CORF news

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Glassy-Winged Sharpshooters in Commercial Nurseries: An Update

by Rick Redak and James A. Bethke - University of California, Riverside
Greg Morris and Stacie Oswalt - California Department of Food and Agriculture

The efforts to prevent the movement of the glassy-winged sharpshooter (GWSS) within California continue with phenomenal success, and California's commercial nursery growers deserve a well earned pat on the back. Since the beginning of the nursery quarantine program that involves both point-of-origin and point-of-destination shipment inspections, as well as extensive continual GWSS control at point-of-origin nurseries, very, very few insects have leaked through quarantine. Given the enormity of the numbers of shipments transported through the state (Fig.1), the relatively few insects that have made it through quarantine is quite amazing.

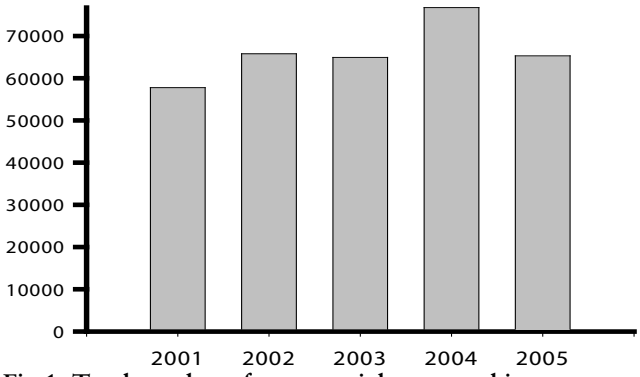


Fig.1: Total number of commercial nursery shipments within the state of California.

Glassy-Winged Sharpshooters cont. on page 2

Pesticides in Nursery Recycling Ponds

by J. Lu, L. Wu, D. Merhaut, and J. Gan - University of California, Riverside and J. Newman, and B. Faber - UC Cooperative Extension, Ventura.

Many medium and large sized nurseries have adopted the practice of using recycling ponds to capture and sometimes reuse irrigation runoff water. This practice is viewed as beneficial for water quality protection because it directly prevents or reduces discharge of surface runoff that may contain pesticides and nutrients. However, people often have questions such as: "Do pesticides build up in the pond?" "Will the level of pesticides in the pond reach a point that it may cause phytotoxicity if the water is used for irrigating plants?" "If the water is released during a storm or maintenance operation, is the water a 'toxic' soup (to environmentalists)?"

Pesticides in Ponds cont. on page 4

The Q-biotype: Widespread and Treatable

by Frank J. Byrne, James A. Bethke, and Rick Redak - University of California, Riverside.

The Q-biotype of the sweet potato whitefly, *Bemisia tabaci* Gennadius, caused quite a stir last year with its introduction into the US. It can be a serious threat to agriculture in the US, which is why quarantines were placed on ornamental production facilities in California that were identified as a source of infested plant material. When the Q-biotype was identified, a task force was quickly assembled and they formed a Technical Advisory Committee. This committee consisted of scientists who were more than willing to tackle the new pest problem. One of the first goals of the committee was

The Q-biotype cont. on page 3

Editor's Note:

In this issue, we focus on insect management issues. You will see a common theme; new insect pests are being found and moved on ornamental nursery stock. Our feature articles include two of the big ones— the glassy-winged sharpshooter and the Q-biotype of the sweet potato whitefly. Ever wonder what happens to pesticides in recycling ponds? The third feature article provides information on that. Inside the newsletter, farm advisors report on other new and old invasive insect pests in their respective "Regional Reports". Don't forget to read the continuing discussions in "Science to Grower" and the effect of fertilizer management on insect populations in "Get Cultured". We're sneaking in one article on disease issues that did not fit in the previous CORF News issue—"Understanding Plant Pathogen Names".

- Steve Tjosvold, Editor,

CORF News

IN THIS ISSUE

Features

Glassy-Winged Sharpshooters 1
Pesticides in Nursery Ponds 1
The Q-biotype Whitefly 1
Websites Associated with Pest Management 3
Understanding Plant Pathogen Names 5

Regional Reports

San Diego County 7
Rash of Invasives in the Last Few Months in San Diego County.

Santa Cruz & Monterey Counties 8
Western Flower Thrips Management is Difficult.

Ventura & Santa Barbara Counties 9
Asian Citrus Psyllid and Citrus Greening Disease.

Orange & Los Angeles Counties 10
Diaprepes Weevil – A New Threat in Southern California.

Other Interests

Science to the Grower 12
Phytophthora ramorum in Container Media: A Persistent Pest?

Get Cultured 13
Effects of Fertilization Programs on Insect Feeding.

Campus News & Research Updates 14

Sponsors 16

Glassy-Winged Sharpshooters cont. from page 1

Figure 2 shows both the total number of GWSS detections in nursery shipments (one detection is equal to finding at least one insect in a single shipment) and the overall percent clean shipments for a given year. Since the quarantine program was initiated, 99.87% of the shipments, on average, have been free from glassy-winged sharpshooters. Those insects that did escape quarantine were in the egg stage, a notoriously difficult stage to detect and treat.

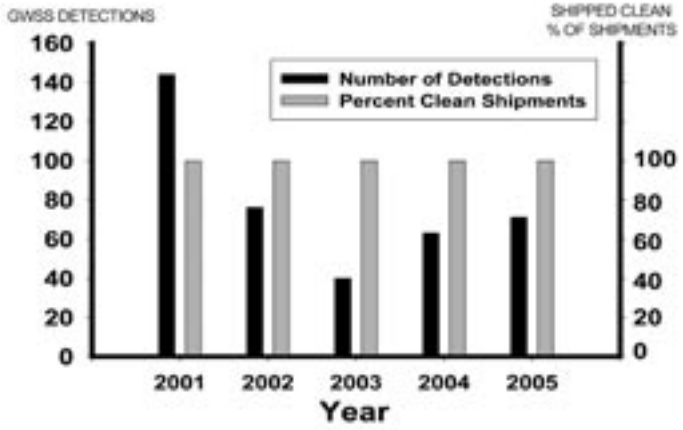
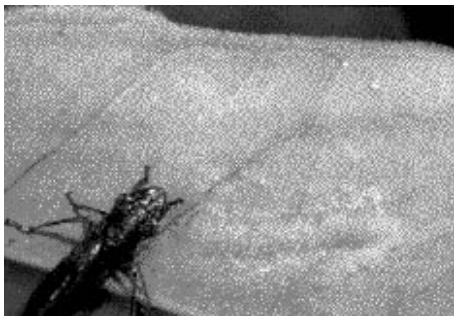


Fig. 2: Relationship of GWSS detections and % of Nursery Shipments free from GWSS.

While these numbers are impressive and demonstrate the overwhelming success of the program, it must be understood that to achieve such success requires not only excellent cooperation and efforts from the industry, but also substantial funding from both state and federal sources. From 2001 to date, the estimated direct cost of the quarantine to the nursery industry has been in excess of fifty million dollars. These funds have come either directly from the nursery industry or the taxpayer (state and federal funding). These costs include monitoring, treatment, safeguarding, and inspections. They do not include the costs of rejections, lost sales, and lost markets. Current estimates are that the quarantine adds $0.30 to every container of nursery product shipped within the state.

It is unlikely that California's nursery industry can rely on the generosity of the state and federal government to ensure an adequate quarantine against the glassy-winged sharpshooter for as long as this insect poses a threat to California's agricultural commodities. Consequently, the costs of quarantines and safeguarding nursery commodities against GWSS must be reduced; the long-term goal being a standard prophylactic disinfestation procedure so that very costly inspections can be eliminated. Control of adult and nymphal stages has not proven difficult. It is the egg stage of the insect that has proven to be the critical link in the quarantine program.

Anticipating the need to develop new quarantine treatments and procedures that are effective against the egg stage and that require fewer costly inspections, the California Department of Food and Agriculture has initiated a small, experimental pilot program. This program utilizes effective, affordable, prophylactic treatments at the point-of-origin nursery in lieu of costly inspections. In this program, sleeved plant material containing fenpropathrin- or carbaryl-treated GWSS egg masses are allowed to enter designated, non-infested nurseries under a special compliance agreement. Currently, three counties of origin (Los Angeles, Orange, and Ventura) and two counties of destination (San Joaquin and Sacramento) are participants of the pilot program. Norman's, Valley Crest, and Village Nurseries are all participating in this pilot program.



GWSS adult next to egg mass. Photo courtesy of CDFA.

To date, the information derived from the nursery pilot program is very encouraging. In 2005, there were 54 total shipments treated within the program. At the destination counties, a total of 297 GWSS egg masses were detected, yet no successful emergence of nymphs occurred. Similarly, in 2006 (to date), there have been 31 shipments containing a total of 106 egg masses. Once again, there has been no emergence of viable GWSS nymphs from these egg masses. Although the experimental pilot program is not yet complete, these data indicate that careful, prophylactic treatment of nursery product immediately prior to shipment can successfully prevent the spread of this insect without the implementation of costly inspections.❋

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The Q-biotype cont. from page 1

to determine the distribution of the Q-biotype within the US. Thanks largely to the efforts of a very cooperative ornamental grower community, insect samples were submitted for identification to several labs located within the US. It is now known that the Q-biotype is present in 22 states in the continental US (Table 1). Almost 70% of all samples came from ornamental growers, with the remainder coming from Departments of Agriculture in various states representing a mixture of cotton, vegetable, and ornamental plantings. Interestingly, the Q-biotype has not been found in field vegetables or cotton.

Table 1. States with positive Q-biotype finds.

Alabama, Arizona, California, Connecticut, Florida, Georgia, Illinois, Indiana, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, North Carolina, South Carolina, Oregon, Pennsylvania, Vermont.

In addition to the survey, a concerted effort on the part of the Technical Advisory Committee and IR-4 was undertaken to determine insecticide products that could be used by the industry to control the Q-biotype. Although many products may be used to suppress the Q-biotype, there are 8 very effective products (see Table 2, page 5). The data is very encouraging, considering that insecticide resistance studies in Europe indicated that this whitefly was highly resistant to IGRs and the neonicotinoid imidacloprid. The fear was that the Q-biotype would arrive in the US already resistant to the entire class of neonicotinoids. Some of our trials are indicating that the neonicotinoids will serve us well in the fight against the Q-biotype. However, it would be prudent to use the neonicotinoids wisely against the Q-biotype. Follow the advice given by the management plan provided by the Technical Advisory Committee. It can be found along with a great deal of other helpful information about the Q-biotype on the following web site: **http://www.mrec.ifas.ufl.edu/lso/BEMISIA/BEMISIA.htm.**

Poinsettias are an important source of movement for the Q-biotype within the US. Considerable effort has, therefore, been focused on optimizing management of the insect on this host. Preliminary research trials against whiteflies on six inch potted poinsettia have indicated that foliar applications of imidacloprid will be distributed on leaf tissues at high levels within the first week of application. Lethal concentrations of imidacloprid remain on leaf tissues for up to three weeks, but thereafter concentrations are no longer efficacious. Drench applications are rapidly taken up by the roots and deposited into leaf tissue within the first week after application. In contrast to foliar applications, systemic imidacloprid concentrations drop off more slowly. Similar observations have been made for dinotefuran. There are important distinctions between foliar and drench treatments. Understanding the differences between them will lead to more effective use of these important chemicals within management programs.

It is important to note that the majority of whiteflies out there are still the B-biotype. Therefore, it is important not to change pest management programs until it is determined what biotype is present. For example, Distance® (pyriproxyfen) is an excellent product for use against the B-biotype. If the Q-biotype is present, however, Distance® could eliminate the B-biotype and leave only the resistant Q-biotype. Then it will be necessary to change products to those known to be

The Q-biotype cont. on page 5

Websites Associated with Pest Identification and Management

compiled by Donald J. Merhaut & James A. Bethke - University of California, Riverside

Below is a list of several websites related to insect pests provided by Jim Bethke. I have reviewed them and given a description of the content of each site. Websites based in other states such as Florida and Ohio may contain information on pests which are not a problem in California. Also, management options may differ, especially for pesticide use. Before using any pesticides, be sure that it is labeled for use on your crop in your area. Read the entire label for handling instructions and use in your area.

http:/floriculture.osu.edu/florinet.html
This site, hosted by Ohio State University, is a site where you can ask questions. You must subscribe to it first.

http://entomology.ucdavis.edu/faculty/parrella/rose%20pma%20thrips.html
Hosted by the University of California, this site is specific for Western Flower Thrips. It also includes information on identifying different thrips species.

http://www.ipm.ucdavis.edu/PMG/selectnewpest.floriculture.html
Another site hosted by the University of California, this site lists pests of floriculture crops. It is organized according to pest type.

http://ohric.ucdavis.edu/
This UC site (Ornamental and Horticulture Research and Information Center) contains a great deal of information. Click on 'UC Publications' on the left of the page for more specific information.

http://ohric.osu.edu/lines/facts.html
This site is maintained by Ohio State University. Click on the 'Entomology Series' for articles related to pest identification and management.

http://woodypest.ifas.ufl.edu/insect.htm
This site is hosted by the University of Florida and lists pests associated mostly with woody plants. However, many of these pests also attack floriculture crops.

http://whiteflies.ifas.ufl.edu/wfly0002.htm
This site is also hosted by the University of Florida. It specifically addresses different types of whiteflies, their host range and management strategies.

http://edis.ifas.ufl.edu/TOPIC_GIDE_IG_Ornamentals
This site, hosted by the University of Florida, provides management guides for insect pests common to woody ornamentals, cut flowers and landscape plants.

http://www.mrrec.ifas.ufl.edu/lso/PinkMANAGE.htm
Hosted by the University of Florida, this site is associated with the control of Pink hibiscus Mealybug (PHM), which, contrary to the name, has a broad host range – at least in Florida. It also contains a link to photos of the most common mealybugs on ornamentals.

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Pesticides in Ponds cont. from page 1

To answer these questions, researchers at UC Riverside and Ventura County Cooperative Extension recently conducted studies in which they measured pesticide persistence in pond water and sediments. Important findings from these published studies are summarized in this article. For copies of the complete report, please e-mail John Lu at **jianhang.lu@ucr.edu.**

Pesticides in Pond Water

In the first study, the researchers measured persistence of several commonly used pesticides in pond water collected from two nurseries in Ventura County and Orange County. The role of temperature, pH, and microbial activity in pesticide degradation was examined. The study showed that the two organophosphate insecticides, diazinon and chlorpyrifos, had longer persistence, with the half-life of diazinon ranging from 34 to 77 days, and the half-life of chlorpyrifos between 30 and 39 days. These half-lives are generally longer than those in stream water and are likely due to decreased microbial activity and low pH, which slowed down chemical and biological hydrolysis of these compounds. In contrast, pendimethalin and chlorothalonil had much shorter persistence, with the half-life from 16 to 29 days and 1 to 4 days, respectively. The degradation of these two pesticides was due mainly to microbial activity. The half-lives of all the pesticides were markedly shorter at 20° C than at 10° C because temperature stimulated microbial growth and activity as well as abiotic reactions. Results from this study suggest that chlorpyrifos and diazinon, or compounds with similar structures, may accumulate in a recycling pond and care must be exercised when releasing the pond water into the environment.

Table 1. Half-lives of selected pesticides in nursery recycling pond waters.

Pesticide	Half-life (in days)
Diazinon	34-77
Chlorpyrifos	30-39
Pendimethalin	16-29
Chlorothalonil	1-4

Pesticides in Sediment

The second study, conducted using sediments from the same recycling ponds, determined the adsorption of the four pesticides and compared their persistence under aerobic and anaerobic conditions. The study showed that diazinon and chlorothalonil adsorbed moderately to the sediment, while chlorpyrifos and pendimethalin adsorbed strongly. The relative adsorption of the pesticides was consistent between the two nursery sediments (pendimethalin > chlorpyrifos > chlorothalonil > diazinon), but the absolute magnitude of adsorption was higher in the sediment with more organic matter. The differences in persistence under aerobic and anaerobic conditions allow for the determination of the influence of redox potential; which, as results showed, was dependent upon the type of pesticide. Diazinon and chlorpyrifos showed moderate persistence under aerobic conditions, and prolonged persistence under anaerobic conditions (Table 2). The persistence of pendimethalin and chlorothalonil was very short in the sediments under both aerobic and anaerobic conditions (Table 2). These results support previous findings that pendimethalin and chlorothalonil have high degradation rates in soil. In addition, the influence of temperature on degradation rate was examined. All four pesticides persisted longer at 10° C than 22° C in the sediments.

Table 2. Half-lives (days) of selected pesticides in sediments from nursery recycling pond.

Pesticide	Aerobic	Anaerobic
Diazinon	8.6	12.2
Chlorpyrifos	27.3	41.2
Pendimethalin	0.32	0.19
Chlorothalonil	2.8	1.9

Implications

These data provide information that can be applied in nursery management. For example, in summer, pesticides in the recycling pond degrade faster due to increased temperatures, and shorter retention times may be adequate when reusing the collected water. In winter, however, the same pesticides may linger longer in the pond. The half-lives could be used to calculate how long it would take for the pesticide to degrade enough to pose a negligible threat to the environment. These studies have shown that pesticides tend to adsorb onto the sediment, and nursery recycling ponds are therefore large sinks for pesticides in runoff water. The use of a recycling pond is highly beneficial because this practice retains the pesticides onsite, decreasing the chances for contaminated runoff to enter surface water.❋

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The Q-biotype cont. from page 3

effective against the Q-biotype. Growers will not know this unless they collect samples and have them tested. Qualified research scientists will test your whiteflies with anonymity. See the web site mentioned on page 3 for a list of researchers willing to test whiteflies.

The message here is to be diligent in the management of whiteflies, especially during this poinsettia season, and seek advice from qualified extension personnel. In addition, there is much more research to be done in the area of whitefly management and the use of the neonicotinoids. Fortunately, some of the concern expressed about the Q-biotype has led to more research dollars, which will help answer some of those questions.❋

Table 2. Relative efficacy of selected pesticides against the Q-biotype of the sweet potato whitefly, *Bemisia tabaci* Gennadius, during trials conducted in 2005 at UC Riverside.

TRADE NAME	COMMON NAME	APPLICATION RATE/100 GAL.	APPLICATION METHOD	RELATIVE EFFICACY
Avid 0.15EC + Talstar®	abamectin + bifenthrin	8 fl. oz. + 18 fl. oz.	Foliar	100%
Flagship 25WG®	thiamethoxam	4 oz.	Drench	80–90%
Judo®	spiromesifen	4 fl. oz.	Foliar	100%
Safari 20 SG®	dinotefuran	24 oz. (4 oz. solution/pot)	Drench	100%
Avid 0.15EC®	abamectin	8 fl. oz.	Foliar	>95%
Sanmite 75WP®	pyridaben	6 oz.	Foliar	>95%
Safari 20 SG	dinotefuran	8 oz.	Foliar	95%
Celero 16WSG®	clothianidin	4 oz. /2000 6-in. pots	Drench	70–90%
Marathon II®	imidacloprid	1.7 fl. oz. /1000 6-in. pots	Drench	60–95%
TriStar 75WSP®	acetamiprid	4 pkt	Foliar	>90%
Dursban ME®	chlorpyrifo	s 50 fl oz.	Foliar	80%
Flagship 25WG®	thiamethoxam	4 oz.	Foliar	80%
Celero 16WSG®	clothianidin	4 oz.	Foliar	70%
Marathon II®	imidacloprid	1.7 fl. oz.	Foliar	70%
Talus®	buprofizen	6 o.z	Foliar	60%
Talstar®	bifenthrin	18 fl. oz.	Foliar	50%
Aria 50SG®	flonicamid	4.3 oz.	Foliar	45%
Tame 2.4EC®	fenpropathrin	16 fl. oz.	Foliar	42–70%
Enstar II®	s-kinoprene	10 fl. oz.	Foliar	38%
Endeavor 50WG®	pymetrozine	5 oz.	Foliar	35%
Distance IGR®	pyriproxifen	8 fl oz.	Foliar	30–95%
MilStop®	potassium bicarbonate	2.5 lb.	Foliar	26%
Discus®	2.94% imidacloprid+0.7% cyfluthrin	25 fl. oz.	Foliar	22%
Orthene TT&O®	acephate	4 oz.	Foliar	18–30%

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Understanding Plant Pathogen Names

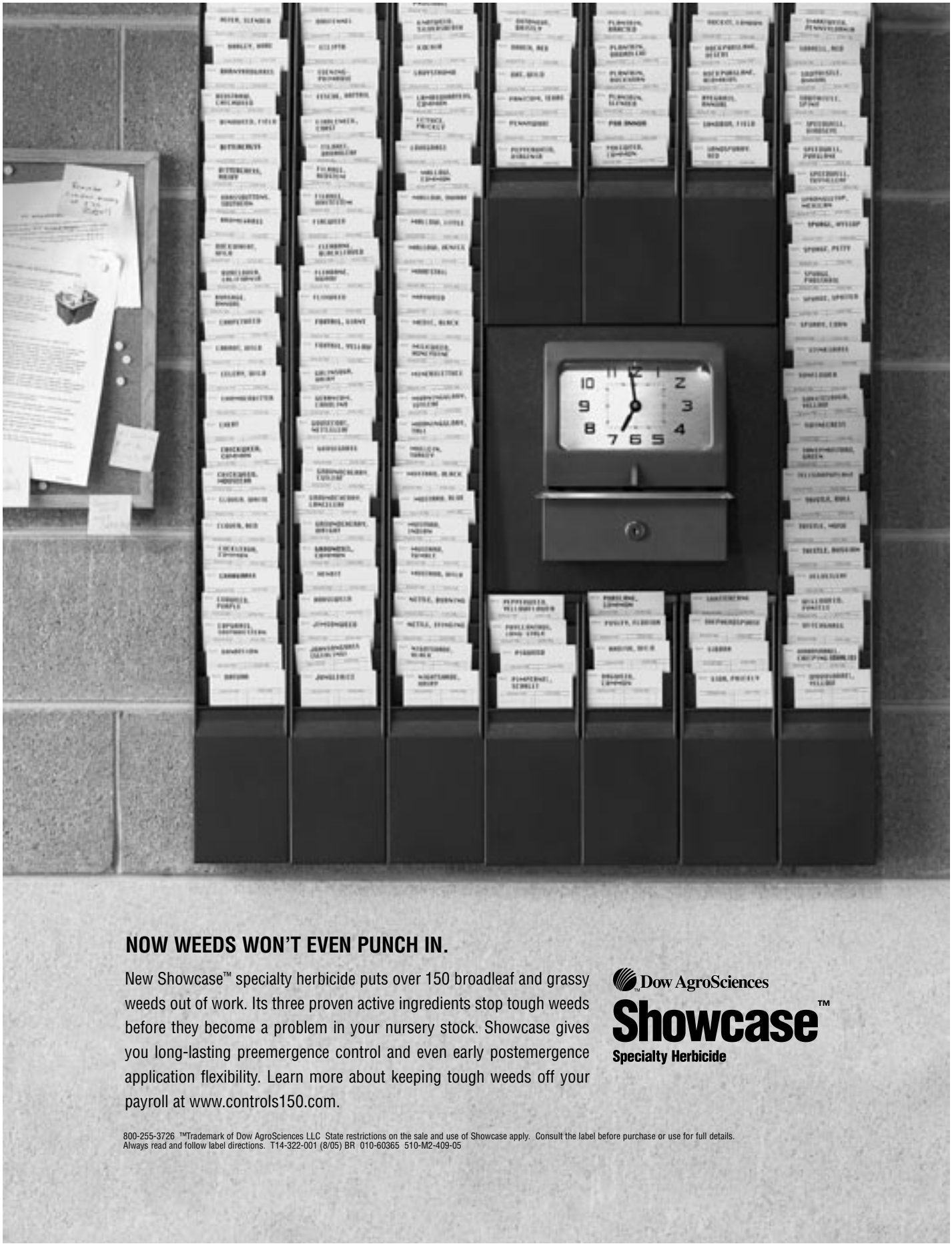
by Steven Koike, UC Cooperative Extension, Monterey

When reading articles about the diseases that affect plants, one commonly will encounter the scientific names (usually genus and species names) of the pathogens that cause the problems. On occasion, these Latin or Greek words might appear to be unnecessarily long, confusing, and accompanied by strange abbreviations. However, a few clues as to how to view such names can assist the reader in understanding some of the biology and importance of the pathogen.

For fungi and fungus-like organisms, most of the names consist of the usual genus and species components, such as *Armillaria mellea* (causing oak root fungus on trees and shrubs), *Puccinia antirrhini* (causing rust on snapdragon), and *Phytophthora ramorum* (causing sudden oak disease on many plants). Researchers have found that some fungal pathogens are restricted to one or a few related hosts. To communicate this special host-pathogen situation, the genus + species names are followed by the designation "forma specialis" (abbreviated f. sp.) plus a name related to a plant host. Forma specialis means "special form."

The Fusarium wilt pathogens are a good example of this practice. The Fusarium wilt pathogen of cyclamen is basically restricted to cyclamen and is therefore named *Fusarium oxysporum* f. sp. *cyclaminis*. The Fusarium wilt pathogen of orchids infects only orchids and is therefore named *Fusarium oxysporum* f. sp. *cattleyae*. The Fusarium wilt organism of tomato does not infect other plants and is therefore named *Fusarium oxysporum* f. sp. *lycopersici*. These forma specialis names are considered to be informal names and do not have official taxonomic status. These designations, however, reflect physiological and pathogenic differences and are useful ways for growers and plant pathologists to differentiate the various Fusarium wilt fungi.

Understanding Plant Pathogen Names cont. on page 11



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Rash of Invasives in the Last Few Months in San Diego County

by James A. Bethke - UC Cooperative Extension, San Diego

I recently attended a rather large meeting of CDFA representatives, university research and extension personnel, and representatives from the citrus and ornamental industries that met at a Citrus Root Weevil (*Diaprepes abbreviatus* L.) infested citrus grove in the Encinitas area of San Diego County. I spoke to several people there who all expressed the same theme to me: In their careers, they had never seen this many Q- and A-rated pests that have invaded and established all at one time. I have been involved in ornamental entomology at UCR for 26 years, and for a full year now, I have been filling in as the San Diego County Floriculture Farm Advisor. In this time period, I have not seen any thing like this, nor have I been this abnormally busy. The onslaught is stretching all of our resources to their limits.

To begin with, three separate square mile areas in San Diego County have been under full quarantine due to finds of the Citrus Root Weevil, and the areas surrounding the infestations are under scrutiny as well. Two of the three infested areas are landscape plantings and one is an area of citrus. Unfortunately, these finds are very troubling especially for the citrus, avocado, landscape, and nursery industries. Several of the citrus trees in the infested grove that we visited were in serious decline, and we were able to see the devastated roots of the affected trees. We were also able to collect all stages of the weevil, except eggs. This problem could be huge, but there appears to be a concerted effort at eradication as expressed by the group.

Other Q-rated insect pests plaguing the San Diego and Riverside County areas include: several species of ground mealybug (mostly *Rhizoecus* spp.) and

Citrus Root Weevil, *Diaprepes abbreviatus* L.

the Magnolia White Scale, *Pseudaulacapis cockerelli* (Cooley). Again, eradication efforts are underway and holds have been placed on infested plants at several local nurseries.

The Q-biotype of the sweet potato whitefly is no longer a Q-rated pest, but it is still a looming problem that caused quarantines at two facilities in California last year, including one in San Diego County. Right now it is a problem on ornamentals, but we are still unsure what will happen when it reaches the cotton or vegetable industries. New regulations may occur at that point.

On another front, one of the two eucalyptus leaf beetles, *Chrysophtharta m-fusca*, formerly a Q-rated pest, has now been downgraded to a B-rated pest. Unfortunately, this pest is an ever-increasing problem for eucalyptus cut foliage producers in San Diego County with this year being the most serious. I have seen as much as two-thirds of large plantings heavily damaged. Growers are not used to treating for anything, except maybe the blue gum psyllid. Chewing damage from the leaf beetles creep up on the growers very quickly, and there are breaks in chewing damage between generations leaving a portion of good plant growth in between damaged growth. Trials are underway in

Rash of Invasives cont. on page 12

Observations

Eucalyptus Leaf Beetle Ravaging Baby Blue Eucalyptus

The Eucalyptus Leaf Beetle, *Chrysophtharta m-fusca,* has been building in numbers, and in the amount of chewing damage it causes to eucalyptus cut foliage crops, over the last few years. While conducting a control trial at one cooperating grower, I have been able to make a few observations about its phenology. It is still unclear when or how the insect aestivates over the winter, i.e. whether it diapauses as an adult, egg, or pupa in the soil. At this point, I can say that there are at least two generations of damage from this pest so far this year. The first generation causes noticeable damage to new growth, but the second generation is quite devastating.

It appears that adults can cause the equivalent amount of damage as about three larvae on new flush growth. Adults are light brown in color and are relatively easy to see. Adult females lay eggs in batches of about 20 eggs (on average) on the upper or lower surface of new growth, and the hatching larvae (neonates) disperse to nearby new growth in bunches of about two to three larvae per branch. The larvae are very cryptic and difficult to spot, and can be found on both upper and lower leaf surfaces.

From my observations, it appears that the insect is quite susceptible to pesticides. The following products are in trial, and I will have more information about efficacy in the future: applied as a soil drench, Safari®, Orthene TT&O®, Martathon II®, Arena®, and Celero®; as foliar sprays, Sevin SL®, Orthene TT&O®, Arena®, Celero®, Marathon II®, and Decathlon®.

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Western Flower Thrips Management is Difficult

by Steve Tjosvold - UC Cooperative Extension, Santa Cruz and Monterey

Western flower thrips (WFT) reportedly have been at extraordinarily high levels this year, and typically effective chemicals are apparently failing in Monterey Bay Area greenhouses. Directly related to this, there has been a significant increase in the incidence of tospovirus diseases that are vectored by WFT. In this report, I thought it necessary to emphasize a few important chemical control strategies that historically have worked for WFT control. You should not forget to review WFT biology, monitoring, and other non-chemical control methods. I've given some references at the end of this article since that information is beyond the scope of this abbreviated report. With chemical management, successful use of insecticides for WFT control requires attention to the three primary issues: pesticide choice, application timing, and coverage.

Pesticide Choice and Timing

Pesticide choice requires a long-view approach because it is important to slow pesticide-resistance and maximize the effective longevity of these chemicals. Approaches vary because resistance management has a somewhat theoretical foundation. Our best knowledge on this is based on specific research with long term pest and pesticide interactions, and that information is limited. All approaches, however, use multiple consecutive applications of a single mode-of-action chemistry, and then followed by rotation to another mode-of-action chemistry.

One approach to try is to use pesticides with a similar mode-of-action consecutively within one WFT life cycle. With average greenhouse temperatures, a WFT generation - egg to adult - is completed in 3 or 4 weeks. So, a recommendation might be to use a chemical (or chemicals) of the same mode-of-action for 3 or 4 weeks, then rotate to another chemical (or chemicals) with a different mode-of-action for another 3 or 4 weeks, then follow with a third mode-of-action, and finally return to the original pesticide(s). Another approach would be to use chemicals with the same sequence as above, but apply chemicals with the same mode-of-action within multiple, perhaps 2 or 3 WFT generations, rather than a single generation. In any case,

Western flower thrips.

a raging WFT infestation must initially be controlled with two consecutive applications only 5 to 7 days apart. The first application is intended to reduce high populations of overlapping generations, and the second application is to kill larvae that were protected as an egg or pupae in the first application. A third application might be needed in this period, especially if spray coverage is not thorough.

Classes of insecticides registered for use on WFT include organophosphates, carbamates, pyrethroids, insect growth regulators (IGR), chlorinated hydrocarbons, chloronicotinyls, spinosyns, macrocyclic lactone, microbials, and horticultural oils. In practical terms, the organophosphates and carbamates have the same mode-of-action and should be considered in the same group. Rotational strategies might include but not limited to IGRs (Ornazin®, Azatin®, Pedestal®), macrocyclic lactone (Avid®), organophosphates and carbamates (Orthene®, Mesurol®), spinosyns (Conserve SC®), and pyrethroids (Talstar®, Attain®, Decathlon®, Astro®). A grower could also consider the use of a biological control such as *Beauveria bassiana* (BotaniGard®) or contact sprays such as insecticidal soaps and oils.

Spray Coverage

To obtain good coverage and better penetration into plant parts where most thrips feed, it is best to use high spray pressure to produce fine droplets. Conventional insecticide wet sprays can be alternated with smokes or aerosol formulations to give a different deposition pattern and possibly better control.*

Web References:

http://www.biocontrol.ucr.edu/WFT.html

http://oregonstate.edu/Dept/nurspest/thrips.htm

http://www.ipm.ucdavis.edu/PMG/r280301411.html

http://www.extension.umn.edu/distribution/horticulture/DG7374.html

http://www.entm.purdue.edu/Entomology/ext/targets/e-series/EseriesPDF/E-110.pdf

Observations

The winter and spring in central California was wet, and very wet in March. As a result many diseases were noted in commercial nurseries in the Monterey Bay area. Some are selected here:

Daylily Rust

This foliar disease on day lilies is caused by the fungus *Puccinia hemerocallidis.* The pathogen was first described in 1880, and is native to Asia, commonly found in China, Japan, Korea, Taiwan, and Russia. It is a relatively new disease to the United States, first identified in August 2000 in the southeast. The disease moved swiftly throughout the country and by the fall of 2001, it had been identified in over 30 states. Daylily rust can easily be seen on the foliage with a 10X hand lens. A good field test to identify it is to wipe suspected pustules with an ordinary white facial tissue. An orange-yellow stain on the tissue will result if the rust is present on the leaves.

Sisyrinchium Rust

This fungus disease is caused by *Uromyces sisyrinchi.* It was found on possibly two species of *Sisyrinchium* nursery stock. One species was *S. californicum,* a California native, and the other *S. montanum*, a native to central and northeastern United States.

Phytophthora* Foliar Blight on *Arbutus

This disease is caused by *Phytophthora nemorosa.* It was found on an unidentified species of *Arbutus* adjacent to a riparian habitat containing many native species. This *Phytophthora* species shares some of the same important woody hosts and biology as *Phytophthora ramorum,* the pathogen that causes sudden oak death. This pathogen, however, grows best at a somewhat lower optimum temperature than *P. ramorum* and is found generally in cooler forest areas. What is notable in this occurrence is that apparently the pathogen moved at least 45 feet from unidentified native hosts on the stream bank to the *Arbutus* stock in the nursery. Movement of spores probably occurred with driving wind and rain during stormy periods and infection followed.

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Asian Citrus Psyllid and Citrus Greening Disease

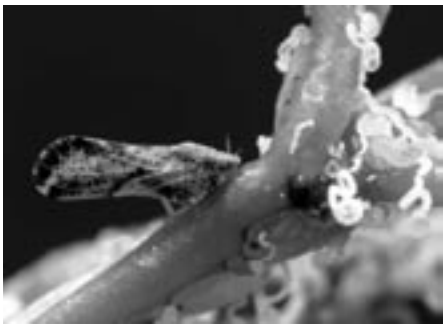
by Julie P. Newman - UC Cooperative Extension, Ventura and Santa Barbara

A UC Cooperative Extension seminar on the Asian citrus psyllid, *Diaphorina citri,* was held in June in Ventura, and two other locations in California, targeted for citrus growers, regulators, and the nursery industry. The meetings were organized by Beth Grafton-Cardwell, Director of the Lindcove Research and Extension Center and IPM Specialist at the Kearney Ag Center, who worked with farm advisors, the University of Florida, and the California Department of Food and Agriculture. The meetings are part of a team project funded by the UC Exotic/Invasive Pests and Diseases Research Program to prevent a bacterial disease, vectored by this pest, from becoming established in California.

Citrus greening or "Huanglongbing", is caused by the plant phloem-inhabiting bacterium "*Candidatus* Liberibacter asiaticus." It is one of the most devastating diseases of citrus in the world. Nursery growers who produce citrus plants and/or ornamental relatives in the Rutaceae family, need to familiarize themselves with the Asian citrus psyllid, which if introduced, could potentially vector this disease. In Florida, the primary movement of Asian citrus psyllid has been on nursery plants, especially *Murraya paniculata* (orange jessamine, orange jasmine). In addition, the pest was introduced into Texas on potted *Murraya* plants from Florida.

The Asian citrus psyllid could invade California at any time. The most likely sources of infestation are Florida, Mexico or Asia. The psyllid is found in tropical and subtropical Asia, South and Central America, Mexico, and many other parts of the world. There were 170 interceptions of Asian citrus psyllid at U.S. ports on plant material from Asia from 1985 to 2003.

The pest was first discovered in Florida in 1998 and is now established throughout that state's citrus growing regions. Greening disease was not discovered until 2005, although it was probably present 6-8 years earlier and was undetected. With the discovery of the disease in Florida, the risk of citrus greening arriving in California has greatly increased.



Asian citrus psyllid adult and nymphs. Photo by M.E. Rogers

Feeding damage caused by the Asian citrus psyllid includes distortion, malformation, leaf drop, witch's broom, dieback, and sooty mold. Symptoms of citrus greening include yellow shoots, mottled and chlorotic leaves, twig dieback, and leaf drop. Fruits are small, lopsided and bitter, with hard, small dark, aborted seeds. Fruits do not color properly, leading to the name "greening."

Growers who produce citrus nursery stock or ornamental relatives e.g. *Murraya paniculata*, *Severinia buxifolia* (boxthorn, Chinese box), *Triphasia trifolia* (limeberry) should monitor these plants for the Asian citrus psyllid and for feeding damage symptoms. Monitoring should be conducted by visually inspecting the new flush growth. Search for all insect stages, including the gray to brownish adults and the brightly colored yellow-orange eggs and nymphs. Yellow sticky cards can be used as an additional tool for monitoring the adults. If you suspect that you have found this psyllid, contact your local county agricultural commissioner's office for identification.❋

For more information, see UCIPM *Publication 8205, Asian Citrus Psyllid* **http://anrcatalog.ucdavis.edu**

Observations

Gladiolus Rust, *Uromyces transversalis*, was found in San Diego County in June. This rust is a Federal Action Pest and all attempts are being made to eradicate it. The sites where it has been found include a cut flower nursery. This fungus attacks principally hybrid cultivars of Gladiolus grown for flower production and could have significant impact if it became established or was transported into greenhouses or nurseries. It also can be a problem on other tropical members of the Iridaceae, e.g. *Crocosmia, Tritonia*, and *Watsonia*.

Gladiolus rust was first found in Michoacán, México, in 2004. There have been unpublished reports of interceptions of this rust on cut gladiolus flowers going from México into the United States. Originally from Africa, the disease has been found in Argentina, Brazil, Southern Europe and Oceania. It was found for the first time in Florida in April.

In conjunction with CDFA, Agricultural Commissioner staff in both Santa Barbara and Ventura Counties has been surveying nurseries and report that no rust was found. Growers are concerned because in addition to being a pathogen of quarantine significance, gladiolus rust is a devastating disease. It looks similar to daylily rust with very bright orange pustules (uredinia). These are arranged transversely across the leaf. For further information and photographs see:

http://nt.ars-grin.gov/taxadescriptions/factsheet/index.cfm?thisapp=Uromycestransversalis

and

http://www.apsnet.org/pd/search-notes/2006/PD-90-0687B.asp

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Diaprepes Weevil – A New Threat in Southern California

By John Kabashima - UC Cooperative Extension, Orange and Los Angeles

The Diaprepes root weevil, *Diaprepes abbreviatus* (L.) Coleoptera: Curculionidae, is a large colorful weevil, 3/8 to 3/4 inch (10 to 19 mm) long, with numerous forms, or morphs, ranging from gray to yellow to orange and black (Fig. 1). This weevil is native to the Caribbean region and was accidentally introduced into Florida in the 1960's where it has caused extensive damage to nursery and landscape ornamentals and citrus.

Fig. 1: Adult diaprepes Root Weevil.

California maintains exterior quarantines to prevent the introduction of destructive pests such as Diaprepes from other states and countries, and has intercepted Diaprepes in shipments of plants to California numerous times. However, on September 17, 2005 an adult Diaprepes root weevil was found at a residence in the Newport Beach area of Orange County, California. Subsequently, localized infestations have been found in the Newport Beach area of Orange County, the Long Beach area of Los Angeles County, and the La Jolla, Carlsbad, and Encinitas areas of San Diego County. The California Department of Food and Agriculture (CDFA) placed all of these areas under an interior quarantine against Diaprepes, its hosts, and possible carriers. (**http://www.cdfa.ca.gov/phpps/plantregs.htm**)

This weevil will feed on over 270 different plants including citrus (all varieties), hibiscus, palm, birch, roses, guava, loquat, holly, and other ornamentals. Because of its broad host range and the abundance of host material in the landscape and production agriculture, the Diaprepes root weevil poses a great threat to the ornamental plant and citrus industries in California.

Fig. 2: Frass & feeding damage by adult diaprepes.

Fig. 3: Diaprepes egg clusters.

Fig. 4: Diaprepes larvae.

The Diaprepes root weevil damages both the leaves and the roots of plants. The adult weevils damage leaves by chewing semi-circular areas out of the leaf margin (Fig. 2). There may also be frass or weevil droppings near the areas that have been fed upon.

Adult weevils are long-lived, with females surviving an average of 147 days and males an average of 135 days. An adult female weevil lays an average of 5,000 eggs in her lifetime. The eggs are white, oval shaped, and slightly

Fig. 5: Larval root feeding damage.

over 0.04 inch (1 mm) in length. They are laid primarily during dawn or dusk, in clusters in leaves that are folded and glued together with a gelatinous substance secreted by the female weevil (Fig. 3). The eggs hatch in 7-10 days, and the newly emerged larvae drop to the soil (Fig. 4). The larvae enter the soil and feed upon the roots of plants, completing 10 or 11 instars over a period of 8 to 15 months. Larvae grow to a length of about 1 inch (2.5 cm). The grub-like larva feeds upon the roots of a plant, with larval instars 3 through 9 being the most aggressive feeders, weakening or killing the plant, and have even girdled the crown of citrus trees in Florida orchards (Fig. 5 & 6, page 11). Larval stages 10 and 11 feed very little as they enter a quiescent, prepupal period. The pupa remains in a pupal chamber in the soil for 15 to 30 days (Fig. 7, page 11).

New adults emerge from the pupal chambers in the soil. Adults may walk on the soil surface or fly a short distance from where they emerge. Adult weevils will not emerge from soil that is dry and compacted. Irrigation or rainfall promotes adult emergence. Mating occurs mainly on the leaves of the host plant, with much of the mating activity occurring in the early morning or late at night. Female weevils may begin ovipositing within 7 to 14 days of emergence. The length of the life cycle of Diaprepes depends on temperature and soil moisture and may be as short as 5 months or as long as 18 months.

Adult weevils are capable of strong flight for a short duration and distance. Once the weevils land, they tend to stay

Diaprepes Weevil cont. on page 11

Diaprepes Weevil cont. from page 10

Fig. 6: Diaprepes crown girdled citrus.

Fig. 7: Pupal stage of diaprepes.

Fig. 8: Shaking tree and drop cloth.

Fig. 9: Tedders Trap.

on that host plant unless they are disturbed or their food source is depleted. Their initial reaction to disturbance is to feign death and fall to the soil. Because of these behaviors, natural dispersal of the weevil is slow.

Detection methods used by CDFA are visual inspection of the above ground parts of a plant for adults or their feeding, use of drop cloths or inverted umbrellas to catch adult weevils that fall from the plant that is shaken or beaten (Fig. 8), and Tedders traps (Fig. 9) that capture adults that climb up the black trunk-like vanes of the trap into an inverted cup at the top.

Because the major damage is done to the underground root system, above ground symptoms or plant death may not appear for years. CDFA expects the eradication program to take up to 6 years of expensive pesticide treatments that target adults and eggs on the foliage, and larvae in the soil. Quarantine protocols for production nurseries are being developed and may require that soil in containers be treated with an approved insecticide 6 months prior to sale, or be certified free from Diaprepes by CDFA.

If you see the adult weevils or have damage to plants you suspect is caused by the weevil, please contact the CDFA Exotic Pest Hotline at 1-800-491-1899. Personnel from CDFA will inspect plants for the presence of the Diaprepes root weevil and send any specimens collected to the CDFA diagnostic laboratory for identification.❋

For additional information on Diaprepes Weevil visit:

http://anrcatalog.ucdavis.edu/pdf/8131.pdf

http://www.ipm.ucdavis.edu/EXOTIC/diaprepescitrus.html

http://www.cdfa.ca.gov/phpps/plantregs.htm

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Understanding Plant Pathogen Names cont. from page 5

Plant pathogenic bacteria have a similar system when it comes to names. Most of the bacterial names consist of the genus and species, such as *Erwinia amylovora*, causal agent of fire blight of rosaceous plants. Researchers found that some bacteria are able to infect only one or a few related hosts. To reflect this host-pathogen specialization, the genus + species names are followed by the designation "pathovar" (abbreviated pv.) plus a name related to a plant host. Pathovar names are informal ones and do not have official taxonomic status. The pathovar designations reflect physiological and pathogenic differences and are helpful in differentiating distinct populations within one species. For example, the *Xanthomonas campestris* species consists of distinct sub-groups that differ in host ranges. *Xanthomonas campestris* pv. *dieffenbachiae* is restricted to foliage plants, *Xanthomonas campestris* pv. *incanae* infects only *Matthiola* species (stock), and *Xanthomonas campestris* pv. *pelargonii* infects only pelargonium and closely related plants.

Hopefully, knowledge of the system of assigning names to plant pathogenic fungi and bacteria will reduce confusion and misunderstanding when such names are read in articles. Understanding these designations will also provide some information on possible host ranges and impacts of these various microorganisms.❋

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Science to the Grower

Phytophthora ramorum in Container Media: A Persistent Pest?

by Richard Y. Evans - UC Cooperative Extension, Davis

Phytophthora ramorum.

Phytophthora ramorum is the fungus which causes the disease commonly called sudden oak death. It attacks many species that are important in the nursery trade, particularly those in the Fagaceae (oaks), Ericaceae (rhododendrons), Theaceae (camellias), and Caprifoliaceae (viburnums) families. It also has killed forest trees and shrubs in California and Oregon. Although few nurseries have been implicated in the spread of the pathogen, stringent regulations have been imposed on the nursery industry to reduce the likelihood of spreading the disease. Plants from nurseries in California must be inspected regularly and shown to be free of the pathogen prior to shipping.

These orders also prohibit movement of bark and mulch of susceptible species. As a result, container plant producers can't use some common organic amendments, such as redwood sawdust and douglas fir bark. Some of these regulations were precautionary steps, taken in the absence of knowledge about the potential for disseminating the live fungus in container media. Now some answers have been provided by scientists in the USDA Agricultural Research Service in Corvallis, OR, where Bob Linderman's lab studied the ability of *Phytophthora ramorum* to live in peatmoss, redwood sawdust, douglas fir bark, coir, clay loam, sand, and manure-based compost.[1]

Each substrate was inoculated with *Phytophthora ramorum* or relatively common soilborne *Phytophthora* species, including *P. cactorum, P. citricola, and P. citrophthora*. There are different genotypes of *Phytophthora ramorum*, one European and the other North American, so the authors evaluated both types. Three forms of inoculum were used for each of these *Phytophthora* organisms: pieces of infected rhododendron leaves, sporangia (fungal structures that are full of spores), and chlamydospores (thick-walled resting spores that can survive in unfavorable conditions). The infected, moist potting media were stored in darkness in plastic bags and checked monthly for live pathogens.

Live *P. ramorum* was not found in substrates that had been inoculated with leaf pieces, but it survived for six months in substrates inoculated with sporangia. Live *P. ramorum* was recovered for up to a year from all substrates except sand that had been inoculated with chlamydospores. In sand, *P. ramorum* introduced as chlamydospores survived for 6 months. Since this pathogen can survive for extended periods in potting media or media components, it could be disseminated to other locations in container-grown plants that lack foliar symptoms. However, there is no evidence yet that the disease can be spread by inoculum in container media. The authors have studies underway to evaluate the effectiveness of steam and fumigation at eradicating the pathogen in container media.❋

[1] Linderman, R.G., and E.A. Davis. 2006. Survival of *Phytophthora ramorum* compared to other species of *Phytophthora* in potting media components, compost, and soil. *HortTechnology* 16(3): 502-507.

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Rash of Invasives cont. from page 7

discovered in San Diego County. Affected myoporum becomes severely stunted and deformed due to thrips feeding.

Two other Q-rated pests in San Diego County are ornamental diseases; Chrysanthemum White Rust, *Puccinia horiana* Henn, and Gladiolus Rust, *Uromyces transveralis* (Thum). Quarantines and investigations are underway concerning those infestations as well. Diseases were covered extensively in the last issue of *CORF News* (Spring 2006).

At this point, there appears to be no end in sight to the invasion of quarantine rated pests, or pests that require immediate action by the CDFA. For at least a few of these pests, serious implications may result from their discovery on ornamentals. Soon, a meeting among the ornamental industry and the CDFA will occur that will spell out what implications the Diaprepes Root Weevil will have on nurseries/ornamentals in quarantined areas. Look for more from your local extension agent.❋

Get Cultured

Effects of Fertilization Programs on Insect Feeding

by Donald J. Merhaut - University of California, Riverside

Like all living organisms, the health of a plant can have an impact on the plant's susceptibility to insect feeding as well as the health of the feeding insects. The nutritional status of a plant can affect the degree of insect feeding by: (1) attracting the insects; (2) altering the rate of insect reproduction; and (3) altering the rate of insect feeding.

Nutrient Quantities

Plants fertilized with luxurious amounts of fertilizer, especially nitrogen, usually exhibit greater incidence of insect feeding and damage. This phenomenon is associated with either: (1) increased insect feeding; or (2) increased reproductive rate, and/or increased survival and vigor of the insects.

Increased Feeding

Increased feeding by root maggot (*Delia* spp.*)* on canola (*Brassica napus*) has been measured when plants were fertilized with high rates of nitrogen. However, in this study, the reduced canola yield associated with the damaged roots was still overcompensated by the increased yield associated with the elevated fertilization rates. In rice, increased nitrogen nutrition increased the incidence of some pests, but reduced the incidence of stem borers, suggesting that the response of insect feeding on plants may not always be positively associated with increased nitrogen nutrition.

Increased Insect Reproductive Rate/Populations

In hydroponically-grown wheat plants, increasing nitrogen fertilization rates from 4.2 to 210 ppm (mg/L) increased the reproductive rate of wheat aphids. Similarly, increased aphid reproduction occurred when the nitrogen fertilization rate increased from 120 to 175 ppm (mg/L) for hydroponically-grown cucumber and pepper. Whitefly populations also increased on watermelon, cucumber and squash plants of high nitrogen vs. low nitrogen status. In studies on *Impatiens wallerana*, Western flower thrips (*Farnkliniella occidentalis*) populations increased when phosphorus nutrition was increased from 10 to 40 ppm (mg/L), but thrips populations were unchanged when nitrogen concentrations of hydroponic solutions were increased from 112 to 280 ppm (mg/L). However, in various cultivars of chrysanthemum (*Dendranthema x grandiflorum*), Western flower thrips populations increased when nitrogen fertilization increased from 80 to 240 ppm (mg/L).

Increased insect vigor

In marsh grass (*Spartina alterniflora*), increased plant nutrition resulted in larger body size of feeding planthoppers.

Nutrient Balance

Plants receiving an unbalanced complement of essential plant nutrients are usually more susceptible to insect feeding. This imbalance of nutrients is usually associated with greater concentrations of nitrogen, relative to the other essential plant nutrients. In tobacco (*Nicotiana tobacum*), the tobacco hornworm (*Manduca sexta*) populations were greatest on plants receiving relatively low concentrations of phosphorus and high concentrations of nitrogen and potassium.

Root Maggot (*Delia* spp.*)* Photo: UC Statewide IPM Project Jack Kelly Clark.

Boron Anomoly

In one study, the feeding of three different insects (soybean looper-*Pseudoplusia includens,* Mexican bean beetle-*Epilachna varivestis* and velvetbean caterpillar-*Ancarsia gemmatalis*) on boron-deficient soybean plants resulted in increased growth and development of the insects vs. the same insect species on boron-sufficient soybean leaves. However, boron-deficient soybean plants were stunted.

Conclusions

Based on the research cited, it is likely that the control of insect feeding on plants may be nutritionally controlled by maintaining a balanced, moderate fertilization program. Increasing fertilization rates, particularly nitrogen, to super-optimum levels (approximately 150 ppm and greater) may result in increased incidence of certain pests. Modifying the ratios of the essential nutrients to one another, (i.e. lower boron concentrations) may deter some insects, but will likely result in poor plant performance and predisposition to other nutritional disorders or pathological problems.*

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Campus News & Research Updates

compiled by Julie P. Newman - UC Cooperative Extension, Ventura and Santa Barbara

New Grower Tool for Evaluating Pesticide Runoff and Leaching Risk

The UC IPM's Pest Management Guidelines (PMGs) provide practical information on pest management techniques for controlling a broad range of California pests, including pests found in floriculture and ornamental nurseries. A recent enhancement to the PMGs is the addition of a new database and decision tool (WaterTox) that addresses water quality and other environmental issues. Using information from USDA–Natural Resources Conservation Service (NRCS), the tool evaluates potential for pesticides to move with water and eroded soil or organic matter, and to affect nontarget organisms. Its purpose is to help growers consider risk of leaching and runoff in making pest management decisions.

Each PMG for a specific crop and pest includes a "Water Quality—Compare Treatments button". This button is located within the tables of possible pesticide treatments, and it links to a graphic display that compares relative risk of leaching and runoff among the listed pesticides. Thus growers can make more informed choices when selecting among pesticides recommended in the PMGs.

For example, if you go to aphids in the Floriculture and Ornamental Nurseries Pest Management Guidelines (**http://www.ipm.ucdavis.edu/PMG/r280300111.html**), scroll down to "Treatments", and click on the button "Water Quality Compare Treatments", you get a display comparing the "Potential Pesticide Hazard on High Risk Soils" of different aphicides. Site and application conditions can be customized to fit your specific conditions.

For more information on this new feature in the PMGs and the environmental risk data that can be obtained from **http://www.uckac.edu/ppq/PDF/05%/20Jan.pdf.**

Two Floriculture and Nursery Farm Advisor Positions To Be Filled

The vacancy of two environmental horticulture positions in San Diego and San Mateo Counties, formerly filled by advisors Karen Robb and Ann King Filmer respectively, have created a void in meeting the needs of floriculture and nursery clientele. Although we have been fortunate in getting support from interim Advisor Jim Bethke and other advisors such as Environmental Issues Advisor Valerie Mellano in San Diego County, we have been feeling the pinch in implementing CORF programs such as this newsletter. Recently, it was announced by UC Associate Vice President Rick Standiford that these two vacant positions are among seven UC Cooperative Extension farm advisor positions in agriculture approved statewide for filling in 2006-2007.

The environmental horticulture position in nursery production and floriculture, formerly based in San Mateo and San Francisco Counties, is planned to expand Bay Area coverage to include Alameda, Contra Costa, and Santa Clara Counties. The floriculture and nursery crops position in San Diego County has been expanded to include South Riverside County. The official position descriptions for the two positions are expected to be completed by the end of the summer, and it is anticipated that the positions will be filled sometime next year.

Heiner Lieth Named Floriculture and Nursery Workgroup Chair

Heiner Lieth, Department of Plant Sciences, UC Davis, is the new UC Division of Agriculture & Natural Resources Floriculture & Nursery Workgroup Chair, replacing Karen Robb, Farm Advisor/County Director, Mariposa County. The Floriculture & Nursery Workgroup is made up of UC farm advisors, specialists, and other researchers who have research and/or educational activities that address the needs of the floriculture and nursery industries in California.

During the coming year, Lieth says that he will work to strengthen support for the industries the workgroup serves. "We should respect how the floriculture and nursery industries are changing in California and support our growers in this time of turbulence."

The cut flower industry is still under siege with pressures from imports and energy costs. Additionally, increased water quality regulations can be especially difficult and expensive to mitigate in container nurseries. These are issues that the Floriculture and Nursery Workgroup can provide assistance with through combined research and outreach efforts.

Another problem is that the number of UC advisors and specialists who are primarily focused on floriculture and nursery production is declining. Although plans are finally underway to recruit and fill the vacant environmental horticulture advisor positions in San Mateo and San Diego counties in the coming year, a lot more work is needed to rebuild our ranks. This is an area that Lieth plans to focus on.

If you have comments on how the Floriculture and Nursery Workgroup can better serve the needs of its clients, please contact Heiner at: Department of Plant Sciences, One Shields Avenue, 1210 Plant and Environmental Sciences Bldg, Davis, CA 95616-8780, (530) 752-7198, **E-mail:jhlieth@ucdavis.edu.**

President Dynes Tours San Diego County Nurseries

University of California President Bob Dynes and other University officials visited growers in northern San Diego County on June 1 as part of Dynes' ongoing program to better understand what Californians will need from UC in the next 20 years. Two of the operations that Dynes visited were Pardee Nursery and Mellano & Company.

At Pardee Nursery, which grows large landscape plants in containers, Bill Widas, vice president-sales, and Lauren

Campus News cont. on page 15

Campus News cont. from page 14

Davis, vice president-construction, described their work with farm advisors to recapture tailwater for reuse on the 300-acre nursery. UC research has not only provided environmental and economic benefits, according to Davis, but has allowed Pardee to comply with strict regulations. Wildlife Specialist and County Director Terry Salmon and staff research assistant Tracy Ellis described their strategies for the tree farm to thwart rabbits - which chew the drip lines that irrigate the trees in containers - by monitoring rabbit behavior and covering drip lines.

Following a lunch hosted by Mellano & Company in one of their packing sheds, which included local growers and other members of the agricultural community, Mike Anthony Mellano showed Dynes and the group around the propagation greenhouse and through flower fields. Mellano and Interim San Diego County Farm Advisor and UCR pest management researcher Jim Bethke talked about UC-developed disease control and IPM methods employed at the nursery. Walking through the cut flower cooler, Mellano showed Dynes how UC research led to quick cooling techniques in postharvest handling and packaging that make the flowers last longer.

"I've seen the hand-in-hand relationship between growers, who are very creative people, and our UC people who have as their first charge a responsibility to help you do what you're trying to do," Dynes said at the lunch meeting at Mellano & Company. "Those of us in UC take that responsibility very seriously. I do not give a talk anywhere that doesn't talk about the agricultural program of the University of California and what a huge asset to California agriculture it is."❋

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UC Riverside's Center for Invasive Species Research

by James A. Bethke - University of California, Riverside
Mark Hoddle - University of California, Riverside
Joseph Morse - University of California, Riverside

It is estimated that the state of California absorbs $3 billion of damage annually due to invasive insects, mites, plants, diseases, and aquatic organisms. In recognition of an ever-increasing problem, which may severely impact California's agricultural and natural resources, University of California, Riverside (UCR) Center for Invasive Species Research (CISR) evolved from the Center for Exotic Pest Research that was established at UCR in September 1994. The proactive long-term goal of the Center is to develop a systematic methodology for dealing with a plethora of invasive pests. An important role of the Center is to encourage cooperation and coordination of research efforts among the UC campuses, USDA, the California Department of Food and Agriculture (CDFA), agricultural industries, and environmental interest groups. An ongoing mission of the CSIR is to identify opportunities and needs related to managing incursive species, and evaluate the effectiveness of emerging and established programs. For more about the CISR, see the following web site: **http://www.ipm.ucdavis.edu/EXOTIC/aboutexotic.html#GOALS.** In addition to the CISR, the University of California began the Exotic/Invasive Pests and Diseases Research Program (EPDRP). The EPDRP was established in 2001 to solicit and evaluate research projects targeting prevention, early detection, and rapid development of control or eradication measures against invasives. Outreach is an important aspect of these proposals. The EPDRP is a unique collaboration between the UC Riverside's CISR and the UC Statewide IPM Program, with funding from the United States Department of Agriculture (USDA) and the Cooperative State Research Education and Extension Service (CSREES). To date, the EPDRP has received $8.4 million from the USDA/CSREES which has supported over 80 innovative research programs which are making a significant contribution to managing California's invasive species. Research projects given priority are those designed to lead to a better understanding of the basic and applied biology of exotic pests and diseases that impact California or are likely to do so in the future. A good example of how well the research projects work was realized in the recent introduction of the Diaprepes Root Weevil. Funding was provided to Beth Grafton-Cardwell (UC Riverside) and others back in 2001 to provide a risk assessment for this pest and to investigate management programs used in Florida in anticipation of the weevil's invasion into California. This information is being used today in the rapid development of eradication measures against this pest in three California counties (it was first detected here in late 2004).❋

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Thursday, November 9, 2006

CORF's first Weed Symposium will be held in Watsonville on November 9, 2006.
Scheduled speakers include:

Jeff Atland
(Oregon State University)
Jeff Derr
(Virginia Tech)
Joe DiTamaso
(UC Davis)
Clyde Elmore
(Professor Emeritus, UC Davis)
Steve Fennimore
(UCCE Monterey County)
Bruce Kidd
(Dow AgroSciences)
Andy Senesac
(Cornell University)

We're planning a great program and hope you will join us for this inaugural event!