and released at additional squarrose knapweed infestations in Lassen, Modoc and Shasta counties. Also, a total of 200 *Sphenoptera jugoslavica*, the rootboring beetle, were shipped from Spokane, Washington by USDA-APHIS-PPQ and released in Lassen, Modoc and Shasta counties. Field monitoring sites in Lassen and Shasta counties continue to reveal dramatic impacts from these three insects.

Yellow Starthistle: A plant pathogen, the rust disease, *Puccinia jaceae* var. *solstitialis*, was approved for limited field release on yellow starthistle in California. One late season release was made in Napa County in July 2003. An additional release was made in the CDFA greenhouses in south Sacramento. For most of 2003, the rust was propagated in the greenhouse, harvested and stored for future releases in 2004. It is hoped that the rust will be released in at least 20 counties statewide in 2004.

Spotted Knapweed: Six biological control insects have been released on spotted knapweed at one site in Shasta County: the gall flies, *Urophora quadrifasciata* and *Urophora affinis*; the seedhead fly, *Terellia virens*; the seedhead weevil, *Larinus minutus*; the root-feeding moth, *Agapeta zoegana*; and the rootboring weevil, *Cyphocleonus achates*. All of these insects have established but their degree of attack varies by species. The root-feeding moth, *A. zoegana*, continues to exist at very low numbers and appears to have little, if any, effect. The attack rate by the root-weevil, *C. achates*, has increased to between 24 and 60 percent and shows greater impact. The seed-head weevil, *L. minutus*, appears to be the most highly effective agent as larvae infest nearly 90 percent of the seed heads. This level of attack has caused seed production to drop over 90 percent. Because the weevil larvae consume the galls or otherwise prevent the development of the other insects, the high level of infestation by the weevil has prevented the other seedhead insects from building high population levels. Upon release, the two gall flies readily established and spread throughout the release site but the level of seedhead attack remains low. The seedhead fly, *T.virens*, has also remained at a low level (less than five percent) for several years in the field.

Purple Loosestrife: In 2003, a total of 525 *Hylobius transversovittaus* rootboring weevils were released on August 14 through 15, 2003 at two sites in Shasta County and at one site in Kern County. The weevils were obtained from USDA-APHIS, Niles, Michigan. Surveys of infested areas in Shasta and Kern counties indicated that the two leaf beetles, *Galerucella calmariensis* and *G. pusilla* released in 2001 through 2002 are established in the 2001 release locations.

Also established is the small flower weevil, *Nanophyes marmoratus*, released in Shasta County in 2001-2002. All populations occur at low densities.

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 700,055 acres of cotton was mapped in California during 2003. Southern California cotton acreage totaled 20,375 acres. The four cotton-growing counties of Northern California's Sacramento Valley had a total of 7,920 acres. The PBW Program personnel mapped 671,760 acres of cotton in six counties of the San Joaquin Valley. The statewide acreage was up slightly (one percent) from the 692,385 acres mapped in 2002. Pima cotton plantings in the San Joaquin Valley for 2003 amounted to 134,820 acres, down 32.8 percent from the 200,805 acres in 2002.

Early detection trapping was done at selected San Joaquin Valley sites having native PBW moth catches in the year 2002 to detect possible over-wintering populations and monitor sterile release. The early detection trapping was conducted from April 21 through July 26. 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 2. The total number of traps deployed during the peak of the season was 8,374 traps. Traps were inspected weekly and were removed by October 15.

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. One PBW moth was detected in the Mojave Desert trap line on September 24, most likely a "blow-in moth," and a result of hurricane "Marty."

The PBW Identification Lab in Visalia examined 13,890 traps containing suspect moths submitted by trappers. A total of 332,727 sterile moths and 180 native moths were identified in the San Joaquin Valley traps. There were 111 native moths caught in 2002.

The sterile moth receipts from the PBW Rearing Facility in Phoenix, Arizona were consistent throughout the entire release period. Approximately 281,032,394 sterile moths, roughly three tons of moths, were released in the San Joaquin Valley.

On September 18, 2003, a reduced tillage permit was issued by the 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. The annual permit expired December 31, 2003.

The 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. Staff also conducted a project to measure the susceptibility (resistance) of beet armyworm to *Bt* cotton. To date, no resistance has been observed.

Silverleaf White Fly

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 Service. Warmer than normal fall temperatures provided ideal conditions for SLWF and a slight rise in overall late season populations was observed.

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. No cotton boll weevils were detected in California.

VERTEBRATE PEST CONTROL

The primary objectives of the Vertebrate Pest Control Program are to maintain the CDFA's 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 rodenticide registrations are currently in the United States Environmental Protection Agency's (USEPA) Re-registration Eligibility Decision (RED) process. In evaluating pesticides for re-registration, the USEPA obtains and reviews a complete set of studies from pesticide producers, describing the human health and environmental effects of each pesticide. The USEPA then develops any mitigation measures or regulatory controls necessary to effectively reduce each pesticide's risks. The USEPA reregisters pesticides that can be used without posing unreasonable risks to human health or the environment. The CDFA's rodenticide registrations are currently in complete compliance with the RED requirements and timelines.

In order to address issues outlined in the RED, the Vertebrate Pest Control Research Program funds studies to investigate experimental application strategies 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 food crops. Since 1991, the Vertebrate Pest Control Research Program has funded 72

research proposals on efficacy, product chemistry, residues, and non-target hazards, totaling $4.9 million to support re-registration and to expand the uses of the CDFA's rodenticides.

The following highlights program progress in 2003:

Western Burrowing Owl

A number of environmental advocacy groups submitted a petition to list the Western Burrowing Owl (*Athene cunicularia* Hypugaea) as an endangered or threatened species in California was filed with the California Fish and Game Commission (CFGC). The Vertebrate Pest Control Program submitted extensive comments to the California Department of Fish and Game (CDFG) in opposition to the petitioner's claims of imminent danger and the science supporting the proposed listing.

On December 4, 2003, the CFGC held a hearing on the petition to list the Western Burrowing Owl under the California Endangered Species Act and to make a final decision on the petition. The CFGC voted unanimously to accept the CDFG recommendation that the species does not warrant listing.

USEPA Re-registration of Rodenticides

The USEPA has determined that the CDFA's rodenticide registrations are in compliance with all re-registration requirements and expect to finalize the re-registration process during late 2004 and issue new rodenticide labels to the CDFA. The CDFA will provide registration information, including information on formulating materials, to counties that manufacture and distribute rodenticide baits as well as counties that sell rodenticide baits as soon as the re-registration process is complete.

USEPA Registration Issues

In 2002, the CDFA submitted a petition for tolerance request to IR-4 (Inter-Regional Program) to establish a permanent tolerance for zinc phosphide on alfalfa. The IR-4 program completed and submitted the tolerance request to the USEPA. Work on the tolerance was scheduled for the fourth quarter of 2003. The initial tolerance petition was published in the Federal Register on July 9, 2003, with a 30-day public comment period. The CDFA, Alameda County, Shasta County and the California Alfalfa and Forage Association, filed comments in support of the tolerance. On October 1, 2003, the final rule to establish a tolerance was published in the Federal Register. A 24(c) Special Local Need registration has been submitted to the California Department of Pesticide Regulation for the use of zinc phosphide on alfalfa to control voles. The CDFA expects the registration to be issued early in 2004.

County Bait Manufacturing Contracts

A Memorandum of Understanding (MOU) between the CDFA, the California Agricultural Commissioners and Sealers Association, and eight county agricultural commissioners (CAC) that formulate rodenticide baits is in the third revised draft stage and will be prepared for distribution to counties interested in manufacturing rodenticide baits. The CACs that formulate rodenticide baits met with the CDFA, Integrated Pest Control Branch staff, and University of California staff to discuss quality control issues including manufacturing contracts. The final

MOU is a result of review and comments provided by CACs and are part of an overall Quality Assurance/Quality Control program for all counties mixing and selling baits.

Vertebrate Pest Control Research Advisory Committee

The Vertebrate Pest Control Research Advisory Committee meeting was held at the San Diego County Cooperative Extension Office on October 8, 2003.

Two new research proposals were recommended for funding to the Secretary of CDFA:

1. "Development and Evaluation of a Research Database and Website for the Vertebrate Pest Control Research Advisory Committee," Dr. Terrell Salmon, University of California, Davis.

2. "Comparison of 20,25-diazacholesterol, 22-azacholesterol, and Aromatase Inhibitor as Orally Delivered Contraceptive Agents for Rodent Population Control," Dr. Lowell Miller, National Wildlife Research Center.

The CDFA has recently accepted the final reports for the following research projects with funding provided by the Vertebrate Pest Control Research Surcharge:

1. "Winter Evaluation of a Bait Station for Deer Mouse Control in Almonds," Paul Gorenzel and Dr. Terrell Salmon, University of California, Davis.

2. "Alternative Formulation Process for Anticoagulant Treated Artichoke Bracts," Dr. Terrell Salmon, University of California, Davis.

3. "Anticoagulant Baiting Strategies for California Meadow Vole (*Microtus californicus*) Control in Artichokes," Dr. Terrell Salmon, University of California.

WEED MANAGEMENT AREAS

The mission of the weed management area initiative is to demonstrate the power of local cooperative action in:

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

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 originated with 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.

California Governor Gray Davis signed legislation (Assembly Bill 1168, Frusetta and Senate Bill 1740, Leslie) providing the CDFA sufficient funding to develop pilot weed management programs (through local WMAs) in several counties. Assembly Bill 1168 (Chapter 961, Statutes of 1999) was adopted in 1999. It 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 $5,000,000 to the Noxious Weed Management Account and extended the time over which funding will be available to WMAs throughout the State.

The following highlights program progress in 2003:

- The number of countywide WMAs in California has grown from seven in early 1998 to 47 in 2003. The groups represent 57 out of 58 counties in the State.

- Over 1,858 individuals attended regular WMA meetings throughout California in 2002. New local partnerships have been created among public agencies, private landowners, agriculturalists and conservationists.

- An estimated 130,896 landowners and citizens have participated in noxious and invasive weed education events statewide.

- Over $1,430,000 was distributed to 42 WMAs in 2003, resulting in over 33,690 acres of high priority weed infestations treated under this program. Most sites had close to 90 percent control. Additionally, at over 473 sites, 100 percent of targeted weeds were eradicated from the site and are not expected to return.

- This state seed money has been matched locally by a total of $3,416,342 of "in-kind" resources (donated equipment or services) and matching cash dollars. Of these resources, $599,563 is direct cash matches by county government and outside grants.

- On September 22 and 23, 2003, 95 WMA members attended the fifth 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.

HYDRILLA

The CDFA is the lead agency[1] in California for the eradication of the aquatic, noxious weed hydrilla (*Hydrilla verticillata*). Hydrilla can reduce water storage capacity of lakes, ponds, and reservoirs; impede water movement through streams, canals, and drains; jam water control structures and choke hydroelectric generators; impede navigation; degrade fish and wildlife habitat; and produce mosquito breeding habitat by reducing water flow rates. Since hydrilla was first discovered in California in 1976 in Lake Ellis, Marysville, Yuba County, there have been 28 separate introduction sites of this pest plant in 17 counties. The CDFA Hydrilla Program has eradicated hydrilla from 19 of these introduction sites in 12 counties.

The CDFA Hydrilla Eradication Project was authorized in 1977 when the California Legislature mandated that the Secretary of Agriculture survey the State for hydrilla and eradicate it wherever feasible[2]. Later, the Legislature authorized research and implementation of biological control agents against hydrilla[3]. The authority to establish exterior and interior quarantines against hydrilla, and establish hydrilla eradication areas, was authorized by regulation[4].

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[1] California Food and Agriculture Code section 7271

[2] Ibid. Section 6048

[3] Ibid. Section 6049

[4] California Code of Regulations Sections 3281, 3410 and 3962

As the lead agency, the CDFA administers the Hydrilla Program, but does so in cooperation with the local county agricultural commissioners and other federal, state, county, city, Native American tribes, and private individuals and entities. In addition, in 2003, the Program received financial support from the California Department of Boating and Waterways, the California Department of Water Resources, the United States Department of the Interior-Bureau of Reclamation, the United States Army Corps of Engineers-Eastman Lake, the United States Department of Agriculture-Animal and Plant Health Inspection Service, the Yolo County Flood Control and Water Conservation District, the Lake County Agricultural Commissioner's Office, and the Lake County Department of Public Works.

There are currently nine active hydrilla eradication projects in eight counties, as follows (see map):

1. Anderson River Park ponds in Shasta County

2. Riverside Golf Course ponds in Shasta County

3. Clear Lake in Lake County

4. Yuba County Water District canal and associated ponds near Oregon House in Yuba County

5. Bear Creek in Calaveras County

6. Mokelumne Hill pond in Calaveras County

7. Eastman Lake and the west fork of the Chowchilla River in Madera and Mariposa counties

8. Springville ponds in Tulare County

9. Imperial Irrigation District in Imperial County

In addition to survey and treatment of the active project, the CDFA Hydrilla Eradication Program also conducts annual surveys of "high risk" water bodies in the State. The largest of these annual surveys is in the Sacramento-San Joaquin River Delta.

In 2003, the Program consisted of four permanent employees and 17 seasonal employees. The permanent employees are one Senior Scientist, one Associate Scientist, one Agricultural Pest Control Supervisor, and one Agricultural Pest Control Specialist.

The Program's field activities in 2003 were approximately distributed as follows:

- Fifty percent consisted of survey and detection of hydrilla at known and historical find sites and defined "high risk" water bodies in the State.

- Twenty-five percent consisted of eradication activities, such as physical removal, biological control (the triploid grass carp), and chemical control.

- Ten percent consisted of outreach and education to elicit the help of the public to report possible hydrilla finds.

- Fifteen percent consisted of water monitoring.

Highlights of each of the active projects in 2003 follow below, by county.

In Shasta County, the main eradication tool was fluridone aquatic herbicide treatment. In the Riverview Golf Course pond system, only one hydrilla plant was detected in the largest, upstream pond in 2003, compared to scattered plants in 2002. No hydrilla was detected in the three smaller ponds. In the two Anderson Park ponds, no hydrilla has been detected for the fourth consecutive year. Water monitoring of the aquatic herbicide treatment showed that it did not adversely affect the "Beneficial Use" of the water.

In Lake County, the main eradication tools were copper and fluridone aquatic herbicide treatments. Because of these treatments, the number of hydrilla finds in Clear Lake has decreased every year since discrete finds could first be counted in 1997 (see Table 1).

Table 1. Level of Hydrilla Infestation in Clear Lake by Number of Finds (1997 to 2003)

Year	1997	1998	1999	2000	2001	2002	2003
Number of hydrilla "finds"	208	194	122	67	41	12	1

Water monitoring studies have shown that both the copper and the fluridone aquatic herbicide treatment did not adversely affect the "Beneficial Use" of the water.

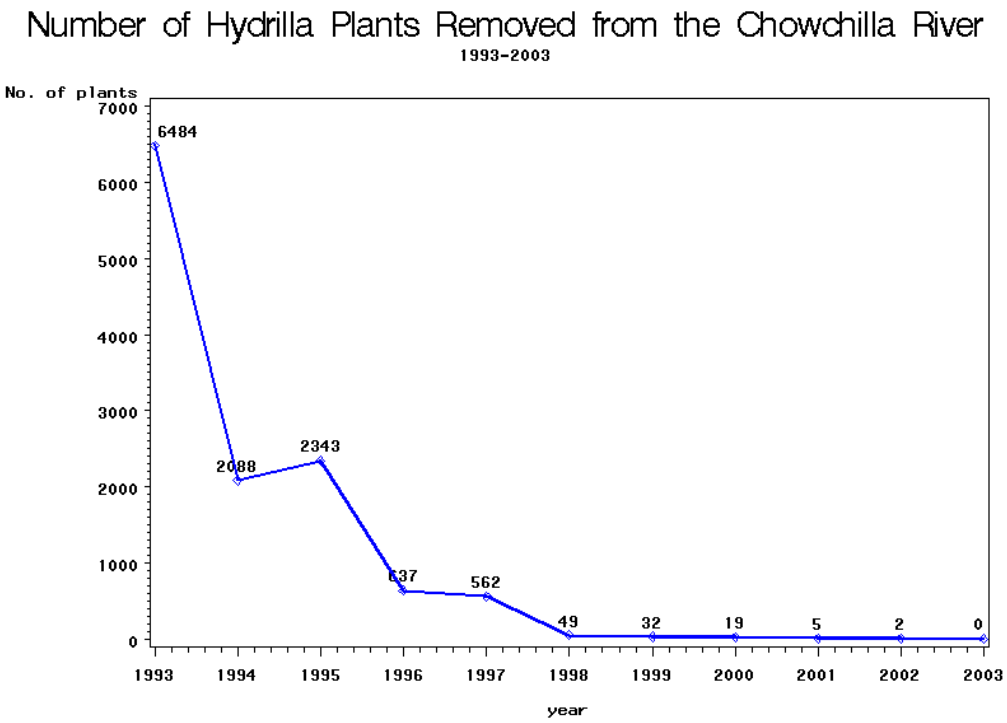
In Yuba County, the main eradication tools were hand removal of plants and tubers and copper and fluridone aquatic herbicide treatment. One new infested pond was detected in 2003. In the Yuba County Water District canal, the tuber abundance has decreased every year since first counted in 1998 (see Table 2).

Table 2. Tuber Abundance in the Oregon House Irrigation Canal (1998-2003)
D. F. Spencer & G. G. Ksander, USDA-ARS, Davis, California

Year	Fall 1998	Fall 2000	Spring 2001	Spring 2002	Fall 2002	Fall 2003
Mean Tubers/m^2	316	84	76	28	13	1.0
Standard Error	+/- 61	+/- 21	+/- 24	+/- 9	+/- 5	+/- 1.6

In Calaveras County, the main eradication tools were hand removal, copper and fluridone aquatic herbicide treatments. In the Bear Creek project, scattered hydrilla plants and tubers were found in the lowest ponded area of the creek. No hydrilla has been found in the more upstream ponded areas of the creek since 1999. In the Mokelumne Hill project, scattered plants were also found in 2003. The two projects are not connected, despite being in the same county. Water monitoring of a copper aquatic herbicide treatment in the lowest ponded area of Bear Creek showed that the treatment did not adversely affect the "Beneficial Use" of the water.

In Madera and Mariposa counties, intensive surveys continued in 2003. No hydrilla plants have been detected in Eastman Lake since 1993. In the Chowchilla River, the number of plants was too numerous to count at the beginning of the project, but has declined from 6,484 in 1993 to two plants in 2002 and zero plants in 2003 (see graph below).



In Tulare County, no hydrilla plants have been detected since 2001. Intensive surveys continue, and sites where hydrilla was detected in 2001 were treated with fluridone aquatic herbicide in 2003.

In Imperial County, the main eradication tools were hand removal, mechanical dredging, and use of the triploid grass carp. The number of infested sites decreased from 67 in 1994 to four in 1999. In 2003, there were two infested sites, but each site only had a few plants.

In summary, the CDFA Hydrilla Eradication Program continued to make significant gains in eradicating hydrilla from California's waterways in 2003.

NOXIOUS WEEDS

The 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.

The Noxious Weed Eradication projects are authorized in the California Food and Agriculture 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 are 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, there are 24 A-rated weeds 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* (BC)
7) Diffuse knapweed - *Centaurea diffusa* (BC)
8) Iberian starthistle - *Centaurea iberica*
9) Spotted knapweed - *Centaurea maculosa* (BC)
10) Squarrose knapweed - *Centaurea squarrosa*
11) Skeletonweed - *Chondrilla juncea* (BC)
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*

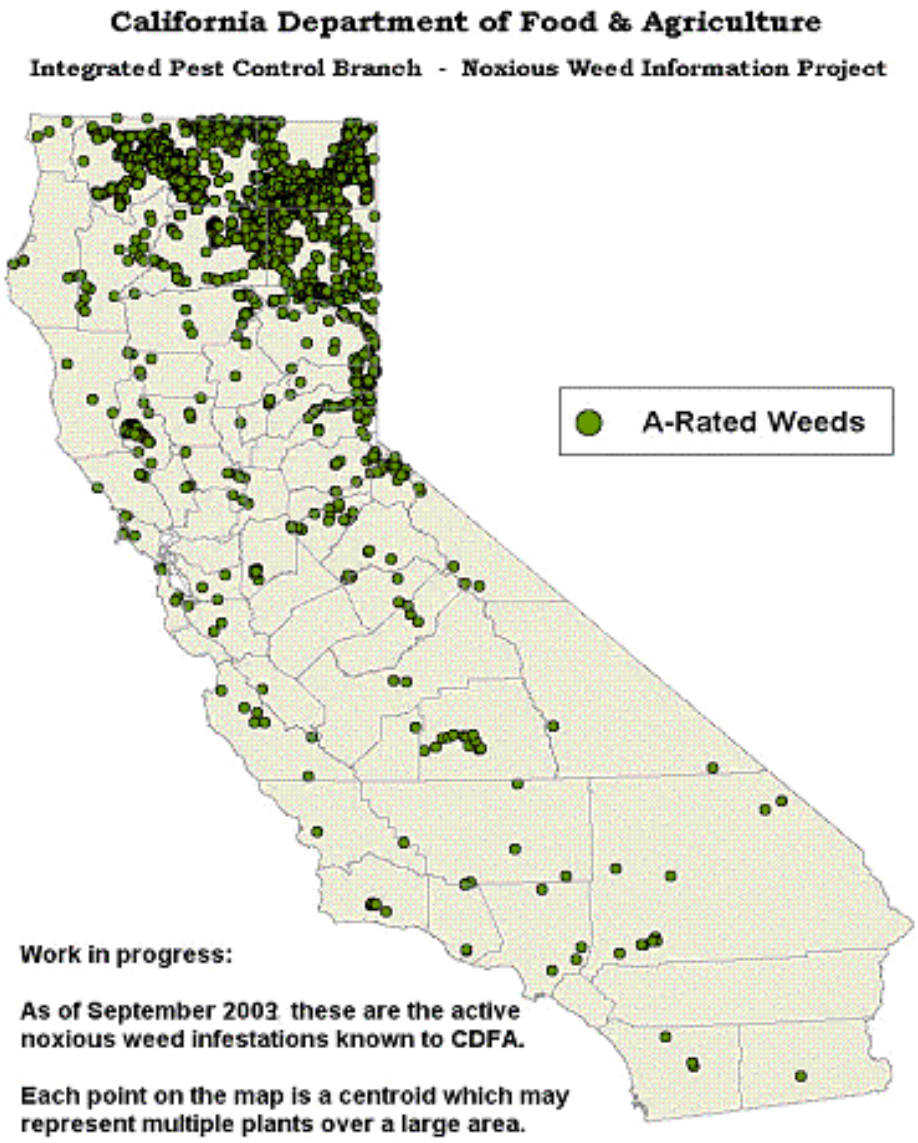
BC = Biological Control program being implemented

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

To date, the Noxious Weed Eradication projects have eradicated 14 weeds from the State. These are 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.

The statewide distribution of current A-rated noxious weed infestations can be seen on the map below. 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.



In 2003, the Noxious Weed Eradication projects personnel consisted of six permanent employees and four seasonal employees. Five of the permanent employees were Associate Agricultural Biologists of which four were assigned to specific districts (see map below). The seasonal employees assisted the Associate Agricultural Biologists in the districts. The fifth Associate Agricultural Biologist provides GIS support to the program

The Noxious Weed Eradication project's field activities in 2003 were approximately distributed as follows:

- 50 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.

- 25 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.

- 20 percent consisted of outreach and education to elicit the help of the public to report possible A-rated noxious weed finds.

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

BEET CURLY TOP VIRUS

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 sugar 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 Curly Top Virus Control Program (CTVCP) utilizes intensive surveys to locate and monitor BLH populations throughout the year. Once the populations are located, they are evaluated as to the amount of virus in BLH samples, potential for migration of BLHs 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 BLHs through the application of insecticide on Russian thistle and other weed hosts in the 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 habitat where a spring population of BLHs has developed preventing migration to crops during late spring and early summer.

The goals of the CTVCP for 2003 were to:

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

2. Locate, monitor and selectively suppress the spring hatch of BLHs to maturation and migration into susceptible crops.

3. Assess the program's success by surveying susceptible crops for BCTV.

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

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

During 2003, using aircraft and ground spray equipment, a total of 113,340 acres was treated with malathion to control BLH populations. The acreage totals for 2003 were well above the 10-year treatment average. Below normal winter rainfall left sparse, ideal host plant conditions with excessive quantities of *Plantago* on the west side of the San Joaquin Valley. Widespread development of the general BLH population and BCTV infection during the spring of 2003 increased the potential for infection to susceptible crops and indicated the increase in treatment acreage.

PLANT PEST DIAGNOSTICS BRANCH

Mission:

The primary mission of the Plant Pest Diagnostics Center (PPDC) is to provide timely and accurate plant pest diagnostics in support of the pest prevention system in the California Department of Food and Agriculture. The branch also serves as a scientific resource and provides professional expertise to a number of clients including the Department, the United States Department of Agriculture, 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.

This report is a summary of accomplishments for this past year. It provides updates on projects and highlights critical areas of research and new methodology in diagnostics and is by no means inclusive of all work performed at the PPDC.

Workload:

The number of diagnostic samples processed in 2003 at PPDC includes:

Plant Taxonomy	3,284	
Plant Pathology	88,233	(includes special projects)
Entomology	36,146	
Nematology	4,782	
Seed sciences	3,067	

[*Please note that the numbers cannot be compared between the different disciplines (labs) as an indication of workload*.]

Staffing Changes:

Dr. Mayhew accepted the position of Director of Plant Health and Pest Prevention Services effective May 2003. Dr. Umesh Kodira was appointed as the Branch Chief of Plant Pest Diagnostics Center effective November 2003. Dr. Mark Epstein and Dr. Shaun Winterton came on board with the PPDC as Associate Insect Biosysytematists during the year. Dr. James Smith, Senior Plant Pathologist, retired from the Department after 37 years of dedicated service.

Research:

The scientists at PPDC have been continuing to do research and publish scientific papers as part of the mission of this branch. In the past year, fifteen scientific papers were published and two posters were presented at professional meetings.

Other Projects:

PPDC has been working with University of California, Davis during the past year in setting up the Western Plant Diagnostic Network, as part of an initiative for homeland security for agriculture. PPDC will provide the diagnostic support for the nine western states. Staff from

PPDC and the Department has also been instrumental in setting up the electronic database for the Network.

New Projects at the Plant Pest Diagnostics Laboratory

- Post Doctoral Researcher, Dr. Peter Kerr, has been working at the Plant Pest Diagnostics Center on a project involving the Systematics of the Tephritidae (identification of exotic fruit flies), using primarily molecular techniques coupled with classical identification methods. There are two major facets of the project. One is to possibly identify the exact origins of certain fruit fly pests, such as Mediterranean fruit fly (Medfly), either when they are found in California or when they are intercepted in quarantine. The second is the identification of larval fruit flies intercepted in quarantine using molecular techniques, particularly those of the *Bacterocera* (Oriental fruit fly) and *Anastrepha* (Mexican fruit fly) groups. Under current classical methods, this is nearly impossible for most species.

- Insect Biosystematist Dr. Marc Epstein has recently joined the PPDB staff, and brings with him many years experience in certain kinds of moths (the Limacodidae, the slug caterpillars) of agricultural significance. He is currently describing the morphology of a species in this group of moths that has recently been introduced in Hawaii and which we have already intercepted in quarantine coming from there. The moth is established in the eastern U.S., and is widespread throughout Asia and the Pacific Rim countries. It is a general feeder and is a serious enough pest to warrant having Mark publish an alert for use by our quarantine personnel and for the larval characters to be made available to other diagnosticians.

- The Nematology lab is currently involved in developing molecular markers for various hard-to-identify but common root-knot nematodes. The projects involve raising various species on hydroponically grown tomato plants in the lab, then saving specimens for further molecular work by saving material in a cryogenic freezer. They are currently raising four common species out of some 65 known species.

- Dr. Fred Hrusa, Botanist, has been collaborating with scientists in Russia, the Ukraine, Uzbekistan, the Kew gardens in England and the Missouri Botanical gardens in a project trying to identify and trace the origins of the several species of Russian thistles (tumbleweeds) that occur in California. Russian thistle has been a serious weed pest all over the western U.S. for many years, and the Botanist and our Bio-Control unit are looking for answers on ways to control the pest with biological methods.

- Insect Biosystematist Ray Gill has been continuing a long-term project on the identification of the various strains and related species of whiteflies called variously the sweet potato whitefly and the silver leaf whitefly. These groups of whiteflies are serious disease vectors of agricultural crops and have caused serious losses in California and all over the world. Collaboration with other identifiers and molecular workers includes scientists at the University of Arizona, Scotland, London, Taiwan, Spain, Israel and other localities.