California Plant Pest & Disease Report

Plant Pest Diagnostics Branch
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California Plant Pest & Disease Report

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Cover Photographs:
The light brown apple moth, *Epiphyas postvittana* (Walker) (Lepidoptera: Tortricidae);
clockwise from lower right – adult moth, male genitalia, mature larva, wing edge with costal fold.
Photos by Marc Epstein & Scott Kinnee; Layout by Megan O'Donnell, CDFA/PPD.

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INTRODUCTION

The California Plant Pest & Disease Report was last printed and issued as Volume 23, Number 1, in 2007, covering the period of July 2005 through December 2006. Since that time, there have been many significant pest finds in the State of California not published through this medium. The current issue (Volume 24) covers the time period from the end of Volume 23 through December 2007.

SIGNIFICANT RECORDS IN ENTOMOLOGY

COLEOPTERA

Keeping up with the dynamics of beetle classification: you can't tell the players without a program!

Prepared by C.L. Bellamy & A.R. Cline

The dynamic nature of the classification and nomenclature of plants and animals is the result of the work of biosystematists and yet often the bane of the user community. For those who use the names to remain current with recent systematic advances, it is necessary that changes should be detailed so that all are on the same page. Many changes to beetle (Coleoptera) nomenclature and classification have taken place in recent years and the time has come to present those changes in a uniform way so that our conversations retain a common language.

The large list of rated pests used throughout CDFA, and by our clients, is well out-of-date and is currently under complete revision. If a particular pest now belongs to a different family, how will users of our identifications know? To avoid confusion and comments such as "in 2006 you guys said this was a lyctid (powder-post beetle) and now you say it's a bostrichid (false powder-post beetle); which is it?", we present below a brief summary of the pertinent major changes in beetledom. Readers should note that there are other lower-level changes, e.g. a genus placed in Cucujidae is now placed in Laemophliidae, but we ask the users of the beetle list and consumers of the lab's identifications to trust that we're paying attention to the details. In the following two tables, we summarize former families now treated as subfamilies (Table 1) and certain genus names that have moved from one family to another (Table 2).

Table 1. Beetles families to subfamilies

Old Family Name	Common Name	New Family Name
Alleculidae	Comb-claw beetles	Tenebrionidae (Alleculinae)
Apionidae	none	Brentidae (Apioninae)
Bruchidae	Seed weevils	Chrysomelidae (Bruchinae)
Cicindelidae	Tiger beetles	Carabidae (Cicindelinae)
Languriidae	Lizard beetles	Erotylidae (Languriinae)
Lyctidae	Powder-post beetles	Bostrichidae (Lyctinae)
Platypodidae	Ambrosia beetles	Curculionidae (Platypodinae)
Ptinidae	Spider beetles	Anobiidae (Ptininae)
Pselaphidae	Short-Winged Mold Beetle	Staphylinidae (Pselaphinae)
Scaphidiidae	Scaphidiid Beetle	Staphylinidae (Scaphidiinae)
Scolytidae	Bark beetles	Curculionidae (Scolytinae)

Many of the changes are in response to the higher level reclassification by Lawrence & Newton (1995), Pakaluk, *et al*. (1995) or subsequent works inspired by those efforts (e.g. Arnett & Thomas 2001; Arnett, *et al*. 2002). The redefinition of family placement or the subordination of a former family to subfamily status elsewhere happens as more effort progresses to define the true higher classification. Nomenclatural works are something like the law, i.e. tenets based on the precedent of earlier decisions. Upon reflection or re-examination, these precedents sometimes require revision. To continue to provide identification results and details to the user community using outdated nomenclature does a disservice to all concerned.

Table 2. Select beetle genus names from one family to another

Old Family Name	**Genus Name**	**New Family Name**
Cucujidae	*Cryptolestes, Laemophloeus, Narthecius*	Laemophloeidae
Cucujidae	*Catogenus*	Passandridae
Cucujidae	*Ahasverus, Cathartus, Oryzaephilus, Psammoecus, Silvanus, Telephanus, Uleiota*	Silvanidae
Lucanidae	*Diphyllostoma*	Diphyllostomatidae
Nitidulidae	*Cybocephalus*	Cybocephalidae
Nitidulidae	*Amartus, Brachypterus, Kateretes*	Kateretidae
Rhizophagidae	*Rhizophagus*	Monotomidae
Scarabaeidae	*Glaresis*	Glaresidae
Scarabaeidae	*Bolbelasmus, Bolbocerastes*	Geotrupidae
Scarabaeidae	*Hybosorus*	Hybosoridae
Scarabaeidae	*Licnanthe*	Glaphyridae
Scarabaeidae	*Ochodaeus*	Ochodaeidae
Scarabaeidae	*Omorgus*	Trogidae
Scarabaeidae	*Pleocoma*	Pleocomidae

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Arnett, Jr., R. H. & M. C. Thomas. 2001. *American Beetles*, Volume 1, Archostemata, Myxophaga, Adephaga, Polyphaga: Staphyliniformia. CRC Press, xv + 443 pp.

Arnett, Jr., R. H., M. C. Thomas, P. E. Skelley & J. H. Frank. (Eds.). 2002. *American Beetles*, Volume 2, Polyphaga: Scarabaeoidea through Curculionoidea. CRC Press, xiv + 861 pp.

Lawrence, J. F. & A. F. Newton, Jr. 1995. Families and subfamilies of Coleoptera (with selected genera, notes, references and data on family-group names), pp. 779-1006. *In*: J. Pakaluk & S.A. Ślipiński. (Eds.). *Biology, Phylogeny, and Classification of Coleoptera*. Papers Celebrating the 80th Birthday of Roy A. Crowson. Muzeum I Instytut Zoologii PAN, Warszawa.

Pakaluk, J., S. A. Slipinski & J. F. Lawrence. 1995. Current classification and family group names in Cucujoidea (Coleoptera). *Genus* 5:223-268.

DIPTERA

Ceratitis capitata (Wiedemann) – Tephritidae
Mediterranean fruit fly

Prepared by S. Gaimari

Mediterranean fruit fly is a serious agricultural pest native to tropical Africa, but invasive and/or established in many other parts of the world with a Mediterranean climate. It feeds on thin-skined fruits of more than 300 plants, such as apple, apricot, avocado, citrus, coffee, dates, grapes, peach, pear, peppers, plums, tomatos, and many others. Direct damage results from oviposition in fruits and soft tissues, and feeding by the larvae. Larval feeding also results in decomposition of plant tissue by invading secondary microorganisms (e.g., fungi, bacteria). Although not established in California, this pest has been trapped repeatedly since 1975, and in every year but six since 1980. In 2007, there were three outbreaks currently under eradication, in Los Angeles, Santa Clara, and Solano Counties. The maps in Figure 1 display the find-sites, as well as delimiting the SIT (sterile insect technique) and quarantine boundaries.

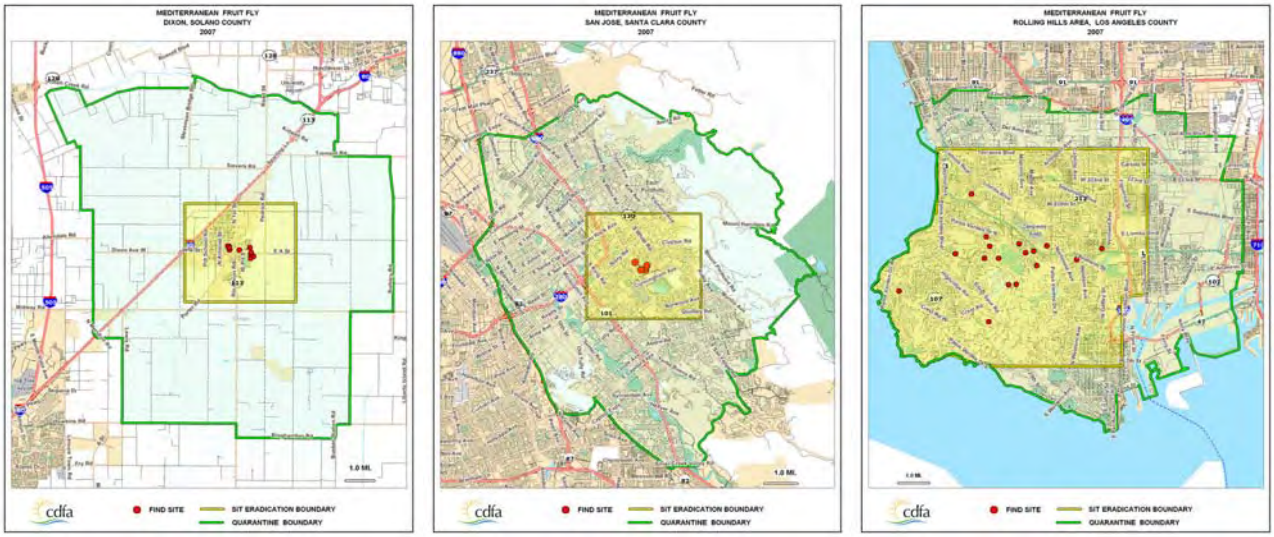

Figure 1. Maps of the Mediterranean fruit fly finds in Solano (left), Santa Clara (middle) and Los Angeles (right) Counties. Also shaded are the SIT zones (yellow) and the quarantine boundaries (green).

The first detection for 2007 was in Solano County (Dixon) on 10 September. For the remainder of 2007, a total of 14 adults [4 females (2 sexually mature, unmated; 2 sexually immature, unmated) and 10 males (all sexually mature)] were detected in Dixon. The last adult was collected on 12 December. In a larval survey, more than 900 pounds of fruit were cut from 40 properties, of which two properties were infested, with the host being peach in both cases. In testing the DNA, all tested finds were mitotype BBBB, which is found in Hawaii, parts of South America, the Mediterranean region, and Africa.

Shortly after the first detection in Solano County, another county joined in. On 18 September, Mediterranean fruit fly was detected in Santa Clara County (San Jose). Between this date and 12 October, a total of 7 adults [4 females (1 sexually mature, unmated; 3 sexually immature, unmated)

and 3 males [2 sexually mature; 1 sexually immature] were detected in San Jose. No larvae were found despite cutting nearly 900 pounds of fruit from 79 properties. The first find on 18 September was of the mitotype AAAB, which is found in Central America, the Mediterranean region, and Africa. The subsequent finds in this county were mitotype AABB, which is found in South America, the Mediterranean region, and Africa.

More than a month after the first finds, on 24 October, Los Angeles County detected Mediterranean fruit flies in Rolling Hills and Rancho Palos Verdes. Between this date and 28 December, a total of 20 adults [18 females (2 sexually immature, unmated; 4 sexually mature, unmated; 12 sexually mature, mated) and 2 males (sexually mature)] were detected in the Rolling Hills/Rancho Palos Verdes area. Out of over 1300 pounds of fruit cut from 189 properties, only one property had a larval infestation. All tested finds were mitotype AAAB, which is found in Central America, the Mediterranean region, and Africa.

HEMIPTERA: AUCHENORRHYNCHA

Two leafhoppers have been collected for the first time in California. The first is a native of Europe, *Allygus mixtus*, which has been in Canada and the Pacific Northwest for many years. The second is a colorful member of the sharpshooter tribe, *Graphocephala fennahi*, a native of the eastern US.

***Allygus mixtus* Fabricius** – Cicadellidae
A leafhopper

Prepared by R. Gill & A. Rung

The leafhopper species *Allygus mixtus* was found in Sonoma County (Santa Rosa, 4 September 2007, collected by Richard Opbroek & P. Lane) on GWSS sticky traps. This Palearctic species has been in the northwestern United States and western Canada for many years. It is normally found on tree and shrub species, but is not known to cause problems or vector diseases.

***Graphocephala fennahi* Young** – Cicadellidae
Rhododendron leafhopper

Prepared by R. Gill & A. Rung

Graphocephala fennahi is part of a complex of species restricted almost entirely to rhododendrons and azaleas in the eastern US. A common and often photographed sister species there is *Graphocephala coccinea*. *Graphocephala fennahi* was first officially recorded in California from GWSS sticky traps in Sonoma County (Fulton, 26 July 2007, collected by D. Curtin). This species has been collected several times from a nursery in San Joaquin County, although this is considered to be a quarantine situation and not an actual infestation. It is apparently common on rhododendrons in the Pacific Northwest, and is especially common on that host in the Portland, Oregon area. It is not known to be a vector of any diseases in the U.S., although it could transmit *Xylella fastidiosa* if given the chance. Otherwise it seems to have no noticeable affect on the rhododendrons. The species has been introduced into Europe, where is is vectoring rhododendron bud blast, a fungal disease that is transmitted when the females slit the flower buds to lay eggs.

Figures. Rhododendron leafhopper, *Graphocephala fennahi*: Left – nymph; Right – adult. Photos by S. Kinnee.

HEMIPTERA: STERNORRHYNCHA

NEW FEDERAL RECORDS

***Euphyllura olivina* Costa** – Psylloidea: Psyllidae
Olive tree psyllid

Prepared by R. Gill & G. Watson

Psyllids are once again in the news this year, although at least they have not been on eucalyptus trees. One species, possibly an important future pest on olive trees here in California, is a new state and North American record. This is the olive tree psyllid, *Euphyllura olivina*. It is probably native to the Mediterranean region, where it occurs commonly on olives in Italy and Greece, although it also occurs in other parts of the world (Africa and Asia) where psecies of olive are native. The psylloid was first collected by L. Bender, master gardener in Old Town State Historic Park, San Diego, San Diego County. Specimens were submitted to David Kellum, San Diego County Entomologist, who made the initial identification. It has since been found in Orange and Los Angeles Counties as well. Included in this issue is a comprehensive article on the psylloid by Dr Gevork Arekelian, Los Angeles County Entomologist.

***"Cacopsylla"* sp.** - Psylloidea: Psyllidae
A psyllid

Prepared by R. Gill & G. Watson

A second psyllid, also a new state and North American record, was found initially in nursery shipments of *Pittosporum* going to Alameda County. The initial find was made by Carmen Franke, Pest Detection Specialist, and subsequent recollections were made by Edmund Duarte, Senior Agricultural Biologist.

Subsequent inspection of the shipping nurseries in Los Angeles County resulted in findings in Lakewood, collected by Agricultural/ Weights & Measures Inspectors Carmen Rieger and Ramos Salcedo on 15 June 2007, and Carson, where some parasitized individuals were found by Inspector Charles Wait on 6 July 2007. The species was initially thought to be in the genus *Cacopsylla*, and has been sent to the Systematic Entomology Laboratory in Beltsville, Maryland for possible identification. Scientists there have sent it to a psylloid specialist in China, but so far there has not been a positive identification. The common mock orange, *Pittosporum tobira*, is native to China and Japan, and there are other Pittosporaceae relatives in those countries, and psylloids that feed on them. But there are also many species of *Pittosporum* in South Africa, New Zealand and Australia, so the species could have come from there. Included here are photographs of the nymphs and some parasitized individuals taken by Dr Gevork Arekelian, Los Angeles County Entomologist.

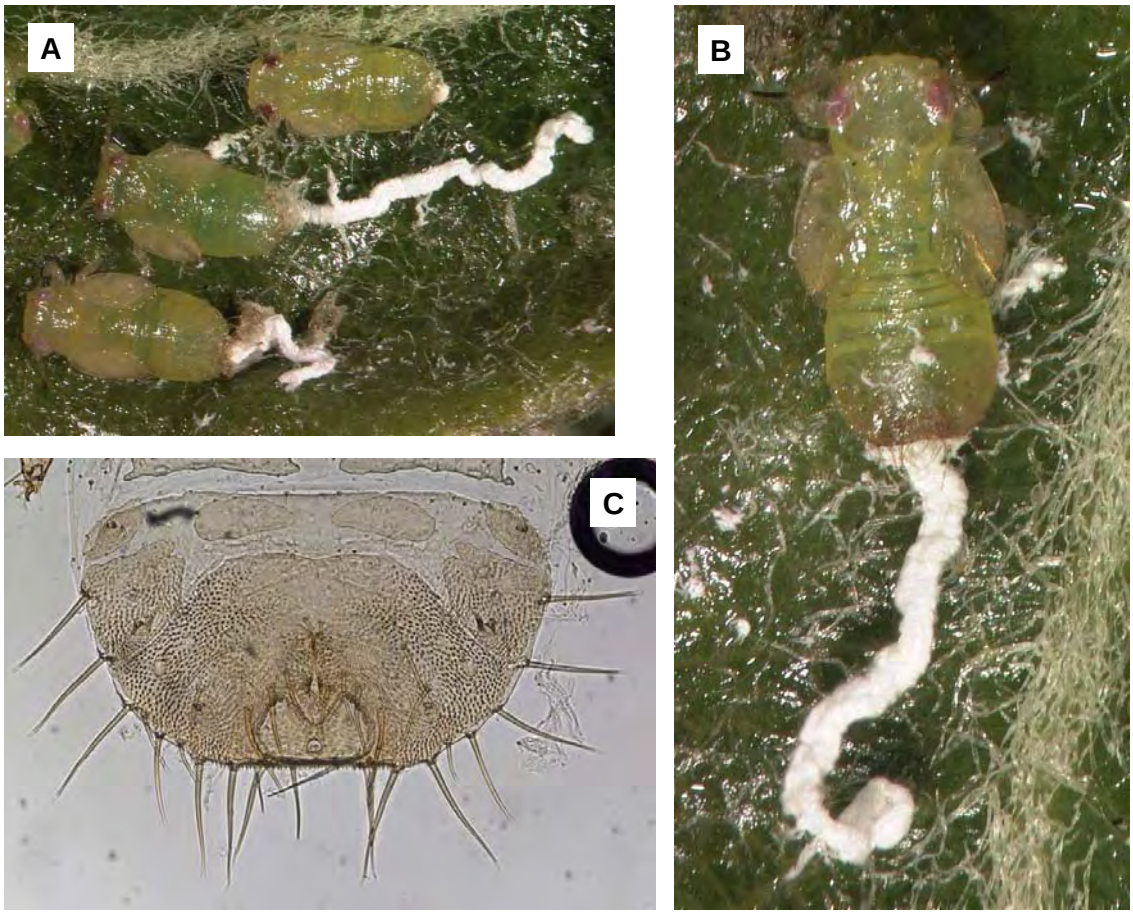

Figure. A, B: Nymphs of *"Cacopsylla"* sp. on *Pittosporum* sp.,by G. Arakelian.
C: pygidium of nymph, cleared and mounted in Hoyer's medium, viewed x 100.

***Sipha maydis* Passerini** – Aphidoidea: Aphididae

An aphid

Prepared by J. Sorensen, B. Cabrera & G. Watson

In October 2007, a nursery detection survey sample of aphids on *Leymus condensatus* (giant wild rye) was collected by Tashina Simon, Agricultural Biologist. It contained a mixture of adult apterae, nymphs and alates of two species: *Sipha flava* (Forbes) (yellow sugar cane aphid), and *Sipha (Rungsia) maydis* Passerini (Aphididae: Chaitophorinae: Siphini). Although *S. flava* is common in North America, *S. maydis* is new to the Nearctic Region.

The aphids were found during a regulatory inspection at a nursery that specializes in ecological restorations in Santa Barbara County, California (Figure 1). Alate females were present in the original sample, so the aphid was assumed to have escaped into the environment. The extent of the current infestation is uncertain. Additional searches located more specimens in a garden at the Santa Barbara City College campus, about 10 km south of the original nursery find, where the host had been transplanted from the nursery. Further searching for additional locations in the area will be conducted in the spring of 2008, when winter population suppression ends.

Figure 1. Inspection of *Leymus condensatus* (giant wild rye) at the nursery.

Sipha maydis feeds broadly on grasses and cereal crops, and has been recorded on numerous species in over 30 genera of Poaceae (=Gramineae) (Blackman & Eastop, 2006). In the literature, its distribution is Europe, to the Middle East, through Central Asia to Pakistan and India; and it occurs in South Africa (Blackman & Eastop, 2006). More recently, the species has been found also in Argentina (Ortego & Difabio, 2002).

Sipha maydis is able to transmit cucumber mosaic virus (a *cucumovirus*) and barley yellow dwarf virus (a *luteovirus*) (Blackman & Eastop, 2000). In drier climates, outside NW Europe, it can

be an economically important pest of all cereal crops (Blackman & Eastop, 2000). *S. maydis* feeds on the upper surfaces of leaf blades near the bases (Figure 2), and sometimes on the stems and inflorescences, where it may be ant attended (Blackman & Eastop, 2006). Heavily infested leaves may become yellowed, rolled into tubes and desiccated (Blackman & Eastop, 2000).

Figure 2. Location of the aphids near the leaf base on the host, *Leymus condensatus*.

Adult apterae of *S. maydis* are small, pear-shaped and somewhat dorsoventrally flattened, dark brown to nearly black, and fully sclerotized on the dorsum (Figure 3, left). The nymphs resemble the adult apterae but are unsclerotized, except for the plates at the setal bases, and hence have a slightly "dirty" yellow appearance (Figure 3, right). The antennae of the adults are 5-segmented and the body setae are spinous, both characteristics of the genus *Sipha*, but the cauda is broadly rounded, a characteristic of the subgenus *Rungsia*, whereas in *Sipha (Sipha)* the cauda is knob-shaped. The species also has alates with a broad, dark sclerotic patch on the dorsum of the abdomen (Blackman & Eastop, 2000).

Figure 3. Left. *Sipha (Rungsia) maydis*, adult aptera. Right. Close-up view of adult aptera and nymphs of *Sipha (Rungsia) maysdis*.

Literature Cited:

Blackman, R.L. & V.F. Eastop, 2000. Aphids on the World's Crops, An Identification and Information Guide. (Second Ed.) John Wiley & Sons, Ltd., Chichester, England. 466 pp.

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Ortego, J. & Difabio, M.E. 2002. Primer registro de *Sipha (Rungsia) maydis* Passerini 1860 (Hemipera:Aphididae) potencial plaga de cereales en Argentina. In: Resúmenes XI Jornadas Fitosanitarias Argentinas. 26-28 de Junio. Fac. de Agronomía y Veterinaria, UNRC, Córdoba. 126 pp.

NEW STATE RECORDS

***Palmicultor lumpurensis* (Takahashi)** - Coccoidea: Pseudococcidae

Bamboo mealybug

Prepared by G. Watson

Palmicultor lumpurensis was first recorded on back-yard bamboo in Vista, San Diego County on 17 October 2006, by Insect Detection Specialist Bill Waldrop. A second record on back-yard bamboo in San Diego was collected on 24 September 2007 by Candy Schaer, Deputy Agricultural Commissioner, and there have been several finds in nursery regulatory inspections. The species is apparently moving about in the nursery trade.

Figure. Left. *Palmicultor lumpurensis* on a bamboo leaf.
Right. *Antonina pretiosa* on bamboo stem with leaf sheath removed.

Bamboo mealybug is an Asian species that has become established in Florida in recent years. It is only known to infest bamboos. Like most bamboo-infesting mealybugs, *P. lumpurensis* mostly lives inside the leaf sheaths and is associated with white waxy secretions and sooty mold deposits.

Prolonged infestation causes dieback of the shoots. *P. lumpurensis* differs from the species of *Antonina* found on bamboos in California by its soft, pink body, presence of legs and lack of any brown sclerotization or white wax anal tube. In contrast, *Antonina* species lack legs; become hard, brown and sclerotized, particularly at the rear end; and produce a white wax anal tube (see photographs above).

NEW COUNTY RECORDS

***Trioza chenopodii* Reuter** – Psylloidea: Triozidae
Chenopodium psyllid

Prepared by R. Gill & G. Watson

The chenopodium psyllid, *Trioza chenopodii*, was found in a Riverside County nursery on *Atriplex* sp. by Agricultural Standards Investigator Mike Lahti. This psyllid is a native of Europe, and was first found in California at Salinas, Monterey County in 1997 (see CPPDR 16(3-6): 41-42). This is only the second collection of this psyllid in the State. The initial collection in Salinas was on lamb's quarters (Chenopodiaceae), which seems to be the favored host of this species. However, it is know to attack spinach, beets, and sugar beets as well as plants in the genus *Atriplex* and others in the Chenopodiaceae. Agriculturally, it could be a problem on sugar beets and any other crop in that plant family that is left in the ground for long periods of time. Finding it on an *Atriplex* sp. in this nursery suggests that it could be a problem on some of the native species in that genus. It is known to severely curl the leaves of some hosts.

***Aleurodicus dugesii* (Cockerell)** – Aleyrodoidea: Aleyrodidae
Giant whitefly

Prepared by G. Watson

Aleurodicus dugesii continues to extend its range slowly in California. It was first recorded from Alameda County on *Xylosma congestum* in a back yard in Fremont, by Ken Peek, Senior Biologist. Previous records from Alameda Co. were all on nursery stock or indoors. For the previous history of giant whitefly in California, and its range of host plants, see CPPDR 22(1): 17-18; 23: 11. An Insect Pest Sheet is available here: http://www.cdfa.ca.gov/phpps/PPD/pest_sheets.html#sternorrhyncha

***Aleuroclava jasmini* (Kuwana)** – Aleyrodoidea: Aleyrodidae
Jasmine whitefly

Prepared by G. Watson

A long-standing infestation of this oligophagous species was first found in California on *Jasminum sambac* at a nursery in Irvine, Orange County in October 1996 by Nick Nisson, Orange County Entomologist. It was subsequently found on *Gardenia jasminoides* in a back yard in Santa Ana, Orange County in January 1997 by L. Largent. Since then, it has been collected periodically in nurseries in Orange and San Diego Counties, and on curry leaves (*Murraya* sp.) at ethnic markets in Alameda County. On 6 June 2007, jasmine whitefly was found in Sacramento County for the first time, in a back yard on gardenia leaves in Sacramento by the owner, Kathleen Casanave.

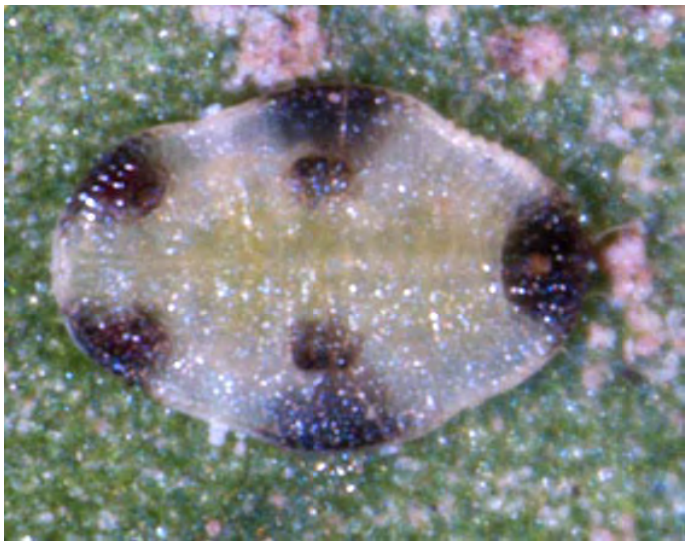


Figure. *Aleuroclava jasmini* 'pupa' on gardenia leaf.

Jasmine whitefly has been recorded from hosts belonging to the following plant genera: *Ardisia, Bischofia, Citrus, Gardenia, Jasminum, Murraya, Osmanthus* and *Quisqualis*.

***Pulvinaria vitis* (Linnaeus)** – Coccoidea: Coccidae
Cottony vine scale

Prepared by G. Watson

Pulvinaria vitis is a morphologically variable species, probably of Palaearctic origin, that now has a patchy distribution in North America (Canada: Ontario and Alberta, and USA: Massachusetts, New York, Kansas and California). In Europe it is a pest of grapes, and it has been recorded damaging peaches in Ontario. In life, *P. vitis* is very difficult to distinguish from *Neopulvinaria innumerabilis* (Rathvon), cottony maple scale, which also occurs in California. Within the state, *P. vitis* had been recorded previously from the coastal counties of Humboldt, Mendocino and Monterey. It was first collected from Napa, Napa County, on grapevines by Greg Music, Agricultural Biologist, on 7 September 2007.

NAME CHANGES

Changes in generic combination:

Aleyrodoidea: Aleyrodidae
The whitefly name changes given below are based upon: Martin, J.H. & L.A. Mound. (2007) An annotated check list of the world's whiteflies (Insecta: Hemiptera: Aleyrodidae). *Zootaxa* 1492:1-84.

Aleurotuberculatus psidii (Singh) to *Aleuroclava psidii* (Singh).
Dialeurodes citrifolii (Morgan) to *Singhiella citrifolii* (Morgan).
Dialeurodes psidii Corbett to *Cockerelliella psidii* (Corbett).
Dialeurodes sakaki Takahashi to *Massileurodes sakaki* (Takahashi).

Coccoidea: Asterolecaniidae
Asterolecanium minus Russell to *Asterodiaspis mina* (Russell).

Changes due to synonymy:

Aleyrodoidea: Aleyrodidae
Aleuroglandulus emmae Russell has been sunk under *Aleuroglandulus subtilis* Bondar.
Bemisia argentifolii Bellow & Perring has been sunk under *Bemisia tabaci* Gennadius.
Tetraleurodes stanfordi Bemis been sunk under *Tetraleurodes perileuca* (Cockerell).

LEPIDOPTERA

***Epiphyas postvittana* (Walker)** – Tortricidae
Light brown apple moth

Prepared by M. Epstein, M. O'Donnell & O. Sage

In 2007, at least 15,000 individual Light Brown Apple Moths (LBAM), *Epiphyas postvittana*, were identified by the staff at the Plant Pest Diagnostic Center. Greater numbers of non-targets were also processed. The majority of samples were adults on sticky traps, although many samples were larvae and pupae. An extended pest sheet (5 pages) to aid in the diagnostics of this pest is provided starting on page 24.This picture-captioned article presents some basic identification tools for separating LBAM from non-target adult moths that have been commonly found in pheromone traps. It should be noted that adult samples often require dissection or degreasing for identification, especially when degraded or submerged in stick-um. Some tips on larval identification are also presented. While this larval information can be used to help separate many non-target species from LBAM, molecular diagnostics is needed to confirm whether these larvae are likely to be LBAM.

Figure. Light brown apple moth adult.

ORTHOPTERA

***Scapteriscus* sp** – Gryllotalpidae
Southern mole cricket

Prepared by R. Garrison

Los Angeles County Entomologist Dr. Gevork Arakelian, reported the discovery of a mole cricket, *Scapteriscus* sp., from a golf course in Downey, Los Angeles Co., in October 2007 where it is apparently established. Because specimens collected thus far have been immature, positive identification to species has yet to be confirmed but it is likely *Scapteriscus borellii* Giglio-Tos, a species currently known from the southeastern United States. This represents the first State Record for this pest. The following information and photos are through courtesy of Dr. Arakelian.

Southern mole cricket arrived in Florida and Georgia about 1900, from southern South America, and is currently in Florida, Georgia, South Carolina, North Carolina, Alabama, Mississippi, Louisiana, Texas, and Arizona. It is a slim, active species which will often "play dead" when captured, but will then suddenly begin moving rapidly.

Figures. Frontal view of southern mole cricket. Right – head on view; left – closeup of dactyl.

Tibiae on the forelegs are armed with two well separated dactyls (see Figures above). Young larvae are wingless but develop short wings in older stage larvae (see Figures below). In adults, the forewings do not reach the tip of the abdomen; the hind wings are longer, pointed and overlap the abdomen. Dorsal side of the thorax often (but not always) have four distinctive light brown dots.

Figures. Larval *Scapteriscus* sp. from Downey Golf Course. Left – lateral and dorsal views; right – close-up of pronotum showing characteristic markings.

The southern mole cricket damages turf and pasture grasses (see Figures below), mainly by tunneling since it is largely a predaceous species, although gut contents have shown that they will eat plant material. Adults are able to fly.

Figures. Turf damage done at Downey Golf Course by southern mole cricket.

THYSANOPTERA

NEW STATE RECORDS

***Androthrips ramachandrai* Karny** – Tubulifera: Phlaeothripidae

A predaceous thrips

Prepared by G. Watson

A thrips native to India, *Androthrips ramachandrai* Karny (Phlaeothripidae), was found to be established in the USA in Florida, in March 2002. The first Californian record of this species living outdoors was collected by Christopher Hanlon at University of California, Riverside, in association with galls caused by *Gynaikothrips ficorum* Marchal (Phlaeothripidae) (Cuban laurel thrips) on *Ficus microcarpa* at UC Riverside, Riverside County on 8 March 2005.

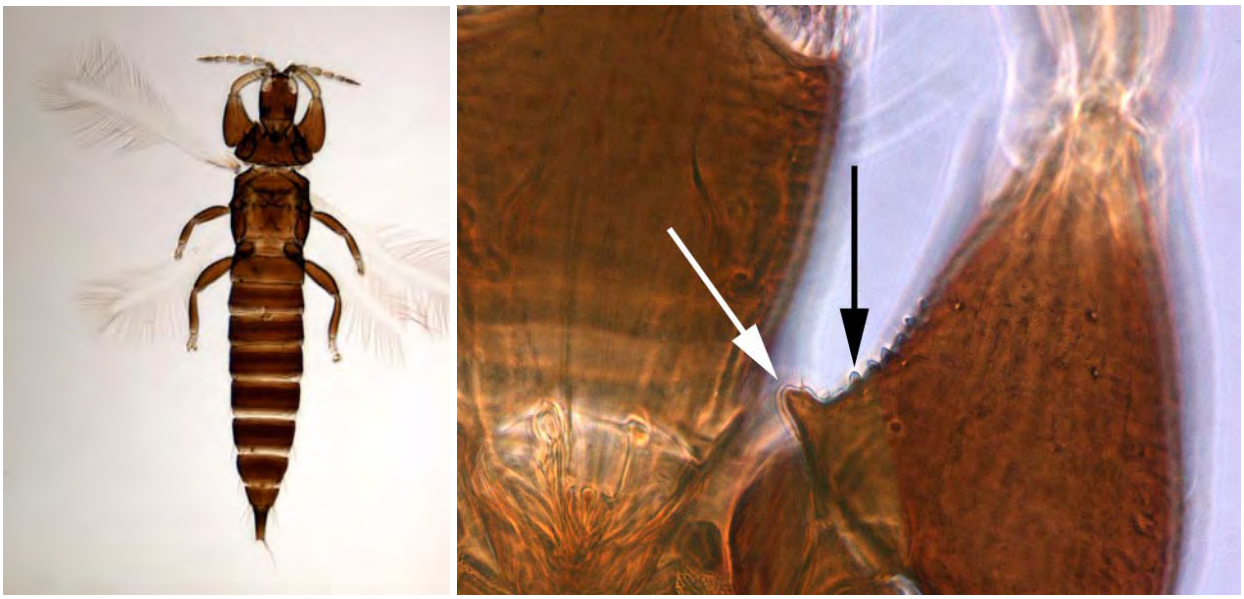


Figure. *Androthrips ramachandrai*. Left. Slide-mounted adult female. Right. Fore femur showing the large tooth (white arrow) and the tubercles lateral to it (black arrow).

Androthrips ramachandrai has also been recorded from Texas (August 2005) and Hawaii (April 2006), always in association with other species of thrips causing leaf galls – usually with either *G. ficorum* or *G. uzeli* (Zimmerman) on *Ficus* spp. host-plants [Boyd, D.W. & Held, D.W. (2006) *Androthrips ramachandrai* (Thysanoptera: Phlaeothripidae): an introduced thrips in the United States. *Florida Entomologist* 89(4): 455-458].

Androthrips ramachandrai can be separated from other dark brown to black phlaeothripids by the large size of the fore femur, with a strong cylindrical tooth near the base of the fore femur and a row of small tubercles lateral to the tooth. In *A. ramachandrai* the apical tube is half the length of that of *G. ficorum* (Boyd & Held, 2006).

Little is known about the biology of *A. ramachandrai* but it is thought to prey on species of thrips that cause leaf galls. The Californian sample contained 285 specimens of *G. ficorum* but only 21 specimens of *A. ramachandrai*. The status of this insect in the USA is discussed by Boyd & Held (2006). It has been spreading through shipment of ornamental plants; for example, it was found together with *G. ficorum* on *Ficus nitida* in a nursery shipment moving from Imperial County to Santa Clara County in September 2004.

NEW COUNTY RECORDS

***Klambothrips myopori* Mound & Morris** – Tubulifera: Phlaeothripidae
Myoporum thrips

Prepared by G. Watson

The undescribed species of *Teuchothrips* sp. on *Myoporum* spp. in California, discussed in CPPDR 23(1): 14-15, has been placed in a new genus and named as *Klambothrips myopori* Mound & Morris [Mound, L.A. & Morris, D.C. (2007) A new thrips pest of *Myoporum* cultivars in California, in a new genus of leaf-galling Australian Phlaeothripidae (Thysanoptera). *Zootaxa* 1495: 35-45].

The range of this species in California has continued to expand, with two new county records in 2007. It was first recorded in San Luis Obispo County from a back yard in San Luis Obispo, on species of *Myoporum*, by Laurel Carlisle, Agricultural Technician, on 28 June 2007. Myoporum thrips was also collected from *Myoporum* growing in a back yard in San Jose, Santa Clara County by Nancy Barrera, Agricultural Biologist, on 22 August 2007.

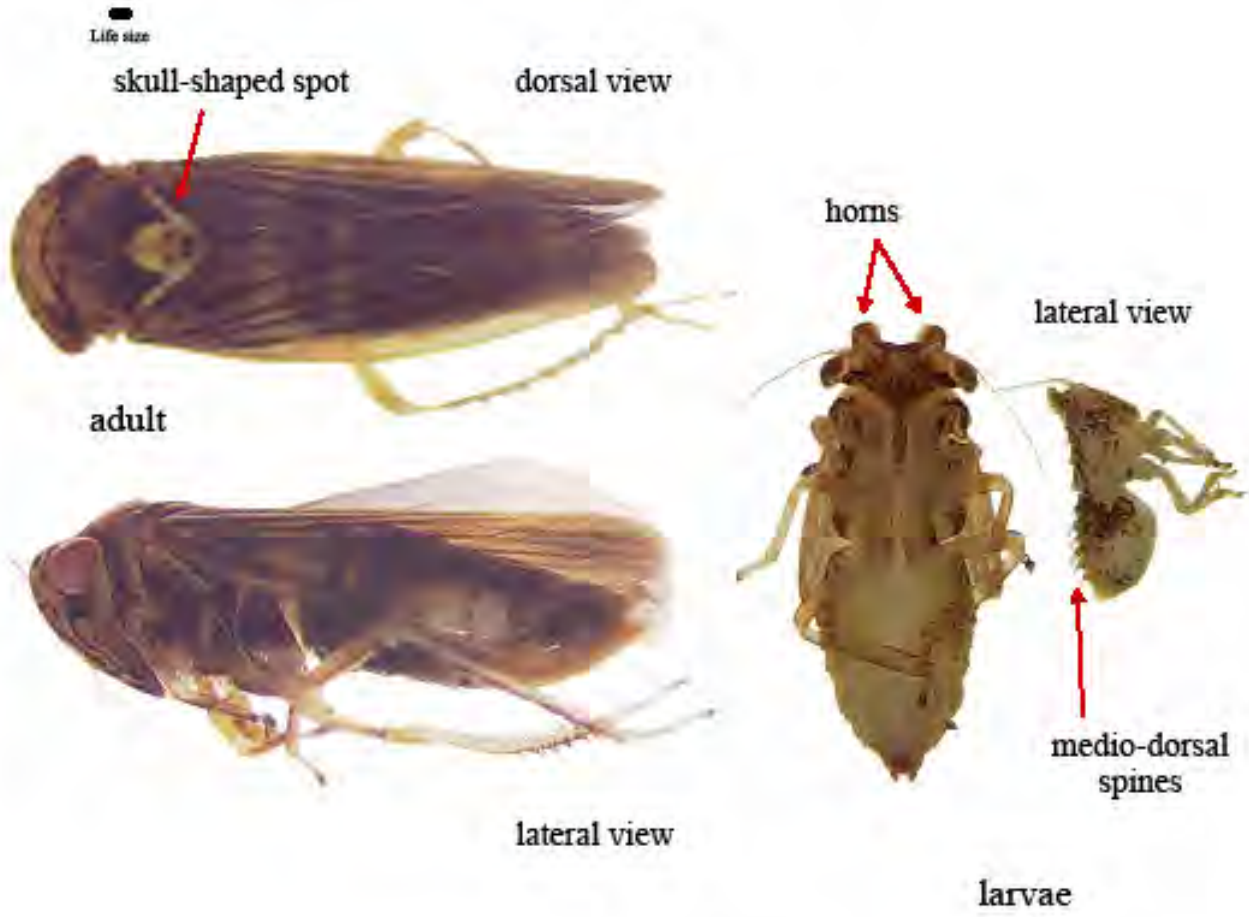
INSECT PEST SHEETS

We continue with our one-page color sheets documenting new or interesting pests relevant to California agriculture. In this issue, we present seven sheets which include: a leafhopper (*Agallia* sp.), barnacle scale (*Ceroplastes cirripediformis*), Boisduval scale (*Diaspis boisduvalii*), coconut mealybug (*Nipaecoccus nipae*), white-footed ant (*Technomyrmex albipes*), and red palm mite (*Raoiella indica*), as well as an extended pest sheet for light brown apple moth (*Epiphyas postvittana*). These and other pest sheets can be freely downloaded at http://www.cdfa.ca.gov/phpps/ppd/pest_sheets.html

Leafhoppers - Cicadellidae

A leafhopper (*Agallia* sp.)

- Intercepted from HI.
- Hosts: Basil; Hot basil; Bay; Betel; La-Lot; Long coriander; Mint; Orchids; Poke; Saluyot; Taro.
- Field ID: Adult about 3 mm long; reddish brown with a skull-shaped white spot on pronotum; head in dorsal view narrow and wide, with evenly curved posterior margin. Larva with a pair of horns on frons, and a medio-dorsal row of spines on abdomen.

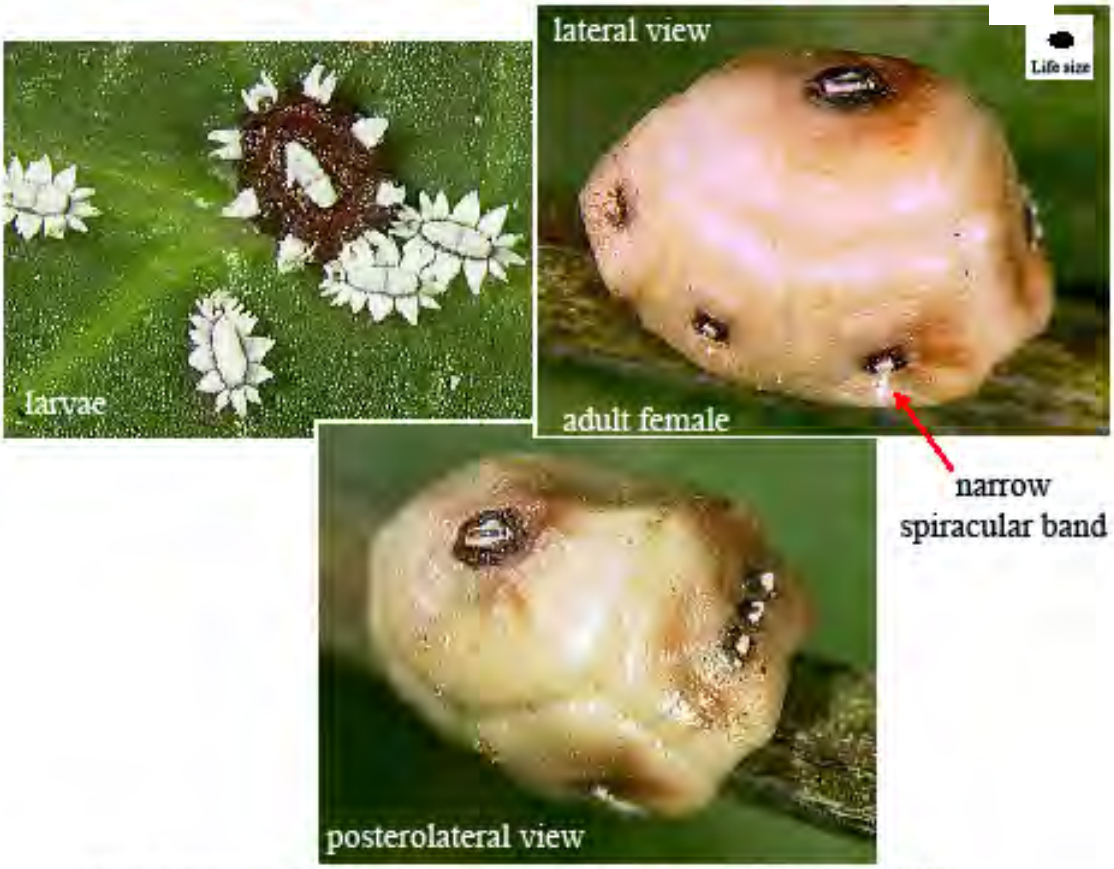


California Department of Food and Agriculture – Prepared by N. von Ellenrieder, March 2004

Soft scales - Coccidae

Barnacle scale (*Ceroplastes cirripediformis*)

- Common in southern CA; intercepted in shipments from HI & FL.
- Hosts: polyphagous. Common hosts are: *Citrus*; *Gardenia*; Ginger; *Ficus*; *Strelitzia*; *Monstera*; Jasmine; *Fuchsia*; *Pittosporum*; Bay laurel; *Tabebuia*; *Nandina*; *Rhus*; *Shefflera*; Guava; Brazilian pepper; *Melaleuca*; *Pinus*; Loquat; *Ravenea rivularis*; *Phoenix roebelenii*.
- Field ID: Adult female 2-5 mm long, hemispherical, body reddish brown with thick **reddish-gray wax cover divided into distinct plates**, each plate with a darkened central area with a **white button-like wax filament**. Larva red with separate white conical wax filaments. Larvae feed on upper leaf surfaces, adults on twigs. Very similar to **Fig wax scale** intercepted from FL, from which it differs by the **narrow lateral spiracular bands** (wide in Fig wax scale).



California Department of Food and Agriculture – Prepared by Natalia von Ellenrieder, August 2003

Armored scales - Diaspididae

Boisduval scale (*Diaspis boisduvalii*)

- Common in CA; intercepted also in shipments from HI & FL.
- Hosts: polyphagous; found on orchids (*Cymbidium* sp.; *Cattleya* sp.), Bird of paradise (*Strelitzia*), Ginger, Pineapple and Palms; Lady palm (*Rhaphis*); *Dracaena*; *Chamaedorea*; *Phoenix roebelenii*; *Kentia*; *Areca* palm; King palm; Queen palm (*Syagrus romanzoffianum*); *Ravenea rivularis*; *Cocos plumosa*.
- Field ID: Adult female 1.5-2.5 mm in diameter; cover **circular**, tan to grayish white, with **yellow subcentral exuviae**; body yellow, with a **pair of horn-like projections** on sides of anterior portion and an apical cleft. In field indistinguishable from Cocos scale (*Diaspis cocois*) on palms.

Adult female with cover

California Department of Food and Agriculture – Prepared by N. von Ellenrieder, September 2003

Mealybugs - Pseudococcidae

Coconut mealybug (*Nipaecoccus nipae*)

- Intercepted in shipments from HI & San Francisco and nurseries in LA (Malibu, Monterrey Park). Occurs also in Florida, Mexico, Central & South America and South Africa.
- Hosts:
  - Palms: Sago palm (*Cycas revoluta*); Pygmy date palm (*Phoenix roebelenii*); California fan palm (*Washingtonia filifera*); Parlor palm (*Chamaedorea elegans*); Queen palm (*Syagrus romanzoffianum*); Fishtail palm (*Caryota mitis*); Areca or cane palm (*Dypsis lutescens*); Kentia palm (*Howea*); Lady palm (*Raphis*).
  - Flowers and cut foliage: Ginger; Ti; Betel; Broadleaf; *Dracaena*; *Heliconia*; Orchids; also Avocado; Guava; Banyan trees.

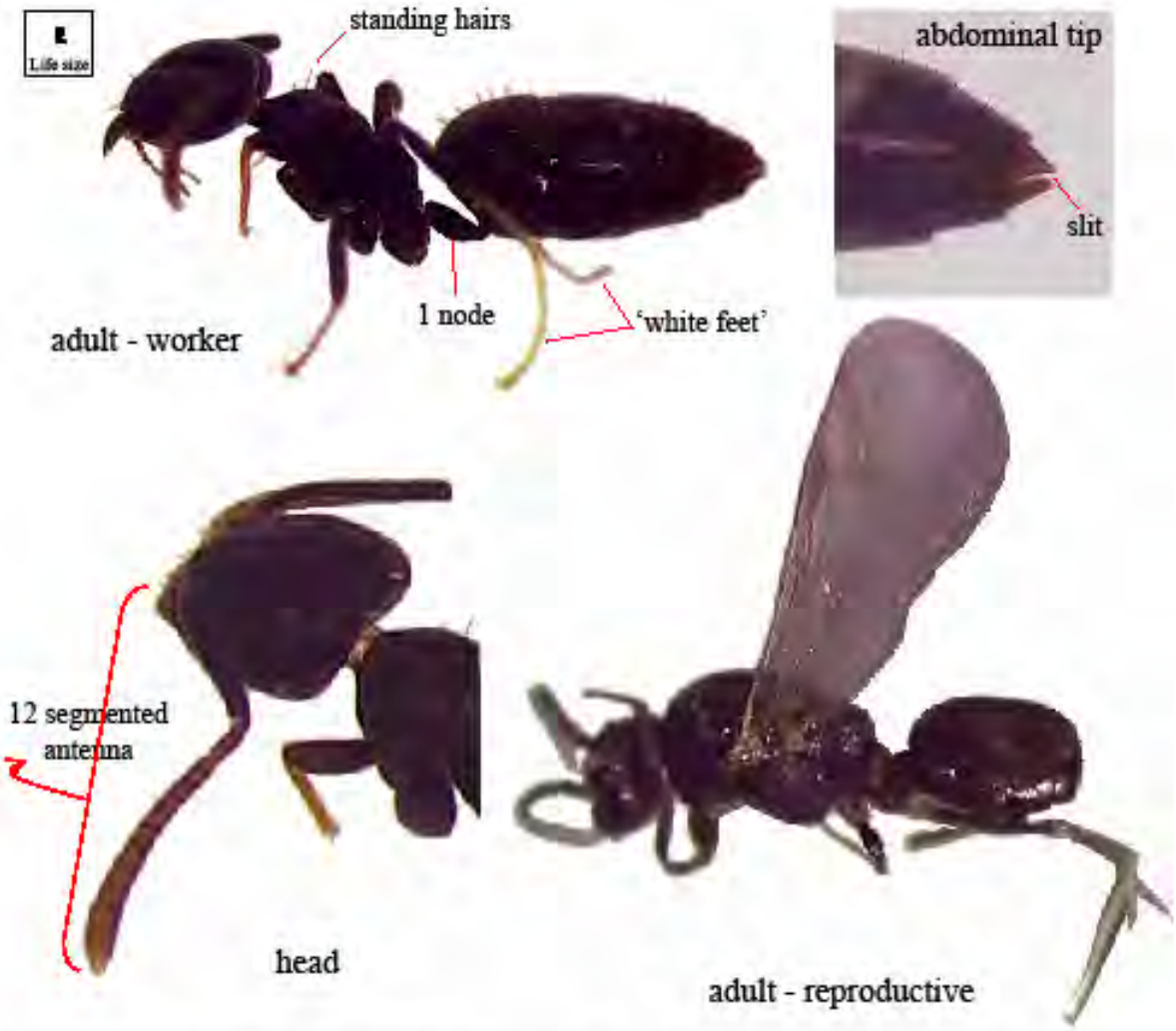
- Field ID: Adult female 1.5-2.5 mm long, **oval**, body yellow to orange covered with **yellowish wax**, and with **marginal pyramid-shaped wax tufts**; no ovisac produced. Males develop in cocoons of very thin white cottony wax, oblong and smaller than females.

California Department of Food and Agriculture – Prepared by Natalia von Ellenrieder, August 2003

Ants – Formicidae

White-footed ant (*Technomyrmex albipes*)

- Native to Indonesia, now widespread by commerce; intercepted in shipments from HI and FL.
- Hosts: Found in shipments of cut flowers, herbs, fruits, houseplants and palms. Adults feed on honeydew of sucking insects, which they tend (*i.e.* aphids, mealybugs and scales)
- Field ID: Adult about 2.5-3 mm long, **black** to **dark brown** with **pale feet**; antenna with **12 segments**; with **2-4 standing hairs on thorax**; **abdominal pedicel lacking dorsal spine**, and **a slit present** at abdominal tip.



California Department of Food and Agriculture – Prepared by N. von Ellenrieder, February 2004

Mites and Ticks - Acari

Red Palm Mite
(Tenuipalpidae: *Raoiella indica*)

- Native to Asia; now found throughout tropical and subtropical regions of Eastern Hemisphere and the Caribbean. Recently detected in Florida.
- Hosts: A serious pest risk of potentially all palm species, bananas, ginger, heliconia, and a few other monocots.
- Field ID: Adult small but visible to the naked eye, ~ 0.3 mm. All life stages, including eggs, are red. **Adult legs red**. Long, spatulate body **setae often with droplets of liquid at their tips**. Adults do not produce webbing, and are not associated with webbing.

Photographs by: Rita Duncan and Jorge Peña, University of Florida

California Department of Food and Agriculture – Prepared by Peter Kerr, March 2008

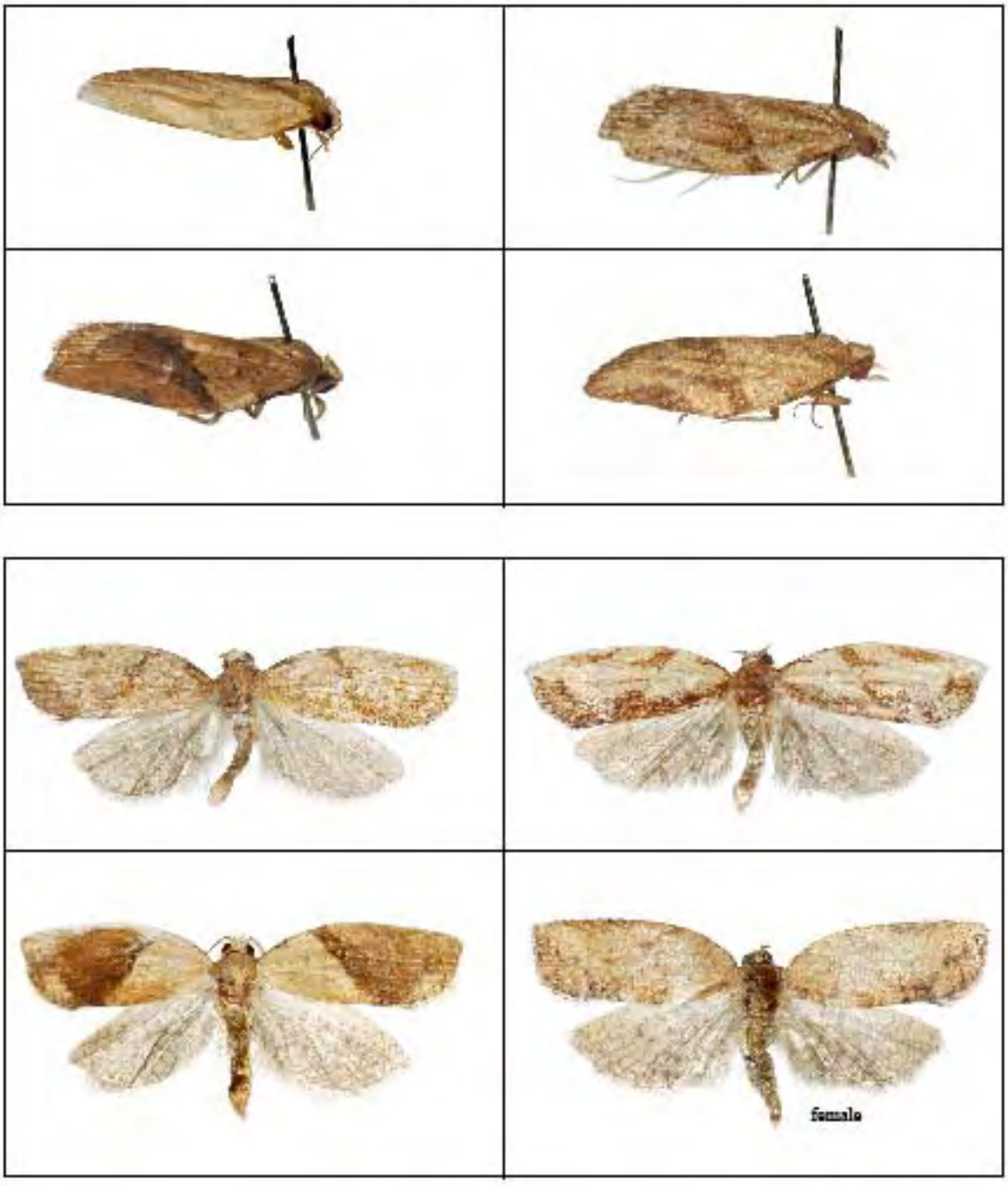
Light Brown Apple Moth (LBAM) *Epiphyas postvittana*, Diagnostics

Marc Epstein, Megan O'Donnell & Obediah Sage
Plant Pest Diagnostics Center, California Department of Food & Agriculture

In 2007, at least 15,000 individual Light Brown Apple Moths (LBAM), *Epiphyas postvittana*, were identified by the staff at the Plant Pest Diagnostic Center. Greater numbers of non-targets were also processed. The majority of samples were adults on sticky traps, although many samples were larvae and pupae.

This picture-captioned article presents some basic identification tools for separating LBAM from non-target adult moths that have been commonly found in pheromone traps. It should be noted that adult samples often require dissection or degreasing for identification, especially when degraded or submerged in stick-um. Some tips on larval identification are also presented. While this larval information can be used to help separate many non-target species from LBAM, molecular diagnostics is needed to confirm the identity of suspected LBAM.

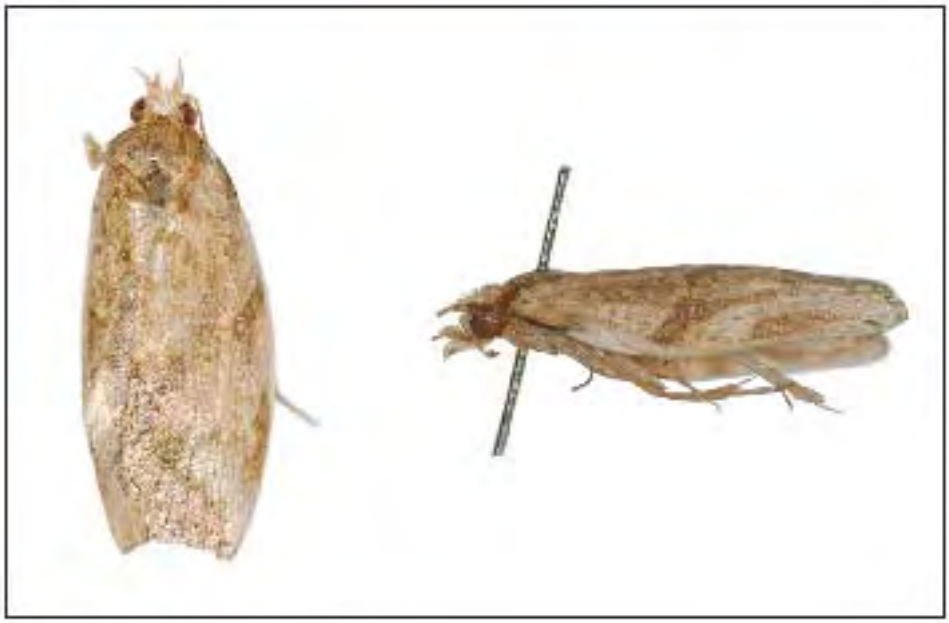
LBAM (*Epiphyas postvittana*)
specimens trapped in Northern California



Size Comparision between Garden Tortrix and LBAM

The Garden Tortrix, one of the moths most commonly confused with LBAM, is much smaller in size and has males that lack the costal fold.

Garden Tortrix (*Clepsis peritana*)
forewing length = 5.00 mm



LBAM (*Epiphyas postvittana*)
forewing length = 8.13 mm

Other Moths Often Found in Light Brown Apple Moth Traps

Achyra occidentalis

Archips argyrospila

Argyrotaenia franciscana (citrana)
Left: orange "citrana" form; Right: lighter "franciscana" form

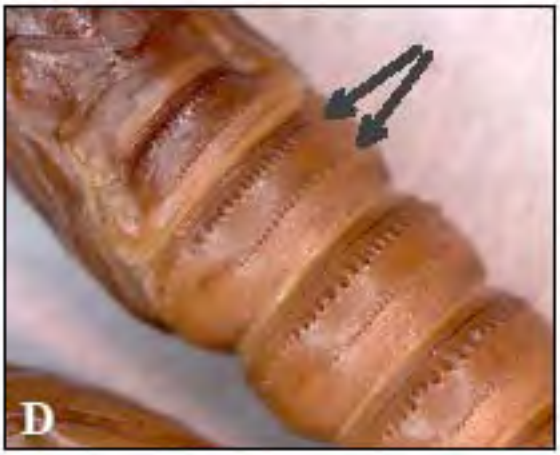
Clepsis fucana
Left: dark form; Right: light form

Clepsis peritana (Ptycholoma)

Henricus umbrabasanus

LBAM Diagnostics

Above: male LBAM have costal folds on the edge of their forwings (A & B).



Above: female LBAM have no costal folds on their wings (C); LBAM pupae have a double row of spines on their back, as do other Tortricidae (D); ventral (belly) of LBAM pupae (E).

LBAM Larval Diagnostics

LBAM larvae are mostly green, have little patterning on the head, thorax or legs, and the pinnacula are the same color as the rest of the body. The anal fork is present and has seven forklets.
Note: the larvae pictured here have lost/reduced their green coloring

A: LBAM larvae are green with little patterning.

B: The pinnacula are the same color as the rest of the body.

C: LBAM larvae have an anal fork with seven forklets.

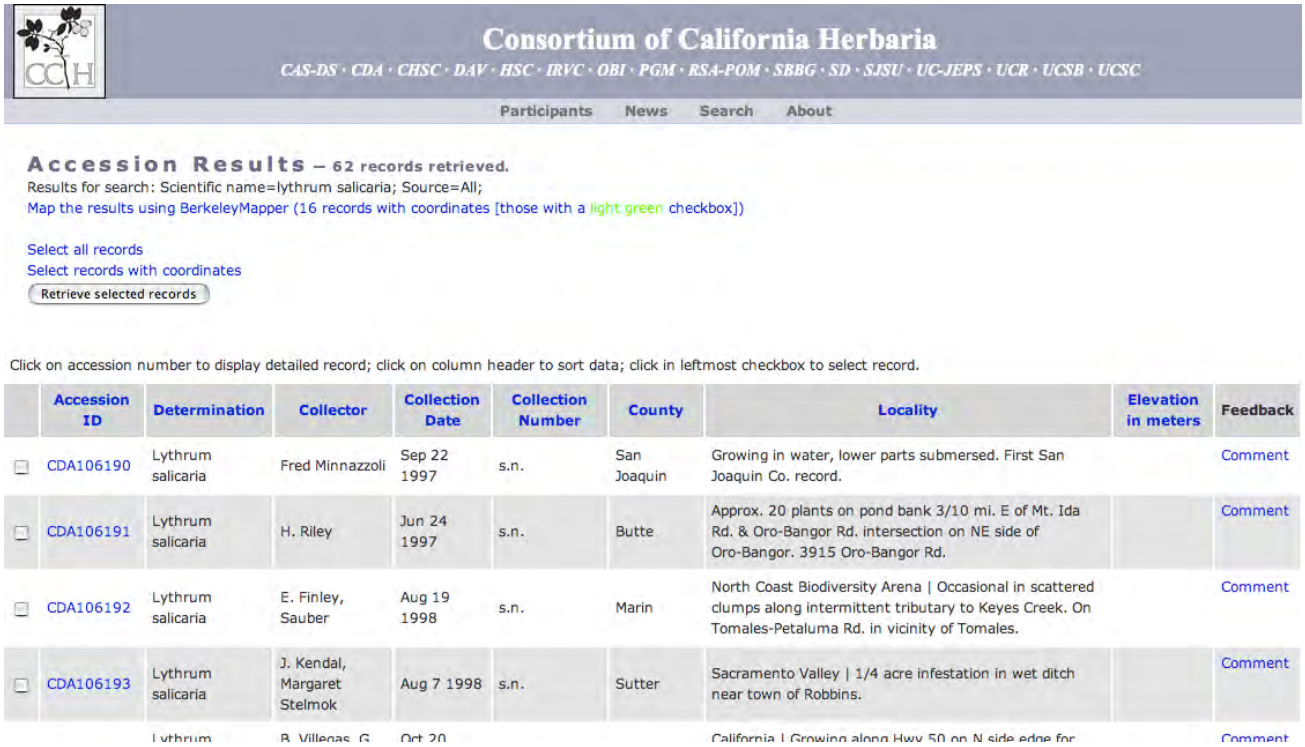
SIGNIFICANT RECORDS IN BOTANY

The Consortium of California Herbaria

Prepared by D. Kelch & F. Hrusa

In 2007, the California Department of Food and Agriculture Herbarium (CDA) joined the Consortium of California Herbaria (http://ucjeps.berkeley.edu/consortium). The Consortium was developed to serve as a gateway to information from California vascular plant specimens that are housed in herbaria throughout the state. The database now includes information from over 927,000 specimens, all searchable through a single interface. Information is output via an easy to read list of all relevant specimens (Figures. 1-2).

Figure 1. Purple loosestrife (*Lythrum salicaria*) is a noxious weed being actively controlled by CDFA. The photo shows a plant in its natural habitat in Europe.



Consortium of California Herbaria

CAS-DS · CDA · CHSC · DAV · HSC · IRVC · OBI · PGM · RSA-POM · SBBG · SD · SJSU · UC-JEPS · UCR · UCSB · UCSC

Participants News Search About

Accession Results – 62 records retrieved.

Results for search: Scientific name=lythrum salicaria; Source=All;

Map the results using BerkeleyMapper (16 records with coordinates [those with a light green checkbox])

Select all records

Select records with coordinates

Retrieve selected records

Click on accession number to display detailed record; click on column header to sort data; click in leftmost checkbox to select record.

	Accession ID	Determination	Collector	Collection Date	Collection Number	County	Locality	Elevation in meters	Feedback
☐	CDA106190	Lythrum salicaria	Fred Minnazzoli	Sep 22 1997	s.n.	San Joaquin	Growing in water, lower parts submersed. First San Joaquin Co. record.		Comment
☐	CDA106191	Lythrum salicaria	H. Riley	Jun 24 1997	s.n.	Butte	Approx. 20 plants on pond bank 3/10 mi. E of Mt. Ida Rd. & Oro-Bangor Rd. intersection on NE side of Oro-Bangor. 3915 Oro-Bangor Rd.		Comment
☐	CDA106192	Lythrum salicaria	E. Finley, Sauber	Aug 19 1998	s.n.	Marin	North Coast Biodiversity Arena | Occasional in scattered clumps along intermittent tributary to Keyes Creek. On Tomales-Petaluma Rd. in vicinity of Tomales.		Comment
☐	CDA106193	Lythrum salicaria	J. Kendal, Margaret Stelmok	Aug 7 1998	s.n.	Sutter	Sacramento Valley | 1/4 acre infestation in wet ditch near town of Robbins.		Comment
		Lythrum	B. Villegas, G.	Oct 20			California | Growing along Hwy 50 on N side edge for		Comment

Figure 2. A portion of the data retrieved by a search of the Consortium of California Herbaria website for specimens of purple loosestrife (*Lythrum salicaria*).

Originally developed around botanical collections from University of California herbaria, the consortium continues to grow as more collections are added. Currently, California herbarium collections from sixteen institutions are accessible through this interface: California Academy of Sciences (CAS-DS), California Department of Food and Agriculture (CDA), California State University, Chico (CHSC), University of California, Davis (DAV), California State University, Humboldt (HSC), University of California, Irvine (IRVC), California Polytechnic University, San Luis Obispo (OBI), Pacific Grove Museum (PGM), Rancho Santa Ana Botanic Garden (RSA-POM), Santa Barbara Botanic Garden (SBBG), California State University, San Diego (SD), California State University, San Jose (SJSU), University of California, Berkeley (UC-JEPS), University of California, Riverside (UCR), University of California, Santa Barbara (UCSB), and University of California, Santa Cruz (UCSC) (see Table 1). The participating institutions cooperate under the guidelines of a Memorandum of Understanding.

Inclusion of specimen information in centralized databases is becoming a major goal of natural history collections everywhere. By combining and concentrating specimen information in one easy to access location, the utility and importance of the information is increased considerably. Easier access means that researchers, government agencies, and the public are able to integrate natural history data into their pursuits in a way that is not practicable when the information resides in widely dispersed and unwieldy collections. Particularly for smaller collections such as CDA, availability of information through such a clearinghouse means information that previously was unknown and therefore largely invisible, becomes available for use in studies of plant distribution, weed science, Integrated Pest Management, ecology, taxonomy, phylogeny, and population biology (Figure 3).

Table 1. Number of individual plant specimens included in the Consortium as of January 20, 2008. Record count: 927,865

CAS-DS	California Academy of Sciences	12396
CDA	California Department of Food & Agriculture	10154
CHSC	Chico State University	57646
DAV	University of California, Davis	26940
HSC	Humboldt State University	754
IRVC	University of California, Irvine	5676
PGM	Pacific Grove Museum of Natural History	7591
RSA-POM	Rancho Santa Ana Botanic Garden	208808
SBBG	Santa Barbara Botanic Garden	58194
SD	San Diego Museum of Natural History	66818
SJSU	San Jose State University	9556
UC-JEPS	University of California, Berkeley	348357
UCR	University of California, Riverside	96761
UCSB	University of California, Santa Barbara	14871
UCSC	University of California, Santa Cruz	3327

Figure 3. The Mount Tamalpais thistle (*Cirsium hydrophilum* ssp. *vaseyi*), known only from serpentine seeps in Marin County, California. The true thistles (*Cirsium* species) are exceptionally well-represented at CDA. This group includes some of the worst weeds in California, as well as some of the rarest plants in North America.

The data included in this database are a snapshot of California vascular plant collections. CDA is smaller than many of the participating institutions. Nevertheless, its databased specimens (representing about 20% of current CDA collections so far) are an important contribution to the Consortium in that they include plant collections from every county in California. Few other herbaria (and only the largest) can boast such a comprehensive coverage of the state.

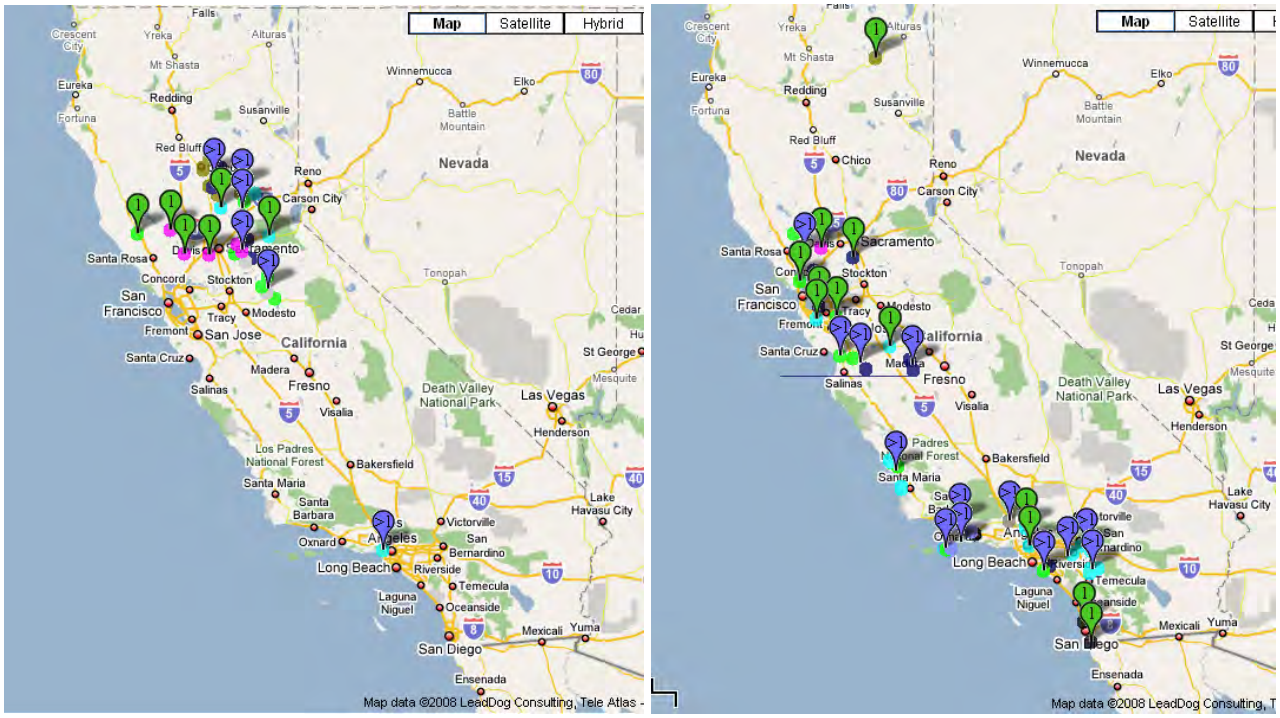
Membership in the Consortium is restricted to institutions that have actual electronic specimen records in the database. CDA has not until recently made any effort to enter older herbarium specimen data into electronic format, but the Senior Plant Taxonomist has, since 1993, kept his own plant collection records in a FoxPro 2.6 application he wrote specifically to hold data and print herbarium specimen labels. Since 1997 all labels made for specimens to be accessioned into the CDA herbarium, including all PDR (Pest and Damage Record) submissions kept as vouchers, unlabeled specimens donated by various researchers, biocontrol vouchers, and other miscellaneous unlabeled material, had their labels made and thus entered into a database, using this application. The application held, at the beginning of the 2007 summer, approximately 14,500 specimen records. Not all of these specimens were held at CDA, and for that reason, over the course of several months, the Senior Taxonomist, Dr. Hrusa, in collaboration where necessary with the Associate Botanist, Dr. Kelch, went through every appropriate specimen in the CDA herbarium and reconciled each with its corresponding record in the database. All specimens were reviewed for determination accuracy, and indeed, all specimens of the particular group held at CDA were reviewed and reclassified if necessary. At completion it turned out that approximately 10,150 specimens with data in the Labels application had been accessioned into CDA, and these data that were provided to the Consortium. Approximately 75% of the CDA records, representing mostly Dr. Hrusa's own collections, are georeferenced and can be mapped. The Consortium is also in the process of completing an Index to California Herbaria that will survey all herbarium collections in the state (Figure 4). The original information comes from the List of California Herbaria and Working Collections by G. Douglas Barbe and Thomas G. Fuller published in 1987 by the California Department of Food and Agriculture Botany Laboratory. We will be updating information for each collection and adding new collections to the list.

California Department of Food and Agriculture	CDA. Founded in 1922, the Herbarium of the California Department of Food and Agriculture serves as a plant identification service for California state agencies, in particular the Department of Food and Agriculture. This includes invasive and horticultural plant identification and evaluation, identification of hosts for insects, plant pathogens and nematodes, as well as seed purity and viability certification programs. The collection focuses on those taxa that best support the diagnostic mission of our facility. This includes a large seed herbarium, general California weeds and native plants (particularly those that may occupy disturbed or agricultural areas), invasive pest plants from inside and outside of California and the U.S. (as well as their close relatives), plants from other areas with a Mediterranean climate, cultivated plants and their wild forms, specialty horticultural species, and general agricultural crops. Size of collection: 40,000 plus 40,000 seed accessions. Approximately 75% of the collection consists of native and naturalized plants of California. Notable collections include those of T. C. Fuller, B. Crampton (seeds), M. Ballou, G. F. Hrusa, and D. G. Kelch.	Contact information: G. Fred Hrusa (fhrusa at cdfa.ca.gov), Senior Plant Systematist Dean G. Kelch (dkelch at cdfa.ca.gov), Associate Botanist Deborah J. Meyer (dmeyer at cdfa.ca.gov), Senior Seed Botanist cdfa.ca.gov/phpps/PPD/herbarium.html
California State University, Chico	CHSC. The Biological Sciences Herbarium at California State University, Chico is the most complete repository of plant specimens from northeastern California. The emphasis is on the local flora, and includes a number of rare, threatened, and endangered plant species. Size of collection: 95,300, 77% from California.	Director: Kristina A. Schierenbeck (KSchierenbeck at csuchico.edu) Curator and data contact: Lawrence Janeway (LJaneway at csuchico) www.csuchico.edu/biol/Herb
Humboldt State University	HSC. Vascular plants from California, especially northwestern California. In addition, a large collection from southwestern Oregon and grasses from North America. Size of collection: 100,000 specimens, 80% California.	Director: Michael Mesler (mrm1 at humboldt.edu) Collection manager and data contact: Robin Bencie (mrb1 at humboldt.edu) www.humboldt.edu/~herb/

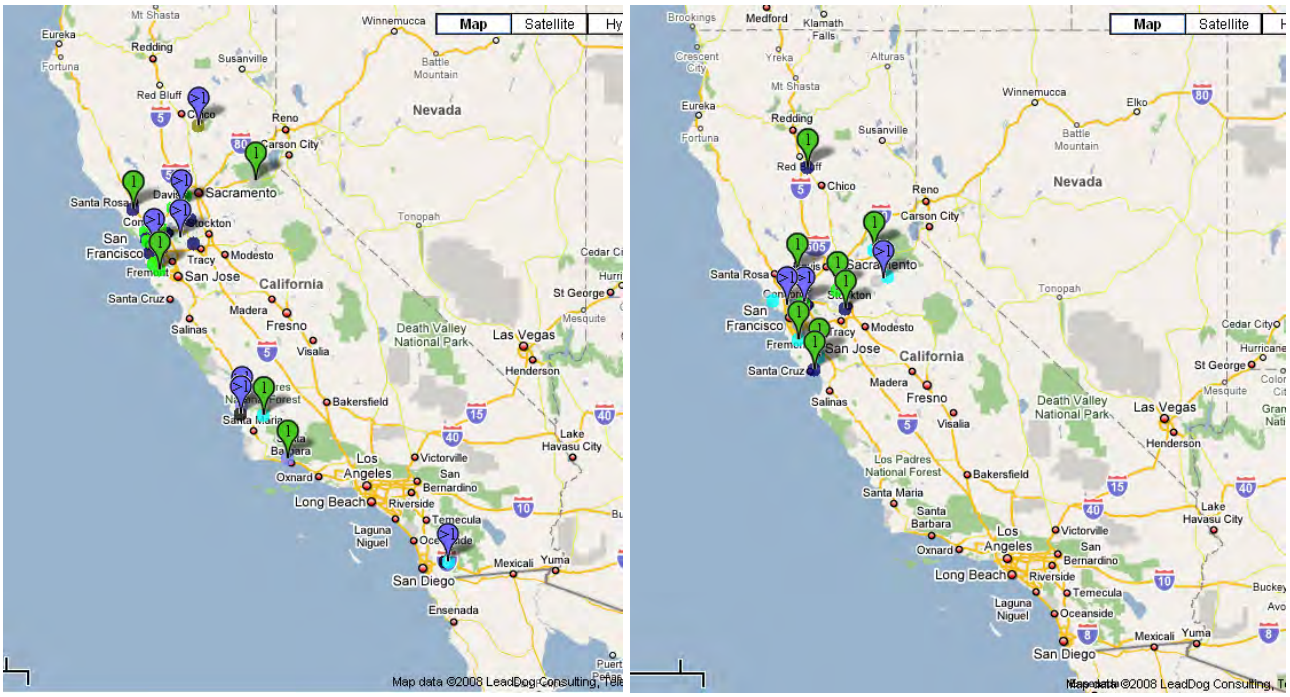
Figure 4. A portion of the index to California Herbaria included on the Consortium website.

As expected due to its focus on pest plants, CDA has an exemplary representation of the weeds of California. As a pilot study of the use of the Consortium for research, CDA is partnering with UC and RSA to database and georeference all specimens of weedy taxa at the three herbaria. This project is being funded by a grant awarded by the Global Biodiversity Information Facility (GBIF), an international organization that is working to make the world's biodiversity data accessible anywhere in the world (www.gbif.org).

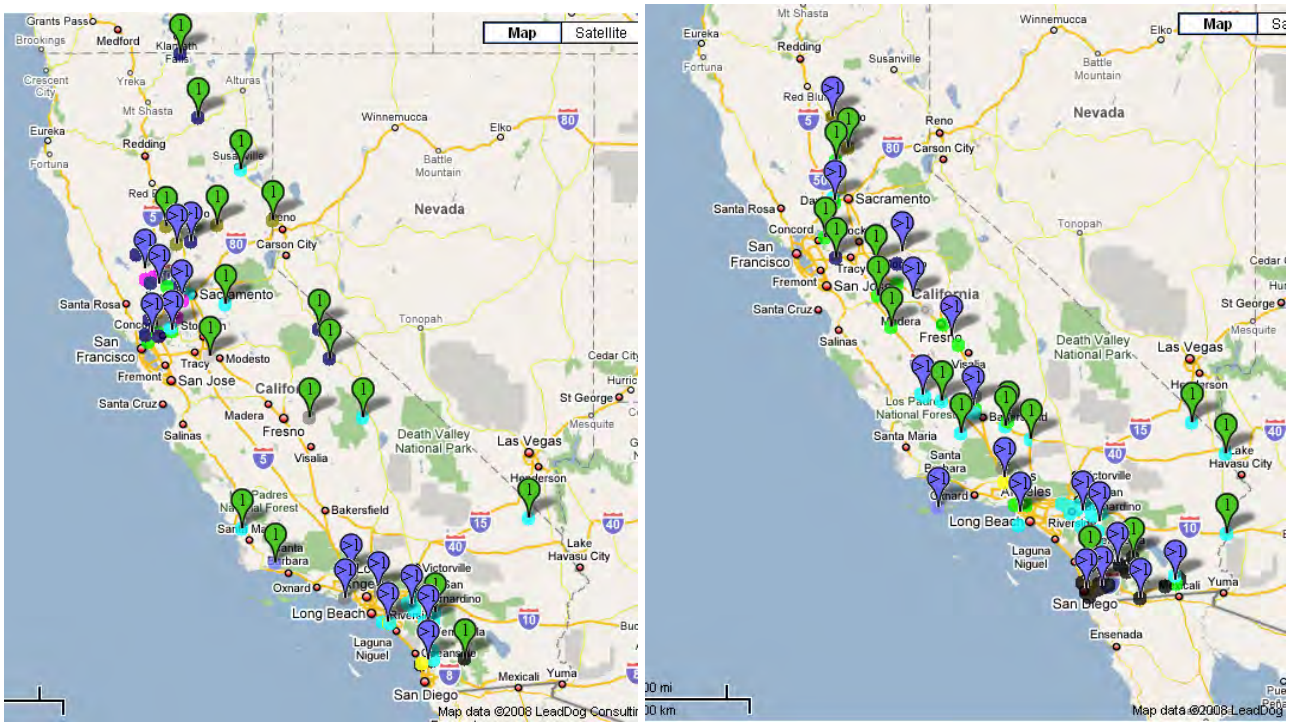
Another goal of the consortium is to provide coordinate data (latitude/longitude) for as many California specimens as possible. Currently, specimens from all sixteen participating institutions are being georeferenced on a county-by-county basis. Nearly 400,000 specimens have been georeferenced as of December, 2007. Using BerkeleyMapper, the georeferenced specimens returned from any Consortium search can be mapped directly from the Consortium accession results page (following Figures). The following maps represent distributions for 6 B-rated weeds, including *Aegilops triuncialis* (barbed goatgrass), *Cardaria draba* (heart-podded hoarycress), *Centaurea calcitrapa* (purple starthistle), *Euphorbia oblongata* (oblong spurge), *Lepidium latifolium* (perennial pepperweed, tall whitetop), and *Solanum elaeagnifolium* (white horsenettle).



Figures. Distributional maps for *Aegilops triuncialis* (barbed goatgrass) (on left), *Cardaria draba* (heart-podded hoarycress) (on right).



Figures. Distributional maps for *Centaurea calcitrapa* (purple starthistle) (on left), *Euphorbia oblongata* (oblong spurge) (on right).



Figures. Distributional maps for *Lepidium latifolium* (perennial pepperweed, tall whitetop) (on left), *Solanum elaeagnifolium* (white horsenettle) (on right).

SIGNIFICANT RECORDS IN SEED BOTANY

Annual Report of the Seed Botany Laboratory

Prepared by D. Meyer, R. Baalbaki, J. Effenberger & D. Joley

SEED LABORATORY RESPONSIBILITIES

- Provide identification and quality assessments of agricultural, vegetable, flower, native and weed seed.
- Substantiate label information on seed lots in the marketplace.
- Prevent introduction and dissemination of noxious weed pests via contaminated seed lots moving into California.
- Provide required seed quality and phytosanitary testing for seed export.
- Serve as a repository for seed and fruit specimens and associated literature used for morphological identification.
- Serve as a resource of scientific expertise in seed identification, seed physiology and seed quality assessment for the Department and the seed industry.

TYPES OF SAMPLES PROCESSED

The numbers of samples processed and tests completed during 2007 for each sample type are indicated in Table 1. Quarantine and noxious weed seed examinations require identification of 25,000 seeds per sample. Purity analyses require identification of 2,500 seeds per sample. Total numbers of seed identifications are in excess of 25,000,000. Germination tests require the evaluation of 400 seedlings per sample; the total number of seedlings evaluated is in excess of 500,000.
The types of samples routinely processed by the Seed Laboratory include:

Quarantine – Tests on quarantine samples require examination of a minimum of 25,000 seed units from each submitted sample to detect the presence of noxious weed seeds. Quarantine samples are drawn from seed lots moving across state and county lines and are an important part of the pest exclusion programs.

Regulatory – Tests on regulatory label compliance samples include a noxious weed seed examination of 25,000 seed units, a purity analysis on 2,500 seed units, and a germination test of 400 pure crop seed, from each submitted sample to determine label integrity. Laboratory procedures used for these tests are those prescribed in the Federal Seed Act. The noxious weed seed examination is similar to that of a quarantine test. The purity analysis determines the physical composition of a seed sample and consists of separation of the pure crop seed kind or kinds (in the case of mixtures of 2 or more species) under consideration from the following contaminants: inert matter, other crop seeds and weed seeds. The components are reported as percentages based on weight, and all contaminating species are identified. The germination test estimates the percentage of normal seedlings a seed lot can produce. Four hundred seed units are planted on various types of artificial media, and are subjected to various environmental conditions deemed appropriate for the species being tested, in an effort to determine the number of normal seedlings produced under optimum conditions. Laboratory results from the noxious weed seed examination, purity analysis, and germination test are compared to the seed lot label; if the results are determined to be out of

tolerance with the seed lot label, appropriate action is taken by State regulatory officials under the Nursery, Seed and Cotton Program.

Service – Tests on service samples include examinations similar to those described for regulatory tests, as well as specialized tests based on client needs. Service samples are processed on a fee for service basis. The test results are reported directly to the client on certificates of analysis and are confidential. These types of documents are the basis for seed commerce throughout the world. Laboratory procedures used in service testing follow those prescribed in the Federal Seed Act, the Association of Official Seed Analysts Rules for Testing Seed, the International Seed Testing Association Rules for Seed Testing and the Canadian Methods and Procedures for Testing Seed. Results of these tests may also be used for resolving contractual disputes. Testing Seed. Results of these tests may also be used for resolving contractual disputes.

Feed Mill Approval – To prevent the spread of weed seeds throughout the state, feed mill certification is dependent upon devitalization of all weed seed contaminants in livestock feed. This is usually achieved when seeds that will be used as feed (e.g., oats, wheat, corn, barley, etc.) are subjected to one or more treatments, such as high temperature, crushing or grinding. Feed mill approval tests include the removal, identification and viability determination of all weed seed found in processed livestock feed samples.

Identification – These samples include identifications of specimens submitted to the laboratory by border stations, counties, other government agencies, commercial seed laboratories, medical doctors, veterinarians, archaeologists and other researchers. These identifications are not only critical in preventing the spread of hazardous weeds, but are often necessary for expediting importation and exportation of agricultural products, are required as evidence in criminal court cases, are necessary for medical and veterinary diagnoses of poisoning cases and provide valuable information for researchers in a variety of scientific fields.

Table 1. Total number of samples processed and tests completed in 2007 for each sample type. Each sample received may require more than one test.

Type of Sample	**# Samples Received**	**# Tests Completed**
Quarantine inspection*	604	604
Identification	519	566
Mill approval	83	150
Service*	620	1404
Regulatory label compliance*	601	1688
Totals	**2427**	**4412**

SIGNIFICANT RECORDS IN PLANT PATHOLOGY

***Phytophthora ramorum* Werres et al.**

2007 Sudden Oak Death project

Prepared by S. Rooney Latham, C. Blomquist & T. Tidwell

CDFA's Plant Pest Diagnostics Laboratory continued its work plan activities of diagnostics and scientific support for the quarantined counties. For California nurseries, the lab processed a total of 22,422 nursery samples, of which 23 tested positive for *P. ramorum*. (See table below)

Nursery Type	Total	Positive for *Pr*
Nursery Stock- Containerized	21,182	23
Nursery Stock- In Ground	859	0
Nursery Stock- Greenhouse Grown	381	0
Total	22,422	23

Figure (right). Sudden oak death, *Phytophthora ramorum*, symptoms on rhododendron. Photo by Joseph O'Brien, USDA Forest Service, www.forestryimages.org

2007 Plant Pest Diagnostics Branch activities for *P. ramorum* included:

- Plant Pest Diagnostics Branch (PPDB) Laboratory hired seven seasonal employees to process the SOD laboratory samples.
- Temporarily assigned seven permanent employees to SOD project, including three exclusively for molecular testing, and one exclusively for ELISA testing.
- Temporarily dedicated eight laboratory rooms to accommodate USDA-mandated SOD protocol for activities such as initial sample processing, DNA extraction, molecular sample testing, ELISA testing, culture plate reading, data entry.

- PPDB Lab scientists gave numerous informational and training presentations to grower groups, nurseries, and county staff, *et al* on recognition of symptoms of *P. ramorum.*
- PPDB Lab scientists participated in various meetings, workshops, and training sessions with USDA to learn protocols and techniques.
- PPDB Lab staff was called upon routinely to consult with County staff on specific samples and nurseries, instructions for re-sampling, soil sampling, etc.
- PPDB scientists, with the help of Professor David Rizzo's laboratory at UCD, developed a way of baiting large holding ponds with Rhododendron leaves directly, instead of shipping prohibitively large amounts of pond water.
- Five PPDB Lab personnel successfully performed and passed provisional laboratory tests as part of the APHIS Provisional Laboratory Accreditation process for nested and quantitative PCR, including new plant pathologist and SOD Diagnostics project leader, Dr. Suzanne Rooney Latham, who did so without the benefit of formal CPHST training
- PPDB scientists Suzanne Latham and Cheryl Blomquist with Tomas Pastalka (CDFA) and Larry Costello (UCCE) identified and characterized a new *Phytophthora* disease which caused cankers on alders in Foster City, California. This species, *P. syskiyouensis* was not known to be a pathogen before this detection. Citation: First report of *Phytophthora siskiyouensis* causing disease on Italian alder in Foster City, California. Rooney-Latham, S., Blomquist, C.L., Pastalka, T., Costello, L.R., *Phytopathology* 97:S101
- PPDB collaborated with, and gave laboratory support to, several SOD projects with other scientists and agencies outside of CDFA, including the following:
    - Project with Steve Tjosvold with University of California Cooperative Extension (UCCE) involving seasonal timing of sampling activities on rhododendron and camellias for best chances of detection (final year). Results have shown we can detect *P. ramorum* by PCR in rhododendrons a year after inoculation.
    - Project with Frank Martin USDA, Mike Coffey UCR and others to test *P. ramorum* PCR-based diagnostics using field samples.
    - Project with Jim MacDonald and Lani Yakabe at UCD Plant Pathology involving management and disposition of P. *ramorum*-infested soil in nurseries.
    - Project with Lani Yakabe and Jim MacDonald at UCD Plant Pathology to describe other aerial *Phytophthoras* that are causing disease in California nurseries. Citation: Identification and frequency of *Phytophthora* species causing foliar diseases in California ornamental nurseries. Yakabe, L.E., Blomquist, C.L., Thomas, S.L., MacDonald, J.D. *Phytopathology* 97: S126
    - Collaboration with Niklaus Grunwald, ARS for genotyping of nursery isolates of *P. ramorum*. The A1 mating type was detected for the first time in California in a Humboldt county retail nursery as a result of this collaboration.
    - Tested many oaks of private residences across the 14 infested counties with the bulk of them coming from Portola Valley in San Mateo County.
    - Worked with Katie Palmieri (COMTF), Amber Morris (CDFA), and Kathy Kosta (CDFA) to combine *P. ramorum* training presentations into a more unified training made available to the USDA and other states. Began collaboration with Jackson McCarty, Sacramento County to develop training for inspectors on how to inspect a nursery for the presence of *P. ramorum.*

Tomato Yellow Leaf Curl Virus

Prepared by T. Tian

In March 2007, Tomato yellow leaf curl virus (TYLCV) was detected in a green house in Brawley, Imperial County, by a group of researchers lead by Dr. Bob Gilbertson of University of California, Davis (Rojas et al. 2007). Because TYLCV is considered to be one of the most severe pathogens on tomato plants, active disease survey and detection have been conducted by biologists from several counties and CDFA. Infection of TYLCV induces severe disease symptoms on tomato plants, including at the late stage of infection, stunting and the edges of young leaves curl upward and turn slightly yellow. In California, only isolated cases of infection have been detected, but severe yield reductions up to 100% have been reported where the disease is widespread (Salati et al. 2002).

Figure 1. Symptoms caused by *Tomato yellow leaf curl virus* infection. Left: Plant with stunted growth and curled leaves (photo by Jolene Dessert). Right: Early symptoms on the young leaves.

TYLCV belongs to the genus, *Begomovirus,* in the family of *Geminiviridae* (Fig. 2).

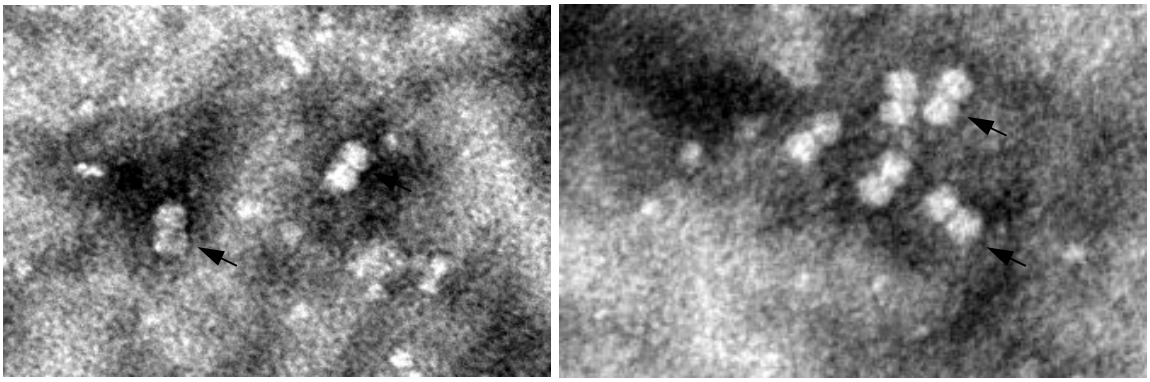


Figure 2. Images of virions of *Tomato yellow leaf curl virus* (arrows pointed).
Virions appear to be twinned (geminate) as a characteristic of the virus family, *Geminiviridae*.

This virus is transmitted by a whitefly, *Bemisia tabaci*, in a circulative persistent manner, but is not transmitted by the greenhouse whitefly, *Trialeurodes vaporariorum*. For the virus to spread from plant to plant, *Bemisia* whiteflies first have to feed on an infected plant to acquire the virus, then move and feed on adjacent healthy plants for inoculation. Once a *Bemisia* whitefly acquires the virus, it will remain capable of transmission for its remaining lifetime.

We used polymerase chain reaction (PCR) according to protocols described by Salati et al. (2002) to examine both plant and whitefly samples. The presence of PCR product of approximately 334 base pair nucleotide indicates the presence of TYLCV.

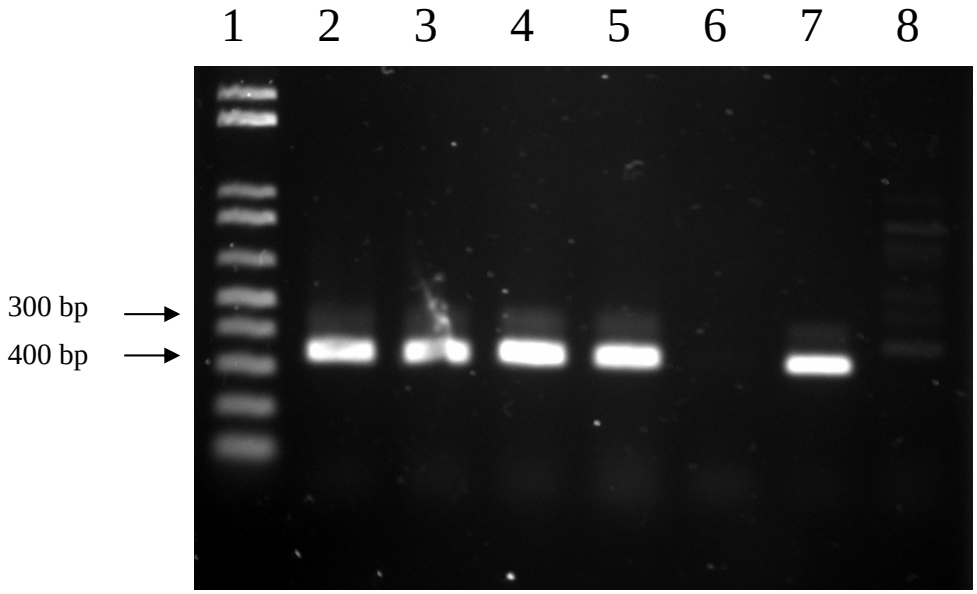


Figure 3. PCR detection for *Tomato yellow leaf curl virus*. Lane 1, DNA markers; Lanes 2 to 5, PCR amplification of DNA extract from 1, 5, 10 and 20 *Bemisia* whiteflies, respectively, collected from an infected tomato; Lane 6, *Beminisia* whitefly control; Lane 7, PCR amplification of DNA extract from an infected tomato; Lane 8, healthy tomato control.

From April to December 2007, we tested 186 tomato samples, 52 whitefly samples (various number of whiteflies in each sample), and 70 weeds or other crops collected from 12 counties in California. Among them, 22 tomato plants, 6 whitefly samples and 2 weeds from Imperial and Riverside counties were positive for TYLCV. Because the majority of samples received are from areas where TYLCV was detected previously, these results do not necessarily indicate a definitive geographical distribution of TYLCV in the state. In other words, this work is not part of a systematic survey for the determination of the virus distribution. However, the results do suggest that TYLCV has a limited distribution even in Imperial and Riverside Counties.

References:

Rajas, M.R., et al. 2007. First report of *Tomato yellow leaf curl virus* associated with tomato yellow leaf curl disease in California. Plant Dis. 91: 1056.

Salati, R., et al. 2002. Tomato yellow leaf curl virus in the Dominican Republic: Characterization of an infectious clone, virus monitoring in whiteflies, and identification of reservoir hosts. Phytopathology 92: 487 – 496.

Palm Wilt Survey for the City of Dana Point

Prepared by S. Rooney Latham

Palm wilt is a serious disease affecting Canary Island Date Palm (*Phoenix canariensis*) worldwide. In California, the disease primarily occurs in the southern part of the state where it can cause severe tree mortality. Palm wilt is a true vascular wilt disease and is caused by the fungus *Fusarium oxysporum* f. sp. *canariensis.* Symptoms include one-sided dieback of the leaflets as well as dark discoloration and streaking of the vascular tissue. Other fungal pathogens can also be found in discolored vascular tissue of *Phoenix canariensis* including those that cause pink bud rot and *Botryosphaeria* cankers. Spread of palm wilt from tree to tree occurs primarily through the use of contaminated pruning tools. At present, there is no known cure of this disease. Therefore, the use of clean pruning and propagation tools as well as the removal of infected fronds (including proper sanitation) are recommended for disease management.

Figure 1. Palm Wilt of *Phoenix canariensis*, caused by *Fusarium oxysporum* f. sp. *canariensis*. Photo by Santa Barbara County Plant Pathologist, Heather Scheck.

During the fall of 2007, a survey was undertaken to determine the prevalence of palm wilt on city street trees in Dana Point, CA (Orange Co). Over a two-month period, fifty-eight (58) Canary Island Date Palm trees showing typical palm wilt symptoms were sampled and submitted to the lab for analyses. Samples were cultured onto semi-selective media and suspect cultures were further analyzed using a polymerase chain reaction (PCR) protocol specific to *Fusarium oxysporum* f. sp. *canariensis.* In total, palm wilt was confirmed in 24% of the total samples, while 71% of the samples were infected with *Gliocladium vermoeseni*, the pathogen causing pink rot. Approximately 92% of the samples that were infected with palm wilt were also infected with pink rot, suggesting a relationship between the two diseases. Various canker causing organisms in the genus *Neofusicoccum* (teleomorph = *Botryosphaeria*) were also detected in the survey (21%). A few of these species have not been previously reported on *Phoenix canariensis.* Although there are few records of palm wilt in California in the PHPPS database, this survey confirms that this "A" rated pest is fairly widespread in Orange County and likely other parts of Southern California as well.

Crown and Root Rot Pathogens in California

Prepared by S. Rooney Latham & C. Blomquist

Many different fungal pathogens are capable of causing significant root and crown rot diseases in California. Below ground symptoms of root rots are often characterized by black sunken lesions, cortical sloughing and a reduction in the number of feeder roots. Some root pathogens can grow from the roots into the crown of the plant. As a result, crown tissue can also become discolored with the vascular tissue plugged. Depending on the host-pathogen combination, some pathogens will rot the crown and roots, some the roots only and others the crown alone. Above ground symptoms include wilting, reduced growth and discolored foliage.

In 2007, our lab received many diagnostic samples in which root rot diseases were suspected. A majority of the positive detections were *Phytophthora* species (see Table). For many of these detections, *Phytophthora* spp. could not be cultured but were confirmed using a *Phytophthora*-specific immunoassay. The confirmed species were C or Q rated and included *P. capsici, P. cinnamomi, P. nicotianae, P niederhauserii, P. palmivora* and *P. siskiyouensis. P. siskiyouensis* is a newly described species and was found causing significant crown rot in a grove of Italian alder (*Alnus cordata*) trees in San Mateo Co., CA (Figure 1).

Figure 1. Bleeding canker near the crown of an *Alnus cordata* tree infected with *Phytophthora siskiyouensis*. Photo taken in Foster City, CA by S. Rooney Latham.

Species of *Cylindrocarpon* and *Cylindrocladium* were also detected from lab samples in 2007. Both of these genera have been reported causing root and crown rot diseases on many different plants worldwide. However, their distribution in California is not well known. *Cylindrocarpon macrodidymum*, previously only known to cause "black foot" disease of grapevines (*Vitis* sp.), was detected from affected roots of *Ceanothus* sp., *Cistus* sp., *Rhus* sp. and *Vitis vinifera* in 2007. *Cylindrocarpon destructans* was found to cause significant root and crown necrosis on *Rhododendron* sp. (azalea), *Cistus* sp., *Escallonia* sp. and *Pittosporum* sp. (Figure 2). *Cylindrocarpon liriodendri*, previously only associated with grapevines and *Liriodendron* sp., was also cultured from necrotic roots of avocado (*Persea americana*) and *Magnolia grandiflora*. Host pathogenicity experiments of many of these *Cylindrocarpon* species, with a proposed B rating pending, are currently in progress. Other root rot-related fungi that were detected in 2007 include *Rhizoctonia solani*, *Armillaria* sp., *Fusarium sambucinum* and many species of *Pythium* (not listed).

Figure 2. Healthy *Rhododendron* sp. (azalea) plant (A), alongside two plants showing varying degrees of root rot caused by *Cylindrocarpon destructans* (B and C). Infected plants had black sunken regions in the roots and crowns, reduced root biomass and stunted foliar growth. Photo by S. Rooney Latham.

Most root and crown rot pathogens occur naturally in the soil and have life cycles that allow them to survive there for long periods of time. Heavy soils that stay wet for prolonged periods of time are very conducive to disease development. *Phytophthoras* (also termed water-molds) are especially problematic due to their production of swimming spores. Proper water management and the use of clean, fast-draining potting mixes in nurseries and sighting plants in areas of good drainage in the landscape are the best recommended strategies for management of these root and crown diseases.

Table. Crown and Root Rot Pathogens detected in 2007 (compiled by J. White & S. Rooney Latham)

Pathogen		**Host(s)**	**County**	**Detections**
Armillaria sp.	B	*Prunus triloba*	Santa Clara	1
Cylindrocarpon destructans	Q*	*Rhododendron* sp.(azalea)	Alameda	1
Cylindrocarpon destructans	B	*Cistus* sp., *Escallonia* sp., *Pittosporum undulatum*	Santa Barbara	5
Cylindrocarpon liriodendri	B	*Liriodendron* sp., *Persea americana*	Santa Barbara	2
Cylindrocarpon liriodendri	B	*Cedrus deodora, Magnolia grandiflora*	Yolo	2
Cylindrocarpon macrodidymum	B	*Ceanothus* sp., *Cistus* sp., *Rhus* sp., *Vitis vinifera*	Santa Barbara	8
Cylindrocladium spathulatum	Q	*Anisodontea* sp., *Myrtus communis*	Santa Barbara	5
Fusarium sambucinum	Q	*Vinca* sp.	Santa Clara	1
Fusarium sambucinum	Q	*Solanum tuberosum*	Sonoma	1
Phytophthora capsici	C	*Lycopersicon esculentum*	Santa Barbara	1
Phytophthora capsici	C	*Capsicum frutescens*	Santa Clara	1
Phytophthora cinnamomi	C	*Quercus agrifolia*	San Mateo	1
Phytophthora cinnamomi	C	*Quercus agrifolia*	Santa Clara	1
Phytophthora nicotianae	C	*Vinca rosea*	Imperial	1
Phytophthora nicotianae	C	*Pointsettia* sp.	San Mateo	1
Phytophthora nicotianae	C	*Lavendula* sp.	Santa Barbara	2
Phytophthora nicotianae	C	*Ceanothus* sp.	Santa Cruz	1
Phytophthora niederhauserii	Q	*Ceanothus* sp.	Santa Barbara	1
Phytophthora palmivora	C	*Ceanothus* sp.	Santa Barbara	2
Phytophthora siskiyouensis	Q	*Alnus cordata*	San Mateo	2
Rhizoctonia solani	C	*Pisum sativum*	Santa Barbara	1

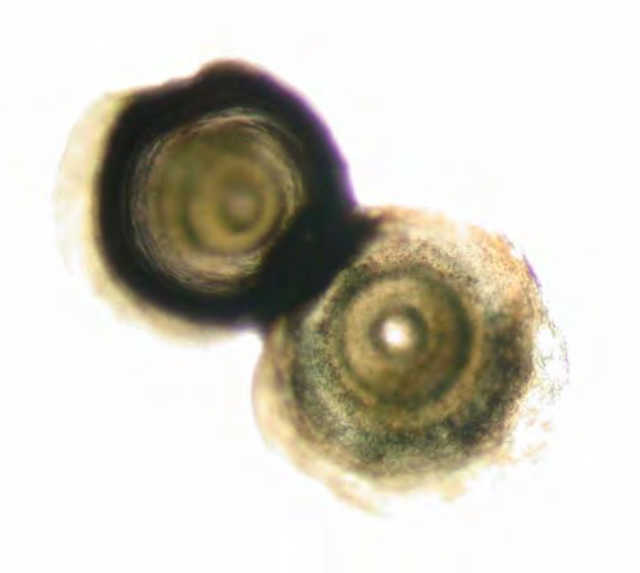
*Assigned prior to final B-rating.

Spots on Apple due to a Cellular Alga?

Prepared by C. Blomquist

Most of the green algae we are familiar with are aquatic. There is an important group of alga, however that is not aquatic, but subaerial and can be found growing on rocks, humid soil, tree bark, leaves, stems and fruit. They are members of a single family, the Trentepohliaceae, with six genera. Algae in this group are photosynthetic and a few are known to cause leaf spot diseases on plants. These algal leaf spot diseases are found in states such as Hawaii or Alabama that have high year round rainfall. Algae from this group that do not cause plant diseases are also found in seasonally arid climates such as California during the rainy season or where moisture is plentiful.

An apple sample was sent to the CDFA lab in early January of 2008 from Trinity County. It was covered with interesting dark spots (Figure 1). These red halos were at a higher density near the top and bottom of the fruit. In the middle of each of the dark spots was a cellular green alga, *Phycopeltis* sp. (Figure 2). *Phycopeltis* sp. is a non-parasitic green alga that lives in association with plants. *Phycopeltis* cells were only located covering the stomata (natural openings in the apple skin) of the apples and perhaps caused the abnormal ripening in those areas. Members of *Phycopeltis* sp. are sometimes the algal partner of the algal-fungal association known as lichens. In this case, the algal cells probably splashed down onto the young apple fruit from either the lichens or the free-living cells on the twigs above. All algae need water for survival and reproduction. Perhaps these cells only survived in areas near the top and bottom of the fruit because the moisture was more plentiful and over the stomates because they provided added moisture. These halo symptoms are very similar to San Jose Scale-infection of apple. The main difference, except for the presence of the scale insect in San Jose Scale, is with scale infection, the centers of the spots eventually turn black.



Figures. 1, left. An apple with red colored spots. In the center of each, is a single *Phycopeltis* sp.cell. 2, right. Photomicrograph of the shield-shaped *Phycopeltis* sp. cellular algae.

The Rusts – A Unique Group of Fungi

Prepared by J. White & C. Blomquist

Rust fungi, classified in the order Uredinales, class Basidiomycetes, comprise the largest group of phytopathogenic fungi with approximately 7000 described species of obligate parasites that grow and reproduce only in living plants. As a group, the rusts are among the most economically important pathogens parasitizing a wide range of host plants including ferns, conifers, and angiosperms (both mono- and dicotyledonous). Rust fungi cause ecomonically important loses on bamboo, bean, chickpea, coffee, corn, cotton, flax, soybean, sugarcane and wheat. Current classification of the rusts into 13 families is based upon life cycle variations, fruiting structure morphology, and host associations. These organisms are called "rusts" because the spore-producing structures, referred to as sori, that develop on green plants are often orange to reddish-orange in color. Rusts exhibit some of the most complex life cycles in the Eumycota kingdom.

A single species of rust fungus may produce up to five morphologically and functionally different spore states in a life cycle. These spore states include basidiospores, spermatia, aeciospores, urediniospores and teliospores. Different spore states may develop at different times of year or may appear together simultaneously. They may also appear at alternate times on different hosts in differing geographical areas. Aeciospores may be produced in spring, urediniospores in summer, and teliospores in late fall or until low temperatures kills the host plant tissue. Some rusts may overwinter as mycelium buried in plant tissues. Basidiospores may be produced in the spring from germinating teliospores and initiate infections of a plant. All five spores states are not found in all rust species. Rust life cycle variations can include all spore states (macrocyclic), lack the uredial state (demicyclic), or lack both the aecial and uredial state (microcyclic).

To add to this complexity, rust species may not only have different spores states but might also require two phylogenetically distinct host plants to complete a life cycle. Heteroecious rusts need two host plant species for life cycle completion (i.e. aecia develop on one host plant and the telia develop on a completely different unrelated plant species). In contrast, autoecious rusts complete an entire life cycle on one host plant (i.e. the aecia and telia develop on the same plant). Pacific Coast Pear Rust, *Gymnosporangium libocedri* is a heteroecious rust producing spermogonia and aecia on Flowering Pear and telia on a conifer host such as Incense Cedar to complete its life cycle. Hollyhock Rust, *Puccinia malvacearum*, is an autoecious rust completing its life cycle on one host. Many combinations of spore states and hosts must be considered in the identification process.

Rust fungi are generally host specific, developing compatible associations with the plants they parasitize. Because of this host restrictiveness, various genera have been useful in biocontrol experiments on noxious weeds. Some genera of rusts such as *Puccinia* and *Uromyces* do include species that are capable of parasitizing a wide range of hosts in numerous plant families. Rust fungi produce conspicuous symptoms on individual plants they infect. These include a diversified range of symptoms exhibited among the many host plants parasitized. Some typical symptoms and signs of infection on various parts of a plant host include: hypertrophy and hyperplasia (galls), fasciation (witches broom), malformation, chlorotic specks and other leaf spots, blistering, swelling, girdling, cankering, and defoliation. Fungal fruiting structures exhibit signs that may be specific to a rust genus, species and host plant.

Identification of a rust on a diseased plant specimen submitted to the Plant Pathology laboratory begins with an accurate identification of the host plant. Since many rusts are host specific this is important information. Rust disease symptoms and the magnitude of infection (early, progressive, severe, too dead to determine!) are noted.

The specimen is examined under a dissecting scope for fungal structures present within symptomatic areas (i.e. pustule with sporulating fungal sorus in host tissue—a telium or uredium, etc.). Microscope slide mounts are examined under the compound microscope to further observe the position of the fungal sorus in host tissue, structural features and to view spore state(s) (ie. teliospores and urediniospores or just teliospores, etc.) and morphology (i.e. color, shape, measured size, surface ornamentation, number and arrangement of germ pores, cell wall color and thickness, single or multi-septate, etc.) When the only spore state present is the urediniospore or aeciospore, identification can be difficult because there is overlap in spore characteristics between species in these spore states. This is where host information becomes especially critical and may constitute the difference between the ability to identify to species versus just to genus. To help us differentiate between rusts with similar spores, we have recently been able to use polymerase chain reaction (PCR) to obtain sequence from rusts to aid in identification.

Scanning electron microscopy can be used as an additional tool for identifying specific spore ornamentation and structure. Taxonomic reference keys classifying genera of rust fungi and corresponding literature are used for final identification. Rust fungi are challenging to identify and beautiful with many species present in California or being brought in through travel and trade.

Rust Disease Pathogens Detected for 2007

Rust Pathogen	Rust Common Name	Host Plant	County
Coleosporium plumeriae	Plumeria Rust	*Plumeria sp.*	Contra Costa
Coleosporium plumeriae	Plumeria Rust	*Plumeria sp.*	Napa
Cronartium ribicola [1]	White Pine Blister Rust	*Ribes spp.*	Santa Cruz
Endocronartium harknessii	Western Gall Rust of Pine	*Pinus halapensis*	Orange
Endocronartium harknessii	Western Gall Rust of Pine	*Pinus sp.*	Sacramento
Gymnosporangium libocedri	Pacific Coast Pear Rust	*Amelanchier sp.*	Placer
Gymnosporangium libocedri	Pacific Coast Pear Rust	*Amelanchier sp.*	El Dorado
Kuehneola uredinis	Caneberry Rust	*Rubus sp.*	Sacramento
Melampsora epitea	Willow Conifer Rust	*Salix sp.*	San Luis Obispo
Melampsora epitea	Willow Conifer Rust	*Salix sp.*	Santa Barbara
Melampsora euphorbiae	Euphorbia Rust	*Euphorbia peplus*	Riverside
Melampsora occidentalis	Cottonwood Rust	*Populus fremontii*	Riverside
Phragmidium rubi-idaei	Yellow Rust of Rubus	*Rubus sp.*	Santa Cruz
Phragmidium sp.	Rose Rust	*Rosa sp.*	San Mateo
*Prospodium appendiculatum**, [2]	Prospodium Rust	*Lycopersicon esculentum*	(Needles)

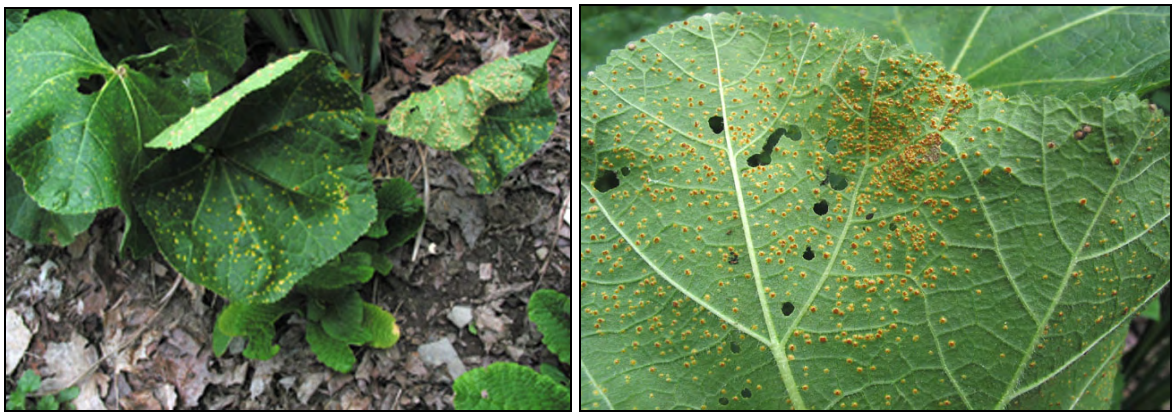
Rust Pathogen	Rust Common Name	Host Plant	County
Puccinia antirrhini	Snapdragon Rust	*Antirrhinum sp.*	Santa Cruz
Puccinia carthami	Safflower Rust	*Carthamus tinctorium*	Sutter
Puccinia carthami	Safflower Rust	*Carthamus tinctorium*	Yolo
Puccinia helianthi	Sunflower Rust	*Helianthus annuus*	Glenn
Puccinia helianthi	Sunflower Rust	*Helianthus annuus*	Solano
Puccinia helianthi	Sunflower Rust	*Helianthus annuus*	Sonoma
Puccinia helianthi	Sunflower Rust	*Helianthus annuus*	Yolo
Puccinia hemerocallidis	Daylily Rust	*Hemerocallis sp.*	Riverside
Puccinia hemerocallidis	Daylily Rust	*Hemerocallis sp.*	San Mateo
Puccinia hemerocallidis	Daylily Rust	*Hemerocallis sp.*	Santa Cruz
Puccinia hordei	Hordeum Rust	*Hordeum brachyantherum*	Santa Barbara
Puccinia horiana [2]	Chrysanthemum White Rust	*Chrysanthemum sp.*	San Diego
Puccinia horiana [2]	Chrysanthemum White Rust	*Chrysanthemum sp.*	Santa Barbara
Puccinia lagenophorae	Senecio Rust	*Senecio sp.*	Santa Cruz
Puccinia malvacearum	Hollyhock Rust	*Alcea rosea*	Santa Cruz
Puccinia menthae	Mint Rust on Origano	*Origanum vulgare*	San Mateo
Puccinia menthae	Mint Rust on Basil	*Ocimum basilicum*	Santa Clara
Puccinia nakanishikii	Lemongrass Rust	*Cymbopogon citratus*	San Joaquin
Puccinia oxalidis	Oxalis Rust	*Oxalis sp.*	San Francisco
Puccinia psidii [1]	Eucalyptus & Guava Rust	*Metrosideros sp.*	San Diego
Puccinia sp.	Rust	*Species unknown*	San Mateo
Pucciniastrum epilobii	Fir/fireweed Rust	*Epilobium sp.*	San Luis Obispo
*Tranzschelia pruni-spinosae**	Prunus Rust	*Prunus sp.*	(Yermo)
Uromyces fabae	Broadbean Rust	*Vicia faba*	Santa Barbara
Uromyces pisi-sativi	Legume Rust	*Astragalus sp.*	Fresno
Uromyces transversalis [2]	Gladiolus Rust	*Gladiolus sp.*	San Diego
Uromyces transversalis [2]	Gladiolus Rust	*Gladiolus sp.*	San Diego
Uromyces transversalis [2]	Gladiolus Rust	*Gladiolus sp.*	San Diego
Uromyces transversalis [2]	Gladiolus Rust	*Gladiolus sp.*	San Diego
Uromyces transversalis [2]	Gladiolus Rust	*Gladiolus sp.*	San Diego

* interceptions only, at Inspection Stations indicated in ( ) instead of county

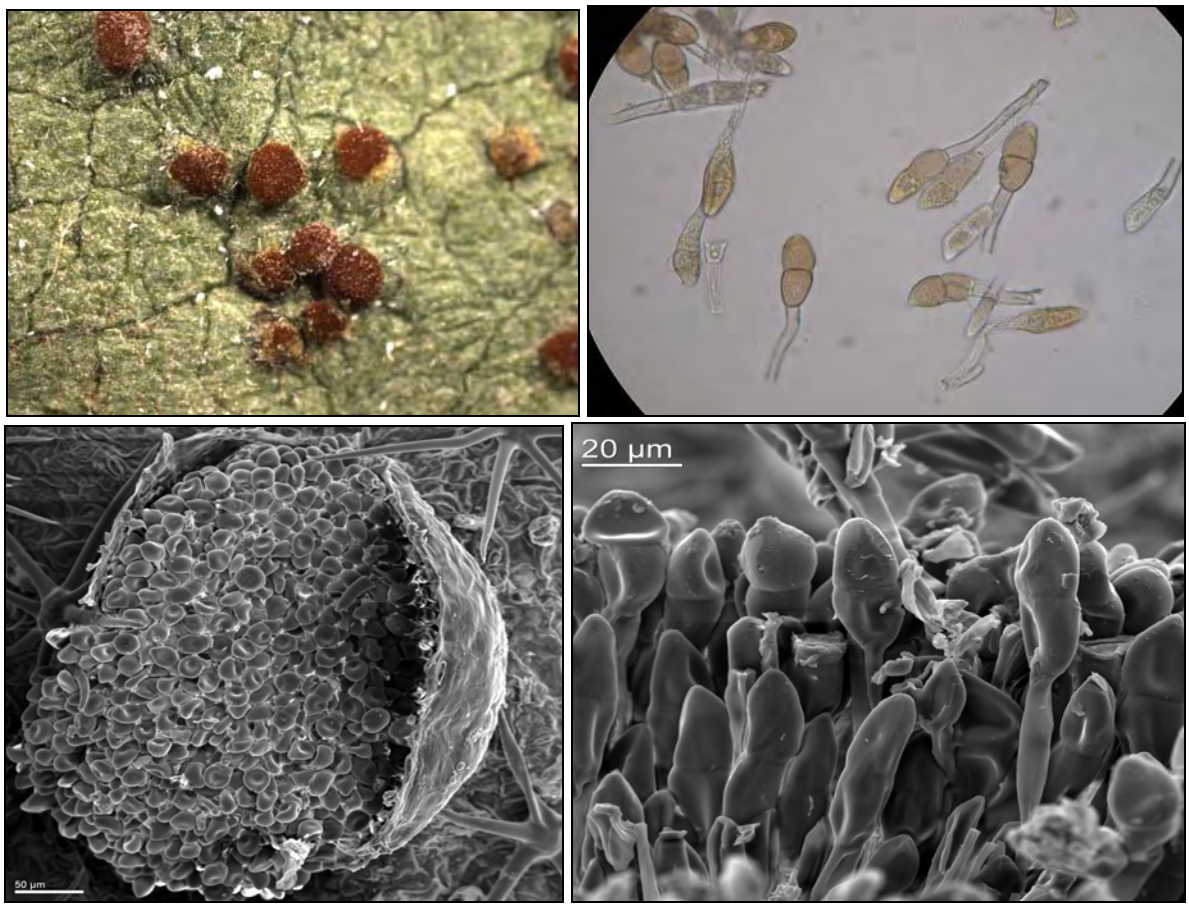
Note, all listed rust disease pathogens are C-rated, except those marked with as follows:

[1] B-rated
[2] Q-rated

Selected Rust Disease Photographs

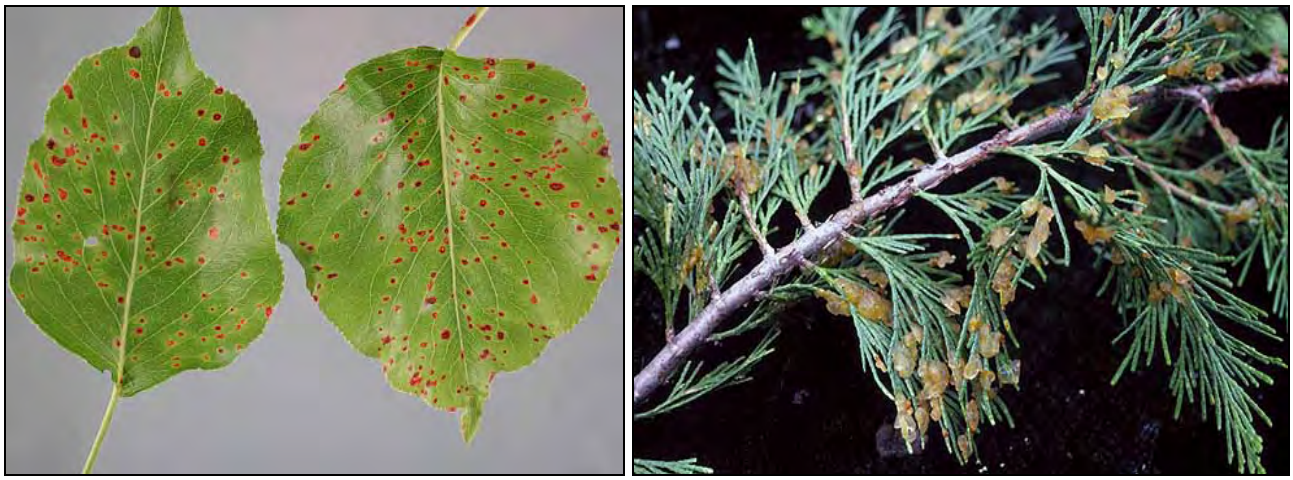


Left: Hollyhock Rust, *Puccinia malvacearum* on Hollyhock (*Althaea sp*.).
Right: Autoecious, microcyclic, rust fungus exhibiting typical yellow-orange leaf spots and orange pustules (telium sori with teliospores) on underside of the leaf. (photographs by Dawn Dailey O'Brian, Cornell University).



Hollyhock/Malva Rust on *Malva sp*., *Puccinia malvacearum*. Top left: Leaf pustules (telial sori). Top right: Teliospores, septate, with pedicle (stalk) under the compound microscope. Bottom left: SEM, telial sorus erupting on underside of leaf epidermis. Bottom right: SEM, septate teliospores inside sorus. (Photograph and photomicrograph by C. Blomquist; SEM's by S. Kinnee & J. White).

Cronartium ribicola, White Pine Blister Rust. Top left: Aecia on the bark of an Eastern White Pine (*Pinus strobes*). (Photograph by Frantisek Soukup). Top right: Alternate host European Blackcurrant (*Ribes nigrum*) with telia (sign) on underside of leaf.(Photograph by Petr Kapitola, State Phytosanitary Admnistration). Bottom: On *Ribes nigrum* , underside of leaf exhibiting telial 'horns'. (Photograph by Petr Kapitola) (all photographs from www.bugwood.org).



Pacific Coast Pear Rust, *Gymnosporangium libocedri.* A heteroecious rust requiring both pear (*Pyrus calleryana*) showing aecial pustules (left) and a conifer (*Cedrus sp*.) with telial state (right) to complete its life cycle. The orange telia swell when wet. (Photographs by Melodie Putnam & Jay W. Pscheidt, Oregon State University).

Pacific Coast Pear Rust, *Gymnosporangium libocedri*. Infected branches of Incense Cedar (*Calocedrus decurrens*) exhibiting 'witches broom' symptoms a perennial structure caused by this rust. (Photographs courtesy of Oregon State University Extension Online Guide)

Eucalyptus and Guava Rust, *Puccinia Psidii* on Rose Apple (*Syzgium jambos*).
Autoecious rust has a macrocyclic life cycle, producing aecia, uredinia, telia and basidia.
Severe infection causing leaf malformation. (Photographs by Forest and Kim Starr)

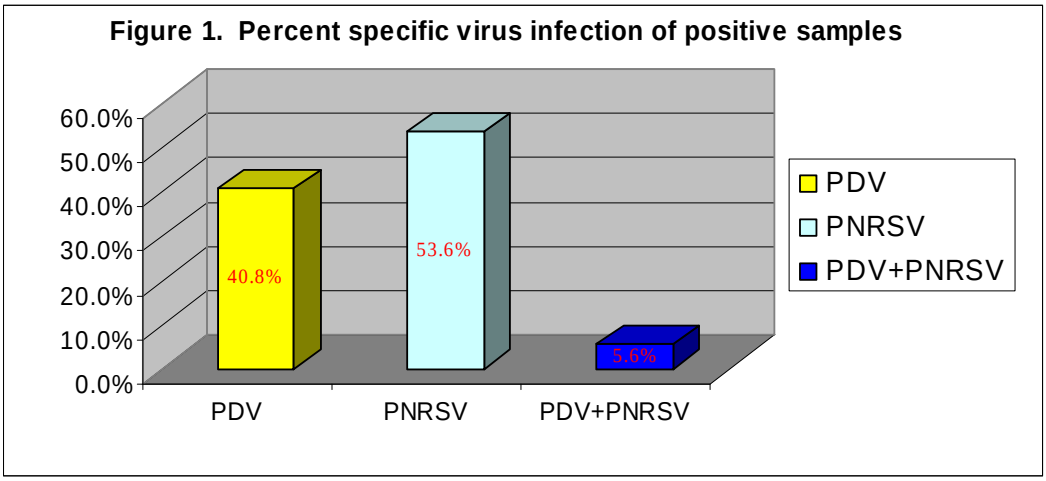
Nursery Annual Survey of Deciduous Fruit Trees, Nut Trees, and Grapevines

Prepared by Y. Zhang, D. Marion, C. Banzhof, J. Estoque & A. Ballesteros

California Fruit Tree, Nut Tree and Grapevine Improvement Advisory Board (IAB) allocates funds each year to survey fruit and nut trees and grapevines for specific viruses for the registered increase block which is then used to produce planting material for the industry. This survey is carried out by the staff of the Nursery, Seed and Cotton Program of the Pest Exclusion branch, including the Plant Pathologists, field Agricultural Biologists, and Seasonal Agricultural Aides.

A total of 49,932 stone fruit tree samples were tested for two ilarviruses, Prune dwarf virus (PDV) and Prunus necrotic ringspot virus (PNRSV) from 16 nurseries, which is a 5.7% increase from previous year. Most of the samples were from the nursery registration and certification program (47,218), of which 119 (0.31%) tested positive. There were also 8,193 service samples tested of which 334 (4.08%) were positive.

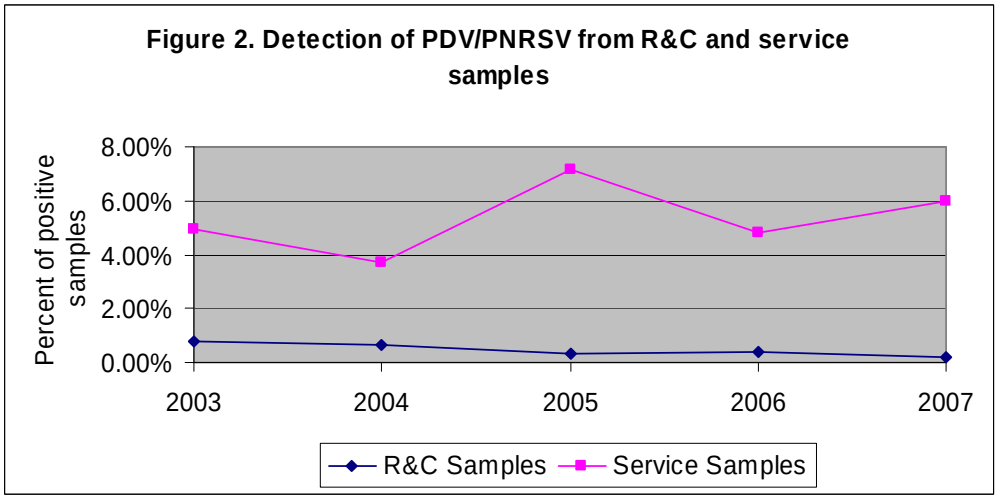
A total of 319 (0.64%) samples tested positive for PDV and /or PNRSV. When the positive samples were tested separately for PDV and PNRSV, the result showed that 130 (40.8%) were infected with PDV, 171 (53.6%) with PNRSV, and 18 (5.6%) with both viruses (Figure 1).



In the month of May 2007, Grapevines in the Nursery program were surveyed for Grapevine fanleaf virus. Each sample was composed of young shoot tips from five vines and tested with ELISA. A total of 1145 samples was tested, only 1 sample was found positive.

Grapevines were surveyed for Grapevine leaf roll associated viruses 2 and 3 from September to November. A total of 793 grapevine samples were tested, which was significantly fewer than 2006 (1532 samples were tested). None of these samples tested positive for Grapevine leafroll associated virus 2, but 48 samples tested positive for Grapevine leafroll associated virus 3. Removal of infected and adjacent vines in the certified blocks were advised.

The Nursery Registration and Certification program along with the Annual Survey has played a significant role in keeping California fruit and nut trees, and grapevines healthy. For the past 5 years (Figure 2), the numbers of infected trees in the R&C program have been at a very low level while the numbers of infected trees not in the R&C program (service samples) were much higher.



Acknowledgements: This project is supported by California Fruit Tree, Nut Tree, and Grapevine Improvement Advisory Board, Pest Exclusion biologists, and participating nurseries.

Seed Health Testing 2007

Prepared by Y. Zhang, T. Tidwell, A. Noguchi, J. Estoque, J. White, A. Ballesteros & E. Ramos

During the calendar year 2007, the Seed Health Testing laboratory staff conducted 444 seed tests from 27 different clients in California and other states. These tests were primarily performed on seed samples officially drawn and sealed by the Agricultural Commissioner's office, which acts on behalf of USDA APHIS. The test service supports the foreign and domestic trading of various agricultural seeds as part of the phytosanitary requirements by different trading partners.

Figure 1. Test of Cotton blight pathogen *Xanthomonas campestris pv. malvacearum* in greenhouse.

The tests performed by the Seed Health Testing Laboratory involved 24 different types of agricultural or horticultural seeds, natural or treated with various chemicals (Table 1). The majority of the tests were performed on Tomato, Cotton (Figure 1), Wheat, Onion, and Alfalfa. These 4 seeds consisted 91% of the seed tests and the other 20 different seeds only consisted 9% of the seeds tests.

Table 1. Types of seed tested for seed borne plant pathogens in the year 2007.

Seed	Number		Seed	Number
Alfalfa	44		Lettuce	3
Barley	3		Mustard	1
Beet	3		Onion	45
Black-eyed cowpea	2		Parsley	1
Cabbage	1		Rice	1
Cauliflower	3		Rye	1
Celery	4		Safflower	4
Clover	2		Squash	2
Cotton	73		Spinach	4
Eggplant	1		Tomato	193
Kohlrabi	1		Watermelon	2
Leek	1		Wheat	49

As part of the National Karnal Bunt Survey Program, the Seed Health Testing Laboratory also tested wheat samples again this year. Forty-eight wheat seed samples from 23 counties were tested for the presence of the Karnal Bunt smut pathogen, *Tilletia indica* (Figure 2). The Karnal Bunt pathogen was not detected in any of the National Survey samples. In addition, thirteen wheat samples from the area currently regulated for Karnal Bunt, namely the Palo Verde Valley (Eastern Riverside County, near the California/Arizona border) were also tested for *Tilletia indica* but the pathogen was not detected in any of those samples.

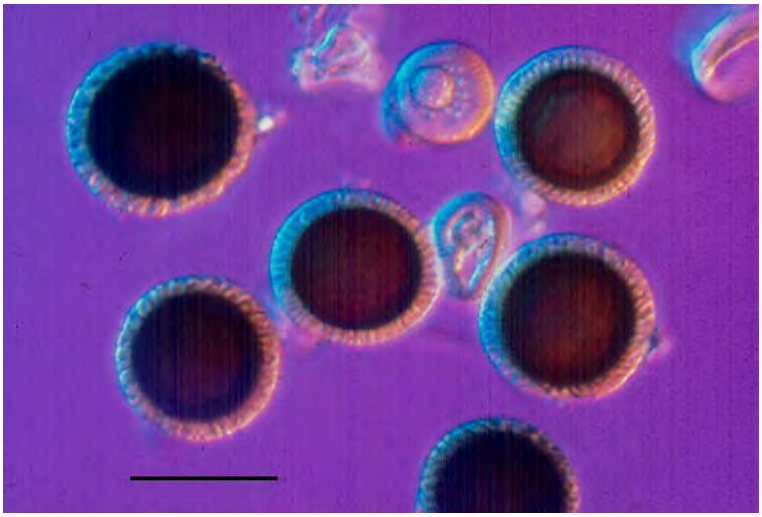


Figure 2. Teliospores of *Tilletia indica*. Bar = 37 µ

Table. Tests were conducted to detect a total of 36 different seed pathogens.

Fungi	
Alternaria brassicicola	11
Alternaria carthami	2
Ascochyta rabiei	1
Botrytis allii	28
Botrytis byssoidea	5
Fusarium oxysporum f.sp. *carthami*	2
Fusarium oxysporum f. sp. *radicis-lycopersici*	53
Glomerella gossypii	4
Magnaporthe grisea	1
Puccina allii	7
Phoma lingam	1
Phomopsis vexans	1
Sclerotinia spp.	1
Tilletia controversa	1
Tilletia indica	51
Urocyctis agropyri	1
Urocyctis cepulae	5
Uromyces betae	4
Verticillium albo-atrum	35
Verticillium dahliae	4

Bacteria	
Clavibacter michiganensis subsp. *sepedonicus*	2
Clavibacter michiganensis subsp. *insidiosus*	2
Erwinia tracheiphila	2
pseudomonas marginalis pv. *marginalis*	2
Pseudomonas syringae pv. *maculicola*	1
Pseudomonas virdiflava	5
Xanthomonas campestris pv. *campestris*	2
Xanthomonas campestris pv. *malvacearum*	69
Xanthomonas campestris pv *vignicola*	2
Viruses	
Alfalfa latent virus	5
Arabis mosaic virus	1
Peanut stunt virus	1
Strawberry latent ringspot virus	1
Tobacco ringspot virus	2
Tomato ringspot virus	67
Viroids	
Potato spindle tuber viroid	63

SIGNIFICANT RECORDS IN NEMATOLOGY

Annual Report of the Nematology Laboratory

Prepared by J. Chitambar, K. Dong, S. Subbotin & R. Luna

The Nematology Laboratory of the Plant Pest Diagnostics Branch (PPDB) provides diagnostic support for the protection of California's agricultural industry against economically important plant parasitic nematodes associated with plant disease. Based largely on the nematode diagnostic support provided by the Laboratory, government agencies are able to:

- Provide nursery certification and standards of pest cleanliness.
- Prevent the introduction and spread of regulatory significant pests.
- Provide phytosanitary certification of foreign export commodities.

Laboratory Staff

The Nematology Laboratory comprises three Nematologists, one Agricultural Biological Technician and a support staff of five Scientific Aides. Scientific Aides comprise mainly of graduate and post-graduate students in Nematology or other biological science from the University of California, Davis.

Role and responsibilities

The role and responsibilities of the State nematologists are mainly four-fold:

- Identification of plant parasitic nematodes in regulatory and survey samples. Diagnoses of nematode related agricultural problems.
- Professional consultations provided to state, federal, university, industry, commercial and private agency personnel.
- Training in nematode sampling, processing, and preliminary identifications provided to county and state personnel.
- Research in nematode taxonomy, methodologies, and other areas of regulatory nematology.

The Agricultural Biological Technician is responsible for the effective and timely management of the support staff, sample processing, data management and other related operations of the Laboratory.

Regulatory sample processing

In order to meet the diagnostic responsibilities, the Laboratory support staff under the direct guidance of the biological technician, processes plant and soil samples that are routinely collected and sent to the Nematology Laboratory by County Agricultural and State personnel. Plant parasitic nematodes are microscopic and inhabit above and below ground plant parts as well as rhizosphere soil of plants, depending on the species and biology of the nematode involved. These samples are designated to Quarantine, Nursery, Commercial or Dooryard (residential) programs, and are sent as

non-processed "raw" samples, or as processed samples of nematode suspensions preserved in two and one-half percent formaldehyde solution contained in vials. Approximately six counties have nematode sample processing facilities and personnel trained and certified by the State Nematology Laboratory. The State Laboratory uses a combination of several scientific tests or procedures to extract nematodes from infested samples. Each of these procedures involves the use of large volumes of water, as nematodes are essentially aquatic animals requiring moisture for activity. The number of tests involved in extracting and preparing a collection of nematodes in clear water suspension for diagnostic evaluation is indication of the fact that the workload of the Nematology Sample Processing Laboratory cannot be entirely based on the number of samples processed.

During 2007 at total of 5,729 samples were diagnosed at the Laboratory. A breakdown of sample type per program is presented in Table 1. The bulk of quarantine samples include those entering the State through the External Quarantine for Burrowing and Reniform Nematodes program and those exported to other countries through the Quarantine Phytosanitary Certification Program. Samples in the former sub-program comprise collections made mainly from indoor decorative foliage plants sold at nurseries, while samples in the latter sub-program consists of mainly plant seeds processed and examined for targeted nematode species not wanted by importing countries. Most nursery samples of plants for sale by the grower comprised garlic (94 seed bulb samples), strawberries (905 foliage and root samples), grape and stone fruits (660 root and soil samples) collected through the State's Registration and Certification, and Nematode Control programs.

Table 1. Total number of samples per program received by the Nematology Laboratory in 2007

Nematode Detection Program	No. of samples
Quarantine (*total*)	**2,952**
Incoming External Quarantine	2,267
Border Station Interceptions	98
Export Phytosanitary Certification	587
Nursery *(total)*	**1,673**
Registration and Certification	1,013
Nematode Control	660
Commercial	**1,091**
(Includes CAPS and PCN surveys)	
Dooryard/Residential	**13**
Total	**5,729**

California Statewide Nematode Survey Project

Prepared by J. Chitambar, K. Dong, S. Subbotin & R. Luna

This survey commenced in spring 2005 and continued through 2007. The project was funded by the National Cooperative Agricultural Pest Survey (CAPS) of the United States Department of Agriculture Animal and Plant Health Inspection Service (USDA-APHIS), and commonly known as the CAPS survey. The operational responsibilities of the project (sample collection) were conducted by the Pest Detection and Eradication Program Branch (PDEP), while survey planning, sample processing and nematode diagnostics were conducted by the Nematology Laboratory, PPDB, of the California Department of Food and Agriculture (CDFA). Following are the 22 target species:

White tip of rice nematode, *Aphelenchoides besseyi*
Wheat seed gall nematode, *Anguina tritici*
Rice stem nematode, *Ditylenchus angustus*
Potato rot nematode, *Ditylenchus destructor*
Onion stem/bulb nematode, *Ditylenchus dipsaci*
Potato cyst nematode, *Globodera pallida*
Golden nematode, *Globodera rostochiensis*
Cereal cyst nematode, *Heterodera avenae*
Soybean cyst nematode, *Heterodera glycines*
Mediterranean cereal cyst nematode, *Heterodera latipons*
British root-knot nematode *Meloidogyne artiellia*
Columbia root-knot nematode, *Meloidogyne chitwoodi*
False Columbia root-knot nematode, *Meloidogyne fallax*
Northern root-knot nematode, *Meloidogyne hapla*
Javanese root-knot nematode, *Meloidogyne javanica*
Pecan root-knot nematode, *Meloidogyne partityla*
False root-knot nematode, *Nacobbus aberrans*
Burrowing nematode, *Radopholus similis*
Reniform nematode, *Rotylenchulus reniformis*
Dagger nematodes, *Xiphinema* spp. (*bakeri, coxi, diversicaudatum*)

In 2007, 210 soil, root and foliage samples were processed by the Laboratory for the detection of 22 exotic and economically important target plant parasitic species. Combined with samples data of 2006, total number of samples for the entire survey was 2,776. Each sample included at least 4 different nematode extraction procedures or tests thereby, resulting in a total of 840 tests in 2007 and a grand total of 11,104 tests for the entire survey. Nematode identifications were accomplished using morphological and molecular procedures. In 2007, only two of the 22 target species were detected, namely, *Meloidogyne chitwoodi* and *M. javanica*. For the entire survey 2005-2007, only 6 of the 22 target species were found, namely, *Aphelenchoides besseyi, Ditylenchus dipsaci, Meloidogyne chitwoodi, M. hapla, M. javanica* and *Paratrichodorus* spp. All six species are already known to exist in California. *Aphelenchoides besseyi* was detected in surveys of paddy rice conducted in 1997-2005. Approximately, ninety plant parasitic nematode species (including six test species) were detected during the entire survey. A detailed report of the survey will be published in due course in a refereed journal.

Potato Cyst Nematode (PCN) Survey Project

Prepared by J. Chitambar, K. Dong, S. Subbotin & R. Luna

This survey commenced in fall 2006 and the bulk of it was completed in 2007. However, some acreage still remains to be surveyed in a few counties. This acreage will be accessible to sampling in late spring – early summer 2008. The survey was in response to a request by the national potato industry to USDA for a nationwide survey per state following the detection of the potato cyst nematode, *Globodera pallida*, in 2006, in a potato field in Idaho. The Idaho find marked the first occurrence of the high-risk nematode species in the United States and USDA holds a federal quarantine against the pest. The project is funded by USDA-APHIS, and is commonly known as the PCN survey. The national survey plan allows for the completion of surveys by spring 2008, if necessary. Sample collection was conducted by PDEP, while sample processing and nematode diagnostics were conducted by the Nematology Laboratory.

Survey of California's potato fields was based on 2006 acreage to seed and commercial production potatoes. In 2006, 39,618 acres in 642 fields were cultivated to production potatoes while seed potatoes were grown on 661 acres in 24 fields. Fig.1 shows 2006 potato acreage within eleven California counties, namely, Imperial, Kern, Los Angeles, Madera, Modoc, Monterey, Riverside, San Benito, San Joaquin, Santa Barbara and Siskiyou. Counties under seed potato cultivation included, Kern, San Joaquin and Santa Barbara.

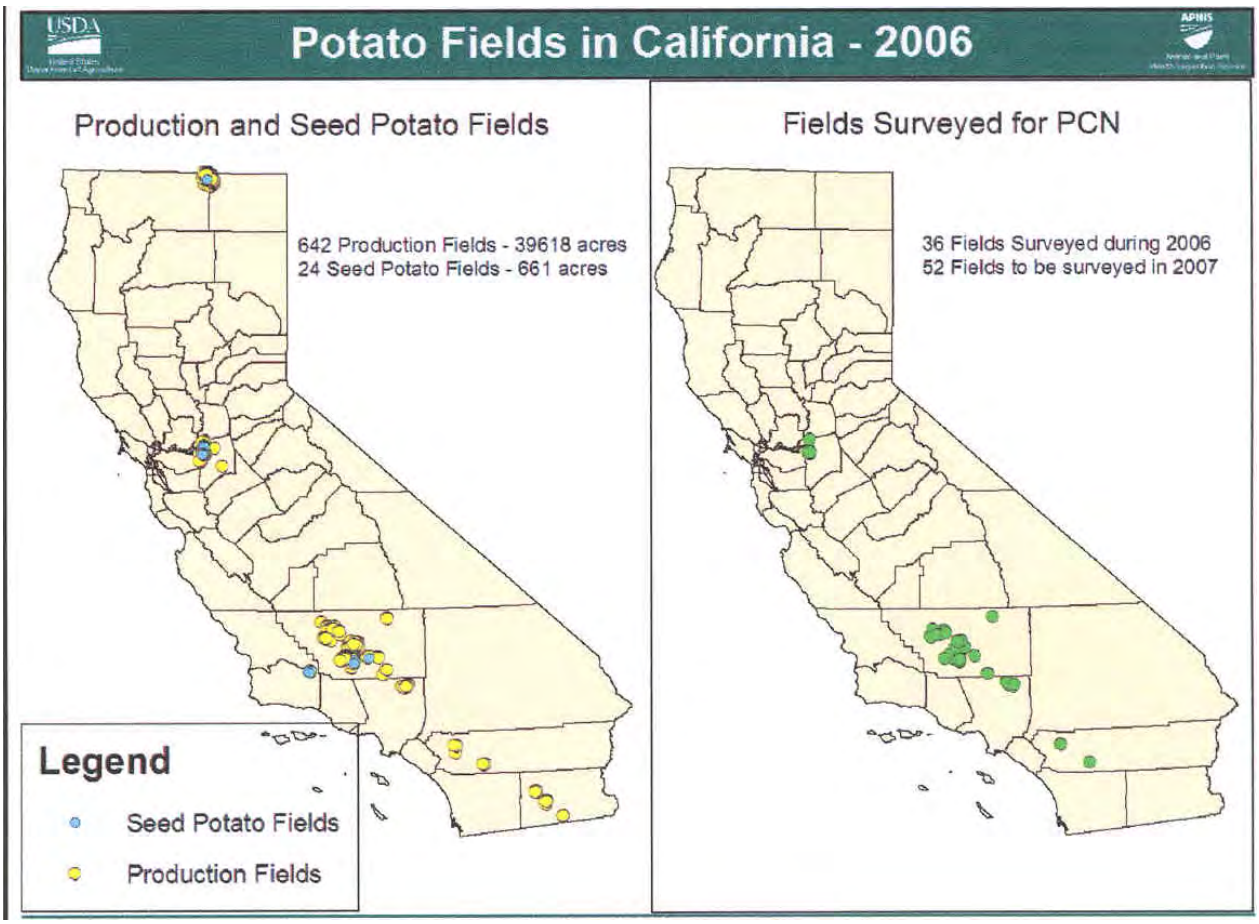


Figure 1. Potato acreage in California.

In addition, 493 acres cultivated to organic potato production were also sampled. This acreage covered 31 fields in Kern, Madera, San Benito, Santa Barbara, Sonoma, Monterey and Yolo counties (Table 2).

According to the sampling protocol established by USDA, ten percent perimeter acreage of each field was sampled for seed and production potato. Only ten percent of all production fields per county were sampled whereas, all seed fields or 100 percent were sampled per county. A survey of all seed potato fields was deemed necessary as seed potato is a pathway of highest risk for short and long distance spread of the potato cyst nematode. Three samples were collected per acre and each sample comprised five pounds of soil.

In 2007, 881 samples were processed and diagnosed. Along with 674 samples in 2006, a total of 1,555 samples have been processed and diagnosed in California's potato cyst nematode survey (Table 2). Samples were processed for the extraction of nematode cysts using a combination of the gravity sieving and sugar centrifugation techniques.

No potato cyst nematodes or cyst nematodes of any other species group were found in California's potato acreage.

Table 2. Number of samples collected per county in 2006-2007 for the detection of potato cyst nematode All samples were negative for potato cyst nematode.

County	**Numbers of potato field soil samples**			
	Seed Potato	**Production Potato**		**Total**
		Non-organic	**Organic**	
Imperial	0	52	0	52
Kern	42	569	9	620
Los Angeles	0	25	0	25
Madera	0	6	2	8
Marin	0	0	6	6
Modoc	32	257	0	289
Monterey	0	5	1	6
Riverside	0	47	0	47
San Benito	0	1	6	7
San Joaquin	41	45	0	86
Santa Barbara	36	0	3	39
Siskiyou	43	300	0	343
Sonoma	0	0	12	12
Yolo	0	0	15	15
Total	**194**	**1307**	**54**	**1555**

Status of ten quarantine "A" nematode pests in California

Prepared by J. Chitambar

The Nematode Pest Rating system was established in the 1950s by the State Department of Food and Agriculture (then known as the State Department of Agriculture, Bureau of Entomology and Bureau of Plant Pathology) in response to an increase of nematode related agricultural problems made known by the Department of Agriculture and the University of California. It was also at this time that both agencies produced the first distribution records of plant parasitic nematodes in California. As a result, the pest rating system was developed primarily as a guideline for evaluating the statewide importance of particular pest species, including nematodes, so that subsequent action could be administered. Hence, it was called the "Action Oriented Rating System" and represented the State Department's view and policy on the importance of a pest to California agriculture and public health, and necessary actions required to deal with a potential pest-related problem. The rating for nematodes was first revised in the mid 1960s, and since then periodically revised according to set protocol by the Division of Plant Health and Pest Prevention Services' Pest Study Team.

According to the current nematode pest rating list, there are fourteen nematode species with an "A" rating. The history of detection, current status and biological feasibility for establishment in California of ten "A" pests are discussed in this article. By definition an "A" rating is "assigned to an organism of known economic importance subject to state (or commissioner when acting as a state agent) enforced action involving: eradication, quarantine regulation, containment, rejection, or other holding action."

Aphelenchoides besseyi Christie

White tip of rice nematode

Detection history: In California, *A. besseyi*, was first detected in 1959 in a quarantine strawberry sample that originated in Canby, Oregon and sent to a nursery in Modesto, Stanislaus County. State action would have resulted in the rejection and/or destruction of the shipment. However, the detection that documented the possible presence of *A. besseyi* in California was in 1963 when the species was found in a *Sclerotium oryzae* fungal culture (Chitambar, 1999). The fungus had been collected from a rice field in Butte County. The rice field was used by a research facility that exchanged seed with regions in southeastern United States where *A. besseyi* was parasitizing rice.

The development of trade agreements with Turkey's Ministry of Agriculture for the export of paddy rice led to more determined attempts to confirm the assumed absence of the White-tip of rice nematode in California's paddy rice. However, after intensive survey of rice seed in county driers representing13 rice producing counties in 1997, one confirmed and three suspected detections of *A. besseyi* were made in 4 samples from Butte and Sutter counties. Since then, and after the establishment of specific sampling protocol agreed upon by Turkey's Ministry of Agriculture, United States Department of Agriculture –APHIS and California Department of Food and Agriculture, the White-tip of rice nematode was detected in paddy rice seed shipments in 1999, 2001, 2002, 2005 and 2008 in Sutter and Yolo County.

Current Status: Aphelenchoides besseyi remains very limited in its distribution and occurrence within rice fields of Butte, Sutter and Yolo Counties. Export shipments of paddy rice are handled on a per shipment basis and disqualify for phytosanitary certification if found contaminated with the White-tip of rice nematode.

White leaf tips of paddy rice cause by *Aphelenchoides besseyi* (photo by E. McGawley)

Biological feasibility for establishment: It is not known how long the nematode species has been present in California. If it was introduced historically, then its low rate of detection in cultivated rice clearly indicates its inability to become established to damaging levels in cultivated fields over time. The nematode survives in unhulled rice grains for months to up to 8 years. Certain biological and ecological factors working against the nematode's ability for increase would include, 1) Insufficient moisture: a continuous supply of moisture with at least 70% atmospheric humidity is necessary for nematode development. While California rice is grown under low relative humidity from April to October, the relative humidity within dense crop growth may reach required levels to spurt sporadic nematode increases, as detected; 2) Flooding: California rice is planted, by airplane, directly into flooded fields. Paddy fields flooded before sowing rice are less susceptible to *A. besseyi* than those flooded at sprouting or later; 3) Resistant varieties may be present; 4) High temperature: in USA, activity of the species was greatest at 25-28 C, inactivity at 35-37 C and 47.5 C was the thermal death point.

***Belonolaimus longicaudatus* Rau**
Sting nematode

Detection history: The CDFA Nematology Laboratory detected the sting nematode in incoming quarantine shipments of Bermuda grass from Georgia in 1962, roses from Texas and coconut palm from Mexico in 1967, and plant-associated soil from Florida in 1983 and 1987. *Belonolaimus longicaudatus* was detected for the first time in California soil in 1992 on Bermuda turfgrass at a golf course near Rancho Mirage, Riverside County. Consequently, intensive and delimiting surveys in the Coachella Valley were conducted by CDFA and the Riverside County Department of

Agriculture and by late 1993, the Sting nematode was detected on Bermuda and rye turfgrass in eight golf courses: four in Rancho Mirage, two in Palm Desert, and one each in Palm Springs and Bermuda Dunes. Following its detection, quarantine restrictions were imposed by State and County in order to contain or suppress the nematode within the Coachella Valley. Eradication was not deemed a practical alternative, due to high cost of operations, extensive sampling required and nature of dissemination of the nematode. Restrictions were placed on movement and disposal of mowed grass clippings from sting nematode-infested properties to non-infested properties or agricultural lands. Composting with sewer sludge was chosen as control of potentially infested grass clippings or thatch. Compliance agreements were established with golf course superintendents accordingly.

Current Status: Restrictions continue to keep the sting nematode under suppression in the Coachella Valley. To date, the nematode species is limited to 8 golf courses around Rancho Mirage. No further surveys for the nematode within the restricted region have been conducted since 1993.

Figures. Left – Turfgrass damage caused by *Belonolaimus longicaudatus* (W. Crow).
Right – Turfgrass roots on left damaged by *Belonolaimus longicaudatus* (photo by B. Dunn)

Biological feasibility for establishment: The detection of the nematode species in Riverside County marked its feasibility for establishment within California. Although a major parasite of grasses, the sting nematode is capable of parasitizing a wide range of plants that include grapes, citrus, cantaloupes, lettuce, tomatoes, beans, onions, corn, wheat, barley, oats, forage crops, cotton, ornamentals and weeds. The nematode has not been found in grapes, citrus and other agricultural plants grown in the Coachella Valley. The distribution of the nematode is restricted to sandy soils (>80% sand). Heavier, fine textured soils may actually inhibit nematode movement and increase. Soil temperature is another limiting factor in the reproduction and distribution of the nematode. In Florida, reproduction was greater at 29.4 C than at 26.7 C and greatly reduced at 35 C (Perry, 1964). In their study on population dynamics of the sting nematode monitored at monthly intervals at three golf courses in Rancho Mirage, Coachella Valley, Bekal and Ole Becker (2000) demonstrated that soil temperature and fluctuation of nematode densities were significantly correlated. Significant increases in nematode populations did not occur until the soil temperature reached 20 C or late spring, and distribution was greatest in the top 15 cm of soil except during the hottest summer months, when the population was higher at depths of 15-30 cm.

Dolichodorus heterocephalus Cobb
Cobb's awl nematode

Detection history: Cobb's awl nematode was first detected in quarantine shipments of aquatic plants from Ohio in 1966. Since then the nematode was detected in soils associated with ornamental plants from Florida: Australian umbrella tree (*Brassaia actinophyla*) in 1985, 1987, 1993, 2000, 2006, and palm (*Chamedorea elegans*) in 1985.

Current Status: Dolichodorus heterocephalus has not been detected in California soil and is most likely not established within the State.

Damage to celery (left) caused by *Dolichodorus heterocephalus* (photo by S. Ayoub)

Biological feasibility for establishment: The nematode species is naturally found in water or wet soil around edges of lakes, streams and ponds. Water hazards in golf courses and flooded soils are good habitats for the nematode, however, it has also been found in areas remote from bodies of freshwater. A range of plant hosts include annual and perennial ornamentals, grasses, bulrush, blueberry, cranberry, citrus, cabbage, celery, corn, cotton, potato, bell pepper, bean and tomato. The nematode is capable of causing as much damage to plants as the sting nematode, however, unlike the latter, distribution of *D. heterocephalus* is generally limited to wet habitats. A number of hosts are present in California that may allow populations of the nematode species to establish and increase in numbers. Plant damage similar to the sting nematode is produced however, information on crop loss due to Cobb's awl nematode is still wanting. Severe root injury and stunting in celery resulted in 50% crop loss (Perry, 1953), while 81% loss in root weight was observed in corn (Paracer *et al.*, 1967).

Globodera pallida (Stone) Behrens & *Globodera rostochiensis* (Wollenweber) Skarbilovich

Potato cyst nematodes: Pale potato cyst nematode & Golden nematode

Detection history: The potato cyst nematode (PCN) comprises two species nether of which have been detected in California soil. Both species are under Federal Quarantine. After the discovery of the Golden nematode in New York State, national surveys have been conducted by the United States Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS) to monitor the pest prior 1982. CDFA and California's agricultural counties have coordinated efforts and sampled select potato producing areas from 1958-81. In 1965, 14 interceptions of *G. rostochiensis* were made at California's ports of entry by USDA-APHIS. Federal action would have resulted in the rejection and/or destruction of the shipment. In 2006, *Globodera pallida* was detected in Idaho thereby, marking the first detection of the species in the United States. The State Department participated in USDA's national survey plan for the detection of potato cyst nematodes in California's potato production acreage. During 2006-2007, a total of 1,531 soil samples examined represented certified seed and production (commercial and organic) potato fields in 14 counties, namely, Fresno, Kern, Los Angeles, Madera, Marin, Modoc, Monterey, Riverside, San Benito, San Joaquin, Siskiyou, Sonoma, Yolo and Yuba. No potato cyst nematodes were found.

Current Status: Potato cyst nematodes continue to be restricted under Federal Quarantine. The recent detection of the Golden nematode in Alberta, Canada has led to the development of USDA-APHIS sponsored "Golden Nematode Trace-forward Survey" of US states that received seed and/or production potatoes from Alberta, possibly traceable from 1998 and forward, or at least, three years back for seed and one year back for commercial production. Details of California fields that were planted to Alberta seed potato, year and number of potato shipments from Alberta, field acreage, number of fields, receiving counties and growers in California, and disposition of shipments are currently being worked out by USDA-Surveillance and Internal Trade Compliance (SITC). Protocol for full-field sampling has been developed with a greater soil collection per acre scheme for seed potato fields than production fields. The objective is to determine whether or not potato cyst nematodes have spread from Alberta, Canada to California soils (and other US states). California Department of Food and Agriculture is expected to commence survey of targeted California potato fields by late spring 2008.

Figures. Left – Potato cultivation damaged by *Globodera rostochiensis* (photo by B. Hammeraas).

Right – Damage to potato on right caused by *Globodera rostochiensis* (photo by U. Zunke)
Biological feasibility for establishment: There is every possibility for the nematode to enter California through checked and non-checked cyst-infested soil accompanying plants or farm equipment and through infested seed potato. This possibility exists as populations of PCN below 200,000 cysts per acre cannot be detected reliably. This low population level allows for the slow build up in numbers while remaining undetected, as evidenced in New York where the golden nematode was detected 15 years after its introduction. Furthermore, the nematodes are able to spread from an infested area to a non infested area at a population level of 10,000 cysts per acre.

Once entered, the possibility for PCN to establish and increase in California soils is dependent mainly on presence and cultivation of a host plant for 20 to 30 years, and suitable soil temperatures. Primary hosts for the nematodes include potato, tomato and eggplant all of which are grown in California. In addition there are several solanaceous weed hosts of which some such as, Jimson weed, hairy nightshade, black nightshade, and heartleaf horsenettle are present in California. Some of these have grown resistant to herbicides and act as reservoirs of PCN. The pale potato cyst nematode is a cool temperature pest and is better adapted to temperatures below 20 C than the golden nematode at 25 C. At 20 C both species are equally active neither species can last at 30 C for lengthy periods. In general, PCN will survive in environments where potatoes can grow. Cooler areas in California are expected to favor PCN.

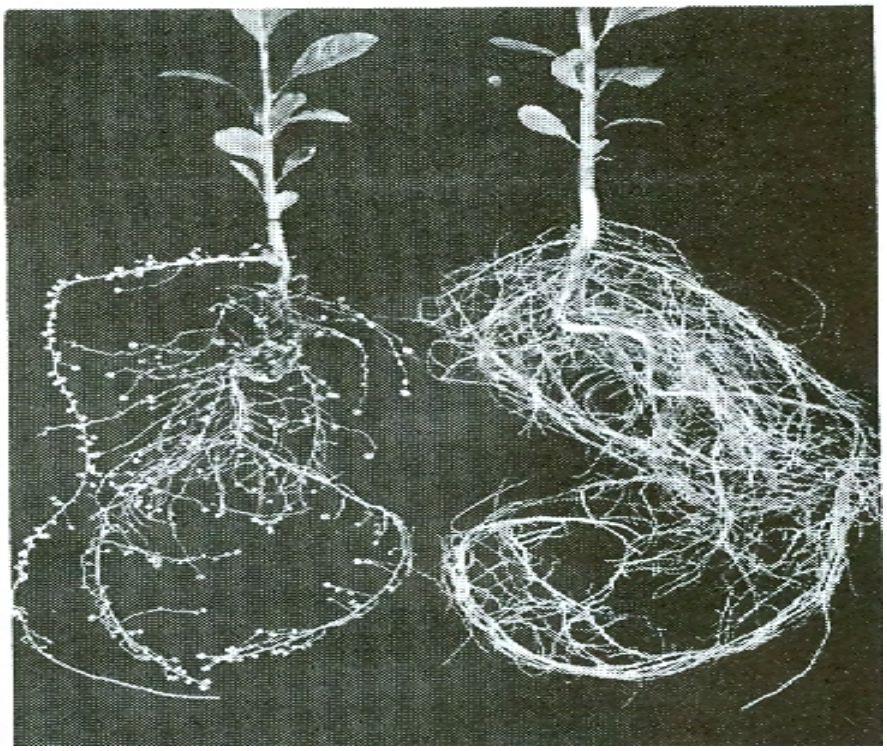
***Hemicycliophora arenaria* Raski**
Sheath nematode

Detection history: The nematode was first found and reported in 1957, parasitizing rough lemon roots in a grower's nursery in the Coachella Valley, near Mecca (McElroy and Van Gundy, 1967). Soon after, the nematode was found about two miles from the original finding and also in citrus soil in Imperial County. All the properties apparently were planted with citrus trees from a commercial nursery located near Niland. This nursery had been planted on virgin desert soil and subsequently failed due to lack of moisture and was eventually abandoned. Surveys were conducted by the State at that time to determine the extent of spread of the nematode. In October 1965, the nematode was found in a number of soil samples taken from Cheese bush (*Hymenoclea* sp.) growing in a virgin desert area about one mile north of the original abandoned nursery. At about the same time, the nematode was also found on Cheese bush near Palm Springs, about 30 miles northwest from the infestation in Mecca. According to CDFA-Nematology records, the species has a recorded limited distribution within California and has been detected in the 1960s – 1970s in Imperial, Riverside and San Diego Counties. In Riverside it was detected in citrus, lemon, orange, tomato and weed plant soils in Niland, Brock Ranch and Holtville. In Riverside it was detected in grapefruit and citrus soils in Mecca, and in San Diego it was found in Cheese bush soil near the Borrego State Park campground. During recent Cooperative Agricultural Pest Surveys in 2006, the nematode was detected once again in lemon and grapefruit soils in Imperial County.

Hemicycliophora arenaria was rated by CDFA an "A" pest and placed under "hold-order" quarantine. Under this action, the nematode was contained within the restricted areas. The movement of all soil, bare-rooted plants and equipment with soil was restricted. Furthermore, *H. arenaria* has only been found in California, and thus far only within the contained areas. At that time, the discovery of the pest was of great concern to other states in trade agreement with

California, especially Florida. Quarantine action was necessary and justified based on the extreme limited distribution, economic crop damage potential, and California trade agreements.

Current Status: To date, *H. arenaria* remains confined to the restricted regions within California and has not been reported from anywhere else in the world.



Root galls on Rough lemon seedling (left) caused by *Hemicycliophora arenaria*
(photo from McElroy & Van Gundy, 1967)

Biological feasibility for spread: H. arenaria is indigenous to California and is a serious potential pathogen of many citrus varieties. Cheese bush and coyote melon are indigenous host plants commonly found in the sandy washes and stream beds in the Coachella and Imperial Valleys and may provide reservoirs of nematodes for infesting future plantings on virgin soil. Greenhouse trials have shown that tomato, pepper, blackeye bean, celery, squash and Tokay grapes are good hosts for the nematode species. Sandy soils favor the nematode. Reproduction is optimum in 90% sand, 5% silt and 5% clay at 30-32 C. Therefore, the potential for spread and establishment is great in hot and sandy environments of California. Regulatory restrictive action is necessary to prevent the interstate and intrastate spread of the nematode.

***Heterodera glycines* Ichinohe**
Soybean cyst nematode

Detection History: The soybean cyst nematode (SCN) has not been detected in California either in imported quarantine plant shipments or in the state's agricultural production sites. The reason for this may be contributed at least, in part, to a history of national and state quarantines imposed against the nematode. It appears that SCN came from Japan where it was first reported more than 75

years ago. The nematode was first detected in North Carolina in 1954 and thereafter, in 25 more states in southeastern and central United States (Riggs, *et al*., 1988). During November 8, 1966 to September 30, 1972, USDA maintained and enforced Federal Domestic Quarantine 79 against SCN. Under this federal quarantine, California was protected from the entrance of SCN into the State. When the federal quarantine was rescinded, there was no known commercial acreage cultivated to soybean in California and subsequently, CDFA decided that quarantine would not be needed. However, in 1972, 1978 and 1979 soybean was cultivated on 5, 22,000 and 10,000 acres respectively, while cultivation was expected to continue and increase in future years. In 1980 CDFA took protective action and prepared the Soybean Cyst Nematode Exterior Quarantine. Under this quarantine all states and districts of the United States were under quarantine for SCN and restriction was placed on entry into California of hosts and possible carriers of the pest from areas under quarantine. Since the quarantine was adopted, commercial soybean production was discontinued in California, and in 1992 there was no reported acreage or value associated with commercial production of soybean. Based on this fact and the misinformation that soybean is the only host of SCN, CDFA found it inappropriate to restrict entrance of plant hosts and carriers of the nematode into California and in 1994, repealed the Soybean Cyst Nematode Exterior Quarantine, while maintaining its "A" rating.

Current Status: The nematode continues its rank as a quarantine pest that is not known to occur in California.

Figures. Left – Soybean cultivation damage caused by *Heterodera glycines* (phot by J. Eisenback)
Right – *Heterodera glycines* on soybean roots (photo, Michigan State University)

Biological feasibility for establishment: The lack of soybean production in California definitely decreases the potential incidence of the pest, however, SCN has a broad host range, especially among legumes including beans (green, snap, dry, red, lima, mung, bush and Adzuki), garden peas and cowpeas, and also attacks many non-legumes, including ornamentals and weeds. Some of these "other hosts" especially snap, dry, red and lima beans, are economically important crops cultivated in the State and may present possible reservoirs for establishment and increase of SCN. At the same time, biological races of SCN exist that vary in their parasitic ability of different hosts. The nematode is able to develop within a range of 10-34 C. Climatic conditions favorable for the growth of host plants in California would also be conducive for SCN development.

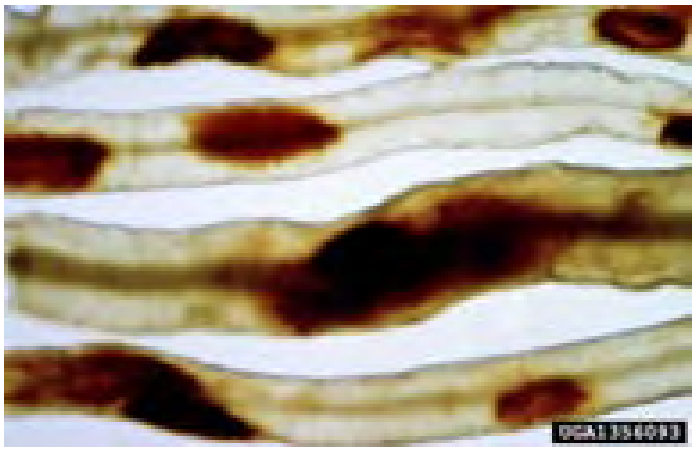
Radopholus similis (Cobb) Thorne
Burrowing nematode

Detection History: In 1953 the burrowing nematode was recognized as the cause for spreading decline in Florida, thereby, giving CDFA sufficient cause to protect California against this devastating pest. The next year *R. similis* was found in banana in a Los Angeles nursery. In the years to follow, a series of actions occurred within California, the highlights of which are chronicled below:

- In 1954-56, a state-county survey revealed several ornamental host plants in nurseries to be infested with *Radopholus similis*. Eradicative measures were pursued.
- In 1956, the Burrowing Nematode Exterior Quarantine was established by CDFA to restrict the entrance of the pest from infested areas.
- In 1956, a nationwide survey of citrus-producing areas was organized by USDA. In California, surveys were conducted through the cooperative efforts of federal, state and county agricultural commissioners. Citrus and avocado orchards, as well as, citrus, avocado and ornamental nursery stock comprising 630 properties from 14 counties were surveyed over 2 months. No *R. similis* was found in this survey.
- From 1956 to 1963 no organized surveys were conducted for detecting *R. similis*. Some counties conducted their own sampling schemes during this time. Random sampling of indoor decorative plants was encouraged by the State.
- In February 1963, an established burrowing nematode infestation of 3,000 *Anthurium* spp. plants was discovered in San Mateo County during a routine nursery inspection. Based on this occurrence, CDFA initiated a state-wide survey of *Anthurium* spp. Also, CDFA in conjunction with federal and county officials developed a survey for the detection of the burrowing nematode in California. The survey lasted till 1964, and comprised three main inspections.
    - Inspection of all *Anthurium* spp. plants grown by cut-flower growers, nurseries and hobbyists. Samples were collected at 100 locations in 18 counties. 15,000 plants were included from 67 nurseries, 7 commercial florists and 26 hobbyists. *Radopholus similis* was found in 7 locations in 4 counties: San Mateo, Contra Costa, Santa Barbara and Orange counties.
    - Inspection of citrus and avocado orchards and nursery stock, as well as, residential/dooryard plants of subtropical host plants adjacent to orchards. More than 4,300 individual properties comprising 150,000 acres of orchards were surveyed. No *R. similis* was found in the 6,842 samples, and it was firmly believed that the nematode was not established in California orchards. No *R. similis* was found in the 178 citrus nurseries and 27 avocado nurseries surveyed.
    - Inspection of nurseries engaged in wholesale production of indoor decorative plants. 214 nurseries in 19 counties were surveyed. Burrowing nematode was detected in 29 locations in ten counties. The most extensive infestations were in Los Angeles, Orange, San Mateo and San Diego counties.
- The survey resulted in no indication "that *Radopholus similis* is an established resident of the natural environment of the State."

- Also in 1964, CDFA created the Burrowing Nematode Detection Program for California nurseries. The program was terminated in 1994 as the pest risk potential did not justify the economic costs and workload.
- On October 26-28, 1971, a survey of 65 lemon orchards in Ventura County failed to yield the Burrowing Nematode.
- In 2005-2007 CDFA, in collaboration with USDA-APHIS/CAPS conducted a statewide survey for several target nematode pests including *R. similis*. Burrowing nematode was not detected.
- From 1982 to February 2008, 157 burrowing nematode detections were made in external quarantine plant shipments. These interceptions led to eradicative measures.
- A noteworthy early detection of an established *R. similis* population occurred in 1996, in a residential property in Huntington Beach, southern California, in actively growing banana corms that had been imported from Louisiana. The nematode was eradicated from the area through the administration of excavation of soil, effective chemical, cultural and sanitary treatments. Thereafter, periodic sampling of the treated area failed to yield the nematode.

Current Status: Radopholus similis is not present in California and continues its rank as an important quarantine pest.



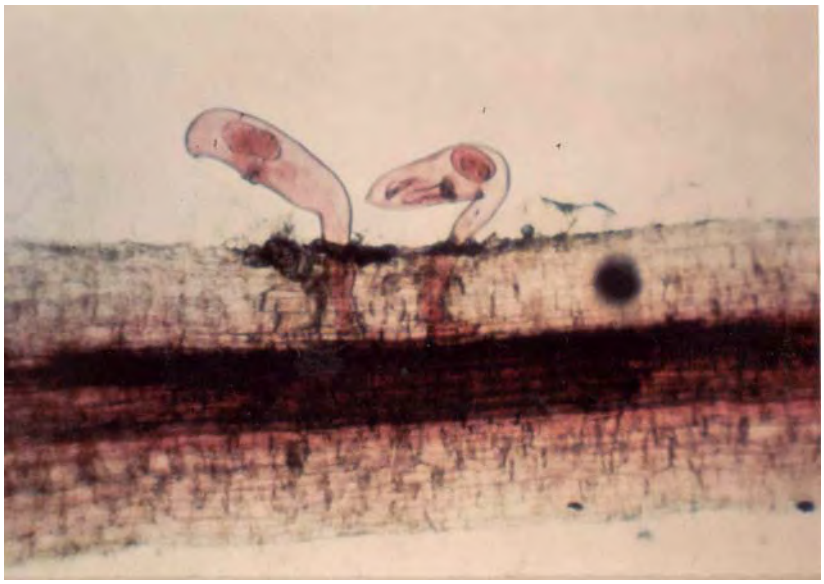
Figures. Left – Banana Plant damage caused by *Radopholus similis* (photo, Nemapix).
Right – Symptom on roots infested with *Radopholus similis* (photo by A. Mani)

Biological feasibility for establishment: California provides favorable climate and hosts for the establishment and increase of the burrowing nematode. There are over 350 host plants of which citrus, strawberry, carrots and ornamentals are examples of major hosts cultivated in California. The nematode prefers coarse, sandy soils which are present in the Coachella Valley, the Bard Valley near Blythe, the Edison-Arvin citrus district of Kern County, and in streaks throughout the state. Citrus and date palm, good hosts of the nematode, in the Coachella Valley are planted in soils subject to temperatures favorable to the development of the nematode. Host crops along the coastal areas, when planted in sandy soil, experience soil temperatures that can favor the development of the nematode if even for a few months (Ferris, *et al*, 2003).

Rotylenchulus reniformis Linford & Oliveira
Reniform nematode

Detection History: In 1960, an established population of reniform nematode infested pygmy date palms and bread palms was detected in a residential property in San Diego. The plants had entered the state in a quarantine shipment and were planted prior to the confirmed diagnosis of the nematode pest. Subsequently, the plants were removed, destroyed and the infested site was treated with methyl bromide. In 1967, another established infestation was detected on *Yucca gloriosa* grown in 13 residential properties in San Bernardino County. The areas were treated with Nemagon®, however, in 1971 the nematode was detected again in the same properties. Despite continued treatments the nematode reappeared in 1973 and 1974. After intensive herbicide and fumigation trials the infested areas were declared eradicated on December 31, 1978. The nematode reappeared in 1980. No further treatment was pursued of the residential properties. The status of the nematode in those sites is not known nor has the nematode been detected in any agricultural production sites in San Bernardino or elsewhere in California. From 1982 to February 2008, eighty-eight detections of the reniform nematode have been made in imported quarantine plant shipments.

Current Status: Rotylenchulus reniformis is not present in California's agricultural crop production sites and continues its rank as an important quarantine pest. *[The Exterior Quarantine Burrowing Nematode Program was amended in 1997 to include the reniform nematode.]*



Adult female *Rotylenchulus reniformis* feeding on plant root

Biological feasibility for establishment: Similar to the burrowing nematode, California provides favorable climate and hosts for the establishment and increase of the reniform nematode. Reniform nematode populations were readily established in San Diego and San Bernardino before eradication. With a host range of over 140 plant species, the nematode poses serious threat especially to California's cotton and tomato production as well as the ornamental industry. Unlike the burrowing nematode, reproduction and development of the nematode is favored by fine-textured soils (Robinson et al., 1987). Temperatures that favor the development of the host plants also favor nematode development.

Xiphinema diversicaudatum (Micoletzky) Thorne
European dagger nematode

Detection History: X. diversicaudatum was found in two residential properties in San Diego County in 1970, during CDFA's Urban Detection Survey Program. The nematode was also found in a rose cut-flower greenhouse in Alameda County in 1975 (Siddiqui *et al.*, 1973). At that time, all three sites were treated with a soil sterilant and the nematode populations were believed to be suppressed below detectable level. The greenhouse site has since been replaced by residential property. In San Diego, despite soil treatment of the residential properties, the nematode continued to reappear in low numbers until 1983. Following intensive soil treatment, the site was declared eradicated of the nematode. However, in 1994, high populations of the nematode were again detected (Chitambar, 1997). The property is not close to any commercial agricultural production, nor has the nematode been detected elsewhere within the state.

Current Status: Xiphinema diveriscaudatum is not present in California's commercial agricultural production sites and continues its rank as a quarantine pest.

Rose plants parasitized by *Xiphinema diversicaudatum* (photo by J. Chitambar)

Biological feasibility for establishment: Although *X. diversicaudatum* is considered endemic to northern Europe (Boag, *et al*., 1983), it has become established in other parts of the world, e.g. Australia (Stubbs, 1971), Canada (Townshend, 1961) and New Zealand (Dale, 1971). In 1997, Boag *et al*. used a computer program to fit a model to the known European distribution of the European Dagger nematode and to predict its potential establishment globally. Temperature and precipitation were the main climate factors used in the prediction model. Their results indicated that the nematode could become established in North America, Australia, New Zealand and parts of Asia. The persistent resurgence of the species in a residential garden in San Diego, California despite treatment is evidence of the nematode's aggressive capability to establish itself in that region. The nematode

species parasitizes a range of agricultural crops and weeds. Those important to California include rose, grape, strawberry, raspberry, stone fruit, asparagus, celery, cucumber and cabbage. The nematode may take up to three years to complete a generation, from egg to egg. In the absence of its host, the nematode can survive in soil without multiplying for at least three years (Pitcher *et al.*, 1974). In a laboratory study, Brown and Coiro (1985) reported that the longevity and reproduction capacity of *X. diversicaudatum* was similar to the American Dagger Nematode, *X. index*, also present with limited distribution in California. The European Dagger Nematode is reported to occur in sandy textured soil with high silt content (Jiménez Guirado, *et al.*, 1995), as well as loam soil (Lišková et al., 1993). The San Diego site comprised a sandy loam soil. Given the opportunity to enter California's agricultural site, it is possible for the nematode to establish and increase in numbers causing detriment to crop production.
Xiphinema diversicaudatum is a NEPO virus vector.

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Detections of Interest and Significance

Prepared by J. Chitambar, K. Dong, S. Subbotin & R. Luna

The Reniform nematode, *Rotylenchulus reniformis* (Figure 1) was the only "A" rated quarantine species detected in imported shipments of *Schfflera* sp. to San Diego County through the External Quarantine Burrowing and Reniform Nematodes program.

Figure 1. *Rotylenchulus reniformis*, Reniform Nematode

Two "B" rated nematode species, namely, the Columbia root-knot nematode, *Meloidogyne chitwoodi* and the California Dagger nematode, *Xiphinema index* were detected in the CAPS survey. The former species was detected on commercially grown wheat in fields that had previously been cultivated to potato and oats in Modoc County, while the latter species was detected on commercially grown grape in Tulare County. Both species are limited in their distribution within California and are potential economic threats to grape and potato industries.

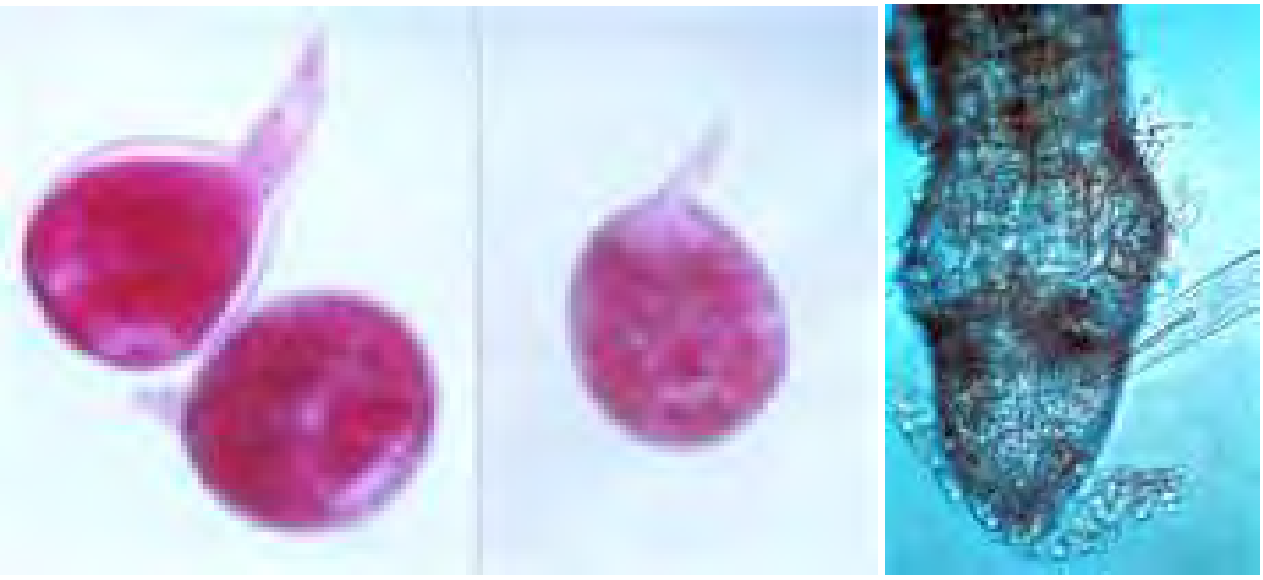

Figure 2. Left & Middle – *Meloidogyne chitwoodi*, Columbia Rootknot Nematode.
Right – *Xiphinema index*, California Dagger Nematode, feeding on grape root.

Two "C" rated nematode pests (Figure 3) were detected in 2007. *Longidorus africanus* was detected in Imperial County during the 2007 CAPS survey. This nematode species, although found associated with oat roots, is known to cause damage to lettuce in southern California. The Citrus nematode, *Tylenchulus semipenetrans* was detected in citrus orchards in Ventura, Orange and Santa Barbara Counties.

Figure 3. Left – *Longidorus africanus*, anterior (head) and posterior body ends.
Right – *Tylenchulus semipenetrans*, Citrus Nematode

DETECTION / INTERCEPTION TABLES

ENTOMOLOGY

A, B & Q RATED DETECTIONS

Order	Family	Scientific Name		County	Total
Acari	Eriophyidae	unidentifiable	Q	Trinity	1
Coleoptera	Bostrichidae	*Micrapate* sp.	Q	San Diego	1
Coleoptera	Cerambycidae	*Chlorophorus diadema*	Q	San Joaquin	1
Coleoptera	Cerambycidae	unidentifiable	Q	Sacramento	1
Coleoptera	Cerambycidae	*Phoracantha* sp.	B	Sonoma	1
Coleoptera	Chrysomelidae	*Trachymela sloanei*	B	Kern	1
Coleoptera	Chrysomelidae	*Trachymela sloanei*	B	Sacramento	1
Coleoptera	Chrysomelidae	*Trachymela sloanei*	B	Santa Cruz	1
Coleoptera	Chrysomelidae	*Trachymela sloanei*	B	Sonoma	1
Coleoptera	Chrysomelidae	*Trachymela sloanei*	B	Ventura	1
Coleoptera	Curculionidae	*Diaprepes abbreviatus*	A	Los Angeles	292
Coleoptera	Curculionidae	*Diaprepes abbreviatus*	A	Orange	203
Coleoptera	Curculionidae	*Diaprepes abbreviatus*	A	Orange	1
Coleoptera	Curculionidae	*Diaprepes abbreviatus*	A	San Diego	910
Coleoptera	Curculionidae	*Gasterolisus tricostatus*	Q	Santa Cruz	1
Coleoptera	Nitidulidae	*Aethina tumida*	B	Colusa	1
Coleoptera	Nitidulidae	*Aethina tumida*	B	Fresno	1
Coleoptera	Nitidulidae	*Aethina tumida*	B	Orange	1
Coleoptera	Nitidulidae	*Aethina tumida*	B	Sacramento	1
Coleoptera	Nitidulidae	*Aethina tumida*	B	Sutter	1
Coleoptera	Nitidulidae	*Aethina tumida*	B	Tehama	1
Coleoptera	Scarabaeidae	*Gymnetis stellata*	Q	San Mateo	1
Coleoptera	Scarabaeidae	*Popillia japonica*	A	Lake	1
Coleoptera	Scarabaeidae	*Popillia japonica*	A	Los Angeles	3
Coleoptera	Scarabaeidae	*Popillia japonica*	A	Orange	5
Coleoptera	Scarabaeidae	*Popillia japonica*	A	Riverside	1
Coleoptera	Scarabaeidae	*Popillia japonica*	A	San Bernadino	5
Coleoptera	Scarabaeidae	*Popillia japonica*	A	San Diego	2
Diptera	Agromyzidae	unidentifiable	Q	San Luis Obispo	1
Diptera	Tephritidae	*Anastrepha ludens*	A	Los Angeles	1
Diptera	Tephritidae	*Anastrepha ludens*	A	San Diego	2
Diptera	Tephritidae	*Bactrocera correcta*	A	Los Angeles	3
Diptera	Tephritidae	*Bactrocera dorsalis*-complex	A	Los Angeles	16
Diptera	Tephritidae	*Bactrocera dorsalis*-complex	A	Orange	1
Diptera	Tephritidae	*Bactrocera dorsalis*-complex	A	Sacramento	2
Diptera	Tephritidae	*Bactrocera dorsalis*-complex	A	San Bernadino	1
Diptera	Tephritidae	*Bactrocera dorsalis*-complex	A	San Diego	2
Diptera	Tephritidae	*Bactrocera dorsalis*-complex	A	San Mateo	1

Order	Family	Scientific Name		County	Total
Diptera	Tephritidae	*Bactrocera dorsalis*-complex	A	Santa Clara	4
Diptera	Tephritidae	*Bactrocera oleae*	A	Alameda	2
Diptera	Tephritidae	*Bactrocera oleae*	A	Marin	1
Diptera	Tephritidae	*Bactrocera oleae*	A	Riverside	2
Diptera	Tephritidae	*Bactrocera oleae*	A	San Benito	2
Diptera	Tephritidae	*Bactrocera oleae*	A	San Joaquin	1
Diptera	Tephritidae	*Bactrocera oleae*	A	San Luis Obispo	1
Diptera	Tephritidae	*Bactrocera oleae*	A	Santa Clara	3
Diptera	Tephritidae	*Bactrocera oleae*	A	Sonoma	1
Diptera	Tephritidae	*Bactrocera oleae*	A	Stanislaus	2
Diptera	Tephritidae	*Bactrocera oleae*	A	Yolo	1
Diptera	Tephritidae	*Bactrocera zonata*	A	Alameda	1
Diptera	Tephritidae	*Bactrocera zonata*	A	Santa Clara	1
Diptera	Tephritidae	*Ceratitis capitata*	A	Los Angeles	19
Diptera	Tephritidae	*Ceratitis capitata*	A	Santa Clara	5
Diptera	Tephritidae	*Ceratitis capitata*	A	Solano	13
Diptera	Tephritidae	*Rhagoletis pomonella*	B	Contra Costa	1
Diptera	Tephritidae	*Rhagoletis pomonella*	B	Marin	1
Diptera	Tephritidae	*Rhagoletis pomonella*	B	San Joaquin	1
Diptera	Tephritidae	*Rhagoletis pomonella*	B	Santa Clara	1
Diptera	Tipulidae	*Tipula oleracea*	B	Humboldt	1
Diptera	Tipulidae	*Tipula oleracea*	B	Yolo	1
Hemiptera[1]	Cicadellidae	*Allygus mixtus*	Q	Sonoma	1
Hemiptera[1]	Cicadellidae	*Homalodisca coagulata*	B	Sacramento	1
Hemiptera[1]	Cicadellidae	*Homalodisca* sp.	B	Imperial	1
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Fresno	45
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Imperial	1
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Kern	1
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Los Angeles	1
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Riverside	8
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Sacramento	32
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	San Joaquin	12
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	San Luis Obispo	1
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	San Mateo	1
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Santa Barbara	1
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Santa Clara	3
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Santa Cruz	2
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Tulare	4
Hemiptera[2]	Lygaeidae	*Raglius alboacuminatus*	Q	San Joaquin	1
Hemiptera[2]	Pentatomidae	*Scotinophara* sp.	Q	Contra Costa	1
Hemiptera[3]	Aleyrodidae	*Aleuroclava aucubae*	Q	Sacramento	1
Hemiptera[3]	Aleyrodidae	*Aleurotrachelus* sp.	Q	Los Angeles	2
Hemiptera[3]	Aleyrodidae	unidentifiable	Q	Santa Cruz	1
Hemiptera[3]	Aleyrodidae	*Tetraleurodes perseae*	B	Santa Barbara	1

Order	Family	Scientific Name		County	Total
Hemiptera[3]	Aleyrodidae	*Trialeurodes* sp.	Q	Santa Cruz	1
Hemiptera[3]	Aphididae	*Cerataphis* sp.	Q	San Diego	1
Hemiptera[3]	Aphididae	unidentifiable	Q	Alameda	1
Hemiptera[3]	Aphididae	unidentifiable	Q	San Luis Obispo	1
Hemiptera[3]	Aphididae	unidentifiable	Q	Santa Barbara	1
Hemiptera[3]	Aphididae	*Prociphilus* sp.	Q	Los Angeles	1
Hemiptera[3]	Aphididae	*Sipha maydis*	Q	Santa Barbara	3
Hemiptera[3]	Asterolecaniidae	*Bambusaspis miliaris*	Q	Orange	2
Hemiptera[3]	Coccidae	*Ceroplastes sinensis*	B	Santa Barbara	1
Hemiptera[3]	Coccidae	*Coccus viridis*	A	Orange	1
Hemiptera[3]	Coccidae	*Eulecanium kunoense*	B	San Joaquin	1
Hemiptera[3]	Coccidae	unidentifiable	Q	Orange	1
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Contra Costa	1
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Los Angeles	1
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Placer	1
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Riverside	3
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	San Diego	1
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	San Joaquin	1
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	San Luis Obispo	1
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Santa Cruz	1
Hemiptera[3]	Diaspididae	*Aspidiotus destructor*	A	Orange	1
Hemiptera[3]	Diaspididae	*Aspidiotus* sp.	Q	Santa Cruz	1
Hemiptera[3]	Diaspididae	*Aulacaspis yasumatsui*	Q	Orange	2
Hemiptera[3]	Diaspididae	*Aulacaspis yasumatsui*	Q	San Diego	3
Hemiptera[3]	Diaspididae	*Lepidosaphes beckii*	B	Riverside	1
Hemiptera[3]	Diaspididae	*Lepidosaphes* sp.	Q	Riverside	1
Hemiptera[3]	Diaspididae	*Pinnaspis buxi*	A	Los Angeles	1
Hemiptera[3]	Diaspididae	*Poliaspis cycadis*	Q	Orange	1
Hemiptera[3]	Diaspididae	*Pseudaulacaspis cockerelli*	A	Los Angeles	2
Hemiptera[3]	Diaspididae	*Pseudaulacaspis cockerelli*	A	Orange	5
Hemiptera[3]	Diaspididae	*Pseudaulacaspis cockerelli*	A	Orange	1
Hemiptera[3]	Diaspididae	*Pseudaulacaspis pentagona*	A	San Diego	49
Hemiptera[3]	Pseudococcidae	*Delottococcus* sp.	Q	Sonoma	1
Hemiptera[3]	Pseudococcidae	*Dysmicoccus lepelleyi*	Q	Orange	1
Hemiptera[3]	Pseudococcidae	*Dysmicoccus texensis*	Q	Yolo	1
Hemiptera[3]	Pseudococcidae	*Ferrisia gilli*	B	El Dorado	12
Hemiptera[3]	Pseudococcidae	*Ferrisia virgata*	B	Imperial	1
Hemiptera[3]	Pseudococcidae	*Maconellicoccus hirsutus*	A	Imperial	1
Hemiptera[3]	Pseudococcidae	*Nipaecoccus* sp.	Q	Los Angeles	1
Hemiptera[3]	Pseudococcidae	*Nipaecoccus* sp.	Q	San Bernadino	1
Hemiptera[3]	Pseudococcidae	*Palmicultor lumpurensis*	Q	Los Angeles	1
Hemiptera[3]	Pseudococcidae	*Palmicultor lumpurensis*	Q	San Diego	1
Hemiptera[3]	Pseudococcidae	*Phenacoccus* sp.	Q	Riverside	1
Hemiptera[3]	Pseudococcidae	*Planococcus ficus*	B	Alameda	1

Order	Family	Scientific Name		County	Total
Hemiptera[3]	Pseudococcidae	*Planococcus ficus*	B	Monterey	1
Hemiptera[3]	Pseudococcidae	*Planococcus ficus*	B	Napa	5
Hemiptera[3]	Pseudococcidae	*Planococcus ficus*	B	Santa Barbara	3
Hemiptera[3]	Pseudococcidae	*Planococcus* sp. prob. *ficus*	B	Kern	29
Hemiptera[3]	Pseudococcidae	*Planococcus* sp. prob. *ficus*	B	Lake	2
Hemiptera[3]	Pseudococcidae	*Planococcus* sp. prob. *ficus*	B	Merced	1
Hemiptera[3]	Pseudococcidae	*Planococcus* sp. prob. *ficus*	B	Monterey	9
Hemiptera[3]	Pseudococcidae	*Planococcus* sp. prob. *ficus*	B	Napa	33
Hemiptera[3]	Pseudococcidae	*Planococcus* sp. prob. *ficus*	B	San Benito	4
Hemiptera[3]	Pseudococcidae	*Planococcus* sp. prob. *ficus*	B	San Luis Obispo	3
Hemiptera[3]	Pseudococcidae	*Planococcus* sp. prob. *ficus*	B	Sonoma	15
Hemiptera[3]	Pseudococcidae	*Pseudococcus baliteus*	Q	Orange	2
Hemiptera[3]	Pseudococcidae	*Pseudococcus* sp.	Q	Los Angeles	1
Hemiptera[3]	Pseudococcidae	*Pseudococcus* sp.	B	Monterey	1
Hemiptera[3]	Pseudococcidae	*Pseudococcus* sp.	Q	Riverside	2
Hemiptera[3]	Pseudococcidae	*Pseudococcus* sp.	Q	San Diego	1
Hemiptera[3]	Pseudococcidae	*Pseudococcus* sp.	Q	Santa Cruz	1
Hemiptera[3]	Pseudococcidae	*Rhizoecus floridanus*	Q	Riverside	13
Hemiptera[3]	Pseudococcidae	*Rhizoecus floridanus*	Q	San Diego	1
Hemiptera[3]	Pseudococcidae	*Rhizoecus* sp.	Q	Riverside	1
Hemiptera[3]	Pseudococcidae	*Ripersiella hibisci*	Q	Riverside	7
Hemiptera[3]	Pseudococcidae	*Ripersiella hibisci*	Q	San Diego	1
Hemiptera[3]	Psyllidae	*Cacopsylla* sp.	Q	Los Angeles	2
Hemiptera[3]	Psyllidae	*Euphyllura olivina*	Q	Orange	6
Hemiptera[3]	Psyllidae	*Euphyllura olivina*	Q	San Diego	4
Hemiptera[3]	Psyllidae	*Trioza chenopodii*	Q	Riverside	2
Hymenoptera	Formicidae	unidentifiable	Q	Orange	1
Hymenoptera	Formicidae	*Pheidole megacephala*	Q	Los Angeles	1
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Alpine	1
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Kern	1
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Los Angeles	4
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Madera	34
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Merced	85
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Orange	576
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Placer	1
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Plumas	1
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Riverside	467
Hymenoptera	Formicidae	*Solenopsis invicta*	A	San Bernadino	71
Hymenoptera	Formicidae	*Solenopsis invicta*	A	San Diego	1
Hymenoptera	Formicidae	*Solenopsis invicta*	A	San Joaquin	1
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Stanislaus	1
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Contra Costa	1
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Orange	1
Hymenoptera	Vespidae	unidentifiable	Q	Contra Costa	1

Order	Family	Scientific Name		County	Total
Lepidoptera	Arctiidae	unidentifiable	Q	Humboldt	1
Lepidoptera	Geometridae	*Disclisioprocta stellata*	Q	Los Angeles	1
Lepidoptera	Geometridae	*Disclisioprocta stellata*	Q	Riverside	1
Lepidoptera	Geometridae	unidentifiable	Q	Los Angeles	1
Lepidoptera	Gracillaridae	unidentifiable	Q	Santa Cruz	1
Lepidoptera	Gracillariidae	unidentifiable	B	Stanislaus	1
Lepidoptera	Gracillariidae	*Phyllocnistis citrella*	B	Orange	1
Lepidoptera	Gracillariidae	*Phyllocnistis citrella*	B	Riverside	2
Lepidoptera	Gracillariidae	*Phyllocnistis citrella*	B	San Luis Obispo	1
Lepidoptera	Gracillariidae	*Phyllocnistis citrella*	B	Santa Barbara	3
Lepidoptera	Gracillariidae	*Phyllocnistis citrella*	B	Stanislaus	1
Lepidoptera	Hesperiidae	unidentifiable	Q	Contra Costa	1
Lepidoptera	Lymantriidae	*Lymantria dispar*	A	Alameda	2
Lepidoptera	Lymantriidae	*Lymantria dispar*	A	Los Angeles	3
Lepidoptera	Lymantriidae	*Lymantria dispar*	A	Orange	2
Lepidoptera	Lymantriidae	*Lymantria dispar*	A	Santa Clara	1
Lepidoptera	Lymantriidae	*Lymantria dispar*	A	Ventura	1
Lepidoptera	Lymantriidae	*Orgyia* sp.	Q	San Mateo	1
Lepidoptera	Noctuidae	*Noctua pronuba*	Q	Sacramento	1
Lepidoptera	Noctuidae	*Noctua pronuba*	Q	Santa Clara	1
Lepidoptera	Noctuidae	*Noctua pronuba*	Q	Santa Cruz	1
Lepidoptera	Noctuidae	*Noctua pronuba*	Q	Sonoma	1
Lepidoptera	Noctuidae	*Noctua pronuba*	Q	Yolo	1
Lepidoptera	Pyralidae	unidentifiable	Q	San Joaquin	1
Lepidoptera	Tortricidae	*Epiphyas postvittana*	A	Alameda	357
Lepidoptera	Tortricidae	*Epiphyas postvittana*	A	Contra Costa	120
Lepidoptera	Tortricidae	*Epiphyas postvittana*	A	Los Angeles	1
Lepidoptera	Tortricidae	*Epiphyas postvittana*	A	Marin	69
Lepidoptera	Tortricidae	*Epiphyas postvittana*	A	Monterey	460
Lepidoptera	Tortricidae	*Epiphyas postvittana***	Q	Monterey	6
Lepidoptera	Tortricidae	*Epiphyas postvittana*	A	Napa	2
Lepidoptera	Tortricidae	*Epiphyas postvittana*	A	San Francisco	671
Lepidoptera	Tortricidae	*Epiphyas postvittana***	Q	San Francisco	26
Lepidoptera	Tortricidae	*Epiphyas postvittana*	A	San Luis Obispo	1
Lepidoptera	Tortricidae	*Epiphyas postvittana*	A	San Mateo	83
Lepidoptera	Tortricidae	*Epiphyas postvittana***	Q	San Mateo	5
Lepidoptera	Tortricidae	*Epiphyas postvittana*	A	Santa Clara	20
Lepidoptera	Tortricidae	*Epiphyas postvittana*	A	Santa Cruz	3184
Lepidoptera	Tortricidae	*Epiphyas postvittana***	Q	Santa Cruz	158
Lepidoptera	Tortricidae	*Epiphyas postvittana*	A	Solano	8
Lepidoptera	Tortricidae	*Epiphyas postvittana***	Q	Sonoma	1
Lepidoptera	Tortricidae	*Rhyacionia frustrana*	B	Riverside	2
Lepidoptera	Zygaenidae	*Harrisina brillians*	B	Los Angeles	1
Lepidoptera	Zygaenidae	*Harrisina brillians*	B	Napa	1

Order	Family	Scientific Name		County	Total
Orthoptera	Gryllotalpidae	*Scapteriscus* sp.	Q	Los Angeles	3
Pelecypoda	Dreisseniidae	*Dreissena bugensis*	Q	San Diego	1
Phasmatodea	Phasmatidae	*Carausius morosus*	Q	Orange	1
Phasmatodea	Phasmatidae	*Medauroidea extradentata*	Q	Orange	1
Thysanoptera	Phlaeothripidae	*Klambothrips myopori*	Q	San Diego	1
Thysanoptera	Phlaeothripidae	*Klambothrips myopori*	Q	San Luis Obispo	2
Thysanoptera	Phlaeothripidae	*Klambothrips myopori*	Q	Santa Clara	1
TOTAL					**8390**

[1] Suborder Auchenorrhyncha, [2] Suborder Heteroptera, [3] Suborder Sternorrhyncha

** These represent larval samples tested using DNA-based methods, and were determined to be "probable LBAM," which is as close as is possible with this method, and so were given a Q-rating.

Notes:

This table represents the number of individual PDR's with these identifications, with many representing multiple specimens per PDR.

Those identified as "unidentifiable" represent samples where further identification was not possible, due to samples being damaged or incomplete, or the wrong sex or life stage for identification.

ENTOMOLOGY

A, B & Q RATED INTERCEPTIONS FROM BORDER STATIONS

"Pers" vehicle type refers to personal vehicles such as automobile, bus, camper, recreational vehicles, trailers, utility vehicles, self-movers. "Comm" vehicle type refers to commercial vehicles such as tractor-trailer trucks.

Order	Family	Scientific Name		Station	Com	Pers
Acari	misc. eggs		Q	Needles	10	91
Acari	unidentifiable		Q	Truckee	1	
Acari	Tarsonemidae	unidentifiable	Q	Hornbrook	1	
Acari	Tarsonemidae	unidentifiable	Q	Needles	1	1
Acari	Tenuipalpidae	*Brevipalpus* sp.	Q	Needles		2
Acari	Tenuipalpidae	unidentifiable	Q	Needles		1
Acari	Tetranychidae	unidentifiable	Q	Needles		2
Acari	Tetranychidae	*Tetranychus* sp.	Q	Meyers		1
Acari	Tydeidae	*Lorryia* sp.	Q	Needles	2	
Blattodea	Blattidae	unidentifiable	Q	Winterhaven	1	
Coleoptera	Anobiidae	unidentifiable	Q	Needles		1
Coleoptera	Buprestidae	unidentifiable	Q	Benton		1
Coleoptera	Buprestidae	unidentifiable	Q	Needles		4
Coleoptera	Cerambycidae	*Aneflomorpha* sp.	Q	Needles		1
Coleoptera	Cerambycidae	*Astylopsis* sp.	Q	Truckee	1	
Coleoptera	Cerambycidae	*Dorcasta* sp.	Q	Vidal	1	
Coleoptera	Cerambycidae	*Eupogonius* sp.	Q	Vidal	1	
Coleoptera	Cerambycidae	*Leptostylopsis* sp.	Q	Hornbrook	1	
Coleoptera	Cerambycidae	unidentifiable	Q	Blythe		1
Coleoptera	Cerambycidae	unidentifiable	Q	Meyers		1
Coleoptera	Cerambycidae	unidentifiable	Q	Needles		5
Coleoptera	Cerambycidae	unidentifiable	Q	Redwood Hwy		1
Coleoptera	Cerambycidae	*Monochamus* sp.	Q	Needles		1
Coleoptera	Cerambycidae	*Monochamus* sp.	Q	Truckee	1	
Coleoptera	Cerambycidae	*Prionus* sp.	Q	Vidal		1
Coleoptera	Chrysomelidae	*Diabrotica undecimpunctata*	Q	Dorris	1	
Coleoptera	Chrysomelidae	*Diabrotica undecimpunctata howardi*	A	Needles		1
Coleoptera	Chrysomelidae	unidentifiable	Q	Blythe	1	
Coleoptera	Chrysomelidae	unidentifiable	Q	Needles		1
Coleoptera	Chrysomelidae	unidentifiable	Q	Winterhaven	1	
Coleoptera	Chrysomelidae	unidentifiable	Q	Yermo	1	
Coleoptera	Chrysomelidae	*Oulema melanopus*	A	Truckee	1	
Coleoptera	Chrysomelidae	*Trirhabda* sp.	Q	Needles		1
Coleoptera	Curculionidae	*Anthonomus* sp.	Q	Blythe	2	

Order	Family	Scientific Name		Station	Com	Pers
Coleoptera	Curculionidae	*Curculio* sp.	Q	Blythe		1
Coleoptera	Curculionidae	*Curculio* sp.	Q	Needles		1
Coleoptera	Curculionidae	*Diaprepes abbreviatus*	A	Blythe	1	
Coleoptera	Curculionidae	unidentifiable	Q	Blythe	3	
Coleoptera	Curculionidae	unidentifiable	Q	Needles	3	21
Coleoptera	Curculionidae	unidentifiable	Q	Vidal	2	
Coleoptera	Curculionidae	unidentifiable	Q	Winterhaven		1
Coleoptera	Curculionidae	*Plocetes* sp.	Q	Winterhaven	1	
Coleoptera	Curculionidae	undet. Scolytinae	Q	Needles		2
Coleoptera	Elateridae	*Conoderus* sp.	Q	Needles		1
Coleoptera	Elateridae	unidentifiable	Q	Needles		3
Coleoptera	unidentifiable		Q	Needles		1
Coleoptera	Nitidulidae	*Aethina tumida*	B	Blythe	1	
Coleoptera	Nitidulidae	*Aethina tumida*	B	Needles	11	
Coleoptera	Nitidulidae	*Aethina tumida*	B	Truckee	1	
Coleoptera	Nitidulidae	*Aethina tumida*	B	Vidal	3	
Coleoptera	Nitidulidae	*Aethina tumida*	B	Winterhaven	1	
Coleoptera	Nitidulidae	unidentifiable	B	Needles	1	
Coleoptera	Scarabaeidae	*Anomala* sp.	Q	Truckee	3	
Coleoptera	Scarabaeidae	*Aphodius* sp.	Q	Truckee	1	
Coleoptera	Scarabaeidae	*Cyclocephala* sp.	Q	Needles		1
Coleoptera	Scarabaeidae	*Cyclocephala* sp.	Q	Truckee	1	1
Coleoptera	Scarabaeidae	*Diplotaxis* sp.	Q	Truckee	1	
Coleoptera	Scarabaeidae	*Diplotaxis* sp.	Q	Vidal		1
Coleoptera	Scarabaeidae	*Euphoria* sp.	Q	Needles		1
Coleoptera	Scarabaeidae	unidentifiable	Q	Needles		7
Coleoptera	Scarabaeidae	*Onthophagus* sp.	Q	Vidal	1	
Coleoptera	Scarabaeidae	*Pelidnota* sp.	Q	Needles		1
Coleoptera	Scarabaeidae	*Phyllophaga* sp.	Q	Truckee	1	
Coleoptera	Scarabaeidae	*Phyllophaga* sp.	Q	Needles		19
Coleoptera	Scarabaeidae	*Phyllophaga* sp.	Q	Truckee	15	1
Coleoptera	Scarabaeidae	*Phyllophaga* sp.	Q	Vidal	4	
Coleoptera	Scarabaeidae	*Phyllophaga* sp.	Q	Yermo	3	
Coleoptera	Scarabaeidae	*Phyllophaga* sp.	Q	Needles		1
Coleoptera	Scarabaeidae	*Popillia japonica*	A	Hornbrook	2	2
Coleoptera	Scarabaeidae	*Popillia japonica*	A	Needles		46
Coleoptera	Scarabaeidae	*Popillia japonica*	A	Truckee	3	1
Coleoptera	Scarabaeidae	*Popillia japonica*	A	Yermo		1
Diptera	Agromyzidae	*Liriomyza* sp.	Q	Truckee	1	
Diptera	Agromyzidae	*Liriomyza* sp.	Q	Winterhaven	1	
Diptera	Agromyzidae	unidentifiable	Q	Hornbrook		1
Diptera	Agromyzidae	unidentifiable	Q	Needles	3	
Diptera	Agromyzidae	unidentifiable	Q	Winterhaven	1	
Diptera	Cecidomyiidae	*Dasineura mali*	Q	Hornbrook	1	

Order	Family	Scientific Name		Station	Com	Pers
Diptera	Cecidomyiidae	unidentifiable	Q	Blythe	1	
Diptera	Cecidomyiidae	unidentifiable	Q	Needles		2
Diptera	Cecidomyiidae	unidentifiable	Q	Winterhaven		1
Diptera	Ephydridae	*Hydrellia* sp.	Q	Vidal	1	
Diptera	unidentifiable		Q	Blythe	1	
Diptera	unidentifiable		Q	Needles		3
Diptera	unidentifiable		Q	Vidal	2	
Diptera	Otitidae	*Tritoxa flexa*	Q	Blythe	1	
Diptera	Otitidae	*Tritoxa* sp.	Q	Vidal	1	
Diptera	Tephritidae	*Anastrepha fraterculus*-group	A	Blythe	1	
Diptera	Tephritidae	*Anastrepha ludens*	A	Blythe	2	
Diptera	Tephritidae	*Anastrepha* sp.	A	Blythe	2	
Diptera	Tephritidae	unidentifiable	Q	Truckee	1	
Diptera	Tephritidae	*Rhagoletis indifferens*	A	Dorris	1	
Diptera	Tephritidae	*Rhagoletis indifferens*	A	Redwood Hwy		8
Diptera	Tephritidae	*Rhagoletis indifferens*	A	Smith River		2
Diptera	Tephritidae	*Rhagoletis indifferens*	A	Yermo		3
Diptera	Tephritidae	*Rhagoletis pomonella*	B	Hornbrook		1
Diptera	Tephritidae	*Rhagoletis pomonella*	B	Meyers		1
Diptera	Tephritidae	*Rhagoletis pomonella*	B	Needles		4
Diptera	Tephritidae	*Rhagoletis pomonella*	B	Redwood Hwy		3
Diptera	Tephritidae	*Rhagoletis pomonella*	B	Truckee	1	
Diptera	Tephritidae	*Rhagoletis pomonella*	B	Yermo	1	2
Diptera	Tephritidae	*Rhagoletis suavis*	A	Blythe		1
Diptera	Tephritidae	*Rhagoletis suavis*	A	Needles		2
Gastropoda	Bradybaenidae	*Bradybaena similaris*	B	Blythe	4	1
Gastropoda	Bradybaenidae	*Bradybaena similaris*	B	Hornbrook	2	
Gastropoda	Bradybaenidae	*Bradybaena similaris*	B	Needles	3	10
Gastropoda	Bradybaenidae	*Bradybaena similaris*	B	Truckee	1	
Gastropoda	Bradybaenidae	*Bradybaena similaris*	B	Vidal	4	
Gastropoda	Bradybaenidae	*Bradybaena similaris*	B	Winterhaven	7	1
Gastropoda	Camaenidae	*Zachrysia provisoria*	Q	Hornbrook	1	
Gastropoda	Camaenidae	*Zachrysia provisoria*	Q	Yermo	1	
Gastropoda	Subulinidae	unidentifiable	Q	Blythe	1	
Gastropoda	Subulinidae	unidentifiable	Q	Needles		2
Hemiptera[1]	Acanaloniidae	*Acanalonia latifrons*	Q	Truckee	1	
Hemiptera[1]	Cercopidae	*Prosapia bicincta*	Q	Needles		1
Hemiptera[1]	Cicadellidae	*Deltocephalus* sp.	Q	Alturas		1
Hemiptera[1]	Cicadellidae	*Empoasca* sp.	Q	Needles		1
Hemiptera[1]	Cicadellidae	*Endria inimica*	Q	Needles		1
Hemiptera[1]	Cicadellidae	*Graphocephala* sp.	Q	Needles		1
Hemiptera[1]	Cicadellidae	*Gyponana* sp.	Q	Truckee	1	
Hemiptera[1]	Cicadellidae	*Homalodisca* sp.	Q	Needles		1
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Needles		3

Order	Family	Scientific Name		Station	Com	Pers
Hemiptera[1]	Cicadellidae	unidentifiable	Q	Blythe		2
Hemiptera[1]	Cicadellidae	unidentifiable	Q	Dorris	1	
Hemiptera[1]	Cicadellidae	unidentifiable	Q	Needles	1	10
Hemiptera[1]	Cicadellidae	unidentifiable	Q	Vidal	1	
Hemiptera[1]	Cicadellidae	unidentifiable	Q	Winterhaven	1	1
Hemiptera[1]	Cicadellidae	*Oncometopia* sp.	Q	Needles		3
Hemiptera[1]	Cicadellidae	*Paraulacizes irrorata*	Q	Needles		1
Hemiptera[1]	Cicadidae	*Magicicada* sp.	Q	Truckee	1	
Hemiptera[1]	Cicadidae	*Tibicen* sp.	Q	Hornbrook		1
Hemiptera[1]	Cicadidae	*Tibicen* sp.	Q	Needles		1
Hemiptera[1]	Cixiidae	unidentifiable	Q	Needles		1
Hemiptera[1]	Delphacidae	*Delphacodes* sp.	Q	Needles		2
Hemiptera[1]	Delphacidae	unidentifiable	Q	Vidal	1	
Hemiptera[1]	Flatidae	unidentifiable	Q	Needles		1
Hemiptera[1]	Fulgoridae	unidentifiable	Q	Needles		3
Hemiptera[1]	Membracidae	unidentifiable	Q	Needles		2
Hemiptera[2]	Alydidae	unidentifiable	Q	Needles		1
Hemiptera[2]	Coreidae	*Acanthocephala* sp.	Q	Yermo	1	
Hemiptera[2]	Coreidae	*Catorhintha mendica*	Q	Needles		1
Hemiptera[2]	Coreidae	unidentifiable	Q	Needles		1
Hemiptera[2]	Coreidae	unidentifiable	Q	Vidal		1
Hemiptera[2]	Cydnidae	*Cyrtomenus ciliatis*	Q	Yermo	1	
Hemiptera[2]	Cydnidae	unidentifiable	Q	Blythe	1	
Hemiptera[2]	Cydnidae	unidentifiable	Q	Dorris	1	
Hemiptera[2]	Cydnidae	unidentifiable	Q	Needles		3
Hemiptera[2]	Cydnidae	unidentifiable	Q	Truckee	2	
Hemiptera[2]	Cydnidae	unidentifiable	Q	Winterhaven	1	
Hemiptera[2]	Lygaeidae	*Blissus* sp.	Q	Blythe	1	
Hemiptera[2]	Lygaeidae	*Blissus* sp.	Q	Needles	3	2
Hemiptera[2]	Lygaeidae	*Blissus* sp.	Q	Vidal	1	
Hemiptera[2]	Lygaeidae	*Cnemodus mavortius*	Q	Needles		1
Hemiptera[2]	Lygaeidae	*Ischnodemus* sp.	Q	Needles		2
Hemiptera[2]	Lygaeidae	unidentifiable	Q	Needles	2	6
Hemiptera[2]	Lygaeidae	unidentifiable	Q	Vidal	2	
Hemiptera[2]	Lygaeidae	unidentifiable	Q	Yermo	1	
Hemiptera[2]	Lygaeidae	*Myodocha serripes*	Q	Vidal	1	
Hemiptera[2]	Lygaeidae	*Neopamera sp*	Q	Needles	1	
Hemiptera[2]	Lygaeidae	*Nysius* sp.	Q	Blythe	1	
Hemiptera[2]	Lygaeidae	*Nysius* sp.	Q	Needles	1	18
Hemiptera[2]	Miridae	unidentifiable	Q	Blythe	1	
Hemiptera[2]	Miridae	unidentifiable	Q	Needles		2
Hemiptera[2]	unidentifiable		Q	Needles		3
Hemiptera[2]	Pentatomidae	*Brochymena* sp.	Q	Needles		1
Hemiptera[2]	Pentatomidae	*Halyomorpha halys*	Q	Needles		6

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Hemiptera[2]	Pentatomidae	*Mecidea major*	Q	Needles		1
Hemiptera[2]	Pentatomidae	unidentifiable	Q	Blythe	1	
Hemiptera[2]	Pentatomidae	unidentifiable	Q	Needles	1	5
Hemiptera[2]	Pentatomidae	unidentifiable	Q	Truckee		1
Hemiptera[2]	Pentatomidae	unidentifiable	Q	Winterhaven	1	
Hemiptera[2]	Pentatomidae	*Proxys punctulatus*	Q	Truckee	1	
Hemiptera[2]	Pentatomidae	*Proxys punctulatus*	Q	Vidal	3	
Hemiptera[2]	Pyrrhocoridae	*Dysdercus* sp.	Q	Needles		1
Hemiptera[2]	Reduviidae	unidentifiable	Q	Blythe		1
Hemiptera[2]	Scutelleridae	*Dioleus chrysorrhoeus*	Q	Needles		1
Hemiptera[2]	Scutelleridae	*Tetyra bipunctata*	Q	Needles		1
Hemiptera[3]	Aleyrodidae	*Aleurocanthus woglumi*	A	Truckee	1	
Hemiptera[3]	Aleyrodidae	*Aleurocerus* sp.	Q	Yermo	1	
Hemiptera[3]	Aleyrodidae	*Aleuropleurocelus* sp.	Q	Yermo	1	
Hemiptera[3]	Aleyrodidae	*Aleurothrixus* sp.	Q	Yermo	3	
Hemiptera[3]	Aleyrodidae	*Aleurotrachelus* sp.	Q	Blythe		1
Hemiptera[3]	Aleyrodidae	*Aleurotrachelus* sp.	Q	Yermo	3	
Hemiptera[3]	Aleyrodidae	*Dialeurodes* sp.	Q	Needles		1
Hemiptera[3]	Aleyrodidae	unidentifiable	Q	Blythe	1	
Hemiptera[3]	Aleyrodidae	unidentifiable	Q	Truckee		2
Hemiptera[3]	Aleyrodidae	unidentifiable	Q	Winterhaven	2	
Hemiptera[3]	Aleyrodidae	*Trialeurodes* sp.	Q	Needles		1
Hemiptera[3]	Aphididae	*Cinara* sp.	Q	Hornbrook	1	
Hemiptera[3]	Aphididae	unidentifiable	Q	Alturas		1
Hemiptera[3]	Aphididae	unidentifiable	Q	Blythe	5	2
Hemiptera[3]	Aphididae	unidentifiable	Q	Hornbrook	1	1
Hemiptera[3]	Aphididae	unidentifiable	Q	Needles	4	66
Hemiptera[3]	Aphididae	unidentifiable	Q	Redwood Hwy	1	
Hemiptera[3]	Aphididae	unidentifiable	Q	Vidal	4	1
Hemiptera[3]	Aphididae	unidentifiable	Q	Winterhaven	4	
Hemiptera[3]	Aphididae	unidentifiable	Q	Yermo		4
Hemiptera[3]	Aphididae	*Rhopalosiphum* sp.	Q	Blythe	1	
Hemiptera[3]	Asterolecaniidae	*Bambusaspis miliaris*	Q	Needles		2
Hemiptera[3]	Coccidae	*Ceroplastes rusci*	A	Blythe	1	1
Hemiptera[3]	Coccidae	*Ceroplastes* sp. prob. *rusci*	A	Vidal	1	
Hemiptera[3]	Coccidae	*Ceroplastes* sp.	Q	Blythe		1
Hemiptera[3]	Coccidae	unidentifiable	Q	Blythe	1	
Hemiptera[3]	Coccidae	unidentifiable	Q	Needles		2
Hemiptera[3]	Coccidae	unidentifiable	Q	Smith River		1
Hemiptera[3]	Coccidae	unidentifiable	Q	Vidal		1
Hemiptera[3]	Coccidae	unidentifiable	Q	Yermo		1
Hemiptera[3]	Diaspididae	*Abgrallaspis* sp.*	Q	Alturas		1
Hemiptera[3]	Diaspididae	*Abgrallaspis* sp.*	Q	Blythe	16	
Hemiptera[3]	Diaspididae	*Abgrallaspis* sp.*	Q	Needles	1	4

Order	Family	Scientific Name		Station	Com	Pers
Hemiptera[3]	Diaspididae	*Abgrallaspis* sp.*	Q	Smith River		3
Hemiptera[3]	Diaspididae	*Abgrallaspis* sp.*	Q	Vidal	3	
Hemiptera[3]	Diaspididae	*Abgrallaspis* sp.*	Q	Winterhaven	8	
Hemiptera[3]	Diaspididae	*Acutaspis albopicta*	A	Blythe	1	
Hemiptera[3]	Diaspididae	*Acutaspis albopicta*	A	Hornbrook	1	
Hemiptera[3]	Diaspididae	*Acutaspis albopicta*	A	Needles		1
Hemiptera[3]	Diaspididae	*Acutaspis albopicta*	A	Vidal	1	
Hemiptera[3]	Diaspididae	*Acutaspis albopicta*	A	Winterhaven	1	
Hemiptera[3]	Diaspididae	*Acutaspis* sp.	Q	Winterhaven	1	
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Blythe		1
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Dorris		1
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Hornbrook		2
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Needles	3	122
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Smith River		19
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Truckee	4	1
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Vidal	2	4
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Winterhaven	5	
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Yermo	1	5
Hemiptera[3]	Diaspididae	*Aonidiella comperei*	Q	Yermo	1	
Hemiptera[3]	Diaspididae	*Aonidiella orientalis*	A	Blythe		1
Hemiptera[3]	Diaspididae	*Aonidiella orientalis*	A	Needles		4
Hemiptera[3]	Diaspididae	*Aonidiella orientalis*	A	Winterhaven		1
Hemiptera[3]	Diaspididae	*Aonidiella orientalis*	A	Yermo	1	
Hemiptera[3]	Diaspididae	*Aonidiella* sp.	B	Yermo		1
Hemiptera[3]	Diaspididae	*Aonidiella* sp.	Q	Needles	1	
Hemiptera[3]	Diaspididae	*Aspidiotus destructor*	A	Yermo	1	
Hemiptera[3]	Diaspididae	*Aulacaspis* sp.	Q	Smith River		1
Hemiptera[3]	Diaspididae	*Aulacaspis tubercularis*	Q	Blythe	5	
Hemiptera[3]	Diaspididae	*Aulacaspis tubercularis*	Q	Meyers		1
Hemiptera[3]	Diaspididae	*Aulacaspis tubercularis*	Q	Needles	2	2
Hemiptera[3]	Diaspididae	*Aulacaspis tubercularis*	Q	Redwood Hwy		1
Hemiptera[3]	Diaspididae	*Aulacaspis tubercularis*	Q	Smith River		8
Hemiptera[3]	Diaspididae	*Aulacaspis tubercularis*	Q	Truckee	1	
Hemiptera[3]	Diaspididae	*Aulacaspis tubercularis*	Q	Vidal	22	
Hemiptera[3]	Diaspididae	*Aulacaspis tubercularis*	Q	Winterhaven	4	
Hemiptera[3]	Diaspididae	*Aulacaspis yasumatsui*	Q	Needles		2
Hemiptera[3]	Diaspididae	*Chionaspis* sp.	Q	Hornbrook	1	
Hemiptera[3]	Diaspididae	*Diaspidiotus* sp.	Q	Needles		2
Hemiptera[3]	Diaspididae	*Diaspis miranda*	Q	Blythe	2	
Hemiptera[3]	Diaspididae	*Diaspis miranda*	Q	Needles		1
Hemiptera[3]	Diaspididae	*Diaspis miranda*	Q	Winterhaven	4	
Hemiptera[3]	Diaspididae	*Diaspis* sp.	Q	Blythe	2	
Hemiptera[3]	Diaspididae	*Diaspis* sp.	Q	Vidal	1	
Hemiptera[3]	Diaspididae	*Hemiberlesia* sp.	Q	Blythe	1	

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Hemiptera[3]	Diaspididae	*Hemiberlesia* sp.	Q	Needles	1	2
Hemiptera[3]	Diaspididae	*Hemiberlesia* sp.	Q	Smith River		1
Hemiptera[3]	Diaspididae	*Hemiberlesia* sp.	Q	Vidal	2	1
Hemiptera[3]	Diaspididae	*Hemiberlesia* sp.	Q	Winterhaven	4	
Hemiptera[3]	Diaspididae	*Howardia biclavis*	A	Winterhaven	1	
Hemiptera[3]	Diaspididae	*Ischnaspis longirostris*	A	Dorris	1	
Hemiptera[3]	Diaspididae	*Ischnaspis longirostris*	A	Hornbrook		1
Hemiptera[3]	Diaspididae	*Ischnaspis longirostris*	A	Needles		1
Hemiptera[3]	Diaspididae	*Ischnaspis longirostris*	A	Smith River		1
Hemiptera[3]	Diaspididae	*Lepidosaphes beckii*	B	Blythe	1	
Hemiptera[3]	Diaspididae	*Lepidosaphes beckii*	B	Dorris		1
Hemiptera[3]	Diaspididae	*Lepidosaphes beckii*	B	Needles	10	135
Hemiptera[3]	Diaspididae	*Lepidosaphes beckii*	B	Smith River		12
Hemiptera[3]	Diaspididae	*Lepidosaphes beckii*	B	Truckee	5	
Hemiptera[3]	Diaspididae	*Lepidosaphes beckii*	B	Vidal	2	1
Hemiptera[3]	Diaspididae	*Lepidosaphes beckii*	B	Winterhaven	1	
Hemiptera[3]	Diaspididae	*Lepidosaphes beckii*	B	Yermo	2	7
Hemiptera[3]	Diaspididae	*Lepidosaphes* sp.	Q	Needles		3
Hemiptera[3]	Diaspididae	*Lepidosaphes* sp.	Q	Yermo		1
Hemiptera[3]	Diaspididae	unidentifiable	Q	Alturas		1
Hemiptera[3]	Diaspididae	unidentifiable	Q	Blythe	4	
Hemiptera[3]	Diaspididae	unidentifiable	Q	Hornbrook	1	
Hemiptera[3]	Diaspididae	unidentifiable	Q	Needles	1	10
Hemiptera[3]	Diaspididae	unidentifiable	Q	Smith River		8
Hemiptera[3]	Diaspididae	unidentifiable	Q	Vidal	2	
Hemiptera[3]	Diaspididae	unidentifiable	Q	Winterhaven	5	
Hemiptera[3]	Diaspididae	unidentifiable	Q	Yermo	4	3
Hemiptera[3]	Diaspididae	*Mycetaspis personata*	Q	Needles		4
Hemiptera[3]	Diaspididae	*Mycetaspis personata*	Q	Redwood Hwy		1
Hemiptera[3]	Diaspididae	*Mycetaspis personata*	Q	Smith River		2
Hemiptera[3]	Diaspididae	*Mycetaspis personata*	Q	Vidal	10	1
Hemiptera[3]	Diaspididae	*Mycetaspis personata*	Q	Yermo	1	
Hemiptera[3]	Diaspididae	*Parlatoria pergandii*	B	Blythe	3	
Hemiptera[3]	Diaspididae	*Parlatoria pergandii*	B	Needles	19	171
Hemiptera[3]	Diaspididae	*Parlatoria pergandii*	B	Redwood Hwy	1	1
Hemiptera[3]	Diaspididae	*Parlatoria pergandii*	B	Smith River		18
Hemiptera[3]	Diaspididae	*Parlatoria pergandii*	B	Truckee	9	1
Hemiptera[3]	Diaspididae	*Parlatoria pergandii*	B	Vidal	6	1
Hemiptera[3]	Diaspididae	*Parlatoria pergandii*	B	Winterhaven	16	
Hemiptera[3]	Diaspididae	*Parlatoria pergandii*	B	Yermo	3	15
Hemiptera[3]	Diaspididae	*Parlatoria pseudaspidiotus*	A	Alturas		1
Hemiptera[3]	Diaspididae	*Parlatoria pseudaspidiotus*	A	Blythe	2	
Hemiptera[3]	Diaspididae	*Parlatoria pseudaspidiotus*	A	Meyers		1
Hemiptera[3]	Diaspididae	*Parlatoria pseudaspidiotus*	A	Needles		2

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Hemiptera[3]	Diaspididae	*Parlatoria pseudaspidiotus*	A	Smith River		8
Hemiptera[3]	Diaspididae	*Parlatoria pseudaspidiotus*	A	Truckee	1	
Hemiptera[3]	Diaspididae	*Parlatoria pseudaspidiotus*	A	Vidal	4	
Hemiptera[3]	Diaspididae	*Parlatoria pseudaspidiotus*	A	Winterhaven	6	3
Hemiptera[3]	Diaspididae	*Parlatoria pseudaspidiotus*	A	Yermo	2	
Hemiptera[3]	Diaspididae	*Parlatoria* sp.	B	Vidal	1	
Hemiptera[3]	Diaspididae	*Parlatoria* sp.	Q	Needles		1
Hemiptera[3]	Diaspididae	*Pinnaspis* sp.	Q	Needles		3
Hemiptera[3]	Diaspididae	*Pinnaspis* sp.	Q	Vidal	3	
Hemiptera[3]	Diaspididae	*Pinnaspis* sp.	Q	Yermo		1
Hemiptera[3]	Diaspididae	*Pinnaspis strachani*	A	Needles		1
Hemiptera[3]	Diaspididae	*Pinnaspis strachani*	A	Smith River	1	
Hemiptera[3]	Diaspididae	*Pinnaspis strachani*	A	Vidal		1
Hemiptera[3]	Diaspididae	*Pinnaspis strachani*	A	Yermo		1
Hemiptera[3]	Diaspididae	*Pseudaonidia duplex*	Q	Blythe		1
Hemiptera[3]	Diaspididae	*Pseudaonidia trilobitiformis*	Q	Needles	1	1
Hemiptera[3]	Diaspididae	*Pseudaonidia trilobitiformis*	Q	Yermo	2	
Hemiptera[3]	Diaspididae	*Pseudaulacaspis cockerelli*	A	Blythe	2	
Hemiptera[3]	Diaspididae	*Pseudaulacaspis cockerelli*	A	Needles		3
Hemiptera[3]	Diaspididae	*Pseudaulacaspis pentagona*	A	Needles	7	2
Hemiptera[3]	Diaspididae	*Pseudaulacaspis pentagona*	A	Winterhaven	1	
Hemiptera[3]	Diaspididae	*Pseudaulacaspis pentagona*	A	Yermo	1	
Hemiptera[3]	Diaspididae	*Pseudaulacaspis* sp.	Q	Needles		1
Hemiptera[3]	Diaspididae	*Radionaspis indica*	Q	Blythe	1	
Hemiptera[3]	Diaspididae	*Radionaspis indica*	Q	Needles		2
Hemiptera[3]	Diaspididae	*Radionaspis indica*	Q	Smith River		1
Hemiptera[3]	Diaspididae	*Radionaspis indica*	Q	Vidal	1	
Hemiptera[3]	Diaspididae	*Selenaspidus articulatus*	A	Yermo		1
Hemiptera[3]	Diaspididae	*Thysanofiorinia* sp.	Q	Needles		2
Hemiptera[3]	Diaspididae	*Unaspis citri*	A	Blythe	2	
Hemiptera[3]	Diaspididae	*Unaspis citri*	A	Needles		12
Hemiptera[3]	Diaspididae	*Unaspis citri*	A	Truckee	2	
Hemiptera[3]	Diaspididae	*Unaspis citri*	A	Yermo		2
Hemiptera[3]	Diaspididae	*Unaspis* sp.	Q	Vidal	1	
Hemiptera[3]	Pseudococcidae	*Dysmicoccus grassii*	A	Blythe	8	
Hemiptera[3]	Pseudococcidae	*Dysmicoccus grassii*	A	Vidal	1	
Hemiptera[3]	Pseudococcidae	*Dysmicoccus grassii*	A	Winterhaven	1	
Hemiptera[3]	Pseudococcidae	*Dysmicoccus* sp.	Q	Needles		1
Hemiptera[3]	Pseudococcidae	*Dysmicoccus texensis*	Q	Blythe	1	1
Hemiptera[3]	Pseudococcidae	*Ferrisia virgata*	B	Blythe	1	
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	Blythe	131	
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	Needles	18	36
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	Redwood Hwy	1	
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	Smith River	1	2

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Hemiptera[3]	Pseudococcidae	unidentifiable	Q	Truckee	4	
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	Vidal	63	3
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	Winterhaven	5	4
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	Yermo	4	1
Hemiptera[3]	Pseudococcidae	*Nipaecoccus* sp.	Q	Needles		1
Hemiptera[3]	Pseudococcidae	*Palmicultor palmarum*	Q	Blythe		1
Hemiptera[3]	Pseudococcidae	*Palmicultor palmarum*	Q	Needles		1
Hemiptera[3]	Pseudococcidae	*Paracoccus burnerae*	Q	Blythe	1	
Hemiptera[3]	Pseudococcidae	*Paracoccus burnerae*	Q	Needles	1	
Hemiptera[3]	Pseudococcidae	*Phenacoccus* sp.	Q	Vidal	5	
Hemiptera[3]	Pseudococcidae	*Planococcus* sp.	Q	Blythe	9	
Hemiptera[3]	Pseudococcidae	*Planococcus* sp.	Q	Needles	2	1
Hemiptera[3]	Pseudococcidae	*Planococcus* sp.	Q	Truckee	1	
Hemiptera[3]	Pseudococcidae	*Planococcus* sp.	Q	Vidal	1	
Hemiptera[3]	Pseudococcidae	*Pseudococcus jackbeardsleyi*	Q	Blythe	1	
Hemiptera[3]	Pseudococcidae	*Pseudococcus jackbeardsleyi*	Q	Vidal	1	
Hemiptera[3]	Pseudococcidae	*Pseudococcus* sp.	Q	Blythe	8	
Hemiptera[3]	Pseudococcidae	*Pseudococcus* sp.	Q	Needles	3	2
Hemiptera[3]	Pseudococcidae	*Pseudococcus* sp.	Q	Vidal	3	
Hemiptera[3]	Pseudococcidae	*Pseudococcus* sp.	Q	Winterhaven	1	
Hemiptera[3]	Pseudococcidae	*Pseudococcus* sp.	Q	Yermo	1	
Hemiptera[3]	Pseudococcidae	*Trionymus* sp.	Q	Needles		2
Hemiptera[3]	Psyllidae	*Pachypsylla* sp.	Q	Needles		1
Hymenoptera	Formicidae	*Atta* sp.	Q	Winterhaven	1	
Hymenoptera	Formicidae	*Camponotus abdominalis transvectus*	Q	Needles		1
Hymenoptera	Formicidae	*Camponotus* sp.	Q	Blythe	5	1
Hymenoptera	Formicidae	*Camponotus* sp.	Q	Needles	4	17
Hymenoptera	Formicidae	*Camponotus* sp.	Q	Redwood Hwy		1
Hymenoptera	Formicidae	*Camponotus* sp.	Q	Truckee	8	
Hymenoptera	Formicidae	*Camponotus* sp.	Q	Vidal	4	
Hymenoptera	Formicidae	*Camponotus* sp.	Q	Winterhaven	5	1
Hymenoptera	Formicidae	*Camponotus* sp.	Q	Yermo	1	1
Hymenoptera	Formicidae	*Crematogaster* sp.	Q	Needles	1	1
Hymenoptera	Formicidae	*Formica* sp.	Q	Needles		2
Hymenoptera	Formicidae	*Hypoponera* sp.	Q	Needles		5
Hymenoptera	Formicidae	unidentifiable	Q	Blythe	7	
Hymenoptera	Formicidae	unidentifiable	Q	Hornbrook		1
Hymenoptera	Formicidae	unidentifiable	Q	Needles	7	32
Hymenoptera	Formicidae	unidentifiable	Q	Tulelake		1
Hymenoptera	Formicidae	unidentifiable	Q	Vidal	26	
Hymenoptera	Formicidae	unidentifiable	Q	Winterhaven	3	2
Hymenoptera	Formicidae	*Monomorium* sp.	Q	Blythe	1	
Hymenoptera	Formicidae	*Odontomachus* sp.	Q	Meyers		1

Order	Family	Scientific Name		Station	Com	Pers
Hymenoptera	Formicidae	*Paratrechina* sp.	Q	Needles		1
Hymenoptera	Formicidae	*Pheidole megacephala*	Q	Blythe	1	
Hymenoptera	Formicidae	*Pheidole* sp.	Q	Blythe	11	4
Hymenoptera	Formicidae	*Pheidole* sp.	Q	Meyers		1
Hymenoptera	Formicidae	*Pheidole* sp.	Q	Needles	2	40
Hymenoptera	Formicidae	*Pheidole* sp.	Q	Truckee		1
Hymenoptera	Formicidae	*Pheidole* sp.	Q	Vidal	6	1
Hymenoptera	Formicidae	*Pheidole* sp.	Q	Winterhaven		1
Hymenoptera	Formicidae	*Pheidole* sp.	Q	Yermo		3
Hymenoptera	Formicidae	*Ponera* sp.	Q	Blythe	1	
Hymenoptera	Formicidae	*Ponera* sp.	Q	Needles		10
Hymenoptera	Formicidae	*Ponera* sp.	Q	Vidal	1	
Hymenoptera	Formicidae	*Ponera* sp.	Q	Winterhaven		1
Hymenoptera	Formicidae	*Ponera* sp.	Q	Yermo		2
Hymenoptera	Formicidae	*Solenopsis geminata*	A	Yermo	1	
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Blythe	41	
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Needles	11	18
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Truckee	8	2
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Vidal	39	
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Winterhaven	3	1
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Yermo	1	
Hymenoptera	Formicidae	*Solenopsis* sp.	Q	Needles		5
Hymenoptera	Formicidae	*Solenopsis* sp.	Q	Vidal	4	
Hymenoptera	Formicidae	*Solenopsis* sp.	Q	Winterhaven		1
Hymenoptera	Formicidae	*Solenopsis xyloni*	B	Needles		1
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Needles	1	1
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Vidal	1	
Hymenoptera	Formicidae	*Technomyrmex* sp.	Q	Winterhaven	1	
Hymenoptera	Formicidae	undet. Myrmicini	Q	Blythe	1	
Hymenoptera	Formicidae	undet. Myrmicini	Q	Vidal	1	
Hymenoptera	Formicidae	undet. Myrmicini	Q	Winterhaven	1	
Hymenoptera	Formicidae	*Wasmannia auropunctata*	Q	Blythe	1	
Hymenoptera	unidentifiable		Q	Needles		3
Isoptera	unidentifiable		Q	Needles		3
Lepidoptera	Arctiidae	unidentifiable	Q	Blythe	1	
Lepidoptera	Arctiidae	unidentifiable	Q	Needles	1	1
Lepidoptera	Arctiidae	unidentifiable	Q	Yermo	1	
Lepidoptera	Blastobasidae	unidentifiable	Q	Needles		2
Lepidoptera	Blastobasidae	unidentifiable	Q	Vidal	2	
Lepidoptera	Gelechiidae	unidentifiable	Q	Needles		1
Lepidoptera	Geometridae	unidentifiable	Q	Needles		1
Lepidoptera	Geometridae	unidentifiable	Q	Truckee	1	
Lepidoptera	Gracillariidae	unidentifiable	Q	Needles	1	1
Lepidoptera	Gracillariidae	unidentifiable	Q	Tulelake		1

Order	Family	Scientific Name		Station	Com	Pers
Lepidoptera	Hesperiidae	unidentifiable	Q	Needles		1
Lepidoptera	Hesperiidae	unidentifiable	Q	Winterhaven	1	
Lepidoptera	Lasiocampidae	*Malacosoma americanum*	A	Truckee	1	
Lepidoptera	Lasiocampidae	*Malacosoma* sp.	Q	Needles		2
Lepidoptera	Lasiocampidae	*Phyllodesma* sp.	Q	Smith River		1
Lepidoptera	Lymantriidae	*Lymantria dispar*	A	Benton	1	1
Lepidoptera	Lymantriidae	*Lymantria dispar*	A	Needles		3
Lepidoptera	Lymantriidae	*Lymantria dispar*	A	Redwood Hwy		1
Lepidoptera	Lymantriidae	*Lymantria dispar*	A	Truckee	3	2
Lepidoptera	Lymantriidae	*Lymantria dispar*	A	Yermo		2
Lepidoptera	Lymantriidae	unidentifiable	Q	Needles		2
Lepidoptera	Lymantriidae	unidentifiable	Q	Truckee		1
Lepidoptera	Lymantriidae	*Orgyia* sp.	Q	Truckee	1	
Lepidoptera	unidentifiable		Q	Needles	2	2
Lepidoptera	unidentifiable		Q	Truckee	1	
Lepidoptera	unidentifiable		Q	Vidal	1	
Lepidoptera	unidentifiable		Q	Winterhaven	2	
Lepidoptera	unidentifiable		Q	Yermo		1
Lepidoptera	Noctuidae	unidentifiable	Q	Blythe	10	1
Lepidoptera	Noctuidae	unidentifiable	Q	Meyers		1
Lepidoptera	Noctuidae	unidentifiable	Q	Needles		3
Lepidoptera	Noctuidae	unidentifiable	Q	Vidal	9	
Lepidoptera	Noctuidae	unidentifiable	Q	Yermo	1	
Lepidoptera	Noctuidae	*Noctua pronuba*	Q	Dorris	1	
Lepidoptera	Noctuidae	*Noctua pronuba*	Q	Hornbrook		1
Lepidoptera	Noctuidae	*Noctua pronuba*	Q	Truckee	2	
Lepidoptera	Psychidae	unidentifiable	Q	Needles	1	11
Lepidoptera	Psychidae	unidentifiable	Q	Truckee	7	4
Lepidoptera	Psychidae	unidentifiable	Q	Winterhaven		1
Lepidoptera	Pyralidae	*Acrobasis nuxvorella*	A	Vidal	1	
Lepidoptera	Pyralidae	*Diaphania nitidalis*	B	Needles	1	
Lepidoptera	Pyralidae	*Diatraea saccharalis*	A	Needles		1
Lepidoptera	Pyralidae	*Eoreuma loftini*	B	Needles		1
Lepidoptera	Pyralidae	unidentifiable	Q	Hornbrook	1	
Lepidoptera	Pyralidae	unidentifiable	Q	Needles	2	4
Lepidoptera	Pyralidae	unidentifiable	Q	Winterhaven	1	
Lepidoptera	Pyralidae	unidentifiable	Q	Yermo	1	
Lepidoptera	Pyralidae	*Ostrinia nubilalis*	A	Hornbrook	1	
Lepidoptera	Pyralidae	*Ostrinia nubilalis*	A	Yermo		2
Lepidoptera	Saturniidae	*Actias luna*	A	Truckee	1	
Lepidoptera	Saturniidae	unidentifiable	Q	Needles	1	
Lepidoptera	Tortricidae	*Cydia caryana*	A	Blythe	1	5
Lepidoptera	Tortricidae	*Cydia caryana*	A	Long valley		1
Lepidoptera	Tortricidae	*Cydia caryana*	A	Needles		12

Order	Family	Scientific Name		Station	Com	Pers
Lepidoptera	Tortricidae	*Cydia caryana*	A	Truckee	1	
Lepidoptera	Tortricidae	*Cydia caryana*	A	Winterhaven		3
Lepidoptera	Tortricidae	*Cydia* sp.	Q	Needles		1
Lepidoptera	Tortricidae	unidentifiable	Q	Needles	5	4
Lepidoptera	Tortricidae	unidentifiable	Q	Truckee	1	
Lepidoptera	Tortricidae	unidentifiable	Q	Vidal	1	
Lepidoptera	Tortricidae	unidentifiable	Q	Winterhaven	2	
Lepidoptera	Tortricidae	unidentifiable	Q	Yermo	1	
Lepidoptera	Tortricidae	*Thaumatotibia leucotreta*	A	Blythe	2	
Lepidoptera	Tortricidae	*Thaumatotibia leucotreta*	A	Needles	15	2
Lepidoptera	Yponomeutidae	*Atteva punctella*	Q	Needles		1
Lepidoptera	Zygaenidae	*Harrisina americana*	Q	Blythe	1	
Orthoptera	unidentifiable		Q	Needles		1
Orthoptera	Tettigoniidae	unidentifiable	Q	Needles		1
Orthoptera	Tettigoniidae	*Orchelimum* sp.	Q	Needles		2
Orthoptera	Tettigoniidae	*Orchelimum* sp.	Q	Vidal	2	
Pelecypoda	Dreisseniidae	*Dreissena bugensis*	Q	Blythe	3	2
Pelecypoda	Dreisseniidae	*Dreissena bugensis*	Q	Needles		21
Pelecypoda	Dreisseniidae	*Dreissena bugensis*	Q	Truckee	1	
Pelecypoda	Dreisseniidae	*Dreissena bugensis*	Q	Vidal		37
Pelecypoda	Dreisseniidae	*Dreissena bugensis*	Q	Yermo	1	16
Pelecypoda	Dreisseniidae	*Dreissena polymorpha*	Q	Blythe	1	
Pelecypoda	Dreisseniidae	*Dreissena polymorpha*	Q	Long Valley	1	
Pelecypoda	Dreisseniidae	*Dreissena polymorpha*	Q	Needles		4
Pelecypoda	Dreisseniidae	*Dreissena polymorpha*	Q	Truckee	5	3
Pelecypoda	Dreisseniidae	*Dreissena polymorpha*	Q	Winterhaven		1
Pelecypoda	Dreisseniidae	*Dreissena polymorpha*	Q	Yermo		2
Pelecypoda	Dreisseniidae	*Dreissena* sp.	Q	Yermo		1
Pelecypoda	Dreisseniidae	unidentifiable	Q	Blythe		1
Pelecypoda	Dreisseniidae	*Mytilopsis leucophaeta*	Q	Blythe	1	4
Pelecypoda	Dreisseniidae	*Mytilopsis leucophaeta*	Q	Long Valley		1
Pelecypoda	Dreisseniidae	*Mytilopsis leucophaeta*	Q	Needles		1
Pelecypoda	Dreisseniidae	*Mytilopsis leucophaeta*	Q	Yermo	1	
Pulmonata	unidentifiable		Q	Needles		1
Thysanoptera	Aeolothripidae	*Aeolothrips* sp.	Q	Needles		2
Thysanoptera	unidentifiable		Q	Blythe	1	
Thysanoptera	unidentifiable		Q	Needles		3
Thysanoptera	unidentifiable		Q	Tulelake	1	
Thysanoptera	unidentifiable		Q	Vidal	2	
Thysanoptera	unidentifiable		Q	Winterhaven	1	
Thysanoptera	Phlaeothripidae	*Karnyothrips* sp.	Q	Needles		1
Thysanoptera	Phlaeothripidae	*Leptothrips* sp.	Q	Needles		1
Thysanoptera	Phlaeothripidae	unidentifiable	Q	Blythe	2	1
Thysanoptera	Phlaeothripidae	unidentifiable	Q	Needles	1	12

Order	Family	Scientific Name		Station	Com	Pers
Thysanoptera	Phlaeothripidae	unidentifiable	Q	Vidal	2	1
Thysanoptera	Phlaeothripidae	unidentifiable	Q	Winterhaven	1	
Thysanoptera	Phlaeothripidae	unidentifiable	Q	Yermo		2
Thysanoptera	Thripidae	*Frankliniella schultzei*	Q	Needles		2
Thysanoptera	Thripidae	*Megalurothrips* sp.	Q	Needles		1
Thysanoptera	Thripidae	unidentifiable	Q	Needles		9
Thysanoptera	Thripidae	unidentifiable	Q	Vidal	1	
Thysanoptera	Thripidae	unidentifiable	Q	Winterhaven		1
Thysanoptera	Thripidae	*Scirtothrips dorsalis*	Q	Needles	1	
Thysanoptera	Thripidae	*Thrips* sp.	Q	Needles	1	1
Thysanoptera	Thripidae	*Thrips* sp.	Q	Winterhaven	1	
misc. eggs			Q	Blythe	2	2
misc. eggs			Q	Hornbrook	1	
misc. eggs			Q	Vidal	1	2
misc. eggs			Q	Yermo	7	2
unidentifiable			Q	Blythe	1	
unidentifiable			Q	Needles	3	11
unidentifiable			Q	Smith River		1
unidentifiable			Q	Vidal	1	
unidentifiable			Q	Yermo	3	2
TOTALS					**1092**	**1574**

[1] Suborder Auchenorrhyncha, [2] Suborder Heteroptera, [3] Suborder Sternorrhyncha

* these samples were identified as *Abgrallaspis/Diaspidiotus* complex, but it has since been determined to be a new species of *Abgrallaspis* which is being described as new to science.

Notes:

This table represents the number of individual PDR's with these identifications, with many representing multiple specimens per PDR.

Those identified as "unidentifiable" represent samples where further identification was not possible, due to samples being damaged or incomplete, or the wrong sex or life stage for identification. Those labeled as "misc. eggs" were in groups where the egg stage is not identifiable.

ENTOMOLOGY

A, B & Q RATED INTERCEPTIONS BY COUNTY (NON-BORDER STATIONS)

Order	Family	Scientific Name		County	Total
Acari	misc. eggs		Q	Los Angeles	1
Acari	Pyrgomorphidae	*Atractomorpha sinensis*	Q	Los Angeles	6
Acari	Pyrgomorphidae	*Atractomorpha sinensis*	Q	San Mateo	2
Acari	Tydeidae	*Lorryia* sp.	Q	San Joaquin	1
Blattaria	misc. eggs		Q	San Mateo	1
Blattodea	Blattellidae	*Blattella* sp.	Q	San Mateo	1
Blattodea	Blattellidae	unidentifiable	Q	San Mateo	2
Blattodea	Blattidae	misc. eggs	Q	Los Angeles	1
Blattodea	Blattidae	unidentifiable	Q	Alameda	2
Blattodea	Blattidae	unidentifiable	Q	Contra Costa	1
Blattodea	Blattidae	unidentifiable	Q	San Bernadino	2
Blattodea	Diplopteridae	*Diploptera punctata*	Q	Los Angeles	4
Blattodea	Diplopteridae	*Diploptera punctata*	Q	San Diego	1
Blattodea	Diplopteridae	*Diploptera punctata*	Q	San Mateo	1
Coleoptera	Anobiidae	unidentifiable	Q	San Mateo	1
Coleoptera	Anthribidae	*Araecerus levipennis*	Q	San Mateo	1
Coleoptera	Anthribidae	*Exillis lepidus*	Q	San Mateo	1
Coleoptera	Anthribidae	*Exillis sp*	Q	San Mateo	3
Coleoptera	Bostrichidae	*Sinoxylon* sp.	Q	Los Angeles	1
Coleoptera	Bostrichidae	unidentifiable	Q	Mono	1
Coleoptera	Bruchidae	*Amblycerus* sp.	Q	San Mateo	1
Coleoptera	Bruchidae	*Exillis sp*	Q	Los Angeles	1
Coleoptera	Cerambycidae	*Chlorophorus diadema*	Q	San Joaquin	2
Coleoptera	Cerambycidae	*Sybra alternans*	A	Los Angeles	8
Coleoptera	Cerambycidae	*Sybra alternans*	Q	San Mateo	6
Coleoptera	Cerambycidae	unidentifiable	Q	San Diego	1
Coleoptera	Chrysomelidae	*Capraita* sp.	Q	Santa Barbara	1
Coleoptera	Chrysomelidae	*Leptinotarsa decemlineata*	A	Ventura	1
Coleoptera	Chrysomelidae	*Trachymela sloanei*	B	San Luis Obispo	1
Coleoptera	Chrysomelidae	undet. Alticinae	Q	San Mateo	1
Coleoptera	Chrysomelidae	undet. Hispinae	Q	San Mateo	1
Coleoptera	Chrysomelidae	unidentifiable	Q	Los Angeles	1
Coleoptera	Chrysomelidae	unidentifiable	Q	San Bernadino	1
Coleoptera	Chrysomelidae	unidentifiable	Q	San Mateo	1
Coleoptera	Chrysomelidae	unidentifiable	Q	Tulare	1
Coleoptera	Coccinellidae	unidentifiable	Q	San Mateo	2
Coleoptera	Curculionidae	*Cylas formicarius*	A	Los Angeles	1
Coleoptera	Curculionidae	*Diaprepes abbreviatus*	A	Los Angeles	1
Coleoptera	Curculionidae	*Diaprepes abbreviatus*	A	San Diego	2
Coleoptera	Curculionidae	*Myllocerus* sp.	Q	Los Angeles	1
Coleoptera	Curculionidae	*Naupactus sp*	Q	San Mateo	2

Order	Family	Scientific Name		County	Total
Coleoptera	Curculionidae	*Orchidophilus* sp.	Q	Los Angeles	2
Coleoptera	Curculionidae	*Orchidophilus* sp.	Q	San Bernadino	1
Coleoptera	Curculionidae	*Orchidophilus* sp.	Q	San Mateo	3
Coleoptera	Curculionidae	unidentifiable	Q	Alameda	1
Coleoptera	Curculionidae	unidentifiable	Q	Kern	1
Coleoptera	Curculionidae	unidentifiable	Q	Los Angeles	1
Coleoptera	Curculionidae	unidentifiable	Q	Riverside	1
Coleoptera	Curculionidae	unidentifiable	Q	San Bernadino	1
Coleoptera	Curculionidae	unidentifiable	Q	San Mateo	3
Coleoptera	Curculionidae	*Xylosandrus sp*	Q	Alameda	1
Coleoptera	Curculionidae	*Xylosandrus sp*	Q	Los Angeles	1
Coleoptera	Curculionidae	*Xylosandrus sp*	Q	San Mateo	1
Coleoptera	Elateridae	*Conoderus* sp.	Q	San Mateo	1
Coleoptera	Nitidulidae	*Aethina tumida*	B	Fresno	4
Coleoptera	Nitidulidae	*Aethina tumida*	B	Glenn	1
Coleoptera	Nitidulidae	*Aethina tumida*	B	Kern	1
Coleoptera	Nitidulidae	*Carpophilus* sp.	Q	San Mateo	1
Coleoptera	Scarabaeidae	*Adoretus* sp.	Q	San Bernadino	1
Coleoptera	Scarabaeidae	*Adoretus* sp.	Q	San Mateo	3
Coleoptera	Scarabaeidae	*Anomala* sp.	Q	Sacramento	1
Coleoptera	Scarabaeidae	*Anomala* sp.	Q	San Bernadino	1
Coleoptera	Scarabaeidae	*Anomala* sp.	Q	San Mateo	1
Coleoptera	Scarabaeidae	*Cyclocephala* sp.	Q	San Mateo	1
Coleoptera	Scarabaeidae	*Phyllophaga* sp.	Q	Sacramento	1
Coleoptera	Scarabaeidae	*Phyllophaga* sp.	Q	San Diego	2
Coleoptera	Scarabaeidae	*Phyllophaga* sp.	Q	San Mateo	1
Coleoptera	Scarabaeidae	*Popillia japonica*	A	Alameda	76
Coleoptera	Scarabaeidae	*Popillia japonica*	A	Los Angeles	104
Coleoptera	Scarabaeidae	*Popillia japonica*	A	Orange	12
Coleoptera	Scarabaeidae	*Popillia japonica*	A	Sacramento	8
Coleoptera	Scarabaeidae	*Popillia japonica*	A	San Bernadino	38
Coleoptera	Scarabaeidae	*Popillia japonica*	A	San Diego	79
Coleoptera	Scarabaeidae	*Popillia japonica*	A	Santa Clara	15
Coleoptera	Scarabaeidae	*Protaetia fusca*	A	San Mateo	1
Coleoptera	Scarabaeidae	*Protaetia* sp.	A	Orange	1
Coleoptera	Scarabaeidae	*Protaetra fusca*	A	San Mateo	1
Diptera	Agromyzidae	*Phytomyza* sp.	B	Sonoma	1
Diptera	Agromyzidae	*Phytomyza* sp.	Q	Los Angeles	1
Diptera	Agromyzidae	unidentifiable	Q	San Mateo	3
Diptera	Cecidomyiidae	undet. Micromyini	Q	San Mateo	1
Diptera	Cecidomyiidae	unidentifiable	Q	Riverside	1
Diptera	Tephritidae	*Anastrepha suspensa*	A	San Diego	1
Diptera	Tephritidae	*Bactrocera dorsalis*	A	Los Angeles	1
Diptera	Tephritidae	*Bactrocera oleae*	A	Kern	1

Order	Family	Scientific Name		County	Total
Diptera	Tephritidae	*Rhagoletis pomonella*	B	Inyo	1
Gastropoda	Achatinidae	*Achatina fulica*	A	San Mateo	1
Gastropoda	Achatinidae	*Opeas pyrgula*	A	Contra Costa	1
Gastropoda	Bradybaenidae	*Bradybaena similaris*	B	Alameda	7
Gastropoda	Bradybaenidae	*Bradybaena similaris*	B	Los Angeles	31
Gastropoda	Bradybaenidae	*Bradybaena similaris*	B	Monterey	2
Gastropoda	Bradybaenidae	*Bradybaena similaris*	B	Orange	5
Gastropoda	Bradybaenidae	*Bradybaena similaris*	B	Riverside	1
Gastropoda	Bradybaenidae	*Bradybaena similaris*	B	San Diego	60
Gastropoda	Bradybaenidae	*Bradybaena similaris*	B	San Joaquin	6
Gastropoda	Bradybaenidae	*Bradybaena similaris*	B	San Mateo	7
Gastropoda	Bradybaenidae	*Bradybaena* sp.	B	Los Angeles	1
Gastropoda	Bradybaenidae	*Bradybaena* sp.	Q	San Mateo	1
Gastropoda	Bradybaenidae	unidentifiable	Q	San Mateo	1
Gastropoda	Camaenidae	*Zachrysia provisoria*	Q	San Diego	8
Gastropoda	Camaenidae	*Zachrysia provisoria*	Q	San Mateo	2
Gastropoda	Camaenidae	*Zachrysia* sp.	Q	San Diego	1
Gastropoda	Helicidae	*Cepaea nemoralis*	Q	Fresno	1
Gastropoda	Orthalicidae	unidentifiable	Q	Los Angeles	1
Gastropoda	Philomycidae	*Meghimatium striatum*	Q	Orange	1
Gastropoda	Philomycidae	*Meghimatium striatum*	Q	Sacramento	1
Gastropoda	Philomycidae	unidentifiable	Q	Los Angeles	3
Gastropoda	Philomycidae	unidentifiable	Q	Riverside	1
Gastropoda	Subulinidae	*Allopeas clavulinum*	A	San Diego	9
Gastropoda	Subulinidae	*Allopeas* sp.	A	Riverside	1
Gastropoda	Subulinidae	*Paropeas achatinaceum*	A	San Diego	2
Gastropoda	Subulinidae	*Subulina octona*	A	San Diego	1
Gastropoda	Thiaridae	*Melanoides sp*	Q	Kings	1
Gastropoda	Thiaridae	unidentifiable	Q	San Mateo	1
Gastropoda	unidentifiable		Q	Alameda	1
Gastropoda	unidentifiable		Q	San Mateo	2
Hemiptera[1]	Cicadellidae	*Agallia lingula*	Q	San Mateo	1
Hemiptera[1]	Cicadellidae	*Agallia* sp.	Q	Los Angeles	7
Hemiptera[1]	Cicadellidae	*Agallia* sp.	Q	Mendocino	1
Hemiptera[1]	Cicadellidae	*Agallia* sp.	Q	San Luis Obispo	1
Hemiptera[1]	Cicadellidae	*Agallia* sp.	Q	San Mateo	55
Hemiptera[1]	Cicadellidae	*Empoasca* sp.	Q	Los Angeles	3
Hemiptera[1]	Cicadellidae	*Empoasca* sp.	Q	Orange	4
Hemiptera[1]	Cicadellidae	*Empoasca* sp.	Q	San Mateo	15
Hemiptera[1]	Cicadellidae	*Empoasca stevensi*	Q	Orange	1
Hemiptera[1]	Cicadellidae	*Graphocephala fennahi*	Q	Sonoma	1
Hemiptera[1]	Cicadellidae	*Gypona* sp.	Q	Los Angeles	1
Hemiptera[1]	Cicadellidae	*Gypona* sp.	Q	San Mateo	1
Hemiptera[1]	Cicadellidae	*Gyponana germari*	Q	Los Angeles	12

Order	Family	Scientific Name		County	Total
Hemiptera[1]	Cicadellidae	*Gyponana germari*	Q	San Mateo	11
Hemiptera[1]	Cicadellidae	*Gyponana* sp.	Q	Los Angeles	27
Hemiptera[1]	Cicadellidae	*Gyponana* sp.	Q	San Bernadino	1
Hemiptera[1]	Cicadellidae	*Gyponana* sp.	Q	San Mateo	12
Hemiptera[1]	Cicadellidae	*Gyponana* sp.	Q	Shasta	1
Hemiptera[1]	Cicadellidae	*Homalodisca coagulata*	B	Los Angeles	1
Hemiptera[1]	Cicadellidae	*Homalodisca coagulata*	B	Riverside	1
Hemiptera[1]	Cicadellidae	*Homalodisca* sp.	Q	Imperial	1
Hemiptera[1]	Cicadellidae	*Homalodisca* sp.	Q	Los Angeles	2
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Alameda	12
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Contra Costa	3
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Fresno	3
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Imperial	9
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Marin	1
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Monterey	2
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Napa	1
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Orange	7
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Sacramento	1
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	San Diego	1
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	San Joaquin	27
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	San Luis Obispo	27
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	San Mateo	2
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Santa Clara	5
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Santa Cruz	2
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Sonoma	4
Hemiptera[1]	Cicadellidae	*Homalodisca vitripennis*	B	Stanislaus	3
Hemiptera[1]	Cicadellidae	*Kallitaxila granulata*	Q	San Mateo	93
Hemiptera[1]	Cicadellidae	misc. eggs	Q	Los Angeles	1
Hemiptera[1]	Cicadellidae	misc. eggs	Q	Orange	1
Hemiptera[1]	Cicadellidae	misc. eggs	Q	San Mateo	1
Hemiptera[1]	Cicadellidae	*Oncometopia* sp.	Q	Los Angeles	1
Hemiptera[1]	Cicadellidae	*Oncometopia* sp.	Q	Riverside	1
Hemiptera[1]	Cicadellidae	*Oncometopia* sp.	Q	Stanislaus	1
Hemiptera[1]	Cicadellidae	unidentifiable	Q	Los Angeles	9
Hemiptera[1]	Cicadellidae	unidentifiable	Q	Sacramento	1
Hemiptera[1]	Cicadellidae	unidentifiable	Q	San Luis Obispo	1
Hemiptera[1]	Cicadellidae	unidentifiable	Q	San Mateo	17
Hemiptera[1]	Cicadellidae	unidentifiable	Q	Sonoma	1
Hemiptera[1]	Cixiidae	*Oliarus discrepans*	Q	San Mateo	1
Hemiptera[1]	Cixiidae	*Oliarus* sp.	Q	Los Angeles	1
Hemiptera[1]	Cixiidae	unidentifiable	Q	Los Angeles	2
Hemiptera[1]	Cixiidae	unidentifiable	Q	San Mateo	1
Hemiptera[1]	Delphacidae	*Peregrinus maidis*	Q	San Mateo	1
Hemiptera[1]	Delphacidae	*Tarophagus colocasiae*	Q	Los Angeles	2

Order	Family	Scientific Name		County	Total
Hemiptera[1]	Delphacidae	*Tarophagus colocasiae*	Q	San Mateo	8
Hemiptera[1]	Delphacidae	unidentifiable	Q	Los Angeles	1
Hemiptera[1]	Delphacidae	unidentifiable	Q	San Mateo	2
Hemiptera[1]	Flatidae	*Melormenis basalis*	Q	San Mateo	1
Hemiptera[1]	Flatidae	*Melormenis* sp.	Q	Alameda	1
Hemiptera[1]	Flatidae	*Melormenis* sp.	Q	Los Angeles	2
Hemiptera[1]	Flatidae	unidentifiable	Q	Los Angeles	1
Hemiptera[1]	Flatidae	unidentifiable	Q	San Mateo	1
Hemiptera[1]	Fulgoridae	unidentifiable	Q	San Mateo	2
Hemiptera[1]	Tropiduchidae	*Kallitaxila granulata*	Q	Alameda	3
Hemiptera[1]	Tropiduchidae	*Kallitaxila granulata*	Q	Los Angeles	67
Hemiptera[1]	Tropiduchidae	*Kallitaxila granulata*	Q	Orange	1
Hemiptera[1]	Tropiduchidae	*Kallitaxila granulata*	Q	San Bernadino	1
Hemiptera[1]	Tropiduchidae	*Kallitaxila granulata*	Q	San Diego	1
Hemiptera[1]	Tropiduchidae	*Kallitaxila* sp.	Q	Contra Costa	1
Hemiptera[2]	Anthocoridae	unidentifiable	Q	San Mateo	1
Hemiptera[2]	Berytidae	*Berytinus* sp.	Q	San Mateo	1
Hemiptera[2]	Coreidae	*Mozena sp*	Q	San Joaquin	1
Hemiptera[2]	Coreidae	*Physomerus grossipes*	Q	Los Angeles	1
Hemiptera[2]	Coreidae	*Physomerus grossipes*	Q	San Mateo	1
Hemiptera[2]	Cydnidae	*Geotomus pygmaeus*	Q	Los Angeles	1
Hemiptera[2]	Cydnidae	unidentifiable	Q	Los Angeles	1
Hemiptera[2]	Lygaeidae	*Clerada* sp.	Q	San Mateo	1
Hemiptera[2]	Lygaeidae	*Graptostethus manillensis*	Q	Los Angeles	2
Hemiptera[2]	Lygaeidae	*Nysius* sp.	Q	Los Angeles	27
Hemiptera[2]	Lygaeidae	*Nysius* sp.	Q	San Mateo	68
Hemiptera[2]	Lygaeidae	*Oceanides* sp.	Q	Los Angeles	1
Hemiptera[2]	Lygaeidae	*Oxycarenus hyalinipennis*	Q	San Mateo	1
Hemiptera[2]	Lygaeidae	*Remaudiereana nigriceps*	Q	San Mateo	6
Hemiptera[2]	Lygaeidae	unidentifiable	Q	Alameda	1
Hemiptera[2]	Lygaeidae	unidentifiable	Q	Contra Costa	1
Hemiptera[2]	Lygaeidae	unidentifiable	Q	Los Angeles	1
Hemiptera[2]	Lygaeidae	unidentifiable	Q	San Mateo	9
Hemiptera[2]	Miridae	unidentifiable	Q	Contra Costa	1
Hemiptera[2]	Miridae	unidentifiable	Q	Los Angeles	2
Hemiptera[2]	Miridae	unidentifiable	Q	Orange	1
Hemiptera[2]	Miridae	unidentifiable	Q	San Mateo	10
Hemiptera[2]	misc. eggs		Q	Los Angeles	1
Hemiptera[2]	misc. eggs		Q	San Mateo	2
Hemiptera[2]	Pentatomidae	*Euschistus* sp.	Q	San Mateo	1
Hemiptera[2]	Pentatomidae	*Halyomorpha halys*	Q	Sacramento	2
Hemiptera[2]	Pentatomidae	*Piezodorus* sp.	Q	San Mateo	1
Hemiptera[2]	Pentatomidae	*Plautia stali*	Q	Los Angeles	3
Hemiptera[2]	Pentatomidae	*Plautia stali*	Q	San Mateo	1

Order	Family	Scientific Name		County	Total
Hemiptera[2]	Pentatomidae	unidentifiable	Q	Los Angeles	8
Hemiptera[2]	Pentatomidae	unidentifiable	Q	Orange	1
Hemiptera[2]	Pentatomidae	unidentifiable	Q	San Mateo	11
Hemiptera[2]	Pentatomidae	unidentifiable	Q	Sonoma	1
Hemiptera[2]	Plataspidae	*Coptosoma xanthogramma*	Q	Alameda	1
Hemiptera[3]	Aleyrodidae	*Aleurocerus palmae*	Q	Contra Costa	1
Hemiptera[3]	Aleyrodidae	*Aleuroclava jasmini*	Q	Los Angeles	1
Hemiptera[3]	Aleyrodidae	*Aleurodicus dispersus*	Q	Contra Costa	1
Hemiptera[3]	Aleyrodidae	*Aleurodicus dispersus*	Q	Los Angeles	33
Hemiptera[3]	Aleyrodidae	*Aleurodicus dispersus*	Q	Orange	2
Hemiptera[3]	Aleyrodidae	*Aleurodicus dispersus*	Q	Riverside	1
Hemiptera[3]	Aleyrodidae	*Aleurodicus dispersus*	Q	San Bernadino	1
Hemiptera[3]	Aleyrodidae	*Aleurodicus dispersus*	Q	San Francisco	1
Hemiptera[3]	Aleyrodidae	*Aleurodicus dispersus*	Q	San Luis Obispo	2
Hemiptera[3]	Aleyrodidae	*Aleurodicus dispersus*	Q	San Mateo	61
Hemiptera[3]	Aleyrodidae	*Aleurodicus dispersus*	Q	Santa Barbara	2
Hemiptera[3]	Aleyrodidae	*Aleurodicus dispersus*	Q	Shasta	1
Hemiptera[3]	Aleyrodidae	*Aleurodicus dispersus*	Q	Sonoma	1
Hemiptera[3]	Aleyrodidae	*Aleurodicus* sp.	Q	San Mateo	2
Hemiptera[3]	Aleyrodidae	*Aleuroglandulus subtilis*	Q	Santa Barbara	1
Hemiptera[3]	Aleyrodidae	*Aleuroplatus* sp.	Q	San Mateo	2
Hemiptera[3]	Aleyrodidae	*Aleurotrachelus* sp.	Q	Los Angeles	13
Hemiptera[3]	Aleyrodidae	*Aleurotrachelus trachoides*	Q	Los Angeles	1
Hemiptera[3]	Aleyrodidae	*Aleurotulus anthuricola*	Q	San Bernadino	2
Hemiptera[3]	Aleyrodidae	*Aleyrodes* sp.	Q	Alameda	1
Hemiptera[3]	Aleyrodidae	*Aleyrodes* sp.	Q	Contra Costa	1
Hemiptera[3]	Aleyrodidae	*Aleyrodes* sp.	Q	San Bernadino	1
Hemiptera[3]	Aleyrodidae	*Aleyrodes* sp.	Q	San Mateo	4
Hemiptera[3]	Aleyrodidae	*Crenidorsum* sp.	Q	San Mateo	1
Hemiptera[3]	Aleyrodidae	*Dialeurodes kirkaldyi*	Q	Alameda	1
Hemiptera[3]	Aleyrodidae	*Dialeurodes* sp.	Q	Alameda	1
Hemiptera[3]	Aleyrodidae	*Dialeurodes* sp.	Q	Los Angeles	1
Hemiptera[3]	Aleyrodidae	misc. eggs	Q	Alameda	1
Hemiptera[3]	Aleyrodidae	misc. eggs	Q	Contra Costa	1
Hemiptera[3]	Aleyrodidae	misc. eggs	Q	San Mateo	3
Hemiptera[3]	Aleyrodidae	*Orchamoplatus mammaeferus*	Q	Alameda	1
Hemiptera[3]	Aleyrodidae	*Orchamoplatus mammaeferus*	Q	Contra Costa	4
Hemiptera[3]	Aleyrodidae	*Paraleyrodes* sp.	Q	Los Angeles	1
Hemiptera[3]	Aleyrodidae	*Trialeurodes* sp.	Q	Shasta	1
Hemiptera[3]	Aleyrodidae	unidentifiable	Q	Los Angeles	1
Hemiptera[3]	Aleyrodidae	unidentifiable	Q	San Mateo	8
Hemiptera[3]	Aphididae	*Aphis* sp.	Q	San Mateo	2

Order	Family	Scientific Name		County	Total
Hemiptera[3]	Aphididae	*Myzus* sp.	Q	San Mateo	1
Hemiptera[3]	Aphididae	unidentifiable	Q	Alameda	5
Hemiptera[3]	Aphididae	unidentifiable	Q	Contra Costa	3
Hemiptera[3]	Aphididae	unidentifiable	Q	Los Angeles	2
Hemiptera[3]	Aphididae	unidentifiable	Q	Orange	1
Hemiptera[3]	Aphididae	unidentifiable	Q	Riverside	2
Hemiptera[3]	Aphididae	unidentifiable	Q	San Bernadino	1
Hemiptera[3]	Aphididae	unidentifiable	Q	San Luis Obispo	3
Hemiptera[3]	Aphididae	unidentifiable	Q	San Mateo	86
Hemiptera[3]	Aphididae	unidentifiable	Q	Santa Barbara	2
Hemiptera[3]	Asterolecaniidae	unidentifiable	Q	San Bernadino	2
Hemiptera[3]	Coccidae	*Ceroplastes rubens*	A	Contra Costa	3
Hemiptera[3]	Coccidae	*Ceroplastes rubens*	A	Orange	1
Hemiptera[3]	Coccidae	*Ceroplastes rubens*	A	San Bernadino	1
Hemiptera[3]	Coccidae	*Ceroplastes rubens*	A	San Diego	1
Hemiptera[3]	Coccidae	*Ceroplastes rubens*	A	Santa Barbara	1
Hemiptera[3]	Coccidae	*Ceroplastes rusci*	A	Contra Costa	1
Hemiptera[3]	Coccidae	*Ceroplastes rusci*	A	Los Angeles	1
Hemiptera[3]	Coccidae	*Ceroplastes rusci*	A	San Diego	3
Hemiptera[3]	Coccidae	*Ceroplastes rusci*	A	San Mateo	1
Hemiptera[3]	Coccidae	*Ceroplastes* sp.	Q	Los Angeles	2
Hemiptera[3]	Coccidae	*Ceroplastes* sp.	Q	Riverside	1
Hemiptera[3]	Coccidae	*Ceroplastes* sp.	Q	San Mateo	1
Hemiptera[3]	Coccidae	*Coccus acutissimus*	Q	Los Angeles	1
Hemiptera[3]	Coccidae	*Coccus acutissimus*	Q	Orange	1
Hemiptera[3]	Coccidae	*Coccus moestus*	Q	Alameda	1
Hemiptera[3]	Coccidae	*Coccus* sp.	Q	Contra Costa	3
Hemiptera[3]	Coccidae	*Coccus* sp.	Q	Los Angeles	6
Hemiptera[3]	Coccidae	*Coccus* sp.	Q	San Mateo	2
Hemiptera[3]	Coccidae	*Coccus viridis*	A	Orange	1
Hemiptera[3]	Coccidae	*Coccus viridis*	A	Santa Clara	1
Hemiptera[3]	Coccidae	*Coccus viridis*	Q	Alameda	1
Hemiptera[3]	Coccidae	*Inglisia vitrea*	Q	San Mateo	1
Hemiptera[3]	Coccidae	*Milviscutulus mangiferae*	Q	Contra Costa	1
Hemiptera[3]	Coccidae	*Milviscutulus mangiferae*	Q	Los Angeles	1
Hemiptera[3]	Coccidae	*Milviscutulus mangiferae*	Q	Orange	1
Hemiptera[3]	Coccidae	*Milviscutulus mangiferae*	Q	San Bernadino	2
Hemiptera[3]	Coccidae	*Milviscutulus mangiferae*	Q	Santa Barbara	1
Hemiptera[3]	Coccidae	*Milviscutulus* sp.	Q	Los Angeles	1
Hemiptera[3]	Coccidae	misc. eggs	Q	San Luis Obispo	1
Hemiptera[3]	Coccidae	*Protopulvinaria pyriformis*	B	San Luis Obispo	3
Hemiptera[3]	Coccidae	*Pulvinaria polygonata*	Q	San Mateo	1
Hemiptera[3]	Coccidae	*Pulvinaria psidii*	B	Alameda	1
Hemiptera[3]	Coccidae	*Pulvinaria psidii*	B	San Mateo	1

Order	Family	Scientific Name		County	Total
Hemiptera[3]	Coccidae	*Pulvinaria* sp.	Q	Contra Costa	1
Hemiptera[3]	Coccidae	*Pulvinaria* sp.	Q	Los Angeles	1
Hemiptera[3]	Coccidae	*Pulvinaria* sp.	Q	San Mateo	2
Hemiptera[3]	Coccidae	*Pulvinaria urbicola*	B	Los Angeles	2
Hemiptera[3]	Coccidae	*Pulvinaria urbicola*	B	San Luis Obispo	2
Hemiptera[3]	Coccidae	unidentifiable	Q	Contra Costa	4
Hemiptera[3]	Coccidae	unidentifiable	Q	Los Angeles	14
Hemiptera[3]	Coccidae	unidentifiable	Q	Monterey	1
Hemiptera[3]	Coccidae	unidentifiable	Q	San Mateo	4
Hemiptera[3]	Coccidae	*Vinsonia stellifera*	Q	Contra Costa	1
Hemiptera[3]	Coccidae	*Vinsonia stellifera*	Q	Los Angeles	7
Hemiptera[3]	Coccidae	*Vinsonia stellifera*	Q	San Mateo	1
Hemiptera[3]	Diaspididae	*Abgrallaspis* sp.*	Q	Los Angeles	27
Hemiptera[3]	Diaspididae	*Acutaspis albopicta*	A	Los Angeles	2
Hemiptera[3]	Diaspididae	*Acutaspis albopicta*	A	San Mateo	1
Hemiptera[3]	Diaspididae	*Acutaspis* sp.	A	Los Angeles	1
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Alameda	1
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Contra Costa	2
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Los Angeles	1
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Marin	1
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	San Bernadino	3
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	San Diego	1
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	San Luis Obispo	1
Hemiptera[3]	Diaspididae	*Aonidiella aurantii*	B	Santa Cruz	2
Hemiptera[3]	Diaspididae	*Aonidiella inornata*	Q	San Mateo	21
Hemiptera[3]	Diaspididae	*Aonidiella orientalis*	A	Los Angeles	1
Hemiptera[3]	Diaspididae	*Aonidiella orientalis*	A	Santa Barbara	1
Hemiptera[3]	Diaspididae	*Aonidiella* sp.	Q	Los Angeles	2
Hemiptera[3]	Diaspididae	*Aonidiella* sp.	Q	San Mateo	5
Hemiptera[3]	Diaspididae	*Aspidiotus destructor*	A	Alameda	1
Hemiptera[3]	Diaspididae	*Aspidiotus destructor*	A	Contra Costa	1
Hemiptera[3]	Diaspididae	*Aspidiotus destructor*	A	Los Angeles	21
Hemiptera[3]	Diaspididae	*Aspidiotus destructor*	A	San Mateo	3
Hemiptera[3]	Diaspididae	*Aspidiotus destructor*	A	Santa Barbara	4
Hemiptera[3]	Diaspididae	*Aspidiotus excisus*	Q	Los Angeles	1
Hemiptera[3]	Diaspididae	*Aspidiotus excisus*	Q	Orange	2
Hemiptera[3]	Diaspididae	*Aspidiotus* sp.	A	San Mateo	1
Hemiptera[3]	Diaspididae	*Aspidiotus* sp.	Q	Los Angeles	3
Hemiptera[3]	Diaspididae	*Aulacaspis* sp.	Q	Santa Barbara	1
Hemiptera[3]	Diaspididae	*Aulacaspis yasumatsui*	Q	Contra Costa	1
Hemiptera[3]	Diaspididae	*Aulacaspis yasumatsui*	Q	Los Angeles	13
Hemiptera[3]	Diaspididae	*Aulacaspis yasumatsui*	Q	Orange	1
Hemiptera[3]	Diaspididae	*Aulacaspis yasumatsui*	Q	San Diego	2
Hemiptera[3]	Diaspididae	*Aulacaspis yasumatsui*	Q	San Mateo	1

Order	Family	Scientific Name		County	Total
Hemiptera[3]	Diaspididae	*Aulacaspis yasumatsui*	Q	Shasta	1
Hemiptera[3]	Diaspididae	*Chionaspis heterophyllae*	Q	San Luis Obispo	1
Hemiptera[3]	Diaspididae	*Chrysomphalus* sp.	Q	Alameda	1
Hemiptera[3]	Diaspididae	*Diaspis texensis*	Q	Orange	2
Hemiptera[3]	Diaspididae	*Fiorinia* sp.	Q	Alameda	1
Hemiptera[3]	Diaspididae	*Fiorinia* sp.	Q	San Mateo	1
Hemiptera[3]	Diaspididae	*Hemiberlesia palmae*	A	San Mateo	2
Hemiptera[3]	Diaspididae	*Hemiberlesia* sp.	Q	San Mateo	1
Hemiptera[3]	Diaspididae	*Ischnaspis longirostris*	A	Alameda	2
Hemiptera[3]	Diaspididae	*Ischnaspis longirostris*	A	Los Angeles	1
Hemiptera[3]	Diaspididae	*Ischnaspis longirostris*	A	Orange	1
Hemiptera[3]	Diaspididae	*Lepidosaphes beckii*	B	Contra Costa	1
Hemiptera[3]	Diaspididae	*Lepidosaphes beckii*	B	Fresno	1
Hemiptera[3]	Diaspididae	*Lepidosaphes beckii*	B	Orange	1
Hemiptera[3]	Diaspididae	*Lepidosaphes beckii*	B	Riverside	4
Hemiptera[3]	Diaspididae	*Lepidosaphes beckii*	B	San Bernadino	2
Hemiptera[3]	Diaspididae	*Lepidosaphes beckii*	B	Sonoma	1
Hemiptera[3]	Diaspididae	*Lepidosaphes rubrovittata*	Q	Los Angeles	3
Hemiptera[3]	Diaspididae	*Lepidosaphes* sp.	Q	San Mateo	1
Hemiptera[3]	Diaspididae	*Lepidosaphes stepta*	Q	Los Angeles	1
Hemiptera[3]	Diaspididae	*Lopholeucaspis cockerelli*	A	Orange	1
Hemiptera[3]	Diaspididae	*Melanaspis bromeliae*	Q	Contra Costa	1
Hemiptera[3]	Diaspididae	*Parlatoria pergandii*	B	San Bernadino	3
Hemiptera[3]	Diaspididae	*Parlatoria pergandii*	B	Sonoma	2
Hemiptera[3]	Diaspididae	*Parlatoria* sp.	Q	San Mateo	1
Hemiptera[3]	Diaspididae	*Pinnaspis buxi*	A	Alameda	2
Hemiptera[3]	Diaspididae	*Pinnaspis buxi*	A	Contra Costa	2
Hemiptera[3]	Diaspididae	*Pinnaspis buxi*	A	Los Angeles	93
Hemiptera[3]	Diaspididae	*Pinnaspis buxi*	A	Orange	7
Hemiptera[3]	Diaspididae	*Pinnaspis buxi*	A	San Mateo	44
Hemiptera[3]	Diaspididae	*Pinnaspis buxi*	A	Santa Barbara	2
Hemiptera[3]	Diaspididae	*Pinnaspis* sp.	A	Los Angeles	1
Hemiptera[3]	Diaspididae	*Pinnaspis* sp.	Q	Contra Costa	1
Hemiptera[3]	Diaspididae	*Pinnaspis* sp.	Q	San Luis Obispo	1
Hemiptera[3]	Diaspididae	*Pinnaspis* sp.	Q	San Mateo	2
Hemiptera[3]	Diaspididae	*Pinnaspis strachani*	A	Alameda	5
Hemiptera[3]	Diaspididae	*Pinnaspis strachani*	A	Contra Costa	1
Hemiptera[3]	Diaspididae	*Pinnaspis strachani*	A	Fresno	1
Hemiptera[3]	Diaspididae	*Pinnaspis strachani*	A	Los Angeles	10
Hemiptera[3]	Diaspididae	*Pinnaspis strachani*	A	Orange	7
Hemiptera[3]	Diaspididae	*Pinnaspis strachani*	A	San Bernadino	1
Hemiptera[3]	Diaspididae	*Pinnaspis strachani*	A	San Diego	1
Hemiptera[3]	Diaspididae	*Pinnaspis strachani*	A	San Joaquin	2
Hemiptera[3]	Diaspididae	*Pinnaspis strachani*	A	San Luis Obispo	4

Order	Family	Scientific Name		County	Total
Hemiptera[3]	Diaspididae	*Pinnaspis strachani*	A	San Mateo	8
Hemiptera[3]	Diaspididae	*Pinnaspis uniloba*	Q	Orange	2
Hemiptera[3]	Diaspididae	*Pseudaonidia trilobitiformis*	Q	Alameda	1
Hemiptera[3]	Diaspididae	*Pseudaonidia trilobitiformis*	Q	Contra Costa	2
Hemiptera[3]	Diaspididae	*Pseudaonidia trilobitiformis*	Q	Los Angeles	2
Hemiptera[3]	Diaspididae	*Pseudaonidia trilobitiformis*	Q	Orange	1
Hemiptera[3]	Diaspididae	*Pseudaonidia trilobitiformis*	Q	San Mateo	1
Hemiptera[3]	Diaspididae	*Pseudaulacaspis brimblecombei*	Q	Contra Costa	6
Hemiptera[3]	Diaspididae	*Pseudaulacaspis brimblecombei*	Q	Orange	2
Hemiptera[3]	Diaspididae	*Pseudaulacaspis brimblecombei*	Q	Sacramento	1
Hemiptera[3]	Diaspididae	*Pseudaulacaspis brimblecombei*	Q	San Bernadino	1
Hemiptera[3]	Diaspididae	*Pseudaulacaspis brimblecombei*	Q	Sonoma	1
Hemiptera[3]	Diaspididae	*Pseudaulacaspis cockerelli*	A	Alameda	3
Hemiptera[3]	Diaspididae	*Pseudaulacaspis cockerelli*	A	Contra Costa	4
Hemiptera[3]	Diaspididae	*Pseudaulacaspis cockerelli*	A	Los Angeles	9
Hemiptera[3]	Diaspididae	*Pseudaulacaspis cockerelli*	A	Orange	2
Hemiptera[3]	Diaspididae	*Pseudaulacaspis cockerelli*	A	San Bernadino	2
Hemiptera[3]	Diaspididae	*Pseudaulacaspis cockerelli*	A	San Diego	17
Hemiptera[3]	Diaspididae	*Pseudaulacaspis cockerelli*	A	San Joaquin	1
Hemiptera[3]	Diaspididae	*Pseudaulacaspis cockerelli*	A	San Mateo	19
Hemiptera[3]	Diaspididae	*Pseudaulacaspis cockerelli*	A	Santa Cruz	1
Hemiptera[3]	Diaspididae	*Pseudaulacaspis pentagona*	A	Contra Costa	1
Hemiptera[3]	Diaspididae	*Pseudaulacaspis pentagona*	A	San Bernadino	3
Hemiptera[3]	Diaspididae	*Pseudaulacaspis pentagona*	A	San Diego	1
Hemiptera[3]	Diaspididae	*Pseudaulacaspis pentagona*	A	San Mateo	23
Hemiptera[3]	Diaspididae	*Pseudoparlatoria parlatorioides*	A	Los Angeles	3
Hemiptera[3]	Diaspididae	*Pseudoparlatoria* sp.	Q	San Mateo	1
Hemiptera[3]	Diaspididae	*Selenaspidus articulatus*	A	Los Angeles	4
Hemiptera[3]	Diaspididae	*Selenaspidus articulatus*	A	Orange	1
Hemiptera[3]	Diaspididae	*Selenaspidus articulatus*	A	San Mateo	3
Hemiptera[3]	Diaspididae	unidentifiable	Q	Contra Costa	1
Hemiptera[3]	Diaspididae	unidentifiable	Q	Los Angeles	3
Hemiptera[3]	Diaspididae	unidentifiable	Q	San Bernadino	2
Hemiptera[3]	Diaspididae	unidentifiable	Q	San Diego	1
Hemiptera[3]	Diaspididae	unidentifiable	Q	San Mateo	18
Hemiptera[3]	Diaspididae	*Velataspis* sp.	Q	Los Angeles	1
Hemiptera[3]	Margarodidae	*Icerya* sp.	Q	San Mateo	1
Hemiptera[3]	Margarodidae	unidentifiable	Q	San Mateo	2

Order	Family	Scientific Name		County	Total
Hemiptera[3]	Pseudococcidae	*Delottococcus* sp.	Q	San Bernadino	1
Hemiptera[3]	Pseudococcidae	*Dysmicoccus neobrevipes*	Q	Santa Cruz	1
Hemiptera[3]	Pseudococcidae	*Dysmicoccus* sp.	Q	Contra Costa	1
Hemiptera[3]	Pseudococcidae	*Dysmicoccus* sp.	Q	Riverside	1
Hemiptera[3]	Pseudococcidae	*Ferrisia* sp.	B	San Mateo	1
Hemiptera[3]	Pseudococcidae	*Ferrisia virgata*	B	Alameda	1
Hemiptera[3]	Pseudococcidae	*Ferrisia virgata*	B	Los Angeles	2
Hemiptera[3]	Pseudococcidae	*Ferrisia virgata*	B	Orange	1
Hemiptera[3]	Pseudococcidae	*Ferrisia virgata*	B	San Mateo	2
Hemiptera[3]	Pseudococcidae	*Geococcus coffeae*	Q	San Diego	1
Hemiptera[3]	Pseudococcidae	*Laminicoccus pandani*	Q	San Mateo	1
Hemiptera[3]	Pseudococcidae	*Maconellicoccus hirsutus*	A	Alameda	2
Hemiptera[3]	Pseudococcidae	*Maconellicoccus hirsutus*	A	San Bernadino	1
Hemiptera[3]	Pseudococcidae	*Nipaecoccus* sp.	Q	Los Angeles	2
Hemiptera[3]	Pseudococcidae	*Nipaecoccus* sp.	Q	San Bernadino	2
Hemiptera[3]	Pseudococcidae	*Nipaecoccus* sp.	Q	San Mateo	4
Hemiptera[3]	Pseudococcidae	*Nipaecoccus* sp.	Q	Santa Cruz	1
Hemiptera[3]	Pseudococcidae	*Nipaecoccus* sp.	Q	Shasta	1
Hemiptera[3]	Pseudococcidae	*Paracoccus marginatus*	Q	Sonoma	1
Hemiptera[3]	Pseudococcidae	*Paracoccus* sp.	Q	San Luis Obispo	1
Hemiptera[3]	Pseudococcidae	*Phenacoccus madeirensis*	Q	San Mateo	1
Hemiptera[3]	Pseudococcidae	*Phenacoccus* sp.	Q	San Mateo	1
Hemiptera[3]	Pseudococcidae	*Planococcus* sp.	Q	Alameda	1
Hemiptera[3]	Pseudococcidae	*Planococcus* sp.	Q	Contra Costa	3
Hemiptera[3]	Pseudococcidae	*Planococcus* sp.	Q	Mendocino	1
Hemiptera[3]	Pseudococcidae	*Planococcus* sp.	Q	San Bernadino	1
Hemiptera[3]	Pseudococcidae	*Planococcus* sp.	Q	San Mateo	8
Hemiptera[3]	Pseudococcidae	*Pseudococcus cryptus*	A	Los Angeles	1
Hemiptera[3]	Pseudococcidae	*Pseudococcus cryptus*	A	San Mateo	2
Hemiptera[3]	Pseudococcidae	*Pseudococcus dolichomelos*	Q	Orange	1
Hemiptera[3]	Pseudococcidae	*Pseudococcus elisae*	Q	Mendocino	1
Hemiptera[3]	Pseudococcidae	*Pseudococcus jackbeardsleyi*	Q	Contra Costa	1
Hemiptera[3]	Pseudococcidae	*Pseudococcus jackbeardsleyi*	Q	Los Angeles	2
Hemiptera[3]	Pseudococcidae	*Pseudococcus jackbeardsleyi*	Q	Orange	1
Hemiptera[3]	Pseudococcidae	*Pseudococcus jackbeardsleyi*	Q	San Bernadino	1
Hemiptera[3]	Pseudococcidae	*Pseudococcus jackbeardsleyi*	Q	San Mateo	61
Hemiptera[3]	Pseudococcidae	*Pseudococcus jackbeardsleyi*	Q	Santa Clara	1
Hemiptera[3]	Pseudococcidae	*Pseudococcus jackbeardsleyi*	Q	Sonoma	1
Hemiptera[3]	Pseudococcidae	*Pseudococcus landoi*	Q	Los Angeles	1
Hemiptera[3]	Pseudococcidae	*Pseudococcus landoi*	Q	San Mateo	2
Hemiptera[3]	Pseudococcidae	*Pseudococcus odermatti*	Q	Alameda	1
Hemiptera[3]	Pseudococcidae	*Pseudococcus odermatti*	Q	Los Angeles	1
Hemiptera[3]	Pseudococcidae	*Pseudococcus odermatti*	Q	San Bernadino	1
Hemiptera[3]	Pseudococcidae	*Pseudococcus odermatti*	Q	San Joaquin	2

Order	Family	Scientific Name		County	Total
Hemiptera[3]	Pseudococcidae	*Pseudococcus* sp.	Q	Contra Costa	2
Hemiptera[3]	Pseudococcidae	*Pseudococcus* sp.	Q	Los Angeles	2
Hemiptera[3]	Pseudococcidae	*Pseudococcus* sp.	Q	San Joaquin	1
Hemiptera[3]	Pseudococcidae	*Pseudococcus* sp.	Q	San Mateo	6
Hemiptera[3]	Pseudococcidae	*Rhizoecus americanus*	Q	San Diego	3
Hemiptera[3]	Pseudococcidae	*Rhizoecus nemoralis*	Q	San Luis Obispo	1
Hemiptera[3]	Pseudococcidae	*Rhizoecus* sp.	Q	Riverside	1
Hemiptera[3]	Pseudococcidae	*Rhizoecus* sp.	Q	San Diego	1
Hemiptera[3]	Pseudococcidae	*Ripersiella hibisci*	Q	Los Angeles	1
Hemiptera[3]	Pseudococcidae	*Ripersiella hibisci*	Q	Orange	1
Hemiptera[3]	Pseudococcidae	*Ripersiella hibisci*	Q	San Diego	11
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	Alameda	6
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	Contra Costa	12
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	Los Angeles	6
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	Mendocino	2
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	Orange	3
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	Riverside	3
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	Sacramento	1
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	San Bernadino	5
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	San Diego	3
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	San Luis Obispo	2
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	San Mateo	50
Hemiptera[3]	Pseudococcidae	unidentifiable	Q	Santa Cruz	1
Hemiptera[3]	Pseudococcidae	*Vryburgia* sp.	Q	Orange	1
Hemiptera[3]	Psyllidae	*Cacopsylla* sp.	Q	Alameda	2
Hemiptera[3]	Psyllidae	*Diaphorina citri*	Q	Los Angeles	1
Hemiptera[3]	Psyllidae	*Diaphorina citri*	Q	San Mateo	4
Hemiptera[3]	Psyllidae	*Heteropsylla* sp.	Q	San Mateo	1
Hemiptera[3]	Psyllidae	unidentifiable	Q	San Mateo	1
Hemiptera[3]	unidentifiable		Q	San Bernadino	1
Hemiptera[3]	unidentifiable		Q	San Mateo	1
Hymenoptera	Chalcididae	unidentifiable	Q	Alameda	1
Hymenoptera	Formicidae	*Anoplolepis gracilipes*	Q	Contra Costa	2
Hymenoptera	Formicidae	*Anoplolepis gracilipes*	Q	Los Angeles	2
Hymenoptera	Formicidae	*Anoplolepis gracilipes*	Q	San Bernadino	1
Hymenoptera	Formicidae	*Anoplolepis gracilipes*	Q	San Mateo	4
Hymenoptera	Formicidae	*Camponotus* sp.	Q	Los Angeles	1
Hymenoptera	Formicidae	*Camponotus* sp.	Q	Sacramento	1
Hymenoptera	Formicidae	*Camponotus* sp.	Q	San Mateo	1
Hymenoptera	Formicidae	*Hypoponera* sp.	Q	San Mateo	1
Hymenoptera	Formicidae	*Monomorium* sp.	Q	Alameda	1
Hymenoptera	Formicidae	*Monomorium* sp.	Q	Orange	1
Hymenoptera	Formicidae	*Monomorium* sp.	Q	San Mateo	7
Hymenoptera	Formicidae	*Ochetellus glaber*	Q	Alameda	1

Order	Family	Scientific Name		County	Total
Hymenoptera	Formicidae	*Ochetellus glaber*	Q	Contra Costa	1
Hymenoptera	Formicidae	*Ochetellus glaber*	Q	Los Angeles	4
Hymenoptera	Formicidae	*Ochetellus glaber*	Q	Orange	1
Hymenoptera	Formicidae	*Ochetellus glaber*	Q	Riverside	1
Hymenoptera	Formicidae	*Ochetellus glaber*	Q	San Mateo	14
Hymenoptera	Formicidae	*Ochetellus glaber*	Q	Sonoma	1
Hymenoptera	Formicidae	*Pheidole megacephala*	Q	Alameda	10
Hymenoptera	Formicidae	*Pheidole megacephala*	Q	Contra Costa	14
Hymenoptera	Formicidae	*Pheidole megacephala*	Q	Los Angeles	12
Hymenoptera	Formicidae	*Pheidole megacephala*	Q	Mendocino	2
Hymenoptera	Formicidae	*Pheidole megacephala*	Q	Orange	1
Hymenoptera	Formicidae	*Pheidole megacephala*	Q	Sacramento	1
Hymenoptera	Formicidae	*Pheidole megacephala*	Q	San Bernadino	5
Hymenoptera	Formicidae	*Pheidole megacephala*	Q	San Luis Obispo	1
Hymenoptera	Formicidae	*Pheidole megacephala*	Q	San Mateo	40
Hymenoptera	Formicidae	*Pheidole megacephala*	Q	Santa Clara	1
Hymenoptera	Formicidae	*Pheidole megacephala*	Q	Santa Cruz	1
Hymenoptera	Formicidae	*Pheidole megacephala*	Q	Sonoma	1
Hymenoptera	Formicidae	*Pheidole* sp.	Q	Alameda	6
Hymenoptera	Formicidae	*Pheidole* sp.	Q	Contra Costa	4
Hymenoptera	Formicidae	*Pheidole* sp.	Q	Los Angeles	2
Hymenoptera	Formicidae	*Pheidole* sp.	Q	Orange	8
Hymenoptera	Formicidae	*Pheidole* sp.	Q	Riverside	1
Hymenoptera	Formicidae	*Pheidole* sp.	Q	Sacramento	1
Hymenoptera	Formicidae	*Pheidole* sp.	Q	San Bernadino	2
Hymenoptera	Formicidae	*Pheidole* sp.	Q	San Joaquin	1
Hymenoptera	Formicidae	*Pheidole* sp.	Q	San Mateo	20
Hymenoptera	Formicidae	*Pheidole* sp.	Q	Santa Barbara	1
Hymenoptera	Formicidae	*Solenopsis geminata*	A	Los Angeles	3
Hymenoptera	Formicidae	*Solenopsis geminata*	A	San Mateo	6
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Fresno	4
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Merced	1
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Riverside	2
Hymenoptera	Formicidae	*Solenopsis invicta*	A	San Mateo	1
Hymenoptera	Formicidae	*Solenopsis invicta*	A	Shasta	1
Hymenoptera	Formicidae	*Solenopsis* sp.	Q	Los Angeles	5
Hymenoptera	Formicidae	*Solenopsis* sp.	Q	Riverside	1
Hymenoptera	Formicidae	*Solenopsis* sp.	Q	San Mateo	11
Hymenoptera	Formicidae	*Strumigenys sp*	Q	San Diego	1
Hymenoptera	Formicidae	*Tapinoma* sp.	Q	Contra Costa	1
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Alameda	42
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Contra Costa	37
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Humboldt	2
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Los Angeles	75

Order	Family	Scientific Name		County	Total
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Marin	2
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Mendocino	6
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Orange	17
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Riverside	2
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Sacramento	5
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	San Bernadino	21
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	San Luis Obispo	5
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	San Mateo	63
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Santa Barbara	4
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Santa Clara	2
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Santa Cruz	2
Hymenoptera	Formicidae	*Technomyrmex albipes*	Q	Sonoma	1
Hymenoptera	Formicidae	*Technomyrmex* sp.	Q	Mendocino	1
Hymenoptera	Formicidae	undet. Myrmicini	Q	San Luis Obispo	1
Hymenoptera	Formicidae	undet. Myrmicini	Q	San Mateo	1
Hymenoptera	Formicidae	unidentifiable	Q	Contra Costa	2
Hymenoptera	Formicidae	unidentifiable	Q	Los Angeles	1
Hymenoptera	Formicidae	unidentifiable	Q	Mendocino	1
Hymenoptera	Formicidae	unidentifiable	Q	Riverside	1
Hymenoptera	Formicidae	unidentifiable	Q	San Mateo	9
Hymenoptera	Megachilidae	*Osmia* sp.	Q	Merced	1
Hymenoptera	unidentifiable		Q	Alameda	1
Hymenoptera	unidentifiable		Q	San Bernadino	1
Hymenoptera	unidentifiable		Q	San Luis Obispo	1
Hymenoptera	unidentifiable		Q	San Mateo	1
Isoptera	unidentifiable		Q	Alameda	1
Isoptera	unidentifiable		Q	San Mateo	2
Lepidoptera	Arctiidae	unidentifiable	Q	San Mateo	1
Lepidoptera	Blastobasidae	unidentifiable	Q	San Mateo	4
Lepidoptera	Coleophoridae	unidentifiable	Q	San Bernadino	1
Lepidoptera	Cosmopterigidae	unidentifiable	Q	Los Angeles	2
Lepidoptera	Cosmopterigidae	unidentifiable	Q	San Diego	1
Lepidoptera	Cosmopterigidae	unidentifiable	Q	San Mateo	6
Lepidoptera	Gelechiidae	unidentifiable	Q	San Mateo	7
Lepidoptera	Geometridae	unidentifiable	Q	Sacramento	1
Lepidoptera	Geometridae	unidentifiable	Q	San Mateo	1
Lepidoptera	Gracillariidae	*Phyllocnistis citrella*	B	Alameda	1
Lepidoptera	Gracillariidae	unidentifiable	B	San Luis Obispo	1
Lepidoptera	Gracillariidae	unidentifiable	Q	San Mateo	1
Lepidoptera	Gracillariidae	unidentifiable	Q	Shasta	1
Lepidoptera	Gracillariidae	unidentifiable	Q	Sonoma	1
Lepidoptera	Limacodidae	*Darna pallivitta*	A	Alameda	1
Lepidoptera	Limacodidae	*Darna pallivitta*	A	Los Angeles	1
Lepidoptera	Limacodidae	*Darna pallivitta*	A	Orange	4

Order	Family	Scientific Name		County	Total
Lepidoptera	Lycaenidae	unidentifiable	Q	Alameda	1
Lepidoptera	Lycaenidae	unidentifiable	Q	San Mateo	2
Lepidoptera	Lymantriidae	*Lymantria dispar*	A	Alameda	1
Lepidoptera	Lymantriidae	*Lymantria dispar*	A	Kern	1
Lepidoptera	Lymantriidae	*Lymantria dispar*	A	Marin	1
Lepidoptera	Lymantriidae	*Lymantria dispar*	A	Riverside	2
Lepidoptera	Lymantriidae	*Lymantria dispar*	A	Sacramento	1
Lepidoptera	Lymantriidae	*Lymantria dispar*	A	Santa Clara	2
Lepidoptera	misc. eggs		Q	San Mateo	1
Lepidoptera	misc. eggs		Q	Shasta	1
Lepidoptera	Noctuidae	*Chrysodeixis chalcites*	A	San Mateo	2
Lepidoptera	Noctuidae	*Chrysodeixis criosoma*	A	San Mateo	1
Lepidoptera	Noctuidae	*Chrysodeixis eriosoma*	A	Los Angeles	20
Lepidoptera	Noctuidae	*Chrysodeixis eriosoma*	A	Orange	3
Lepidoptera	Noctuidae	*Chrysodeixis eriosoma*	A	San Mateo	29
Lepidoptera	Noctuidae	*Heliothis* sp.	Q	San Mateo	1
Lepidoptera	Noctuidae	*Spodoptera* sp.	Q	San Mateo	3
Lepidoptera	Noctuidae	unidentifiable	Q	Los Angeles	7
Lepidoptera	Noctuidae	unidentifiable	Q	Sacramento	1
Lepidoptera	Noctuidae	unidentifiable	Q	San Diego	1
Lepidoptera	Noctuidae	unidentifiable	Q	San Francisco	1
Lepidoptera	Noctuidae	unidentifiable	Q	San Luis Obispo	1
Lepidoptera	Noctuidae	unidentifiable	Q	San Mateo	37
Lepidoptera	Noctuidae	unidentifiable	Q	Santa Cruz	1
Lepidoptera	Nymphalidae	unidentifiable	Q	San Mateo	1
Lepidoptera	Plutellidae	unidentifiable	Q	San Mateo	1
Lepidoptera	Psychidae	unidentifiable	Q	San Mateo	2
Lepidoptera	Pterophoridae	unidentifiable	Q	San Mateo	1
Lepidoptera	Pyralidae	*Diaphania nitidalis*	B	Los Angeles	13
Lepidoptera	Pyralidae	*Diaphania nitidalis*	B	San Bernadino	2
Lepidoptera	Pyralidae	*Diaphania nitidalis*	B	San Mateo	4
Lepidoptera	Pyralidae	*Moodna bisinuella*	Q	Alameda	1
Lepidoptera	Pyralidae	unidentifiable	Q	Alameda	1
Lepidoptera	Pyralidae	unidentifiable	Q	Los Angeles	1
Lepidoptera	Pyralidae	unidentifiable	Q	Mendocino	1
Lepidoptera	Pyralidae	unidentifiable	Q	San Bernadino	3
Lepidoptera	Pyralidae	unidentifiable	Q	San Diego	1
Lepidoptera	Pyralidae	unidentifiable	Q	San Mateo	12
Lepidoptera	Tineidae	unidentifiable	Q	Humboldt	2
Lepidoptera	Tortricidae	*Epiphyas postvittana*	A	Contra Costa	1
Lepidoptera	Tortricidae	*Epiphyas postvittana*	A	San Francisco	1
Lepidoptera	Tortricidae	*Epiphyas postvittana*	A	Santa Cruz	7
Lepidoptera	Tortricidae	*Epiphyas postvittana***	Q	San Francisco	1
Lepidoptera	Tortricidae	*Epiphyas postvittana***	Q	Santa Cruz	26

Order	Family	Scientific Name		County	Total
Lepidoptera	Tortricidae	*Rhyacionia frustrana*	B	Riverside	3
Lepidoptera	Tortricidae	unidentifiable	Q	Alameda	2
Lepidoptera	Tortricidae	unidentifiable	Q	Los Angeles	1
Lepidoptera	Tortricidae	unidentifiable	Q	Marin	1
Lepidoptera	Tortricidae	unidentifiable	Q	Sacramento	1
Lepidoptera	Tortricidae	unidentifiable	Q	San Diego	2
Lepidoptera	Tortricidae	unidentifiable	Q	San Mateo	22
Lepidoptera	Tortricidae	unidentifiable	Q	Santa Cruz	41
Lepidoptera	Tortricidae	unidentifiable	Q	Sonoma	1
Lepidoptera	unidentifiable		Q	Sacramento	1
Lepidoptera	unidentifiable		Q	San Bernadino	1
Lepidoptera	unidentifiable		Q	San Francisco	1
Lepidoptera	unidentifiable		Q	San Joaquin	2
Lepidoptera	unidentifiable		Q	San Mateo	4
Lepidoptera	unidentifiable		Q	Shasta	1
Lepidoptera	Yponomeutidae	*Aculepsia sp*	Q	San Mateo	1
Lepidoptera	Yponomeutidae	unidentifiable	Q	San Mateo	1
Mollusca	Phylomycidae	unidentifiable	Q	Alameda	1
Mollusca	unidentifiable		Q	San Mateo	1
Mollusca	unidentifiable		Q	Santa Clara	1
Orthoptera	Gryllidae	*Leptogryllys* sp.	Q	San Mateo	1
Orthoptera	Gryllidae	*Trigonidomorpha sjostedti*	Q	Contra Costa	1
Orthoptera	Gryllidae	*Trigonidomorpha sjostedti*	Q	Los Angeles	2
Orthoptera	Gryllidae	*Trigonidomorpha sjostedti*	Q	San Bernadino	1
Orthoptera	Gryllidae	*Trigonium sp*	Q	Los Angeles	1
Orthoptera	Gryllidae	*Trigonium sp*	Q	Orange	1
Orthoptera	Gryllidae	unidentifiable	Q	Alameda	1
Orthoptera	Gryllidae	unidentifiable	Q	Los Angeles	2
Orthoptera	Gryllidae	unidentifiable	Q	San Mateo	2
Orthoptera	misc. eggs		Q	Los Angeles	1
Orthoptera	misc. eggs		Q	Santa Barbara	1
Orthoptera	Pyrgomorphidae	*Actractomorpha sinensis*	Q	Los Angeles	2
Orthoptera	Pyrgomorphidae	*Actractomorpha sinensis*	Q	San Mateo	1
Orthoptera	Tettigoniidae	*Conocephalus saltator*	Q	Los Angeles	2
Orthoptera	Tettigoniidae	*Conocephalus saltator*	Q	San Mateo	1
Orthoptera	Tettigoniidae	*Euconocephalus* sp.	Q	San Mateo	1
Orthoptera	Tettigoniidae	*Phaneroptera furcifera*	Q	Los Angeles	1
Orthoptera	Tettigoniidae	*Phaneroptera* sp.	Q	Los Angeles	3
Orthoptera	Tettigoniidae	*Phaneroptera* sp.	Q	San Mateo	1
Orthoptera	Tettigoniidae	unidentifiable	Q	Alameda	3
Orthoptera	Tettigoniidae	unidentifiable	Q	Contra Costa	1
Orthoptera	Tettigoniidae	unidentifiable	Q	Los Angeles	6
Orthoptera	Tettigoniidae	unidentifiable	Q	Orange	2
Orthoptera	Tettigoniidae	unidentifiable	Q	San Bernadino	1

Order	Family	Scientific Name		County	Total
Orthoptera	Tettigoniidae	unidentifiable	Q	San Mateo	14
Stylommatophora	Veronicellidae	unidentifiable	Q	Alameda	2
Stylommatophora	Veronicellidae	unidentifiable	Q	Los Angeles	5
Stylommatophora	Veronicellidae	unidentifiable	Q	San Mateo	5
Stylommatophora	Veronicellidae	*Veronicella* sp.	Q	Alameda	1
Stylommatophora	Veronicellidae	*Veronicella* sp.	Q	Los Angeles	4
Stylommatophora	Veronicellidae	*Veronicella* sp.	Q	Orange	1
Stylommatophora	Veronicellidae	*Veronicella* sp.	Q	Riverside	1
Stylommatophora	Veronicellidae	*Veronicella* sp.	Q	San Diego	2
Stylommatophora	Veronicellidae	*Veronicella* sp.	Q	San Mateo	4
Thysanoptera	Phlaeothripidae	*Haplothrips* sp.	Q	San Mateo	1
Thysanoptera	Phlaeothripidae	*Teuchothrips sp*	Q	San Luis Obispo	1
Thysanoptera	Phlaeothripidae	unidentifiable	Q	Contra Costa	1
Thysanoptera	Phlaeothripidae	unidentifiable	Q	Los Angeles	2
Thysanoptera	Phlaeothripidae	unidentifiable	Q	Mendocino	1
Thysanoptera	Phlaeothripidae	unidentifiable	Q	San Mateo	1
Thysanoptera	Thripidae	*Dichromothrips corbetti*	Q	Alameda	1
Thysanoptera	Thripidae	*Dichromothrips corbetti*	Q	Contra Costa	1
Thysanoptera	Thripidae	*Dichromothrips corbetti*	Q	Orange	1
Thysanoptera	Thripidae	*Dichromothrips* sp.	Q	Riverside	1
Thysanoptera	Thripidae	*Frankliniella schultzei*	Q	Alameda	1
Thysanoptera	Thripidae	*Selenothrips rubrocinctus*	A	San Mateo	1
Thysanoptera	Thripidae	*Thrips orientalis*	Q	Alameda	1
Thysanoptera	Thripidae	*Thrips orientalis*	Q	Orange	8
Thysanoptera	Thripidae	*Thrips palmi*	A	San Mateo	1
Thysanoptera	Thripidae	*Thrips* sp.	Q	Alameda	1
Thysanoptera	Thripidae	*Thrips* sp.	Q	Orange	2
Thysanoptera	Thripidae	*Thrips* sp.	Q	San Mateo	3
Thysanoptera	Thripidae	unidentifiable	Q	San Luis Obispo	1
Thysanoptera	unidentifiable		Q	San Luis Obispo	2
Thysanoptera	unidentifiable		Q	San Mateo	1
misc. eggs			Q	Alameda	1
misc. eggs			Q	Contra Costa	1
misc. eggs			Q	Los Angeles	13
misc. eggs			Q	Riverside	2
misc. eggs			Q	Sacramento	1
misc. eggs			Q	San Bernadino	1
misc. eggs			Q	San Mateo	17
misc. eggs			Q	Santa Barbara	1
misc. eggs			Q	Santa Cruz	1
misc. eggs			Q	Sonoma	1
unidentifiable			Q	Alameda	1
unidentifiable			Q	San Mateo	5
TOTAL					**3429**

[1] Suborder Auchenorrhyncha, [2] Suborder Heteroptera, [3] Suborder Sternorrhyncha

* these samples were identified as *Abgrallaspis/Diaspidiotus* complex, but it has since been determined to be a new species of *Abgrallaspis* which is being described as new to science.

** These represent larval samples tested using DNA-based methods, and were determined to be "probable LBAM," which is as close as is possible with this method, and so were given a Q-rating.

Notes:

This table represents the number of individual PDR's with these identifications, with many representing multiple specimens per PDR.

Those identified as "unidentifiable" represent samples where further identification was not possible, due to samples being damaged or incomplete, or the wrong sex or life stage for identification. Those labeled as "misc. eggs" were in groups where the egg stage is not identifiable.

BOTANY

A & Q RATED DETECTIONS BY COUNTY

County	Scientific Name	Common Name		**Total**
Los Angeles	*Alternanthera philoxeroides*	alligator weed	A	4
Stanislaus	*Arctotheca calendula*	capeweed	A	1
Orange	*Atriplex amnicola*	river saltbush	Q	1
El Dorado	*Azolla* sp.	mosquito fern	Q	1
Contra Costa	*Bupleurum rotundifolium*	hare's ear	Q	4
Contra Costa	*Cabomba caroliniana*	Carolina fanwort	Q	1
San Bernardino	*Carduus nutans*	musk thistle	A	1
Mariposa	*Centaurea diffusa*	diffuse knapweed	A	1
Monterey	*Centaurea diffusa*	diffuse knapweed	A	1
El Dorado	*Centaurea maculosa*	spotted knapweed	A	1
Fresno	*Centaurea maculosa*	spotted knapweed	A	2
Mariposa	*Centaurea maculosa*	spotted knapweed	A	2
Santa Cruz	*Centaurea maculosa*	spotted knapweed	A	1
Calaveras	*Chondrilla juncea*	skeleton weed	A	1
Fresno	*Chondrilla juncea*	skeleton weed	A	20
Glenn	*Chondrilla juncea*	skeleton weed	A	1
San Mateo	*Chondrilla juncea*	skeleton weed	A	2
Santa Barbara	*Chondrilla juncea*	skeleton weed	A	1
Sonoma	*Chondrilla juncea*	skeleton weed	A	1
Alameda	*Cuscuta* cf. *japonica*	Japanese dodder	A	12
Butte	*Cuscuta* cf. *japonica*	Japanese dodder	A	1
Contra Costa	*Cuscuta* cf. *japonica*	Japanese dodder	A	25
Fresno	*Cuscuta* cf. *japonica*	Japanese dodder	A	9
Merced	*Cuscuta* cf. *japonica*	Japanese dodder	A	3
Sacramento	*Cuscuta* cf. *japonica*	Japanese dodder	A	4
Solano	*Cuscuta* cf. *japonica*	Japanese dodder	A	3
Sutter	*Cuscuta* cf. *japonica*	Japanese dodder	A	1
Yuba	*Cuscuta* cf. *japonica*	Japanese dodder	A	2
Butte	*Cuscuta japonica*	Japanese dodder	A	2
Contra Costa	*Cuscuta japonica*	Japanese dodder	A	4
Tulare	*Cuscuta japonica*	Japanese dodder	A	1
Yuba	*Cuscuta japonica*	Japanese dodder	A	1
San Diego	*Cyperus* sp.	nutsedge	Q	1
San Mateo	*Drymaria cordata*	whitesnow	Q	1
Orange	*Euphorbia graminea*	grass-leaf spurge	Q	1
Los Angeles	*Fatoua villosa*	hairy crabweed	Q	1
Lake	*Hydrilla verticillata*	hydrilla	A	13
Santa Clara	*Hypericum* sp.	St. Johnswort	Q	1

County	Scientific Name	Common Name		**Total**
San Mateo	*Ipomoea* sp.	morning-glory	Q	4
Contra Costa	*Iris pseudacorus*	yellow-flag iris	Q	1
San Mateo	*Kallitaxila granulata*	planthopper	Q	1
Fresno	*Limnobium laevigatum*	South American spongeplant	A	3
Humboldt	*Limnobium laevigatum*	South American spongeplant	A	1
Merced	*Limnobium laevigatum*	South American spongeplant	A	1
Sacramento	*Limnobium laevigatum*	South American spongeplant	A	1
Shasta	*Linaria dalmatica*	dalmatian toadflax	A	1
Trinity	*Linaria dalmatica*	dalmatian toadflax	A	1
San Diego	*Myosoton aquaticum*	giant chickweed	Q	1
San Joaquin	*Myriophyllum* sp.	watermilfoil	Q	1
Shasta	*Myriophyllum* sp.	watermilfoil	Q	1
Modoc	*Potentilla recta*	sulphur cinquefoil	Q	1
Shasta	*Salvinia molesta*	kariba-weed	A	1
El Dorado	*Sesbania punicea*	rattlebox	Q	1
Sacramento	*Sesbania punicea*	rattlebox	Q	1
Shasta	*Vallisneria americana*	American eelgrass	Q	1
Totals				**155**

BOTANY

A & Q RATED INTERCEPTIONS FROM BORDER STATIONS

Scientific Name	Common Name		**Total**
Centaurea diffusa	diffuse knapweed	A	4
Centaurea maculosa	spotted knapweed	A	9
Halogeton glomeratus	halogeton	A	2
Onopordum acanthium	Scotch thistle	A	7
Totals			**22**

PLANT PATHOLOGY

A & Q RATED DETECTIONS

Pathogen		**2007**
Botrytis hyacinthi	Q	2
Cercospora destructiva	Q	2
*Cercospora tecomae***	Q	1
Coleosporium plumeriae	Q	5
Cylindrocarpon destructans	Q	2
Cylindrocarpon liriodendri	Q	1
Cylindrocarpon macrodidymum	Q	1
Cylindrocladium spathulatum	Q	2
Cucurbit Yellow Stunting Disorder virus	Q	1
Fusarium oxysporum f.sp. canariensis	A	13
Fusarium sambucinum	Q	2
Melampsora sp.	Q	1
Oidium tingitaninum	Q	1
Pea Seed-borne Mosaic virus	Q	4
Phoma zantedeschiae	Q	9
Phragmidium tuberculatum	Q	1
*Phytophthora ramorum**	Q	Numerous
Phytophthora siskiyouensis	Q	2
Phytophthora niederhauserii	Q	1
*Prospodium appendiculatum***	Q	1
Pseudocercospora liquidambaricola	Q	5
Puccinia horiana	Q	11
Ramularia carthami	Q	2
*Schizothyrium pomi***	Q	2
Tomato Yellow Leaf Curl virus	Q	25
Uromyces transversalis	Q	39
Totals		**136***

* *Phytophthora ramorum* not included in totals
** interceptions only

PLANT PATHOLOGY

A & Q RATED PATHOGENS & HOSTS DETECTED BY COUNTY

Pathogen	Host Scientific Name	Common Name	County
Botrytis hyacinthi	*Eucomis comosa*	Pineapple Flower	Monterey
Cercospora destructiva	*Celatrus* sp.	Bittersweet	Santa Barbara
*Cercospora tecomae**	*Lycopersicon esculentum*	Tomato	(Needles)
Coleosporium plumeriae	*Plumeria* sp.	Plumeria	Contra Costa
Cylindrocarpon destructans	*Azalea* sp.	Azalea	Alameda
Cylindrocarpon liriodendri	*Cedrus deodara*	Deodar Cedar	Yolo
Cylindrocarpon macrodidymum	*Vitis vinifera*	Grape	Santa Barbara
Cylindrocladium spathulatum	*Malva* sp.	Cape Mallow	Santa Barbara
Cylindrocladium spathulatum	*Myrtus communis*	Sweet Myrtle	Santa Barbara
Cucurbit Yellow Stunting Disorder virus	*Cucumis melo* var.*cantalupensis*	Canteloupe	Imperial
Fusarium oxysporum f.sp. *canariensis*	*Phoenix* sp.	Canary Island Palm	Orange
Fusarium oxysporum f.sp. *canariensis*	*Phoenix* sp.	Canary Island Palm	Riverside
Fusarium sambucinum	*Solanum tuberosum*	Potato	Santa Clara
Fusarium sambucinum	*Solanum tuberosum*	Potato	Sonoma
Melampsora sp.	*Salix* sp.	Willow	S. L. Obispo
Oidium tingitaninum	*Citrus* sp.	Citrus	Ventura
Pea Seed-borne Mosaic virus	*Pisum sativum*	Pea	Monterey
Phoma zantedeschiae	*Zantedeschia* sp.	Calla Lily	Monterey
Phragmidium tuberculatum	*Rosa* sp.	Rose	Sonoma
Phytophthora ramorum	*Camellia sasanqua*	Camellia	Alameda
Phytophthora ramorum	*Osmanthus* sp.	Sweet Olive	Alameda
Phytophthora ramorum	*Umbellularia californica*	CA Bay Laurel	Alameda
Phytophthora ramorum	*Umbellularia californica*	CA Bay Laurel	Contra Costa
Phytophthora ramorum	*Pieris japonica*	Pieris	Humboldt
Phytophthora ramorum	*Quercus agrifolia*	Live Oak	Humboldt
Phytophthora ramorum	*Quercus agrifolia*	Coast Live Oak	Marin
Phytophthora ramorum	*Lithocarpus densifloris*	Tan Oak	Mendocino
Phytophthora ramorum	*Umbellularia californica*	CA Bay Laurel	Napa
Phytophthora ramorum	*Camellia japonica*	Camellia	Sacramento
Phytophthora ramorum	*Camellia sasanqua*	Camellia	Sacramento
Phytophthora ramorum	*Loropetalum* sp.	Chinese Fringe	Sacramento
Phytophthora ramorum	Soil	Soil	Sacramento
Phytophthora ramorum	*Lithocarpus densifloris*	Tan Oak	San Mateo
Phytophthora ramorum	*Quercus agrifolia*	Coast Live Oak	San Mateo
Phytophthora ramorum	*Umbellularia californica*	CA Bay Laurel	San Mateo
Phytophthora ramorum	*Umbellularia californica*	CA Bay Laurel	Santa Clara
Phytophthora ramorum	*Camellia japonica*	Camellia	Santa Cruz
Phytophthora ramorum	*Camellia sasanqua*	Camellia	Santa Cruz

Pathogen	Host Scientific Name	Common Name	County
Phytophthora ramorum	*Quercus agrifolia*	Coast Live Oak	Sonoma
Phytophthora ramorum	*Umbellularia californica*	CA Bay Laurel	Sonoma
Phytophthora siskiyouensis	*Alnus cordata*	Italian Alder	San Mateo
Phytophthora niederhauserii	*Ceanothus* sp.	Ceanothus	Santa Barbara
*Prospodium appendiculatum**	*Lycopersicon esculentum*	Tomato	(Needles)
Pseudocercospora liquidambaricola	*Loropetalum* sp.	Chinese Fringe	Santa Barbara
Pseudocercospora liquidambaricola	*Loropetalum* sp.	Chinese Fringe	Santa Cruz
Puccinia horiana	*Chrysanthemum* sp.	Chrysanthemum	San Diego
Puccinia horiana	*Chrysanthemum* sp.	Chrysanthemum	Santa Barbara
Ramularia carthami	*Carthamus* sp.	Safflower	Yolo
*Schizothyrium pomi**	*Malus pumila*	Apple	(Needles)
Tomato Yellow Leaf Curl virus	*Datura discolor*	Desert Straw	Imperial
Tomato Yellow Leaf Curl virus	*Lycopersicon esculentum*	Tomato	Imperial
Tomato Yellow Leaf Curl virus	*Lycopersicon esculentum*	Tomato	Riverside
Uromyces transversalis	*Gladiolus* sp.	Gladiolus	San Diego

* interceptions only, at Inspection Stations indicated in ( ) instead of county

NEMATOLOGY

A & Q RATED DETECTIONS

Scientific Name		2005	2006	2007	Total
Aphelenchoides besseyi	A	11			**11**
Aphelenchoides sp.	Q	10			**10**
Dolichodorus heterocephalus	A		1		**1**
Hemicycliophora arenaria	A		3		**3**
Heterodera sp.	Q			1	**1**
Heterodinae	Q	1			**1**
Pratylenchus sp.	Q	1	1		**2**
Radopholus similis	A	1			**1**
Rotylenchulus reniformis	A	2	1	2	**5**
Rotylenchulus sp.	Q	1			**1**
Totals		**27**	**6**	**3**	**36**