CALIFORNIA PLANT PEST and DISEASE REPORT

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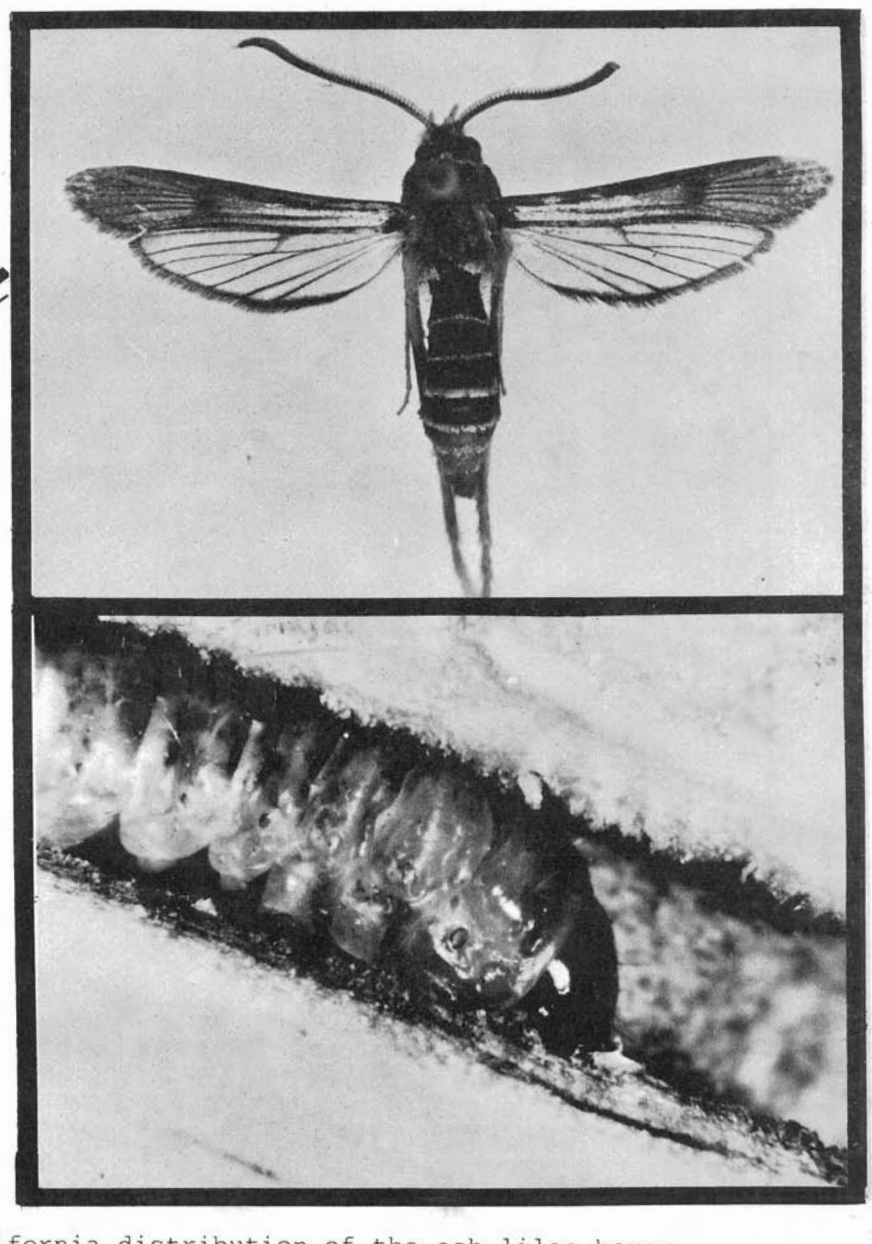

Adult, larva and known California distribution of the ash-lilac borer, *Podosesia syringae*, a possible new pest of olives. See article on page 58.

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DIAGNOSING CROWN GALL - TECHNIQUES AND DIFFICULTIES

Jeanenne B. White and Carl M. Lai

For many years, commercial nurseries in California have had an excessive and continuing problem with crown gall disease caused by the bacterium, *Agrobacterium tumefaciens*. This soil-borne bacterium has a remarkably wide host range, inducing tumorous galls in over 200 species of dicotyledonous plants. Since there are other causal agents that will also induce galls or tumors in plantings (i.e. fungi, insects, genetic abnormalities, physiological problems, etc.), identifying the bacteria in the laboratory using specialized testing techniques is essential for confirmation of crown gall disease.

The various strains of *Agrobacterium* spp. can be isolated from tumorous plants, root surfaces, soil and water. The most efficient and common isolation method is from a gall or tumor on the infected plant (Fig. 1). The gall tissue is washed, surface sterilized with ethanol, diced into 2x2mm pieces, and thoroughly macerated in 1-2 ml. of sterile distilled water. This bacterial suspension is then streaked onto selective media such as D1M (Kado & Heskett) agar or Berberine agar. Both the virulent and avirulent colonies of *Agrobacterium* spp. will grow on the agar within 3 to 6 days. These colonies are morphologically and physiologically indistinguishable from each other and are not identifiable at this point.

Biochemical tests, such as 3-Ketoglycoside production, acid from erythritol, growth in tyrosine and $FeNH_4$ citrate broth and the oxidase test, may be helpful in determining characteristics of the different *Agrobacterium* strains, but not in the determination of virulence.

The only method for accurately identifying the virulent strains is a <u>time-consuming</u> pathogenicity test on susceptible hosts. Freshly cut surface-sterilized carrot discs placed in sterile petri plates are inoculated with purified bacterial colonies from agar plates. The discs are then sealed with parafilm and incubated at room temperature (25^{o}C) for 3 to 4 weeks. Only the virulent strains will eventually produce tumorous growth on the cut surface of the carrot discs (Fig. 2). Host indicator plants, such as sunflower, tomato, Bryophyllum, tobacco (*Nicotiana tobacum*), tree tobacco (*Nicotiana glauca*), and Kalanchoe, may also be inoculated by applying purified bacteria to cut stem surfaces. Tumor tissue will develop within 3 to 4 weeks.

The ability of *Agrobacterium tumefaciens* to induce tumors of plant tissue resides on the Ti (Ti = tumor inducing) plasmid contained in the bacterial cell. The plasmid is a large, extra chromosomal double-stranded DNA molecule. Genes carried by the

Jeanenne B. White is an Agricultural Biological Technician and Carl M. Lai is an Associate Plant Pathologist for the Analysis and Identification Unit at CDFA.

Ti plasmid are genetically coded to confer tumor inducing properties specific to virulent (pathogenic) Agrobacterium strains. The avirulent (nonpathogenic) strains such as Agrobacterium radiobactor do not contain the Ti plasmid. If the Ti plasmid is transferred to a nonpathogenic strain, the recipient bacterial strain will become pathogenic; thus, exhibiting the direct correlation of the plasmid to pathogenicity.

Electrophoresis testing is currently being studied for use in rapid identification of virulent Agrobacterium strains. Purified bacterial cells are grown overnight in nutrient broth, centrifuged at 5,700 rpm for seven minutes and the cell pellet is resuspended in 1 ml. of buffer. Lysing solution is added to the pellet for incubation at 55°C for 7 minutes, then the pellet is again centrifuged at 6,000 rpm for 10 minutes with the addition of phenol/chloroform. The upper aqueous solution will now contain the DNA plasmid; this is transferred to a test tube and prepared for slotted space on an agarose gel slab used for the electrophoresis at 120v for 2 hours. The agarose gel slab is then stained with Ethidium bromide (0.5ug/ml) and the plasmid gel band size, mass, shape, etc., may be visualized through a UV transilluminator. Different types of plasmids including the Ti plasmid may be identified in this way; however, differentiating the plasmids is often difficult due to similar characteristics in the gel bands.

To date, there is no "short-cut" method for identification of the virulent strains of Agrobacterium. Nursery plant shipments, orchards and other commercial establishments must wait at least 3-4 weeks for confirmation of crown gall disease by pathogenicity tests.

Fig. 1 Typical gall formation on the crown of an Euonymous plant infected with Agrobacterium tumefaciens.

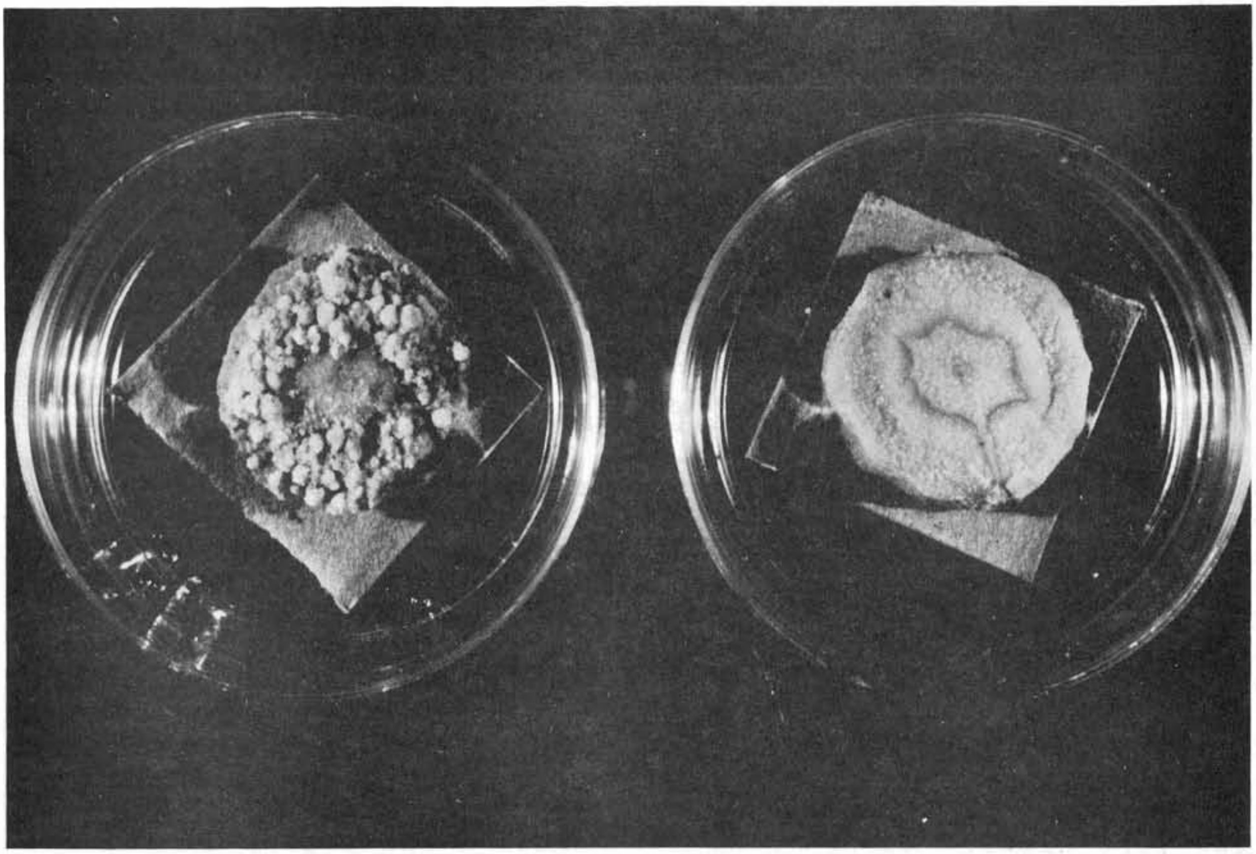
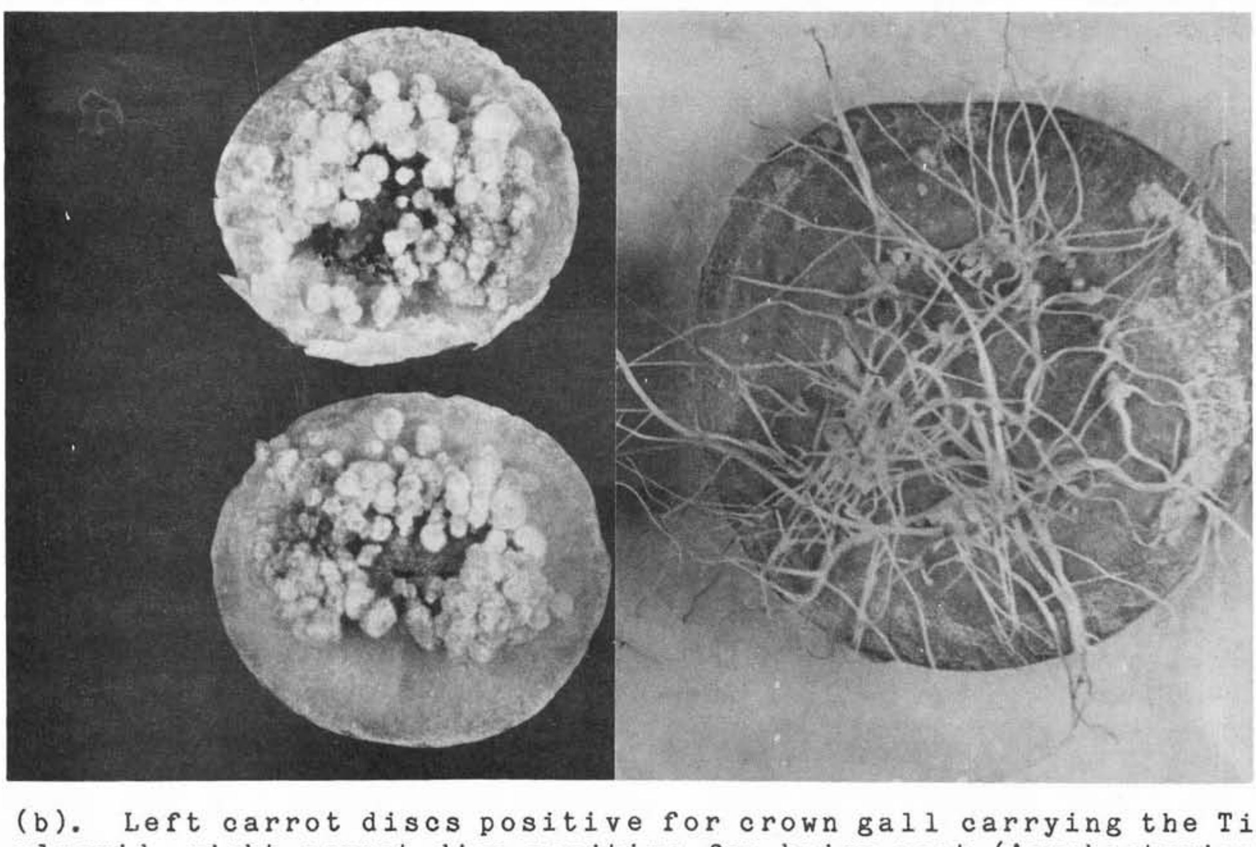


Figure 2 (a.) Left carrot disc inoculated with the virulent (Ti) strain of Agrobacterium, right control disc inoculated with sterile $H^{2}O$.



(b). Left carrot discs positive for crown gall carrying the Ti plasmid, right carrot disc positive for hairy root (Agrobacterium rhizgenes) carrying a Ri (root inducing) plasmid.

Photos courtesy of Dr. Clarence Kado, U.C. Davis.

OCCURRENCE OF PSEUDOMONAS SYRINGAE ON A NEW HOST - CALIFORNIA PEPPER TREE

Mary Sorrell

California pepper (*Schinus molle* L.) is an important landscape tree in Central and Southern California and Arizona. It is frost tolerant to about -5°C and deciduous to semideciduous. In March, 1982 and 1985 several container-grown trees from a local nursery were observed to have trunk cankers and internal streaking. A fluorescent *Pseudomonas* sp. was isolated from the diseased tissue. The bacteria were subsequently identified as *Pseudomonas syringae* (Van Hall). *P. syringae* is an ice-nucleating bacterium and several researchers have observed an interaction between the bacteria and freezing inciting disease.

Other container grown California pepper trees were inoculated with this bacteria and with a strain of *P. syringae* from Dr. C. Kado's lab at the University of California at Davis. Some of the trees were exposed to freezing temperatures and others were left in the lath-house for the winter. Those in the lath-house developed internal streaking and discoloration. The inoculated bacteria could be reisolated from these trees. The trees that were exposed to frost had little or no internal discoloration so frost does not seem to be involved in inciting the disease on container grown California pepper trees.

Mary Sorrell is an Agricultural Biological Technician for the Analysis and Identification Unit at CDFA.

FUSARIUM BASAL ROT OF DAFFODIL

T.E. Tidwell

Although seldom a problem for the homeowner, bulb diseases can cause serious economic losses to commercial bulb growers. In America and Holland, "basal rot" of daffodils (Narcissus spp.) severely affects certain varieties of commercially grown daffodils. Yields normally measured in tons can be reduced to yields of mere bushels within a single season.

In the mid-1920's, the disease was found to be caused by the soil-borne fungus *Fusarium oxysporum* f. *narcissi* (Cke. & Mass.) Snyder & Hansen. It is not the same fungus as that which is responsible for similar basal rot diseases in iris, tulips, and other bulbs. Most of the large trumpeted types are susceptible to *Fusarium* basal rot, particularly the varieties "Golden Harvest", "King Alfred," and "Emperor". The white and bicolored types are also very susceptible. Jonquils and cup type *Narcissus* are rarely affected by the disease.

Infected bulbs undergo a dry rot, becoming soft and spongy. Ultimately the entire bulb may dry up to become a hard, shriveled mummy. If diseased bulbs are cut open, reddish-brown to chocolate-brown (depending upon variety involved) discoloration can be observed. Discoloration usually originates at the basal plate area and proceeds up into the bulb scales (Fig. 1). In the early stages of infection, disease symptoms are not always apparent, and may not become evident until perhaps a month after the bulbs have been dug. Thus, infected bulbs may be overlooked, and consequently mixed together with healthy bulbs during grading, cleaning, storing, or shipping activities. Under the right conditions of temperature and moisture, the fungus can spread rapidly from diseased bulbs to healthy bulbs.

Basal rot is primarily a disease of bulbs in storage or in transit, but may also be a problem in the field. The disease is more prevalent in fields where soil temperatures exceed 18°C (ca. 65°F). Temperatures below 13°C (55°F), as occur in the Pacific Northwest, tend to retard infection. When infected bulbs are planted, they either rot in the field (contaminating the soil with fungal inoculum for future plants), or the plants which grow from such bulbs become stunted and chlorotic. Flower buds, if formed, rarely open. Roots of such plants are usually few to none. The planted bulbs become partially to entirely decayed, and exhibit the same brown discoloration as that of stored bulbs originating at the bulb's basal plate.

Bulb problems which could be confused with *Fusarium* basal rot include (1) overheating, which causes a brown decay beginning at the root initials and flower bud rather than the basal plate; (2) freezing injury, in which tissues other than the root and flower bud are the first to become discolored; and (3) fumigation injury (with methyl bromide) which results in a grayish brown tissue breakdown that progresses uniformly from the outer surfaces inward.

When bulbs are lifted from soil infested with Fusarium, the fungus is believed to be carried in dead tissues at the base of the bulb or via moribund roots still attached to the bulbs. When the bulbs are in storage, the fungus proceeds into the bulb scales, causing the interior discoloration of the bulb. Entry by the fungus occurs anywhere around the basal plate, including the junction of young offset bulblets, particularly where one has broken off (e.g. during cleaning operations). In addition, other openings such as wounds, bruises, sun-scald spots, etc. also provide easy access for the fungus. Even the openings caused by the emergence of new roots is enough for the fungus to gain entry to the bulb. Completely dormant bulbs are fairly resistant to infection but as soon as roots begin to push, they become susceptible again. Cool temperatures retard infection in stored bulbs. The fungus grows well at 18°C to 30°C (ca. 65°F to 86°F), and infection and spread of the fungus is rapid when coupled with a humid, poorly ventilated environment.

Prevention is the most effective control for basal rot. Harvested bulbs should be handled carefully, taking precautions against unnecessary wounding and bruising. Every effort should be made to avoid contaminating healthy bulbs with diseased bulbs. All obviously diseased bulbs should be discarded, both at harvest and again at planting time. Care must be taken to avoid wounding and bruising of the bulbs, as well as excessive splitting off of offsets during digging and cleaning operations. Unnecessary exposure of freshly dug bulbs to the hot sun should also be avoided to prevent sunscald injury. Bulbs should be dried as quickly as possible after lifting, and stored under cool, dry, well ventilated conditions.

Fungicide dips for bulbs is frequently done as a preventative measure. Treatment of the bulbs should be done in the summertime when the bulbs are at full dormancy--most of the old roots have sloughed and root scars have healed over, yet new roots have not begun to push. Hot water treatment for nematodes is another common practice. To prevent the inadvertant spread of Fusarium from diseased bulbs to healthy ones during the treatment, formalin is frequently added to the water. Other preventative measures used by bulb growers involve planting bulbs only in areas in which diseased bulbs have not been harvested, and to avoid planting bulbs on the same land more frequently than once every three years. In addition, it has been shown that excessive nitrogen and phosphorous tend to increase the incidence of basal rot, while high potassium tends to reduce it. Some growers have experienced good results by fertilizing only a separate cover crop rather than the actual bulb crop.

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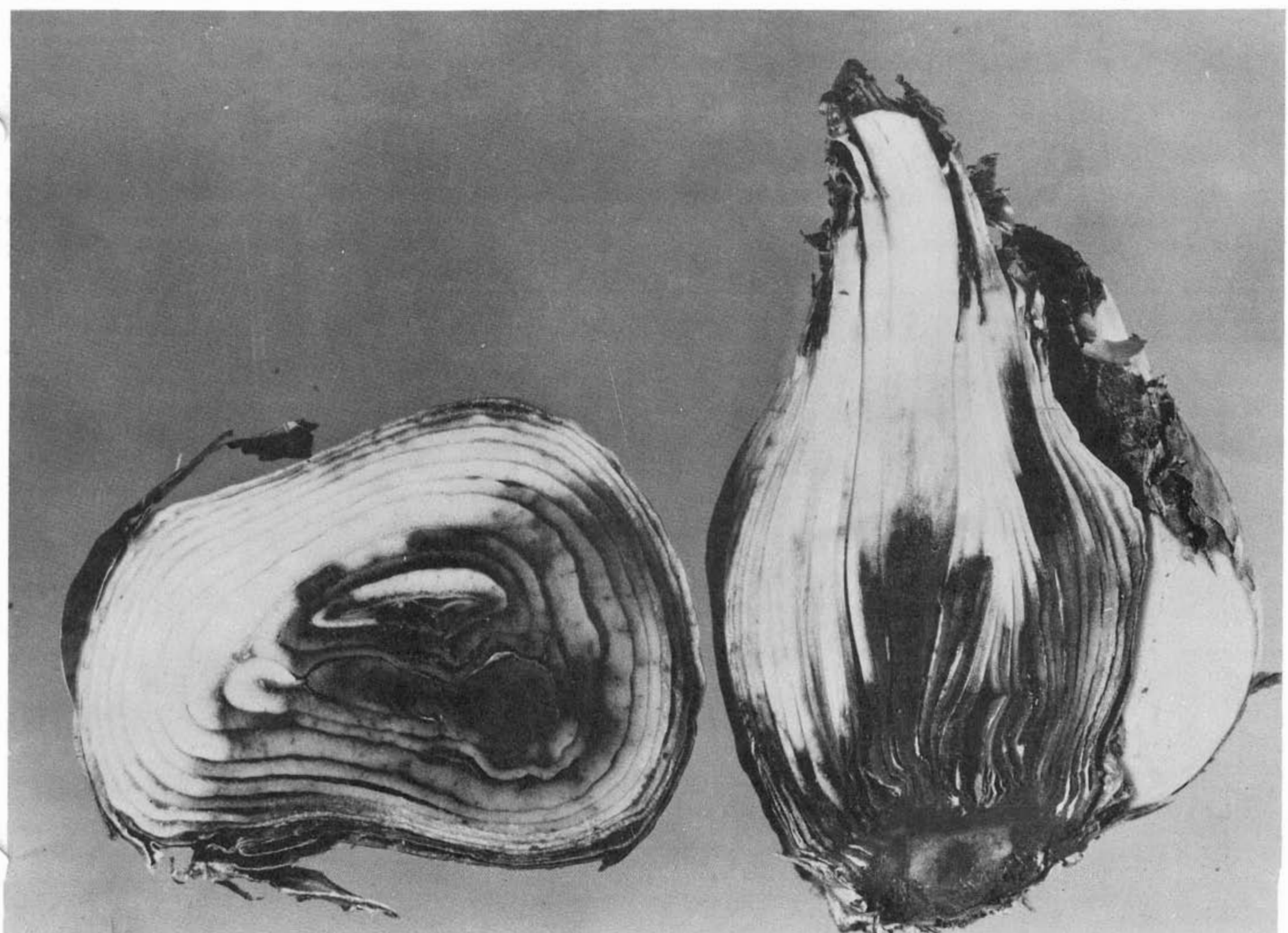


Fig. 1. Cross section (left) and longitudinal section (right) of Narcissus bulbs with _Fusarium_ basal rot.

SUMMARY OF DIAGNOSES OF PLANT VIRUS DISEASES FOR THE CALENDAR YEAR 1984

Barbara Pauly

The following is a list of the positive identifications of plant viruses on a wide variety of plant hosts. The plant samples were sent in by counties, nurseries, and private citizens. The numbers following the host and diagnosis represent the specific California county from which the sample originated. The numbers and their respective counties are as follows:

1. Alameda
2. Alpine
3. Amador
4. Butte
5. Calaveras
6. Colusa
7. Contra Costa
8. Del Norte
9. El Dorado
10. Fresno
11. Glenn
12. Humboldt
13. Imperial
14. Inyo
15. Kern
16. Kings
17. Lake
18. Lassen
19. Los Angeles
20. Madera
21. Marin
22. Mariposa
23. Mendocino
24. Merced
25. Modoc
26. Mono
27. Monterey
28. Napa
29. Nevada
30. Orange
31. Placer
32. Plumas
33. Riverside
34. Sacramento
35. San Benito
36. San Bernardino
37. San Diego
38. San Francisco
39. San Joaquin
40. San Luis Obispo
41. San Mateo
42. Santa Barbara
43. Santa Clara
44. Santa Cruz
45. Shasta
46. Sierra
47. Siskiyou
48. Solano
49. Sonoma
50. Stanislaus
51. Sutter
52. Tehama
53. Trinity
54. Tulare
55. Tuolumne
56. Ventura
57. Yolo
58. Yuba

Host	Diagnosis	County of Origin
Ajuga sp.	Alfalfa Mosaic Virus	43
Angraecum sp.	Tobacco Mosaic Virus O Stain	29
Apium graveolens var. *dulce*	Western Celery Mosaic Virus	56,27
Avena sativa	Barley Yellow Dwarf Virus	31
Beta vulgaris	Beet Western Yellows Virus	11
Brassica oleracea	Cauliflower Mosaic Virus	35
Capsicum annuum	Alfalfa Mosaic Virus	10
Capsicum annuum	Potato Virus Y	37
Capsicum annuum	Tobacco Mosaic Virus	10
Capsicum annuum	Tomato Spotted Wilt Virus	34
Carica papaya	Papaya Ringspot Virus	41
Carthamus tinctorius	Turnip Mosaic Virus	57
Chicorium sp.	Lettuce Mosaic Virus	42
Citrullus lanatus	Watermelon Mosaic Virus	13,57
Cucumis melo	Squash Mosaic Virus	06,35,51
Cucumis melo var. *cantalupensis*	Squash Mosaic Virus	13,51
Cucumis melo var. *cantalupensis*	Watermelon Mosaic Virus	37,51
Cucumis sativa	Watermelon Mosaic Virus	37
Cucurbita pepo	Watermelon Mosaic Virus	39,30,37
Cucurbita sp.	Cucumber Mosaic Virus	06,57
Cucurbita sp.	Squash Leaf Curl Virus	37
Cucurbita sp.	Squash Mosaic Virus	06,24
Cucurbita sp.	Watermelon Mosaic Virus	06,24,37,51, 56,43
Cucurbita sp.	Tomato Spotted Wilt Virus	06
Cymbidium sp.	Cymbidium Mosaic Virus	12,42
Daucus carota	Carrot Motley Dwarf Virus	10
Dianthus caryophyllus	Carnation Latent Virus	27
Dianthus caryophyllus	Carnation Mottle	27
Dianthus caryophyllus	Carnation Necrotic Fleck Virus	42,27
Dieffenbachia sp.	Dacheen Mosaic Virus	19
Freesia sp.	Bean Yellow Mosaic	43
Hibiscus rosa-sinensis	Hibiscus Chlorotic Ringspot Virus	12
Iris pseudacorus	Iris Mild Mosaic Virus	27
Lactuca sativa	Lettuce Mosaic Virus	56
Lactuca sativa	Beet Western Yellows	56
Lactuca sativa	Tomato Spotted Wilt Virus	56
Lavandula sp.	Tobacco Mosaic Virus	34
Lathyrus odoratus	Pea Streak Virus	57
Limonium sp.	Turnip Mosaic Virus	43
Limonium latifolium	Turnip Mosaic Virus	37
Lycopersicon esculentum	Alfalfa Mosaic Virus	34,39
Lycopersicon esculentum	Beet Curly Top Virus	57
Lycopersicon esculentum	Corky Ringspot Strain of Tobacco Mosaic Virus	24,39
Lycopersicon esculentum	Cucumber Mosaic Virus	34,37

Lycopersicon esculentum	Curly Top Virus	56
Lycopersicon esculentum	Potato Virus A	37
Lycopersicon esculentum	Potato Virus Y	37
Lycopersicon esculentum	Tobacco Mosaic Virus	37,35,42
Lycopersicon esculentum	Tomato Big Bud (MLO)	48
Lycopersicon esculentum	Tomato Spotted Wilt Virus-	34,43,39,57
Malus sylvestris	Apple Mosaic Virus	50
Mathiola sp.	Turnip Mosaic Virus	34
Mentha sp.	Alfalfa Mosaic Virus	13
Orchidaceae	Cymbidium Mosaic Virus	19,36,30,42 13
Orchidaceae	Tobacco Mosaic Virus O Stain-	19,42,13,31
Origanum vulgare	Alfalfa Mosaic Virus	13
Persea americana	Sunblotch Viroid	42
Petroselinum crispum	Western Celery Mosaic Virus	56
Phalaenopsis sp.	Cymbidium Mosaic Virus	42
Phaseolus vulgaris	Bean Common Mosaic Virus	06
Pisum sativa	Pea Mosaic Virus	15
Prunus avium	Prunus Necrotic Ringspot Virus	34,04
Prunus domestica	Prune Dwarf Virus	50,10
Prunus domestica	Apple Mosaic Virus	50
Prunus domestica	Prune Necrotic Ringspot Virus	50,10
Prunus persica	Apple Mosaic Virus	33
Prunus persica	Prunus Dwarf Virus	33
Prunus persica	Prunus Necrotic Ringspot Virus	10,33,54
Prunus persica	Tomato Ringspot Virus	57
Prunus persica	Yellow Bud Mosaic	57
Prunus sp.	Apple Mosaic Virus	51,34,57
Prunus sp.	Prune Dwarf Virus	51,34,57
Prunus sp.	Prunus Necrotic Ringspot Virus	51,34,57
Rosa sp.	Apple Mosaic Virus	34
Rosa sp.	Rose Mosaic Virus	43,15
Rosa sp.	Rose Spring Dwarf Virus	43
Solanum tuberosum	Potato Leaf Roll Virus	57,25,33
Solanum tuberosum	Potato Virus A	57
Solanum tuberosum	Potato Virus M	57
Solanum tuberosum	Potato Virus S	57,11,25
Solanum tuberosum	Potato Virus X	57,37,25
Solanum tuberosum	Potato Virus Y	57,37,25,33
Spinacea oleracea	Cucumber Mosaic Virus	34
Tagetes erecta	Asters Yellows (MLO)	42
Vicia faba	Pea Mosaic Virus	42
Vitis vinifera	Fan Leaf Virus	49
Zea mays	Sugar Cane Mosaic Virus	06

Barbara Pauly is an Agricultural Inspector for the Analysis and Identification Unit of CDFA.

IN MEMORIAM

T. Roy Matsumoto

August 13, 1932 - March 12, 1985

T. Roy Matsumoto, a Program Supervisor, with the Department's Pest Exclusion Unit passed away on March 12, 1985. Roy had been employed with the Department for 22 years, primarily with the Nursery Services function. His primary area of responsibility was plant registration and certification and in that capacity he worked with Agricultural Commissioners, University of California researchers, and the nursery industry. His knowledges, abilities, and skills will be greatly missed.

I remember a man -- a man who made a name for himself as a husband, a father, a dad, a friend, a co-worker.

I remember a man -- a sensitive, loving, caring man; a man with endearing qualities. A man of humor. A man of generosity. A man of honor. A man of integrity. A man of loyalty and devotion. A man who could capture the essence of a person or situation in a caricature. I remember a man who earned the respect of his colleagues and associates. I remember a man who though having so much to give was torn from us by a great enemy.

I remember a man -- a man who rests in sleep; a man who lives in the minds and hearts of his family and friends.

I remember a man -- T. Roy Matsumoto.

-- Bill L. Callison

IN MEMORIAM

Ronald M. Hawthorne

September 25, 1911 to December 31, 1984

Ron Hawthorne, retired from State Service since 1978, passed away at years end during a fire which destroyed his home. He is survived by a sister who lives in the Sacramento area.

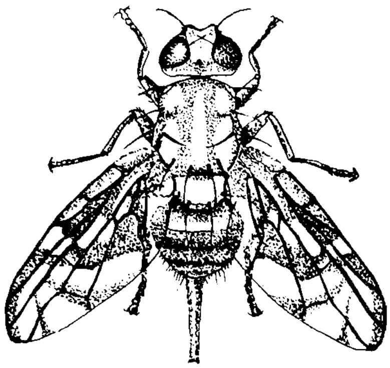
Ron began working for the Department as a seasonal border station inspector in southern California on August 11, 1939. After serving in World War II, he returned to work in the border station program. After a short time, he moved to Sacramento to work in the insect identification laboratory under Hartford Keifer. Later he became a survey and detection entomologist in the southern third of the state. In the early 1950's he was assigned to the detection program for cherry fruit fly in Humboldt and Siskiyou Counties. He was also deeply involved in the successful eradication program against Khapra beetle in southern California. Eventually, he returned to Sacramento where he solved insect control problems.

He authored the California edition of the Cooperative Economic Insect Report, the forerunner of our present California Plant Pest and Disease Report (CPPDR). During this time, he also developed and published the yearly report "Economic Damage and Crop Loss Caused by Insects and Mite Pests". This report is unique and widely used by economic entomologists around the world. It is a tribute to Ron that such a report could have been produced in the first place. Also, the report was discontinued after his retirement, because no one had the depth of knowledge or contacts necessary to maintain it.

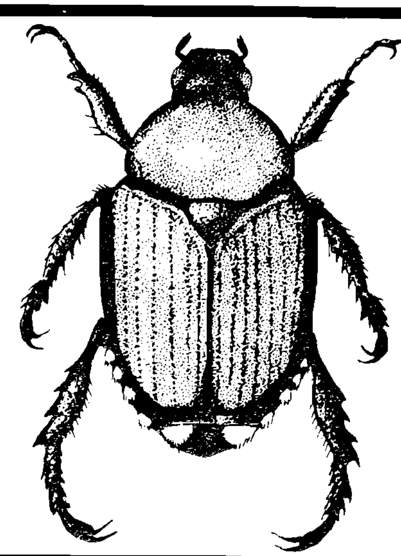
Ron spent considerable time solving insect pest problems for homeowners. He had patience and used good sense in his working relationships with "little old ladies" and particularly with people who were affected by the "Entomophobia syndrome".

We did not see Ron much after his retirement since he was busy maintaining his various properties. He did occasionally attend meetings of the Northern California Entomology Club to renew old friendships. We will miss him there.

-- Raymond J. Gill



Entomology Highlights



MEDITERRANEAN FRUIT FLY, *Ceratitus capitata* -(A)- Fortunately, we have no new finds of this serious fruit pest since the last one in November of 1984 (CPPDR 4(1):15). Unfortunately, there is an infestation in Florida's Dade County. As of March 6, there is a report of at least one and possibly two flies having been found in North Miami.

The following report concerning Florida's last Medfly infestation has been taken from Tri-ology 23(12):6, December 1984: [Mediterranean fruit fly] "was declared eradicated from Florida on November 2, 1984. The campaign began on June 19, 1984 when 4 adult flies were trapped in Miami's "Little Havana" area, Dade County. Thirteen adults (12 males and 1 female) and 1 larva were found during the campaign. Adult flies were found at 7 locations, 6 of those within a 1-square mile area of Little Havana. The last 2 flies were found August 8, 1984 on Dodge Island at the entrance to Miami harbor and slightly outside the original 9-square-mile aerial spray zone".

ORIENTAL FRUIT FLY, *Dacus dorsalis* -(A)- One specimen has been collected so far this year. The following report by John Pozzi outlines the find:

> "One adult male Oriental Fruit Fly (OFF) was detected January 22, 1985 in Redlands, San Bernardino County. This is the first OFF detected in the 1985 calendar year. The adult male OFF was trapped in a Jackson trap placed in an orange tree. The OFF was detected by San Bernardino County Trapper Roger Mann at a residence on Olive Street. The trap density

was two per square mile and as required by protocol the trap density has been increased to five per square mile over an eighty one square mile area.

The positive identification was made by CDFA Systematic Entomologist Marius Wasbauer. CDFA Systematic Entomologist Karen Corwin determined the male OFF was sexually mature."

MEXICAN FRUIT FLY, Anastrepha ludens -(A)- Also, one specimen of this familiar fruit fly has been found this year. The following summary is by John Pozzi:

"The first Mexican fruit fly (MFF) for 1985 was trapped on 1/22/85 in San Ysidro, San Diego County. The discovery was made by County Agricultural Technician Richard Dearie, while servicing a McPhail trap that had been placed in an orange tree along West Park Avenue.

"McPhail trap density in the area was eight traps per square mile. San Diego County Department of Agriculture personnel have increased the density to 50 McPhail traps in the square mile around the find and 25 traps are being placed in each of the eight adjoining square miles.

"According to CDFA Systematic Entomologist Karen Corwin, the Mexican fruit fly was a male with normal testes and there was no evidence of irradiation."

COTTON BOLL WEEVIL, Anthonomus grandis -(A)- The following report by Tom Palmer outlines the current status of this pest eradication program in the southern desert areas:

Trapping Program

Traps are being run every other week in the eradication project area. The number of weevils being trapped have increased during the last two weeks. This is probably as a result of increased plow down efforts by the growers now that the soil is drying out after the rains.

Imperial County Trapping Report - 1/1 to 1/22/85

Bard/Winterhaven	1,832 weevils
Imperial Valley	284 weevils

Riverside County - 1/1 to 1/23/85

Blythe	510 weevils

ACARINE MITE, _Acarapis woodi_ -(A)- The first survey for this honeybee parasite is essentially complete, with no infestations having been found in the state. Tokuwo Kono and his staff should be commended for their painstaking but efficient handling of the dissecting operations. George Buxton should be credited with efficiently overseeing the collection aspects. The following chart compiled by Isa Montenegro summarizes the number of samples collected and dissections made between October 17, 1984 and February 28, 1985:

Total number of	Type of Sample	
	Survey	Quarantine
Field collections	2,358	52
Dissections	121,303	7,800

Total Dissections 129,103

NEW STATE RECORDS

CLOUDYWINGED WHITEFLY, _Dialeurodes citrifolii_ -(A)- A species of whitefly, _Dialeurodes citrifolii_ (the cloudywinged whitefly) has been detected for the first time in California. CDFA Systematic Entomologist Ray Gill made the final determination and supplies the following information on the find:

The first confirmed collection of specimens from an established infestation of cloudywinged whitefly has been made in California. The collection was made by Belinda Moss, San Diego County Pest Management Technician, along Del Mar Avenue, Point Loma on February 4, 1985. The host was grapefruit and the infestation was listed as heavy.

Specimens of this whitefly are listed in the early literature as having been collected in Bakersfield in 1907. However, we have never been able to locate specimens from that collection so that a confirmation can be made, nor have we been able to ascertain whether or not the specimens may have been in quarantine. Therefore, we consider the San Diego collection a new state record.

Cloudywinged whitefly may become a moderate to serious pest of citrus, although, like citrus and woolly whiteflies it may be more of a problem in dooryard situations or more temperate locations along the coast.

At this point in time, it is essentially identical to citrus whitefly in the field when the nymphal and pupal stages. The adults are different because of markings on the wings of cloudywinged whitefly. Published host records for cloudywinged whitefly includes most _Citrus_ species, _Gardenia_ and _Ficus nitida_. The known geographical range of the species includes Florida, Mississippi, North Carolina, Louisiana, Texas and Hawaii, also Japan, India, China, Vietnam, Mexico, Cuba, Jamaica, Puerto Rico, Barbados, Trinidad, Venezuela, and Brazil.

A delimitation survey is currently underway in the county. Although not completed at the time of this writing, the whitefly has been found in the following locations: Coronado, by B. Gardner; Florida Street, San Diego by David Murphy; and Clairemont by Bradberry.

As already mentioned above, cloudywinged whitefly is nearly unseparable from the common and widespread citrus whitefly in the field. Morphologically, however, the two species are easily separated. In the pupal stage, citrus whitefly has small spinules covering the surfaces of the ventral thoracic and abdominal tracheal furrows. In cloudywinged whitefly, the abdominal tracheal furrow has a cobblestone-like reticulation and the two thoracic tracheal furrows are unmarked. In the adults, citrus whitefly males and females have a very unusual development of the sensory pores of the antennae which are not found on the antennae of cloudywinged whitefly.

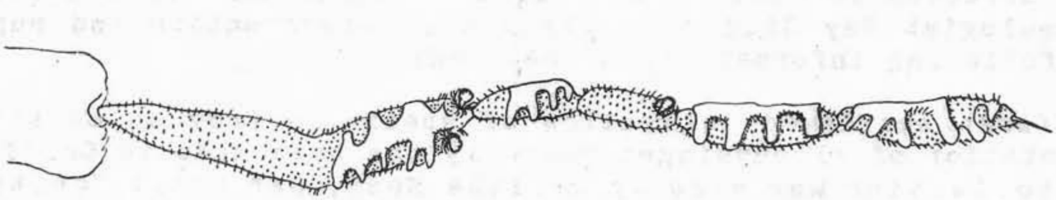
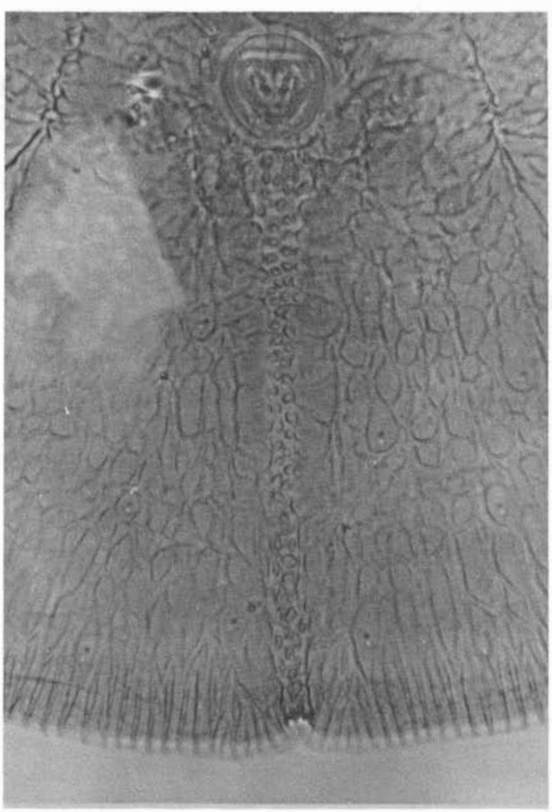


Figure 1. Antenna of adult male citrus whitefly, showing the unusual "wrap-around" sensoria on the antennal segments. Cloudywinged whitefly does not have these sensoria. (Illustration courtesy of Richard F. Wilkey).

Figure 2. Pupal case of cloudywinged whitefly alive on leaf.
Figure 3. Pupal case of citrus whitefly alive on leaf.



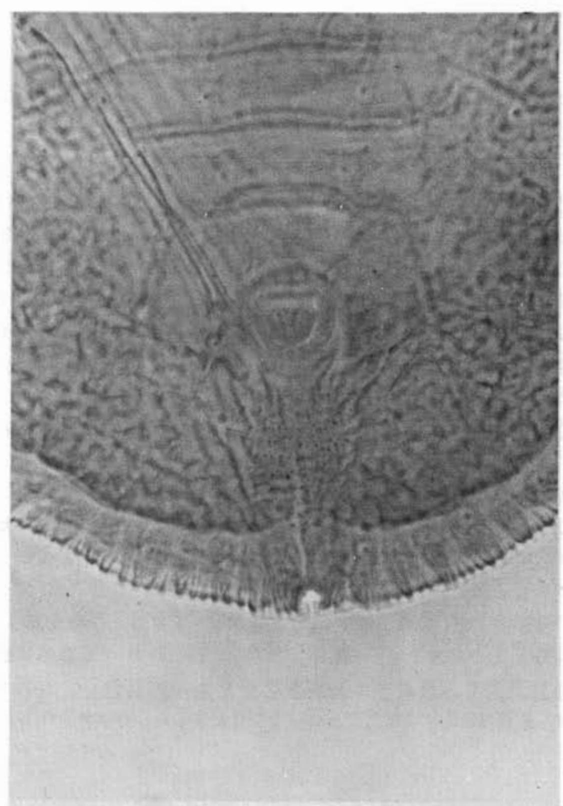


Figure 4. Abdominal tracheal furrow of a slide-mounted specimen of cloudywinged whitefly, showing cobblestone texture.
Figure 5. Abdominal tracheal furrow of a slide mounted specimen of citrus whitefly, showing spinous textur..

NEW COUNTY RECORDS

FUCHSIA MITE, Aculops fuchsiae -(B)- The first CDFA record for this mite has been established for Ventura County. The collection was made by David Van Epp in Ventura, February 27, 1985 on Fuchsia.

MISCELLANEOUS INSECT PROBLEMS

MINT APHID, Eucarazzia elegans -(C)- First found in the United States in Riverside County [CPPDR 3(3):53, 1984], this aphid is still present in Southern California. Dr. Eldon Reeves, Riverside County Entomologist, has recently checked on the aphid, and although he believes that more data can be supplied in three or four months, he nonetheless submits this report on its current status in Riverside County.

Eucarazzia elegans (FERRARI), MINT APHID, COLLECTED ON LAMIACEAE PLANTS IN RIVERSIDE COUNTY, CALIFORNIA (HOMOPTERA:APHIDIDAE)

Eldon L. Reeves

February 6, 1985

Eucarazzia elegans (Ferrari), mint aphid, was field collected for the first time in North America, less than a year ago, on bell pepper plants in Mecca, Riverside County, California. It was detected by B. Ballen and M. Grunnet and identified by Dr. Manya Stoetzel, USDA-ARS. The literature indicates a geographical distribution for E. elegans limited essentially to the Mediterranean region and its host plants to be limited to members of the family Lamiaceae (=Labiatae).

Since its appearance in Riverside County we have taken this aphid on at least 22 species of non-mint family plants. Many of these were alate females taken while actively feeding and/or depositing nymphs. These include such diverse kinds of plants as: bell pepper, watermelon, fan palm, Ribes nevadense, sweet corn, and sunflower, as well as known plant virus reservoirs, e.g., Amaranthus retroflexus. Many of these were taken in the intensely agricultural Coachella Valley.

The primary purpose of this report is to record the various Lamiaceae plant species from which this aphid has been taken in Riverside County between March 28th, 1984 and February 5th, 1985:

1. Lavandula dentata, French Lavender
2. Mentha spicata, Spearmint
3. Nepeta cataria, Catmint/Catnip
4. Nepeta mussinii, Persian Catmint
5. Ocimum basilicum, Basil
6. Rosmarinus officinalis, Rosemary
7. Salvia apiana, White Sage
8. Salvia apiana X Salvia mellifera
9. Salvia canariensis
10. Salvia chionopeplica
11. Salvia clevelandii X Salvia pachyphylla
12. Salvia leucophylla, Purple Sage
13. Salvia mellifera, Black Sage
14. Salvia mohavensis X Salvia vaseyi
15. Salvia munzii
16. Salvia officinalis, Sage
17. Salvia splendens, Scarlet Sage
18. Thymus vulgaris, Thyme

The currently known California distribution of E. elegans extends from Imperial County and San Diego County, on the Mexican Border, north and west to Santa Barbara County. This covers an area of some 300 by 100 miles.

Between January 15th and February 5th, 1985, I observed the mint aphid population to expand rather dramatically under field conditions in the Riverside area. It was nearly impossible to find any form of this aphid as late as January 15, 1985, even on preferred hosts, such as Salvia mellifera. By January 22, 1985, 2 or 3 leaves on a large S. mellifera plant typically would have 1 or 2 alates, each with 2 or 3 young nymphs. By January 30, 1985 these same 2 or 3 leaves would be covered on the underside by 3 or 4 alates and many young and developing nymphs. During this 22 day observation period, t he field temperature range was: high maximum 24°C, high minimum 8°C; low maximum 8°C, low minimum 2°C; with two periods of precipitation totalling 0.84". This year E. elegans had been taken in the field only on four species of Lamiaceae by January 24, 1985. By February 5, 1985 it had been recorded on 13 species of the approximately 30 species of Lamiaceae originally surveyed. Due to temperatures as low as -5°C in the Coachella Valley during January and February 1985, we have been unable, so far, to detect E. elegans in previously infested commercial mint fields.

The crowded conditions observed on these individual leaves may be conducive to the production of alate forms, which would be beneficial to the species for rapid dispersal and colonization. Some pre-alate forms already have been observed under these conditions.

A mycosis attacking E. elegans was first observed January 22, 1985 by Steven J. Castle, USDA-ARS and the author while surveying Salvia mellifera X Salvia apiana plants in the Lamiaceae test plots maintained by the University of California, Riverside, Botanic Garden. The diseased individuals change in color from their normal light to medium green to a bright to dull red. This color change makes their detection easy. The fungal etiologic agent has been identified as Entomophthora planchoniana, Cornu (Entomophthorales:Entomophthoraceae) by Ken Y. Arakawa, University of California, Riverside, Entomology Department/Biological Control Division. This entomogenous fungus appears to kill E. elegans rather rapidly. The cadaver remains attached to the leaf by rhizoids that penetrate the dead aphid's integument and anchor it to the leaf. From this advantageous position the maturing fungal conidia may be dispersed into the surrounding environment. The behavioral tendency for this aphid to crowd many individuals onto a given leaf predisposes the population to this type of a mycosis. Due to the close proximity of the individual aphids, the dispersing conidia from the cadavers would immediately come in contact with other potentially susceptible hosts. As many as 20% of the aphids on a given leaf have been observed tobe dead and red in color due to this mycosis. This may well exert a certain level of natural control on this new pest.

Under favorable conditions, this aphid has been observed to build up to high population levels, such as during June 1984 on certain Salvia species in the UCR Botanic Garden. At that time, honeydew and sooty mold were a problem. Consequently, the aphids were treated with an insecticide to reduce the population.

ASH/LILAC BORER, Podosesia syringae -(B)- In May 1979 lepidopterist Tom Eichlin discovered the presence in Sacramento of the ash/lilac borer (Podosesia syringae, Sesiidae), a serious pest of ash, lilac and privet (New State Record 1979, CPPR-USDA 4(18):313). With the aid of sex attractants, surveys of the area revealed a widespread infestation in the city and surrounding county but as yet nowhere else in the state. In a followup report (1981 - CPPR-Cal 4(9):96), Dr. Eichlin verified that various ashes, including hybrid varieties, and lilac were serving as host plants for the clearwing moth borer in the area.

Since the initial discovery of the pest in California and because its reported hosts are in the same family as olive (Olea europaea), we have been concerned about olive becoming a new host. Our fears were justified last August when Ron Somerby recognized a larva in an olive branch sample as being a sesiid. Tom then verified that it was the ash/lilac borer, thus proving that olive is vulnerable to attack by this borer. Subsequently, the sampled tree, an ornamental planting near a new office complex, was examined and shown to have dead branches throughout, presumably the direct result of borer activity.

Since that first identification by Tom Eichlin last fall of the B-rated ash/lilac borer from an ornamental planting of olive in Sacramento, our Detection Unit has been concerned about the potential effect of this pest in commercial olive orchards. They have enlisted Dr. Eichlin's aid to set up a trapping study using sex attractant baits in the major olive producing areas in the Central Valley.

Additionally, Pam Bone, Sacramento County Extension Service Entomologist, is cooperating with Tom to conduct a systematic survey in Sacramento to determine the exact flight period (emergence period) for this same pest. Fortunately, another pest, the red-banded clearwing (Synanthedon culiciformis), which is devastating white alders in various parts of town, also responds to the sex attractant used to trap the ash/lilac borer males; so, the survey will be expanded to include both pest species. This emergence data and length of flight period information are critical to the timely application of appropriate control procedures.

Dr. J. Wendell Snow, Director, USDA Lab., Byron, Georgia, who collaborates with Dr. Eichlin on several research projects, has very kindly provided the sex attractant for all of the above mentioned studies at no cost to our Department. Detection is providing the traps; Pam Bone and her group will be deploying and monitoring the traps used in the local survey. All of this is scheduled to begin in early March.

See photos of Ash/Lilac Borer and current distribution map on cover.

A MEALYBUG, Pseudococcus sp. -(Q)- An undescribed mealybug has been recollected from agave in Montecito, Santa Barbara County during October. The initial collection was made by Joe Karl on October 1, and subsequent recollections were made by Joe Karl and Gerry Davidson. The mealybugs were originally collected near the same location in April of 1981 by Richard Doutt.

The species is either undescribed or a variant of a Mexican species called Pseudococcus agavis. The taxonomy fo the agave-infesting group of Pseudoccus species will have to be studied in depth before a conclusion can be reached on an exact identification.

The mealybug seems to be restricted thus far to the agave group of plants and probably will not be of economic concern.

QUARANTINE AND EXCLUSION

GYPSY MOTH, Lymantria dispar -(A)- The following chart outlines the moth finds for the months of September, October:

County	Origin	Date	Stage	Collector
OR	New Jersey	9/7	L,P	Wynn
OR	Massachusetts	9/11	E	Wynn
SD	New York	9/18	E,L	Cochrane
H	New York	9/18	-	Spadoni
V	Maryland	9/18	E,A	Hillis
SBO	Maryland	9/21	-	Cruzen
SM	Massachusetts	10/2	E,L	Sampson/ Masini
SD	New York	10/4	E,P	McCutcheon/ Sixtus
OR	New York	10/15	E,P	Park
ALA	New York	10/18	E,L,A	Brownfield

TENT CATERPILLARS, Malacosoma sp. -(Q)- Several specimens of this injurious group of moths were discovered while inspecting for gypsy moth:

County	Origin	Date	Stage	Collector
SD	Pennsylvania	8/30	P	Ginsky
SD	New York	8/30	P	Bertrand
V	Pennsylvania	9/13	-	Arnold
SLO	Michigan	10/10	-	McCaslin/ Smithback
OR	Pennsylvania	10/18	P	Wyatt

The following A, B and Q pests have been intercepted in Quarantine from August to October

Rating	Species	Common Name	Date	Origin	County	Host	Collector
Q	Luparia notulata	Cockroach	9/5	Hawaii	LA	Aohmea	Papilli
Q	Echinothrips americanus	A thrips	9/12	Florida	DN	Hibiscus	Spadoni
Q	Echinothrips americanus	A thrips	9/12	Florida	IM	Hibiscus	Shaffer
Q	Echinothrips americanus	A thrips	9/12	Florida	SJ	Hibiscus	Willson
Q	Echinothrips americanus	A thrips	9/14	-	LA	Hibiscus	Cox
A	Pseudaulacaspis cockerelli	Magnolia whitescale	8/29	Hawaii	STB	Strelitzia	Van Epp
A	Pseudaulacaspis cockerelli	Magnolia whitescale	9/11	Hawaii	PLA	Strelitzia	Jensen
A	Pseudaulacaspis cockerelli	Magnolia whitescale	9/19	Hawaii	V	Strelitzia	Van Epp
A	Pseudaulacaspis cockerelli	Magnolia whitescale	9/20	Florida	SD	Palm	Bertrand
A	Pseudaulacaspis cockerelli	Magnolia whitescale	9/25	Hawaii	SD	Palm	Boch
A	Pseudaulacaspis cockerelli	Magnolia whitescale	10/4	Hawaii	LA	Sago	Kellam
A	Pseudaulacaspis cockerelli	Magnolia whitescale	10/15	Florida	O	Palm	Ellis
A	Pulvinaria psidii	Green shield scale	9/28	Hawaii	SF	Flowers	Rios
Q	Pinnaspis buxi	Boxwood scale	9/28	Hawaii	SF	Flowers	Rios
Q	Pinnaspis buxi	Boxwood scale	8/31	Hawaii	SF	Ti	Rios
Q	Pinnaspis buxi	Boxwood scale	9/14	Hawaii	SF	Ti	Rios
Q	Pinnaspis buxi	Boxwood scale	10/9	Hawaii	SJ	Dracaena	Helmar
A	Pinnaspis strachani	Lesser snow scale	9/15	Hawaii	LA	Ti	Papilli
A	Pinnaspis strachani	Lesser snow scale	9/26	Hawaii	STCL	Coconut	Gilmour
A	Selenaspidus articulatus	Rufous scale	9/11	Argentina	SF	Grapefruit	Brown
Q	Parlatoria citri	Citrus parlatoria	10/16	Malaysia	SF	Citrus	Brown
B	Aonidiella aurantii	California red scale	9/16	Finland	SF	Citrus	Brown
A	Ceroplastes rubens	Red wax scale	8/29	Hawaii	STB	Plumeria	VanEpp
Q	Coccus viridis	Green scale	10/12	Hawaii	SM	Ti	Buerer
Q	Coccus viridis	Green scale	10/9	Hawaii	SF	Plumeria	Rios
Q	Coccus viridis	Green scale	10/10	Hawaii	SF	Plumeria	Rios
Q	Coccus viridis	Green scale	10/11	Hawaii	SF	Plumeria	Rios
A	Kilifia acuminata	Acuminate scale	9/12	Florida	SM	Philodendron	Buerer
A	Kilifia acuminata	Acuminate scale	9/13	Florida	SM	Philodendron	Buerer
A	Kilifia acuminata	Acuminate scale	9/17	Hawaii	LA	Monstera	Adams/Creekman
A	Pulvinaria psidii	Green shield scale	10/19	Hawaii	SJ	Ginger	Watkins
A	Pulvinaria psidii	Green shield scale	10/15	Hawaii	SF	Flowers	Rios
A	Pulvinaria psidii	Green shield scale	10/1	Hawaii	LA	Flowers, Ti	Adams
A	Pulvinaria psidii	Green shield scale	9/5	Hawaii	SD	Ginger	Ginsky/Kennedy
A	Howardia biclavis	Mining scale	10/10	Hawaii	SF	Plumeria	Rios
Q	Palmicultor palmarum	Palm mealybug	9/26	Hawaii	STCL	Coconut	Gilmour
Q	Pseudococcus sp. undes.	A mealybug	9/4	Florida	LA	Schefflera	Smith/Adams
Q	Rhizoecus americanus	A soil mealybug	10/2	Florida	LA	Palm	Rawald
Q	Geococcus coffeae	A soil mealybug	9/10	Hawaii	SD	Ginger	Ginsky/Kennedy
B	Dysmicoccus alazon	Alazon mealybug	9/5	So. America	LA	Banana	Peterson
Q	Pseudococcus nr. lycopodii	Clubmoss mealybug	9/10	Hawaii	LA	Lycopodium	Adams
Q	Pseudococcus nr. lycopodii	Clubmoss mealybug	9/10	Hawaii	LA	Lycopodium	Adams
Q	Pseudococcus nr. lycopodii	Clubmoss mealybug	9/11	Hawaii	LA	Lycopodium	Adams
Q	Pseudococcus nr. lycopodii	Clubmoss mealybug	9/17	Hawaii	LA	Lycopodium	Adams/Creekmur
Q	Pseudococcus nr. lycopodii	Clubmoss mealybug	9/19	Hawaii	LA	Lycopodium	Adams/Simon
Q	Pseudococcus nr. lycopodii	Clubmoss mealybug	9/24	Hawaii	LA	Lycopodium	Adams
Q	Pseudococcus nr. lycopodii	Clubmoss mealybug	9/26	Hawaii	LA	Lycopodium	Adams
Q	Pseudococcus nr. lycopodii	Clubmoss mealybug	10/9	Hawaii	LA	Lycopodium	Adams
Q	Pseudococcus nr. lycopodii	Clubmoss mealybug	10/10	Hawaii	LA	Lycopodium	Adams
Q	Pseudococcus nr. lycopodii	Clubmoss mealybug	10/15	Hawaii	LA	Lycopodium	Adams

Q	_Aleurodicus dispersus_	Spiraling whitefly	9/4	Hawaii	LA	Ti	Smice/Adams
Q	_Aleurodicus dispersus_	Spiraling whitefly	9/11	Hawaii	SF	Ti	Rios
Q	_Aleurodicus dispersus_	Spiraling whitefly	9/26	Hawaii	V	Ti	VanEpp
Q	_Crenidorsum_ sp. undes.	A whitefly	10/12	Hawaii	SD	Anthurium	Walsh
Q	_Aleurocanthus spiniferus_	Citrus blackfly	9/24	Malaysia	ALA	Citrus	Brown
B	_Siphanta acuta_	Torpedo bug	10/19	Hawaii	STCL	Protea	Price
Q	_Empoasca_ nr. _stevensi_	A leafhopper	10/19	Hawaii	SD	Ti	Melvin/Boch
Q	_Erythroneura_ sp.	A grape leafhopper	9/26	Arkansas	R	Grape	Siedschlag
Q	_Protaetia fusca_	Mango flower beetle	10/11	Hawaii	ALA	Automobile	Brown
Q	_Anomala_ sp.	A scarab	10/10	Taiwan	SLA	Packing Box	Hopkins
Q	_Orchidophilus attarinus_	An orchid weevil	10/1	Hawaii	LA	Orchid	Adams
Q	_Chrysodeixis chalcites_	Green garden looper	9/19	Hawaii	SJ	Ti	Frieders
Q	_Oiketicus abbotii_	A psychid moth	9/14	-	SJ	Palm	Johnson/Brown
Q	_Carposina_ sp.	A carposinid moth	9/25	Oregon	SM	Huckleberry	Buerer
Q	_Carposina_ sp.	A carposinid moth	10/9	Oregon	SM	Huckleberry	Buerer
Q	_Pheidole magacephala_	Bigheaded ant	10/1	Hawaii	SJ	Ginger	Watkins
Q	_Pheidole megacephala_	Bigheaded ant	10/3	Hawaii	LA	Protea	Calicchia
Q	_Pheidole megacephala_	Bigheaded ant	10/6	Hawaii	SD	Anthurium	Ginsky
Q	_Pheidole megacephala_	Bigheaded ant	10/17	Hawaii	SBO	Protea	Mitchell
Q	_Pheidole megacephala_	Bigheaded ant	10/18	Hawaii	MER	Flowers	Watkins
Q	_Tapinoma melanocephalum_	Blackheaded ant	10/10	Hawaii	SF	Ginger	Rios
Q	_Tapinoma melanocephalum_	Blackheaded ant	9/20	Hawaii	O	Aechmea	Robertson
Q	_Tapinoma melanocephalum_	Blackheaded ant	10/3	Hawaii	SF	Ginger	Rios
Q	_Anoplolepis longipes_	Long legged ant	10/15	Hawaii	SF	Ginger	Rios
Q	_Technomyrmex albipes_	An ant	10/19	Hawaii	SJ	Anthurium	Watkins
A	_Solenopsis invicta_	Red imported fire ant	9/5	Florida	MY	Ficus	Bunch
Q	_Paratrechina_ sp.	An ant	9/4	Florida	LA	Palm	Calicchia
Q	_Paratrechina_ sp.	An ant	9/17	Florida	LA	Dieffenbachia	Sulentich
Q	_Paratrechina_ sp.	An ant	9/24	Florida	LA	Palm	Calicchia
Q	_Paratrechina_ sp.	An ant	10/16	Florida	LA	Palm	Calicchia
B	_Bradybaena similaris_	A snail	9/17	Florida	SBO	Schefflera	Chandler
B	_Bradybaena similaris_	A snail	10/19	Hawaii	STCL	Dracaena	Maggi

The following insects and molluscs are "A" or "Q" rated pests intercepted during July and August in quarantine which were not immediately identifiable to species because of life stage, condition or lack of comprehensive taxonomic studies of the groups.

Q	Geometridae	A moth	9/18	Oregon	LA	Dahlia	Adams,Simon
Q	Arctiidae	Tiger moth	9/24	Pennsylvania	SBO	Table	Auzen
Q	Pyralidae	A pyralid moth	9/29	Puerto Rico	LA	Misc. fruit	Wegener
Q	Noctuidae	A cutworm moth	10/1	Hawaii	LA	Ti	Adams
Q	Noctuidae	A cutworm moth	10/4	Hawaii	SF	Dendrobium	Rios
Q	Pyralidae	A pyralid moth	10/4	Hawaii	SF	Dendrobium	Rios
Q	_Pyrausta_ sp.	A pyralid moth	10/5	Michigan	STCZ	Hollyhock	Morton
Q	Noctuidae	A cutworm moth	10/19	Hawaii	SD	Ti	Boch/Melvin
Q	Otitidae	A frit fly	10/14	China	H	?	Spadoni

BORDER STATIONS

It looks like people will go to great lengths to bring their products and produce to California. Inspite of all the good work that our quarantine people do, we just cannot fill all the cracks. No wonder so many pests seem to be entering the state. As an example, this next item was a load of fruit which was inspected at a border station and fortunately, had USDA certification:

"Foreign Fruit - A truck load (1,620 cases) of MOROCCAN oranges were checked through Yermo by Bob. They were accompanied by a USDA permit and had been trucked all the way from New Jersey, enroute to the Los Angeles market. Very interesting."

Is the market really so good in California that someone can afford to ship fresh Moroccan oranges to California for sale?

Kudos are in order for the following border station personnel:

Special Recognition - Station Supervisor Dave Sage and his crew have each personally intercepted at least one gypsy moth this year. They now join the Needles crew as 100 percent GYPSY MOTHers.

Members of the successful Truckee crew include Shift Supervisors Dave Bienenfeld, Steve Free (3), Doug McCready and Joan Suther (10). The permanent Plant Quarantine Inspector staff includes Marshall Anderson (7), Joanie Bobbit (4), Christy Donaldson (7), Bill London (10), Rich McCollum (8), Mona Montano (7), Mae OBata (4), Deanna Rosenbalm, Dan Rudolph (7), and Brian Shurtleff (3). Seasonal Inspectors Glenn Moline (8), Donna McMillian (3), Beth Brown (2), David Hart (2), Anna Smith, and Judy Ramos also scored. Caroline Leem, who has since resigned, is also a member of the club.

Tricky Trucker Thwarted - On January 13, a truck pulled into Winterhaven...the driver routinely handed Jaime Castro a freight bill for peat moss from Florida. Jaime got that instinctive "inspector feeling" when he noted that the bill might have been altered. "Open up for inspection, please," was ordered. The driver opened the door part way...saying, "See, just peat moss."

Jaime asked him to open the door...all the way... and went to get a ladder to enter the truck. Surprise! The only peat moss in the load was stacked in front of the side and rear doors. The rest of the trailer was filled with uncertified plants.

The "gamey gear-jammer" kept protesting, "I didn't know that there were plants in my trailer." Whatever...he was provided with a rejection notice...a citation for "failure to declare"...and orders to turn his truck around and take his illegal load back out of California. Good show, Jaime!!!

BORDER STATION INTERCEPTIONS
(Since September 27, 1984)

HICKORY SHUCKWORM	(Cydia caryana)	-A-	21
PECAN WEEVIL	(Curculio caryae)	-A-	10
PINK BOLLWORM	(Pectinophora gossypiella)	-A-	9
A WOOLLYBEAR	(Arctiidae)	-Q-	11
PURPLE SCALE	(Lepidosaphes beckii)	-B-	19
GYPSY MOTH	(Lymantria dispar)	-A-	23
CHAFF SCALE	(Parlatoria pergandii)	-B-	24
APPLE MAGGOT	(Rhagoletis pomonella)	-A-	5
EASTERN TENT CATERPILLAR	(Malacosoma americanum)	-Q-	7
PAPAYA FRUIT FLY	(Toxotrypana curvicauda)	-A-	1
HOLLY LEAFMINER	(Phytomyza ilicis)	-B-	30
GLOVER SCALE	(Lepidosaphes beckii)	-B-	3
CALIFORNIA RED SCALE	(Aonidiella aurantii)	-B-	3
A TENT CATERPILLAR	(Malacosoma sp.)	-Q-	8
EUROPEAN CORN BORER	(Ostrinia nubilalis)	-A-	1
BOLL WEEVIL	(Anthonomus grandis)	-A-	3
PECAN PHYLLOXERAN (LEAF GALL)	(PHYLLOXERA sp.)	-Q-	2
A GELECHIID MOTH (PUPAL SKIN)	(Gelechiidae)	-Q-	1
A BAGWORM	(Psychidae)	-Q-	1
A LEAFROLLER	(Tortricidae)	-Q-	3
ARROWHEAD SCALE	(Unaspis yanonensis)	-Q-	2
A NEEDLE MINER	(Olethreutidae)	-Q-	1
JAPANESE BEETLE	(Popillia japonica)	-A-	2
WHITE-MARKED TUSSOCK MOTH	(Orgyia leucostigma)	-Q-	1
A LEAF SKELETONIZER	(Bucculatrix sp.)	-Q-	1
AN ANT	(Paratrechina sp.)	-Q-	1
AN EARWIG	(Labia sp.)	-Q-	1
MAGNOLIA WHITE SCALE	(Pseudaulacaspis cockerelli)	-A-	1
CITRUS SNOW SCALE	(Unaspis citri)	-Q-	1
PINE SCALE	(Chionaspis heterophyllae)	-Q-	1
A LEAF BEETLE	(Diabrotica sp.)	-Q-	1
A CASE BEARER	(Coleophoridae?)	-Q-	1
MEXICAN FRUIT FLY	(Anastrepha sp. prob. ludens)	-A-	2
A CECIDOMYIID FLY	(Carya sp?)	-Q-	1
A CECIDOMYIID FLY	(Caryomya sp.)	-Q-	1
MEXICAN FRUIT FLY	(Anastrepha ludens)	-A-	1
GRASSHOPPER EGGS		-Q-	1