

Glassy-Winged Sharpshooter
Nursery Stock
Approved Treatment Manual

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First Edition

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Editors

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Pierce's Disease Control Program's Mission

The mission of the Pierce's Disease Control Program (PDCP) is to minimize the statewide impact of Pierce's disease and its vectors in California.

Statement from the Secretary

In 2007, the new pest on the block is the Light Brown Apple Moth (LBAM). Over the past few years, we've seen a steady march of new, invasive species ranging from an aggressive weed called Japanese dodder to an aquatic pest called Quagga mussel, to insects like the Asian longhorned beetle and the Diaprepes root weevil. Each pest brings with it a unique set of challenges for California, as did the glassy-winged sharpshooter when it arrived.

Each time a new pest arrives, this agency and our colleagues at the local and federal levels construct a program to eradicate or suppress the infestations if good science facilitates its feasibility. As we proceed through the necessary steps to combat these new pests, we often look to the established Pierce's Disease Control Program as a model of what works. From the advisory groups and researchers who keep us focused on the task at-hand, to the trappers and surveyors who accurately track the sharpshooter, to the industry and inspectors who keep nursery shipments free from this pest, every participant in this program serves a vital purpose and all of us together have moved consistently closer to a permanent solution to the problem of Pierce's disease.

As California's agriculture secretary, I commend our growers as well as the many staff, advisory panel members, researchers and other stakeholders who have helped make this program a success. This report summarizes and takes stock of these efforts. I look forward to continuing our work toward finding an innovative solution to Pierce's disease and the glassy-winged sharpshooter.

A.G. Kawamura, Secretary

California Department of Food and Agriculture

Glassy Winged Sharpshooter Nursery Regulations

Regulatory Overview

Nursery stock is a high-risk commodity for spreading the glassy-winged sharpshooter. California has approximately 11,500 licensed nurseries, 72% of which are located in sharpshooter-infested counties. Many of these nurseries ship to the uninfested areas of the state. Activities to mitigate the risk of moving GWSS on nursery stock include:

1. Inspection of nursery stock in infested areas prior to shipping to non-infested areas;
2. Treatment of nursery stock when necessary;
3. Certification of shipments (blue tag); and
4. Inspection of nursery stock at receiving nurseries prior to sale.

Inspection Results

In 2006, there were 69,027 shipments of nursery stock from infested areas to uninfested areas. Viable life stages of GWSS were discovered on only 47 of these shipments. Since 2001, the total number of shipments has increased by 26% while the total number of loads with viable life stages has decreased by 46%.

The 2005-2007 nursery treatment pilot program tested the effectiveness of treating plants, known to have GWSS egg masses, with approved pesticides. Plants were treated, sleeved with a mesh protective covering and shipped to destination localities where they were observed. To date, the data confirms 100% mortality of all emerging GWSS nymphs.

With the adoption of the “Nursery Stock Approved Treatment Protocol” (NSATP), an option is available for growers to ship without the 100% visual inspection requirement, if they:

- Enter into a compliance agreement with the origin CAC.
 - Qualify for a compliance agreement by establishing a written GWSS Pest Management Plan.
 - Have their GWSS pest management plan approved by the CAC.
- Comply with all compliance agreement and protocol requirements.
- Treat and safeguard all plants and plant material destined for non-infested counties within California with the CDFA-approved pesticides Sevin® (carbaryl) or Tame® (fenpropathrin).
- Ensure applications are made by and/or supervised by an individual trained to meet label requirements and proper application techniques for Sevin® and Tame®.
- Make treatments in the presence of a licensed origin CAC inspector

Nursery operators who do not participate in the NSATP can ship nursery stock from an area infested with glassy winged sharpshooter (GWSS) to a non-infested area under a Compliance Agreement with the origin County Agriculture Commissioner (CAC).

Plants shipped under a “Blue Tag” must follow procedures set forth in Plant Quarantine Manual section: 510.1 and 510.2. Non free from nurseries require the shipment to be foliar treated under the supervision of the origin CAC with a insecticide labeled to control leafhoppers in a nursery setting (with Sevin® (carbaryl) or Tame® (fenprothrin) in Napa and Sonoma only) to eliminate all life stages of GWSS; and be fully inspected by the CAC of the origin county and found to be free of GWSS. Free from nurseries in a generally infested area are required to ship under a blue tag but are not required to treat or have an inspection by the CAC.

Each incoming shipment may be inspected by the County Agricultural Commissioner at destination or at a site designated by the Commissioner, as agreed upon by CDFA and the Commissioner. The Commissioner shall have the authority to destroy and/or return any infested plants with apparently viable life stages found on them and take whatever action the Commissioner feels is an appropriate disposition for the remainder of the shipment.

Complete information on plant quarantine Section 454: Regulations and Section 510: Counties with regulations more stringent than 3650, and the Nursery Stock Approved-Treatment Protocol, are at the end of this manual and can also be found in the Plant Quarantine Manual available from the local CAC office, CDFA or the CDFA website: <http://www.cdfa.ca.gov/pdcp/Regulations.html> and <http://cdfa.ca.gov/phpps/pdcp>

**GWSS Nursery Approved Treatment Best
Management Practices
First Edition**

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GLASSY WINGED SHARPSHOOTER DAMAGE AND IDENTIFICATION

The glassy-winged sharpshooter (GWSS), *Homalodisca vitripennis* (formerly *H. coagulata*) is an insect that was inadvertently introduced into southern California in the early 1990s. This insect is native to the southeastern United States and was most likely brought into California accidentally as egg masses in ornamental or agricultural plant foliage.

The glassy winged sharpshooter is in a subgroup of leafhoppers called sharpshooters. Sharpshooters and leafhoppers are in the family Cicadellidae, which all have mouthparts that allow them to pierce the plant tissue and feed on plant juices. Most leafhopper are about 0.25 inch long and slender and may be brightly colored or similar in color to the host plant. They often jump away or move sideways when disturbed. Leafhoppers and sharpshooters have incomplete metamorphosis, immature (nymphs) are similar in structure to adults but are smaller, wingless, and may differ in color. Their growth is limited by the cuticle, which must be shed and replaced as they grow in size, resulting in the pale cast skins that may be found on leaf surfaces.

The glassy-winged sharpshooter is a large leafhopper (about 0.5 inches long) that obtains its nutrients by feeding on plant fluids in the water-conducting tissues of a plant (the xylem). Feeding on plants rarely causes significant plant damage, although the insects do excrete copious amounts of liquid that can make leaves and fruit appear whitewashed when dry. The excrement is a special nuisance when shade trees are heavily infested because cars parked under the trees tend to become spotted. During hot weather, heavy populations of glassy-winged sharpshooters feeding on small plants may cause them to wilt.

The real problem associated with GWSS is that it can spread the disease-causing bacterium *Xylella fastidiosa* from one plant to another and quickly develops high populations that substantially increase the number of insects vectoring the destructive *Xylella fastidiosa* bacteria to crops. In addition, it:

- Travels longer distances in a shorter time than other sharpshooters;
- Makes use of more breeding habitats and plant hosts than native vectors; and
- Transmits the bacteria from vine to vine, resulting in an exponential increase in disease incidence in vineyards.

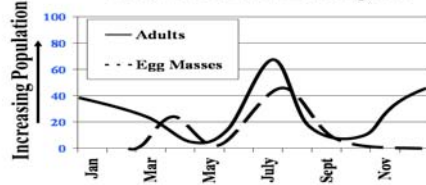
This bacterium is the causal agent of devastating plant diseases such as Pierce's disease of grape, oleander leaf scorch, almond leaf scorch and mulberry leaf scorch. Other diseases to landscape plants in California include sweet gum dieback and cherry plum leaf scorch. Outside of California, other strains of *X. fastidiosa* cause phony peach disease, plum leaf scald, leaf scorches in sycamore, elm, maple, and oak, and variegated citrus chlorosis (not in California). It should be noted that the strain of *X. fastidiosa* that causes oleander leaf scorch will not cause Pierce's disease in grapes and the strain of *X. fastidiosa* that causes mulberry leaf scorch does not cause disease in oleanders or grapes. At this time there is no cure for any of these diseases. Because of this, GWSS is under quarantine in California and shipment of host plant material from

infested or partially infested areas of California to noninfested or suppression areas of enforcing counties must be shipped under “blue tag”.

IDENTIFICATION

Glassy-winged sharpshooter (*Homalodisca vitripennis* (formerly *H. coagulata*). Adult glassy-winged sharpshooters are about 0.5 inches long and dark brown in color. Wings are membranous and translucent, with reddish veins. The head is brown to black and covered with numerous ivory to yellowish spots. The insects overwinter as adults and begin to lay egg masses about late February. There appear to be two generations of glassy-winged sharpshooters per year in California.

Glassy-winged Sharpshooter Generalized Lifecycle



Females lay their eggs in masses of about 10 to 12 under the lower leaf surface of young, fully developed leaves. The eggs lay side-by-side in a single layer. When it is first laid, each individual egg appears as a greenish blister beneath the epidermis of the leaf. The female covers the egg mass with the white chalky material making it more visible. Shortly after the eggs hatch, the leaf tissue begins to turn brown. The dead leaf tissue remains as a permanent brown scar.



Nymphs hatch in 10 to 14 days and feed on the leaf petioles or small young succulent stems while they progress through five immature stages. The gray-colored nymphs are smaller than the adults and wingless. There are 5 immature stages. As they feed on xylem tissue, they excrete a large amount of liquid substance that drops to the leaves or the ground below. The glassy-winged sharpshooter has a broad host range that includes many ornamental plant species.



In summer first generation adults begin to appear in May through July. Egg laying for the second generation occurs between mid-June through October. The nymphs emerging from these egg masses develop into overwintering adults.

Smoke-tree sharpshooter (*Homalodisca liturata*). The smoke-tree sharpshooter is native to the desert region of southern California. The head of the smoke-tree sharpshooter is covered with wavy, light-colored lines, rather than spots. In profile, the immature stages (nymphs) of the glassy-winged sharpshooter look similar to that of the adult, except they are smaller, wingless, uniform olive-gray in color, and have prominent bulging eyes.



Aster leafhopper *Macrostelus fascifrons* (Stal). The aster leafhopper is also called the six-spotted leafhopper because it has three pairs of black spots on its head. The adults are small (about 0.12 inches long) and usually light green to yellow, with black marking on the thorax and abdomen. Their wings are transparent. Nymphs are usually dark green.



Blue-green sharpshooter (*Graphocephala atropunctata*). The blue-green sharpshooter has green to bright blue wings, head, and thorax, and yellow legs and abdomen, which are visible on the underside. It is about 0.25 inches long. There is one generation a year in most of California and a second generation in some southern areas of the state. Adults become active in late winter/early spring. They can become abundant in ornamental landscaping around homes. They also feed on numerous weeds mostly along stream banks or in ravines or canyons where there is dense vegetative growth. As natural vegetation dries up, adults disperse into crops and irrigated plantings. Eggs hatch from May through July with some of the nymphs becoming adults by mid-June.



Green Sharpshooter (*Draeculacephala minerva*). The green sharpshooter is considered to be one of two important species of insect vectors for Pierce's disease and alfalfa dwarf diseases in the Central Valley of California. It also occurs in coastal areas in grasses and sedges along streams. Although it has been found on many species of herbaceous plants, it strongly prefers to feed and reproduce on grasses. It is most common on water grass (*Echinochloa cruz-galli*), fescues, perennial rye grass and Bermuda grass. Its most common habitats are ditch banks, weedy hay fields and permanent irrigated pastures, anywhere that its preferred grasses continue to grow throughout the year. For this reason it is common in orchard or vineyard cover crops only when there are attractive plants in the cover crop at all times of the year. It is only rarely seen feeding on grape. Its role as a Pierce's disease vector is based on the consistent occurrence of its breeding habitats near vineyards.



Two-spotted leafhopper (*Sophonia orientalis*). Two-spotted leafhopper adults are about 0.25 inches (5mm) long and pale yellow with a dark stripe down the center of the back. A red or pink flush of varying degrees borders the black dorsal stripe. On the end of the wings are two prominent eye spots that make it appear that the leafhopper is walking backwards. This leafhopper feeds on a wide range of ornamental plants. Feeding may cause chlorosis of leaves in some species.



Red-Headed Sharpshooter (*Xyphon (=Carneocephala) fulgida*). The red-headed sharpshooter is a sharpshooter of historical importance as a vector of alfalfa dwarf. It is about 0.25 inch (6 mm) long and similar in appearance to the green sharpshooter except that it has reddish coloration on the front tip of its head. The red-headed sharpshooter usually has four generations per year in the Central Valley and strongly prefers to breed on bermudagrass. It tolerates slightly drier conditions than the green sharpshooter.



DETECTION AND MONITORING

Detection and monitoring data enable growers to measure results and spot trends. Did we get the results we expected from BMPs, are peak populations lower or higher than previous years? If monitoring shows GWSS populations migrating into the nursery from adjacent properties than it may be time to link efforts with neighbors to reduce population pressure or to join or lobby for a local “Area Wide Management Program”.

Even though this insect is large enough to be seen with the naked eye, it is very inconspicuous in nature. The brown coloration of the insect blends very well with the color of the twigs where it is usually found, and it hides by moving to the other side of the twig or branch when it detects movement or is otherwise approached or disturbed. A very fine mist or a whitish, powdery coating on leaves or fruit may indicate heavy glassy-winged sharpshooter feeding. Detection and monitoring data should tell you the life stage(s) in an area, population intensity, and help to determine where the populations are located.

Yellow sticky traps

Commonly used in orchards and nurseries to monitor for the adults, this method will only detect adult GWSS at relatively high population densities. Consult CDFA recommendations for number of traps per acre. The current recommendation is placement of traps spaced evenly throughout the nursery growing areas at a minimum density of 2 traps per ½ acre and at



nursery shipping docks. Traps will be inspected a minimum of once every two weeks by a shipping California Agriculture Commissioner (CAC) inspector.

Beat sheets, beat trays or Sweep Nets

When the ambient air temperature is cool, GWSS can be detected by having a white sheet, or hand held, light colored tray or umbrella underneath the canopy and then striking or shaking the canopy vegetation and examining the debris. Sweeping an insect net through the foliage is another detection method.



Visual Inspection

Glassy-winged sharpshooter infestations can also be determined by examining the underside of plant leaves for egg masses.

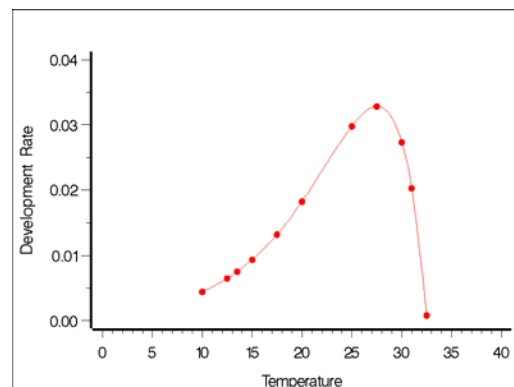


Degree-Days

Insects require a certain amount of heat to develop from one point in their life cycle to another. Because of yearly variations in weather, calendar dates are not a reliable basis for predicting when these events will occur. Measuring the amount of heat accumulated over time provides a physiological time scale that is biologically more accurate than calendar days.

All organisms have temperature thresholds above and below which growth does not occur. These thresholds vary from species to species. The amount of heat above the lower developmental threshold required to complete a given organism's development does not vary-the combination of temperature (between thresholds) and time will always be the same. Physiological time is often expressed in units called degree-days (DD or °D). A degree-day is the amount of heat that accumulates over a 24 hour period when the average temperature is 1° above the lower developmental threshold of an organism.

Preliminary data developed by Dr. Rick Redak at the University of California at Riverside indicate that the lower developmental threshold temperature for GWSS is approximately 11°C and the upper thermal maximum is approximately 32°C. At the optimum developmental temperature (approximately 27°C), approximately 850 degree-days are required for post embryonic development. The lower and upper threshold temperatures can be entered into the UC IPM degree day calculator at:



<http://www.ipm.ucdavis.edu/WEATHER/ddretrieve.html>.

Select a weather station or manually enter weather data and the calculator will print a table of degree days accumulated.

BEST MANAGEMENT PRACTICES

Inspections

Transfers and incoming shipments

Do not jeopardize your GWSS management program by failing to manage incoming plant material. You should buy only from knowledgeable and reputable suppliers that are willing to make sure you receive clean product even though there are no GWSS regulations within the infested area. Hold all incoming stock in a quarantine area until it can be inspected and treated. Do not send it directly to the growing area or to the dock for shipment. Incoming stock that has been treated with an approved insecticide at time of shipment by the supplier should still be inspected before being moved within your facility. It is always a good idea to document all buy in or transferred stock transactions. This is particularly important if your facility has limited outside pest pressure (free from status).

Outgoing shipments

Outgoing shipments from GWSS infested areas (see CDFA Plant Quarantine Manual section 510.1 or Appendix B of the State Miscellaneous Ruling: Pierce's Disease Control Program, pages 454.7 through 454.10) to noninfested or suppression areas of enforcing counties require 100% visual inspection by CAC personnel(except for free-from nurseries) if shipped under "Blue Tag" . Plants shipped under the "Approved Treatment Protocol" should be visually inspected by nursery personnel.

CDFA 2000-2007 shipment rejection data by host with greater than 10 rejections lists the following hosts in descending order:

1. Lagerstroemia	7. Nandina
2. Photinia	8. Tristania
3. Ligustrum/Privet	9. Camellia
4. <i>Raphiolepis indica</i>	10. Melaleuca
5. Pittosporum	11. Roses
6. Vinca	

Data such as the distribution of GWSS finds by month which document the time of year when each of the top 10 host plants were rejected can be used to

determine when extra monitoring and management are needed. For example, Lagerstroemia rejections were highest from June through September, while Photinia and Ligustrum rejections were highest in March and April and in July and August.

NUMBER OF REJECTIONS BY PLANT AND MONTH												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Lagerstroemia		0	0	X	X	XXX	XXX	XXX	XX	X	0	
Photinia			XXX	X	0		XX	XX	X		XX	0
Ligustrum	0	X	XXX	XX			XX	XX	X			
Raphiolepis			X	XX	X	0	X	X	XX	0		
Pittosporum		X	XX	0			XX	XX	X	0		
Vinca			0	0			X	XXX	XX			
Nandina		X	XX	0	0			XX	X	XX		
Tristania		X	0		0		XX	X	X		0	
Camellia		0		0	0		XX	XX	0		0	
Melaleuca			XX	0	X		0		X	0		
Roses					0		XX	XX	X			
Key												
XXX = 5+												
XX = 3-5												
X = 2												

Site Design

Field layout: When planning on where to place plants in the field, use all available data to aid you in this process. Use trapping data to identify fly ways and points of entry into the facility. Acquire monitoring data from neighbors if possible. Knowing the wind patterns is also important. Place the most preferred host plants in the most sheltered, least GWSS impacted areas. Placing preferred host plants the farthest from known entry points can also be helpful. This may not stop infestation but will help limit the amount and degree of the problem. Place preferred host plants in areas where mitigative measures have been taken (behind barriers in shade or greenhouses if applicable). Given favorable wind patterns placing preferred host in open areas between structures can be very effective in providing protection.

Physical, Mechanical, and Biological Measures

Barriers: Barriers can be any type of physical intervention that prevents GWSS from entering an area. Greenhouses could be referenced as barriers if the air intake and venting systems were screened to prevent GWSS from being pulled into the house.



Probably the best known and widely used barrier BMP is the use of shade cloth. University testing of shade cloth barriers determined that over 90% of adult GWSS fly at heights between 1 and 6 meters above ground. Therefore the posts and cable system must support netting/ saran cloth to at least this height to be effective.



Determination of where to place these barriers is also very important (see diagrams). Barriers facing into prevailing wind patterns are most often used. This may or may not be the best use of this BMP at particular facilities. If the facility is downwind of a GWSS reservoir source such as Citrus but only in a Santa Ana wind condition then it would be best to place it where it mitigates the problem best. The location near an infested hillside is also critical. In this case the barrier needs to be set back far enough to mitigate movement from the incline.

Another physical barrier method is the use of yellow sticky tape. This is available under several brand names. The use of this material as a BMP is limited. Trapping as a method to reduce populations is generally not effective. It may however be useful in certain situations as a barrier to GWSS.

Plant Screening: This barrier is very similar to the shade cloth barrier but consists of hedging non-preferred host plant or plants such as junipers or cypress that have leaf structures that do not provide enough area to lay eggs on. This is very similar to trap cropping but is not intended to draw GWSS to it. In this case it is used as a physical barrier. This BMP will require occasional treatment to get rid of buildup of trapped adults. The fact that there should be no oviposition means that an endemic infestation should not occur. A good example would be an Italian Cypress or pine hedge. The chosen plant would need to grow to the needed height and again should not be a host plant species.



Trap Crops: There is no documented process for the use of trap crops in the traditional sense of this methodology at the present time. If not situated away from production areas and maintained properly, drawing GWSS to a trap crop (preferred host) may actually cause compliance problems under the pest management protocol and trapping thresholds. However, continuously treating a preferred host trap crop such as crape myrtle with a systemic such as imidacloprid could be very efficacious. Anecdotally, growers have reported that injecting insecticide into Eucalyptus windrows significantly reduced GWSS populations inhabiting the trees.

Biological Control:

The California Department of Food and Agriculture initiated the biological control component of the Pierce's Disease Control Program in 2000. The Program recognized that this control strategy could play two important roles:

1. To reduce GWSS populations area-wide through the introduction of biological control agents new to the location.
2. To reduce GWSS populations locally through the augmentation of biological control agents already present at the location.

A total of six species of biological control agents have been produced by the CDFA production facilities in Kern and Riverside counties. Since the inception of the program, 1.3 million parasitoids have been released to control GWSS in 13 counties. A structured monitoring protocol has been in place at all release sites since 2002. The best practice at present is to observe the biological control activity in the field and manage pesticide use to promote continued activity.

TREATMENTS

Plant Destruction

In some instances, destruction of plant material may be necessary due to the presence of GWSS (i.e. the presence of adult or nymphal stages). If mobile life stages are found during inspection and the immediate return of the nursery stock is not an option, the nursery and/or county employees may opt to destroy the infested stock. This may be done by bagging the material and hauling to a landfill. If the material is chipped onsite, care must be taken to ensure the infested material is either treated or handled in a manner to eliminate the potential spread of the insect.

Insecticides

Insecticides are one of the major tools used to successfully control GWSS populations in an infested nursery.

However, the insecticides, Tame® and Sevin SL®, should only be used to treat plants being shipped to prevent the possibility of GWSS insecticide resistance. Use of Tame® and Sevin SL® in nursery production is strongly discouraged.

Grower should pay special attention to chemical rotation when other classes of insecticides are available. Change insecticide chemistry whenever the situation allows. For example, don't substitute one pyrethroid for another pyrethroid, instead, select an insecticide from another class of pesticide (see appendix "Leafhopper and Sharpshooter Insecticides").

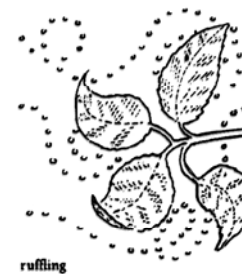
Application Techniques and procedures

To comply with NSATP protocol and procedures:

- TREATMENTS SHALL BE CONDUCTED IN THE PRESENCE OF A LICENSED CAC INSPECTOR.
- PLANT FOLIAGE MUST BE DRY BEFORE APPLYING INSECTICIDES.
- TREATED PLANTS MUST BE PROTECTED FROM OVERHEAD IRRIGATION OR RAIN UNTIL PESTICIDE HAS DRIED.



- Applications must be made/and or supervised by an individual trained to meet label requirements and proper application techniques for carbaryl and fenprothrin for GWSS control.
- Proper preparation: Make sure that the pesticide is mixed in the most effective range of solution pH and kept in agitation.
- Make sure the application equipment is working properly and calibrated. This will be especially important in treating plant material with approved materials for certification.



It is crucial that applicators use the proper nozzles, pressure, and application guns/wands that will ensure pesticide coverage on all upper and lower leaf surfaces. Spray guns, wands, nozzles and pressure should be selected for the type of plant material being sprayed, such as large trees, shrubs, potted flowering plants, and ground cover. Sprays improperly aimed at the foliage may cause shingling, a condition in which leaves clump together and prevent droplets from reaching some leaf surfaces, especially at high pressures. The application should produce ruffling so spray droplets are evenly dispersed on both sides of foliage.

UC IPM

DEVELOPING A PEST MANAGEMENT PROGRAM

A successful pest management program requires a commitment to detection and monitoring program that is maintained and documented regularly. Collected data should be analyzed regularly and used to develop, update and implement a plan of attack. For GWSS this plan must be completed before receiving a compliance NSATP agreement and ideally should be created at the end of the previous year before overwintering adults become active.

Use the data that shows the seasonal occurrence of GWSS, to identify the most opportune time to attack this pest. In the case of GWSS the goal is to suppress the density of the first generation of adults. If the population is on site as over-wintering adults), reduce their numbers in November and certainly no later than December. Since

the vast majority of the population is in the adult stage at this time, choose an appropriate insecticide that is effective and economical that targets the adult stage. In pest management there is a principle referred to as topping populations.

Basically this means you do not wait for the population to get to the peak point before you act. Use trapping data and degree day data (if available) to develop a

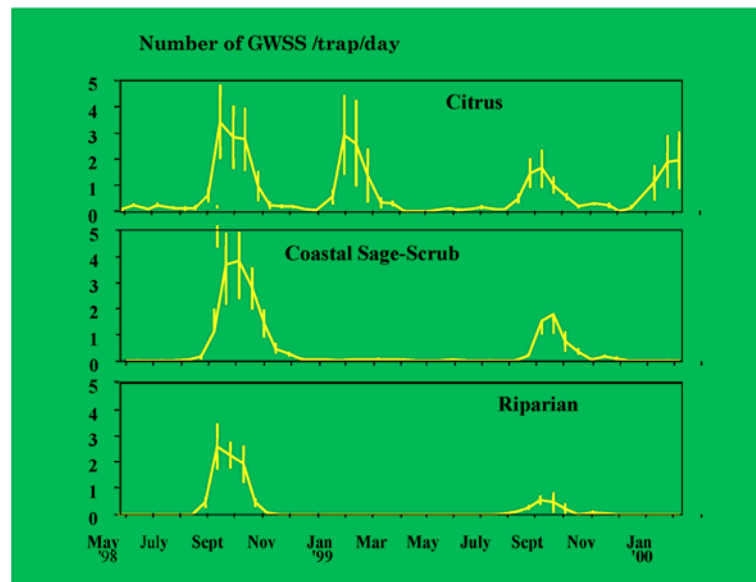
population cycle model to estimate the next point where the adult population will begin to increase, which should be around April.

For example, if trapping records indicate movement from surrounding citrus occurs first in these areas, treat the site starting with the perimeter area first, using a material that is effective on emerging nymphs. This will impact the development of the next generation. Therefore we treat with a product that is effective on emerging nymphs at the end of March or early April.

Reference weather data to see if weather conditions are similar to the previous year and time treatments appropriately. If treatment timing is accurate, then fewer adults should be detected in traps in May then at the May peak in the previous year. If the next valley occurred in June, it is at or near this point that another treatment should be scheduled. Again, the goal is to block the development of the current generation which consists primarily of immature stages.

In keeping with pest management principles of pesticide chemistry rotation, use a different pesticide with a totally different chemistry or mode of action, for this treatment. This should result in trap numbers that show a lower July peak. Adult detections in traps should gradually decline by September. We should plan our rotational treatment back to an insecticide to eliminate any adults that will be seeking overwintering sites.

It is now time to evaluate the current year's treatment. Were peak populations decreased compared to the previous year's records? The scenario used is an example of an actual implemented plan in Irvine, California. At this nursery, peak populations (May, July, and Aug) were cut in half after the first year. Even with the dramatic impact in suppression of GWSS pest pressure as attained in this example, GWSS populations may still be at a higher level of pest pressure than we want. With further scrutiny of data



from trap records and other monitoring in space and time, data we may indicate that preventing GWSS from flying into the nursery may require linking efforts with neighbors to further impact resident populations, or coordinating with local Area Wide Management Programs.

EMPLOYEE TRAINING

In addition to the California Department of Pesticide Regulation's annual training requirements and Regional Water Quality Control Board runoff regulations, applications must be made/and or supervised by an individual trained to meet label requirements and proper application techniques for carbaryl and fenprothrin for GWSS control.

To comply with the training requirement of the NSATP, the Glassy Winged Sharpshooter BMP training for nursery workers must include the following information:

- GWSS Regulatory Overview
 - What is required to ship out of regulated counties?
- Pest Description and Damage
- Pest Population Detection and Monitoring
- Inspections
 - On-site and incoming shipments
- Best Management Practices
 - Site Design
 - Physical, Mechanical, and Biological Preventative Measures
 - Greenhouse and Shade House
 - Barriers
 - Shade Cloth
 - Plant Screening/Non-egg laying hosts
 - Biological Control
 - Treatments
 - Plant destruction
 - Insecticides
 - Application Techniques and procedures
 -

Assessing spray coverage with water sensitive spray cards or spray dyes.

A spray card is a strip of water- or oil-sensitive paper. The cards are produced in a range of sizes. Various spray dyes and fluorescent dyes are available that leave a residue on foliage that can be used to qualitatively assess spray coverage. Water sensitive spray cards and spray dyes were developed for use in the field for quick evaluation of spray coverage and droplet size.

Using spray cards

Spray cards are one of several tools you can use to assess spray coverage. They cost approximately \$1 per 2" x 3" card, and allow you to see where the spray is going in your crop and what sort of spray coverage you are getting with your spray equipment.



The spray cards can be placed in the crop using staples, pegs or paper clips prior to any spray operation. Be sure to use bright colored pegs as the water sensitive spray cards turn blue when wet, and can be difficult to see in green foliage. The cards should be collected as soon as they are dry.

Water-sensitive yellow cards turn blue where water droplets hit them, showing spray density and penetration. Oil-sensitive cards are gray and are for use with oil-based sprays.

Since these cards are water sensitive and fingers have moisture on them, the applicators being trained or instructor, need to be provided with gloves to handle the cards. The pesticide applicator trainee or trainer should place cards within a grouping of plants similar to actual conditions at the nursery and attach cards that have been sized to match the leaf size of the plant species within the canopy horizontally and vertically. The pesticide applicator trainee or instructor should then spray the plants. The spray solution will be water only. After letting the cards dry for a few minutes, collect cards and place in a labeled Zip-loc bag. Droplets on the cards can then be counted to visually assess application technique.

Spray cards can also be used to evaluate different spray guns, nozzles, and pressures.

Materials

- Gloves
- Water sensitive paper
- Card holders
- Zip-loc bags

Appendices

GWSS/PIERCES DISEASE REFERENCES

BMP Record Keeping Forms

Leafhopper and Sharpshooter Insecticides

GWSS Links/Sources of Information

Regulations

Plant Quarantine Manual Section 450 Regulations

Plant Quarantine Manual Section 510 Regulations

Nursery Stock Approved Treatment Protocol

Leaf Hopper and Sharpshooter Insecticides

Class	Pesticide (commercial name)	Manufacturer	R.E.I.	Comments
Botanical	Pyrethrin/PBO ² (PT 1100 Pyrethrum TR)	Whitmire MicroGen	12	An aerosol.
	pyrethrin/rotenone (Pyrellin EC)	Webb Wright	12	
carbamate	carbaryl* (Sevin SL)	Bayer	12	May be applied through sprinkler irrigation systems only.
insect growth regulator	azadirachtin (Azatin XL Plus)	Olympic	4	Must contact insect. Repeated applications as necessary. Aphid suppression only. Label permits low-volume application.
	azadirachtin (Ornazin 3%EC)	SePRO	12	Do not exceed 22.5 oz/acre/application.
	s-kinoprene (Enstar II)	Wellmark	4	Apply prebloom. Also labeled for low volume use. Do not use through any type of irrigation system.
neonicotinoid	acetamiprid (TriStar 70WSP)	Cleary	24	Alternate with insecticides that have a different mode of action to prevent development of resistance to neonicotinoids.
	imidacloprid (Marathon 1G) (Marathon II)	Olympic	12	Not to be used more than once every 16 weeks. Alternate with insecticides that have a different mode of action to prevent development of resistance to neonicotinoids. Do not apply to soils that are water logged or saturated. Do not apply to bedding plants intended to be used as food crops.
	imidacloprid (Marathon 60 WP)	Olympic	12	As above, but apply only as a drench.
oil ³	clarified hydrophobic extract of neem oil (Triact 70)	Certis	4	Do not spray plants under stress. Target pest must be completely covered with spray-this material may not effectively control melon aphid because it is often on the underside of lower leaves. Check label for list of plants that can be treated. May cause injury to flowers. Do not use through any type of irrigation system.
	horticultural oil Ultra-Fine Oil	Whitmire MicroGen	4	Use as above for neem oil. Also, do not use with sulfur fungicides; check label for tank mix restrictions.
	SafTSide JMS Stylet Oil	Brandt JMS Farms	4 4	
organophosphate	acephate	Dow	24	Do not use through any type of irrigation system.
	acephate (Orthene T, T&O Spray) 75WP	Valent	24	A number of chrysanthemum varieties have exhibited phytotoxic reactions. Only labeled for use on anthurium, cact, carnation, rose, orchids, some foliage plants, young poinsettia and some varieties of chrysanthemum. Can stunt new growth in roses. Do not use through any type of irrigation system.
	acephate (PT 1300 Orthene TR)	Whitmire MicroGen	24	An aerosol that is only for greenhouse use.
	chlorpyrifos* (PT DuraGuard ME)	Whitmire MicroGen	12	
organophosphate/ pyrethroid	chlorpyrifos/ cyfluthrin* (PT Duraplex TR)	Whitmire MicroGen	12	An aerosol.

Leaf Hopper and Sharpshooter Insecticides

Class	Pesticide (commercial name)	Manufacturer	R.E.I.	Comments
pyrethroid ⁴	bifenthrin* (Talstar Flowable)	FMC	12	Label permits low-volume application. Do not use through any type of irrigation system.
	cyfluthrin (Decathlon 20 WP)	Olympic	12	Label permits low-volume application. Do not use through any type of irrigation system.
	deltamethrin (DeltaGard T&O)	Aventis	12	For outdoor use only. Do not use through any type of irrigation system.
	fenpropathrin* (Tame 2.4 EC)	Valent	24	Label permits low-volume application. Do not use through any type of irrigation system.
	fluvalinate (Mavrik Aquaflow)	Wellmark	12	Label permits low-volume application. Do not use through any type of irrigation system. Also labeled as a cutting dip at 5 fl oz/100 gal.
	lambda-cyhalothrin* (Scimitar)	Syngenta	24	Supplemental label for greenhouse and nursery use. Apply at 7-day intervals. Do not apply more than 52.4 fl oz of concentrate/acre/year. Do not mix with EC formulations or oils.
	permethrin* (Astro)	FMC	12	Direct application to blooms may cause browning of petals. Marginal leaf burn may occur on salvia, diffenbachia and pteris fern. Label permits low-volume application. Do not apply more than 2 lb a.i./acre/year.
soap ³	potash soap (Insecticidal soap)	Olympic	12	Must contact insect, so thorough coverage is important. Repeat weekly as needed up to 3 times. Test for phytotoxicity. Do not spray new transplants or newly rooted cuttings. Do not add adjuvants.
	(M-Pede)	DowAgro	12	

¹ Restricted entry interval (hours)

² PBO = piperonyl butoxide

³ Single doses of soaps or oils can be used at anytime in a pesticide rotation scheme without negatively impacting resistance mgmt programs.

⁴ Pyrethroids are generally not effective against green peach aphid.

* Restricted use material. Permit required for purchase or use.

Glassy-winged Sharpshooter (GWSS)

Links/Sources of Information

California Department of Food and Agriculture

- <http://www.cdfa.ca.gov/phpps/pdcp/>

Complete information on plant quarantine Section 454: Regulations and Section 510: Counties with regulations more stringent than 3650, and the Nursery Stock Approved-Treatment Protocol, are at the end of this manual and can also be found in the Plant Quarantine Manual available from the local CAC office, CDFA or the CDFA website:

- <http://www.cdfa.ca.gov/pdcp/Regulations.html>

University of California Agriculture and Natural Resources Media Kit

- <http://www.news.ucanr.org/mediakits/gwsskit/gwsskit.shtml>

University of California, Riverside, Media Resources Page

- <http://info.ucr.edu/gwss/>

University of California, GWSS workgroup

- <http://gwss.ucanr.org/mainindex.html>

Dr. Beth Grafton-Cardwell, Research & Extension Entomologist, UC Riverside and Kearney Ag Center

- <http://citrusent.uckac.edu/glassywing.htm>

Bug Spot.Org

- <http://www.bugspot.org/>

Citrus Research Board Website

- www.citrusresearch.org

California Department of Pesticide Regulation

- <http://www.cdpr.ca.gov/>

PIERCE'S DISEASE CONTROL PROGRAM

State Miscellaneous Ruling

Article 1. General Provisions.

Section 3650. Legislative Intent and Authority.

- (a) The Legislature has declared that the plant killing bacterium, *Xylella fastidiosa* and the resulting Pierce's disease, and its vectors present a clear and present danger to California's grape industry, as well as to many other commodities and plant life. The Legislature has created the Pierce's Disease Control Program in the Department of Food and Agriculture.
- (b) The Secretary is authorized to establish, maintain, and enforce regulations consistent with the intent of the Legislature as expressed in Sections 6045-6047, Food and Agricultural Code, as may be necessary to interpret, clarify, or implement Sections 6045-6047. This authority shall be liberally construed to effectuate the intent of Sections 6045-6047.
- (c) The regulations in this subchapter are of statewide interest and concern and are intended to wholly occupy the field.

Section 3651. Control Program.

- (a) **The Pierce's Disease Control Program** is to be conducted by the local public entity designated by that county's board of supervisors under a Department approved local Pierce's disease workplan, including proposed treatment of Pierce's disease and its vectors.
- (b) **The Department** shall provide logistical support and assistance when necessary for combating Pierce's disease and its vectors. Logistical support and assistance includes:
 - (1) Biological control assistance.
 - (2) Provide information on production practices to reduce levels of Pierce's disease and its vectors.
 - (3) Conduct workplan activities when necessary.
 - (4) Develop pest control alternatives.
- (c) **Workplans.**
 - (1) **The Pierce's Disease Control Program workplan elements shall include, but are not limited to, all of following:**
 - (A) Develop and deliver producer outreach information and training to local communities, groups, and individuals to organize involvement with the workplan and to raise awareness regarding Pierce's disease and its vectors.
 - (B) Develop and deliver ongoing training of the designated local public entity's employees in the biology, survey, and treatment of Pierce's disease and its vectors.
 - (C) Identify a local Pierce's disease coordinator within the designated local public entity.
 - (D) Conduct detection and delimitation surveys for vectors.
 - (E) If determined necessary to prevent the establishment and spread of Pierce's disease and its vectors, direct and coordinate treatment programs to control or eliminate Pierce's disease and its vectors. Treatment programs shall comply with all applicable laws and

regulations and shall be conducted in an environmentally responsible manner.

- (F) Develop and implement a data collection system to track and report new infestations of Pierce's disease and its vectors in a manner respectful of property and other rights of those affected.

(2) **The Department may** permit the local public entity to establish variations from the standards set forth in this subchapter based on the written submission to the Department of clear and convincing evidence of stakes and risks to justify a more or less stringent standard.

(3) **The local public entity shall** conduct a hearing if an application of the workplan is appealed in writing to that entity. The results of said hearing shall be transmitted to the Department. The hearing notice procedures shall meet minimum due process standards appropriate for the circumstances. The notice and hearing procedures shall be set out in the workplan of the local public entity.

Section 3652. Definitions. The following definitions apply to this subchapter:

- (a) **"Bulk citrus"** means any unprocessed citrus fruit that have not been commercially packed.
- (b) **"Bulk grapes"** means any unprocessed grapes that have not been commercially packed.
- (c) **"Carriers"** means any vehicle, container, or other article or means of conveyance that the Department determines presents a possible risk of artificial spread of vectors.
- (d) **"Certification"** means the issuance of a certificate in written, stamp, or sticker format by an agricultural commissioner or commissioner representative that affirms that a shipment meets all applicable regulatory requirements.
- (e) **"Infestation"** shall mean the detection of five (5) or more adult vectors within any five-day period and within a 300-yard radius, or the detection of multiple life stages within any five-day period and within a 300-yard radius. Vectors detected in direct association with a shipment from an infested area do not, in themselves, constitute an infestation.
- (f) **"Infested area"** shall mean an area within one (1.0) mile of a vector infestation or an area which has not been surveyed in a manner approved by the Department to detect vectors.
- (g) **"Non-infested area"** shall mean one in which no infestations have been detected after survey in a manner approved by the Department to detect vectors or where the infestation designation has been removed.
- (h) **"Pierce's disease"** means the disease of grapevines caused by *Xylella fastidiosa*, a bacterium.
- (i) **"Plants"** means nursery stock and privately owned plants that may host vectors of Pierce's disease, except when in the form of seeds, bulbs, stolons, corms, pips, buds, cut flowers, cut foliage, tubers, leafless dormant nursery stock, or harvested fruits and vegetables.
- (j) **"Processed grapes"** means grapes which have been juiced, canned, crushed, or dried.
- (k) **"Vectors or Vectors of Pierce's disease"** shall mean *Homalodisca coagulata*, glassy-winged sharpshooter.

Section 3653. Area Designation Procedures

- (a) **An area shall be designated as non-infested** based on written affirmation to the Department by the local public entity that the area has been surveyed in a manner approved by the Department to detect vectors with negative results.
- (b) **An area shall be designated as infested** when the survey results indicate an infestation is present, the Department has defined the infested area, and the local public entity is notified immediately. The Department shall also provide electronic and/or written notification of the area designations to the other local public entities and other interested or affected parties.
- (c) **The local public entity may appeal** an area designation by submission to the Department of a written request for review of the designation, accompanied by clear and convincing evidence justifying a change in the designation. The appeal must be filed no later than ten (10) working days following receipt of the notice of designation. The Department must respond with a written decision no later than ten (10) working days following receipt of the appeal. During the pending of the appeal, the designation under appeal shall remain in effect.
- (d) **The infested area designation shall be removed if:**
 - (1) No additional vectors are detected by trapping or visual surveys during the period of January 1 through October 31 of the year following the last vector detection; or,
 - (2) Only adult vectors were detected and thorough vector survey/detection activities document that a breeding population is not present.

Section 3654. Inspection of Shipments and Disposition of Infested Shipments.

- (a) **All shipments of bulk citrus, bulk grapes, plants, and carriers are subject to inspection by the agricultural commissioner upon arrival at destination.**
- (b) **Any shipment found to be infested** with live vectors shall be refused delivery and may be immediately destroyed unless no damage would be caused to agriculture if the shipment is returned to origin, or processed or treated in a manner approved by the Department to eliminate the vectors.

Article 2. Standards for Grapes. The Secretary hereby establishes the following standards for the movement of bulk grapes to prevent the artificial spread of the Pierce's disease bacterium and its vectors.

Section 3655. Standards for Movement.

- (a) **Bulk grapes shall meet the following standards** prior to shipment from an infested area to a non-infested area:
 - (1) The bulk grapes have originated from a vineyard which has been harvested, handled, or treated in a manner approved by the Department to eliminate vectors and the grapes are monitored during harvest; or,
 - (2) The bulk grapes have originated from a non-infested vineyard as determined by surveys, including trapping and visual, approved by the Department to detect the presence of vectors and the grapes are monitored during harvest; or,
 - (3) If the county agricultural commissioner at origin and destination determine that compliance with

subparagraph (1) or (2) is not feasible, the bulk grapes and associated plant material may be moved for processing in a manner approved by the Department which eliminates the potential artificial spread of vectors and the grapes are monitored during harvest, if feasible, and upon arrival for processing. The commissioners shall notify the Department of their determination as soon as is practicable; or,

- (4) The bulk grapes have completed a post-harvest treatment approved by the Department to eliminate all live vectors.
- (b) **To ensure that the above standards are met, the grower shall do all of the following:**
 - (1) Notify the county agricultural commissioner (of the county in which the vineyard is located) a minimum of 72 hours prior to the initiation of harvest.
 - (2) Assure that a certificate, as provided in Section 3656, is attached to every shipment and is provided to the receiver.
 - (3) Maintain harvest and shipment records for two years. These records shall be made available to the county agricultural commissioner during normal business hours.
- (c) **To ensure that the above standards are met, the receiver shall do all of the following:**
 - (1) Conduct a trapping and detection program as specified by the agricultural commissioner (of the county in which the receiver is located) to determine if the vector is present at receiver's facility.
 - (2) Collect the certificates, required in Section 3656, for each shipment and maintain them as part of the shipment documentation.
 - (3) Dispose of all material other than grapes in a manner that eliminates vector survival risk. Disposal methods include, but are not limited to, steam, crush, cold treat, and solarization.
 - (4) Maintain trapping, vector detection, and shipment records for two years. These records shall be made available to the county agricultural commissioner during normal business hours.

Section 3656. Certification. Shipments of bulk grapes shall be certified as meeting the standards for movement in the following manner:

- (a) **Each shipment of bulk grapes** shall be accompanied by a certificate issued by the county agricultural commissioner at origin affirming that the shipment meets the standards for movement set forth in Section 3655(a).
- (b) **Prior to the movement of each shipment** of bulk grapes moved under Section 3655(a)(3), the origin agricultural commissioner shall notify the destination agricultural commissioner of the quantity of grapes being moved, the specific destination, and identification information.

Section 3657. Exemptions. These standards do not apply to the following types of shipments:

- (a) **Unprocessed, bulk grapes**, which are being transported without undue delay or diversion through non-infested areas to an infested destination for processing or treatment, or are being moved to a destination outside the State.
- (b) **Processed grapes.**

(c) Shipments originating from non-infested areas.

Article 3. Standards for Plants The Secretary hereby establishes the following standards for the movements of plants to prevent the artificial spread of the Pierce's disease bacterium and its vectors.

Section 3658. Plants. Shipments of the following live plants shall meet the requirements of Article 3, Standards for Plants:

Additional Hosts for Glassy-winged Sharpshooter are listed in appendix A.

Scientific Name	Common Name	
<i>Abelia</i> spp.	Abelia	<i>Callistemon</i> spp. Bottlebrush
<i>Acacia</i> spp.	Acacia	<i>Calodendrum</i> spp. Cape chestnut
<i>Aeschynanthus</i> spp.	Basket plant	<i>Camellia</i> spp. Camellia
<i>Agapanthus</i> spp.	Agapanthus	<i>Campsis</i> spp. Trumpet creeper
<i>Agonis</i> spp.	Willow myrtle	<i>Canna</i> spp. Canna
<i>Ajuga</i> spp.	Bugleweed	<i>Capsicum</i> spp. Pepper, chile
<i>Albizia</i> spp.	Albizzia	<i>Carica</i> spp. Papaya
<i>Aleurites</i> spp.	Aleurites	<i>Caryota</i> spp. Fishtail
<i>Alnus</i> spp.	Alder	<i>Cassia</i> spp. Senna
<i>Althaea</i> spp.	Hollyhock	<i>Castanopsis</i> spp. Chinquapin
<i>Amaranthus</i> spp.	Amaranth	<i>Castanospermum</i> spp. Castanospermum
<i>Ambrosia</i> spp.	Ragweed	<i>Catalpa</i> spp. Catawba
<i>Amelanchier</i> spp.	Serviceberry	<i>Ceanothus</i> spp. Redroot
<i>Ananas</i> spp.	Ananas	<i>Ceratonia</i> spp. Carob
<i>Annona</i> spp.	Annona (cherimoya)	<i>Ceratostigma</i> spp. Ceratostigma
<i>Antirrhinum</i> spp.	Snapdragon	<i>Cercidium</i> spp. Palo verde
<i>Aptenia</i> spp.	Aptenia	<i>Cercis</i> spp. Redbud
<i>Arbutus</i> spp.	Strawberry tree	<i>Cercocarpus</i> spp. Mountain mahogany
<i>Archontophoenix</i> spp.	Seaforthia	<i>Chenopodium</i> spp. Lambsquarter
<i>Arctostaphylos</i> spp.	Manzanita	<i>Chionanthus</i> spp. Fringe tree
<i>Arecastrum (Syagrus)</i> spp.	Queen Palm	<i>Chitalpa</i> spp. Chitalpa
<i>Aronia</i> spp.	Chokecherry	<i>Chlorophytum</i> spp. St. Bernard's lily
<i>Asclepias</i> spp.	Milkweed	<i>Chorisia</i> spp. Floss-silk tree
<i>Asparagus</i> spp.	Asparagus	<i>Chrysanthemum</i> spp. Chrysanthemum
<i>Aspidistra</i> spp.	Aspidistra	<i>Cinnamomum</i> spp. Cinnamomum
<i>Baccharis</i> spp.	Baccharis	<i>Cissus</i> spp. Grape ivy
<i>Bauhinia</i> spp.	Bauhinia	<i>Cistus</i> spp. Rock rose
<i>Berberis</i> spp.	Barberry	<i>Citrus</i> spp. Citrus
<i>Betula</i> spp.	Birch	<i>Clytostoma</i> spp. Clytostoma
<i>Bignonia</i> spp.	Bignonia	<i>Cocculus</i> spp. Cocculus
<i>Bougainvillea</i> spp.	Bougainvillea	<i>Cocos</i> spp. Cocos
<i>Brachychiton</i> spp.	Bottle tree	<i>Coffea</i> spp. Coffee
<i>Brunfelsia</i> spp.	Brunfelsia	<i>Coprosma</i> spp. Coprosma
<i>Buxus</i> spp.	Boxwood	<i>Cordyline</i> spp. Ti
<i>Calliandra</i> spp.	Powderpuff	<i>Cornus</i> spp. Dogwood
		<i>Cotoneaster</i> spp. Cotoneaster
		<i>Crassula</i> spp. Crassula
		<i>Cupaniopsis</i> spp. Cupaniopsis
		<i>Cycas</i> spp. Cycad
		<i>Dianthus</i> spp. Dianthus
		<i>Dietes</i> spp. Dietes
		<i>Diospyros</i> spp. Persimmon
		<i>Dodonaea</i> spp. Dodonaea

<i>Elaeagnus</i> spp.	Elaeagnus	<i>Lactuca</i> spp.	Lettuce
<i>Elaeocarpus</i> spp.	Elaeocarpus	<i>Lagerstroemia</i> spp.	Crape myrtle
<i>Ensete</i> spp.	Ensete	<i>Lantana</i> spp.	Shrub verbena
<i>Erigeron</i> spp.	Fleabane	<i>Laurus</i> spp.	Laurel
<i>Eriobotrya</i> spp.	Eriobotrya	<i>Leucospermum</i> spp.	Pincushion
<i>Erythrina</i> spp.	Coral tree	<i>Ligustrum</i> spp.	Privet
<i>Escallonia</i> spp.	Escallonia	<i>Limonium</i> spp.	Statice
<i>Eucalyptus</i> spp.	Eucalyptus	<i>Lippia</i> spp.	Lippia
<i>Eugenia</i> spp.	Eugenia	<i>Liquidambar</i> spp.	Sweet gum
<i>Euonymus</i> spp.	Euonymus	<i>Liriodendron</i> spp.	Tulip tree
<i>Eupatorium</i> spp.	Boneset	<i>Litchi</i> spp.	Lychee
<i>Euryops</i> spp.	Euryops	<i>Lonicera</i> spp.	Honeysuckle
<i>Fatshedera</i> spp.	Aralia ivy	<i>Loropetalum</i> spp.	Loropetalum
<i>Feijoa</i> spp.	Feijoa	<i>Macadamia</i> spp.	Macadamia
<i>Ficus</i> spp.	Fig	<i>Magnolia</i> spp.	Magnolia
<i>Forsythia</i> spp.	Golden-bells	<i>Malus</i> spp.	Apple
<i>Fortunella</i> spp.	Kumquat	<i>Malva</i> spp.	Mallow
<i>Fraxinus</i> spp.	Ash	<i>Mandevilla</i> spp.	Mandevilla
<i>Gardenia</i> spp.	Gardenia	<i>Mangifera</i> spp.	Mango
<i>Gazania</i> spp.	Gazania	<i>Maytenus</i> spp.	Maytenus
<i>Geijera</i> spp.	Geijera	<i>Melaleuca</i> spp.	Honey myrtle
<i>Gelsemium</i> spp.	Yellow jessamine	<i>Melia</i> spp.	Chinaberry
<i>Ginkgo</i> spp.	Ginkgo	<i>Metrosideros</i> spp.	Metrosideros
<i>Gladiolus</i> spp.	Gladiolus	<i>Michelia</i> spp.	Champak
<i>Gossypium</i> spp.	Cotton	<i>Mirabilis</i> spp.	Umbrella wort
<i>Grevillea</i> spp.	Spider flower	<i>Monarda</i> spp.	Wild bergamot
<i>Grewia</i> spp.	Grewia	<i>Morus</i> spp.	Mulberry
<i>Hardenbergia</i> spp.	Hardenbergia	<i>Murraya</i> spp.	Orange jessamine
<i>Harpephyllum</i> spp.	Kaffir plum	<i>Myoporum</i> spp.	Myoporum
<i>Hedera</i> spp.	Ivy	<i>Myrsine</i> spp.	Myrsine
<i>Helianthus</i> spp.	Sunflower	<i>Myrtus</i> spp.	Myrtle
<i>Hemerocallis</i> spp.	Daylily	<i>Nandina</i> spp.	Nandina
<i>Heteromeles</i> spp.	Toyon	<i>Nephrolepis</i> spp.	Sword fern
<i>Hibiscus</i> spp.	Hibiscus	<i>Nerium</i> spp.	Oleander
<i>Howea</i> spp.	Sentry palm	<i>Nicotiana</i> spp.	Tree tobacco
<i>Hymenosporum</i> spp.	Hymenosporum	<i>Nyssa</i> spp.	Tupelo
<i>Hypericum</i> spp.	St. John's-wort	<i>Oenothera</i> spp.	Evening primrose
<i>Ilex</i> spp.	Holly	<i>Olea</i> spp.	Olive
<i>Itea</i> spp.	Itea	<i>Opuntia</i> spp.	Cactus
<i>Jacaranda</i> spp.	Green ebony	<i>Osmanthus</i> spp.	Osmanthus
<i>Jasminum</i> spp.	Jasmine	<i>Osteospermum</i> spp.	Osteospermum
<i>Juglans</i> spp.	Walnut	<i>Pachysandra</i> spp.	Spurge
<i>Koelreuteria</i> spp.	Golden-rain tree	<i>Pandorea</i> spp.	Pandorea

<i>Parthenocissus</i> spp.	Woodbine	<i>Sassafras</i> spp.	Sassafras
<i>Passiflora</i> spp.	Passion fruit	<i>Schefflera</i> spp.	Umbrella tree
<i>Pelargonium</i> spp.	Pelargonium	<i>Schinus</i> spp.	Schinus
<i>Penstemon</i> spp.	Beard-tongue	<i>Schlumbergera</i> spp.	Christmas cactus
<i>Persea</i> spp.	Avocado	<i>Simmondsia</i> spp.	Jojoba
<i>Philadelphus</i> spp.	Mock orange	<i>Solanum</i> spp.	Solanum
<i>Philodendron</i> spp.	Philodendron	<i>Solidago</i> spp.	Goldenrod
<i>Phlox</i> spp.	Phlox	<i>Sonchus</i> spp.	Sonchus
<i>Phoenix</i> spp.	Date palm	<i>Sorbus</i> spp.	Mountain ash
<i>Phormium</i> spp.	Flax lily	<i>Sorghum</i> spp.	Sorghum
<i>Photinia</i> spp.	Photinia	<i>Strelitzia</i> spp.	Bird-of-paradise
<i>Phyla</i> spp.	Frogfruit	<i>Syringa</i> spp.	Lilac
<i>Phytolacca</i> spp.	Pokeweed	<i>Syzygium</i> spp.	Syzygium
<i>Pinus</i> spp.	Pine	<i>Tabebuia</i> spp.	Trumpet tree
<i>Pistacia</i> spp.	Pistachio	<i>Tecomaria</i> spp.	Tecomaria
<i>Pittosporum</i> spp.	Pittosporum	<i>Ternstroemia</i> spp.	Ternstroemia
<i>Platanus</i> spp.	Sycamore	<i>Thuja</i> spp.	Arborvitae
<i>Platycerium</i> spp.	Staghorn fern	<i>Tipuana</i> spp.	Tipu Tree
<i>Plumbago</i> spp.	Leadwort	<i>Trachelospermum</i> spp.	Trachelospermum
<i>Podocarpus</i> spp.	Podocarpus	<i>Tradescantia</i> spp.	Spiderwort
<i>Polygala</i> spp.	Milkwort	<i>Tristania</i> spp.	Tristania
<i>Polygonum</i> spp.	Polygonum	<i>Tulbaghia</i> spp.	Tulbaghia
<i>Populus</i> spp.	Cottonwood	<i>Tupidanthus</i> spp.	Tupidanthus
<i>Portulacaria</i> spp.	Portulacaria	<i>Ulmus</i> spp.	Elm
<i>Protea</i> spp.	Protea	<i>Vauquelinia</i> spp.	Arizona rosewood
<i>Prunus</i> spp.	Prunus	<i>Veronica</i> spp.	Speedwell
<i>Psidium</i> spp.	Guava	<i>Viburnum</i> spp.	Viburnum
<i>Punica</i> spp.	Pomegranate	<i>Vigna</i> spp.	Vigna
<i>Pyracantha</i> spp.	Pyracantha/Firethorn	<i>Vinca</i> spp.	Periwinkle
<i>Pyrus</i> spp.	Pear	<i>Viola</i> spp.	Violet
<i>Quercus</i> spp.	Oak	<i>Vitis</i> spp.	Grape
<i>Raphiolepis</i> spp.	Raphiolepis	<i>Washingtonia</i> spp.	Washington palm
<i>Rhamnus</i> spp.	Buckthorn	<i>Wisteria</i> spp.	Wisteria
<i>Rhododendron</i> spp.	Azalea	<i>Xanthium</i> spp.	Cocklebur
<i>Rhus</i> spp.	Sumac	<i>Xylosma</i> spp.	Xylosma
<i>Robinia</i> spp.	Locust	<i>Yucca</i> spp.	Yucca
<i>Rosa</i> spp.	Rose	<i>Zantedeschia</i> spp.	Calla lily
<i>Rubus</i> spp.	Blackberry	<i>Zea</i> spp.	Zea
<i>Rudbeckia</i> spp.	Coneflower		
<i>Salix</i> spp.	Willow		
<i>Sambucus</i> spp.	Elderberry		
<i>Sapium</i> spp.	Sapium		
<i>Sarcococca</i> spp.	Sweet box		

Additional Hosts for Glassy-winged Sharpshooter are listed in appendix A.

Section 3659. Standards for Movement.

(a) Plants shall meet the following standards prior to shipment from an infested area to a non-infested area:

- (1) The plants have been produced, handled, or treated in a manner approved by the Department to eliminate vectors; or,
 - (2) The plants originate from a non-infested premise or a non-infested portion of a premise as determined by surveys, including trapping and visual, approved by the Department to detect the presence of vectors and the plants are monitored during loading for shipment; or,
 - (3) The plants have been inspected, found to be free of vectors, and have been safeguarded from vectors until shipped.
- (b) **To ensure that the above standards are met**, the nursery shall do all of the following:
- (1) Train employees to inspect for and recognize suspect vectors.
 - (2) Conduct a trapping and detection program as specified by the agricultural commissioner (of the county in which the nursery is located) to determine if the vector is present at the nursery facility.
 - (3) If the vector is present, conduct an ongoing monitoring program that includes a vector free shipment staging area and inspection of plants for vectors.
 - (4) Conduct treatments, as necessary, to ensure that each shipment is free of the vectors.
 - (5) Maintain treatment, vector trapping, detection, and monitoring records for two years. These records shall be made available to the county agricultural commissioner during normal business hours.
- (c) **Plants which are being transported** without undue delay or diversion through non-infested areas.
- (d) **Plant shipments originating** from non-infested areas.

Section 3660. Certification. Shipments of plants shall be certified as meeting the standards for movement in the following manner:

- (a) **Each shipment of plants** shall be accompanied by a certificate issued by the agricultural commissioner at origin affirming that the shipment meets the standards for movement set forth in Section 3659.

Section 3661. Exemptions. These standards do not apply to the following types of shipments:

- (a) **Privately owned plants** which have been maintained indoors.
- (b) **Plants, which have been designated** by the Department as not presenting a risk for the artificial spread of vectors.

Article 4. Standards for Citrus Fruit The Secretary hereby establishes the following standards for the movement of bulk citrus to prevent the artificial spread of the vectors of Pierce's disease.

Section 3662. Standards for Movement of Bulk citrus from an infested area shall meet the standards in (a) or (b) prior to shipment to a non-infested area or an area in which an active control program is being conducted; or prior to transiting a non-infested area or an area in which an active control program is being conducted. The owner shall notify the county agricultural commissioner (of the county in which the grove is located) a minimum of 72 hours prior to the initiation of harvest.

- (a) **The bulk citrus have been harvested, handled, or treated** in a manner approved by the Department to

eliminate all live vectors including, but not limited to, the following:

- (1) Treat grove(s) when infestation levels of vectors are evidenced by multiple detections(s); or,
 - (2) Mechanically brush and protect citrus from infestation by vectors; or,
 - (3) Post-harvest treatment of citrus.
- (b) **The bulk citrus have originated from a non-infested grove** as determined by surveys, including trapping and visual, approved by the Department to detect the presence of vectors and the citrus fruit are monitored during harvest.
- (c) **To ensure that the standards** in (a) or (b) are met, the receiver shall do all of the following:
- (1) Collect the certificates, required in Section 3663, for each shipment and maintain them as part of the shipment documentation.
 - (2) Notify the agricultural commissioner (of the county in which the receiver is located) when suspect vector are detected.
 - (3) Safeguard infested shipments until rejection action is specified by the agricultural commissioner.
 - (4) Maintain shipment records for two years. These records shall be made available to the county agricultural commissioner during normal business hours.

Section 3663. Certification. Shipments of bulk citrus shall be certified as meeting the standards for movement in the following manner:

- (a) **Each shipment of bulk citrus** shall be accompanied by a certificate or other document issued by the agricultural commissioner at origin affirming that the shipment meets the standards for movement set forth in Section 3662.

Section 3663.5. Exemptions. These standards do not apply to the following types of shipments:

- (a) **Processed citrus fruit**, including citrus fruit which has been washed and waxed and is being moved in bulk quantities.
- (b) **Shipments originating from non-infested areas.**
 - (c) **Shipments originating in the infested area** that do not enter a non-infested area or an area in which an active control program is being conducted

APPENDIX A

02-20-08

Additional Hosts for Glassy-winged Sharpshooter.

Scientific Name	Common Name
<i>Acer</i> spp.	Japanese Maple
<i>Aeonium</i> spp.	Aeonium
<i>Alstroemeria</i> spp.	Peruvian lily
<i>Aralia</i> spp.	Japanese aralia
<i>Buddleja</i> spp.	Butterfly bush
<i>Carissa</i> spp.	Natal plum

<i>Chamaedorea</i> spp.	Palms
<i>Chilopsis</i> spp.	Desert willow
<i>Clematis</i> spp.	Evergreen clematis
<i>Coleus</i> spp.	Coleus
<i>Crataegus</i> spp.	Thornless hawthorn
<i>Dalbergia</i> spp.	Indian rosewood
<i>Datura</i> spp.	Jimsonweed
<i>Dracaena</i> spp.	Dracaena
<i>Duranta</i> spp.	Golden dewdrop
<i>Fatsia</i> spp.	Japanese fatsia
<i>Geranium</i> spp.	Cranesbill
<i>Gerbera</i> spp.	Transvaal daisy
<i>Gleditsia</i> spp.	Honey locust
<i>Hydrangea</i> spp.	Hydrangea
<i>Ipomoea</i> spp.	Morning glory
<i>Juniperus</i> spp.	Juniper
<i>Leucophyllum</i> spp.	Texas Ranger
<i>Liriope</i> spp.	Giant turf lily
<i>Luma</i> spp.	Luma
<i>Monstera</i> spp.	Monstera
<i>Musa</i> spp.	Banana
<i>Parkinsonia</i> spp.	Mexican Palo Verde
<i>Pereskia</i> spp.	Barbados Gooseberry
<i>Plectranthus</i> spp.	Plectranthus
<i>Prosopis</i> spp.	Mesquite
<i>Salvia</i> spp.	Sage
<i>Sophora</i> spp.	Sun king sophora
<i>Tecoma</i> spp.	Yellowbells

the intersection of South Willow Avenue and East Tulare Avenue; then, easterly along East Tulare Avenue to its intersection with North Clovis Avenue; then, northerly along North Clovis Avenue to its intersection with East Belmont Avenue; then, easterly along East Belmont Avenue to its intersection with North Temperance Avenue; then, southerly along North Temperance Avenue to the point it becomes South Temperance Avenue; then continuing southerly along said avenue to its intersection with Southern Pacific Railroad; then due west along said railroad to its intersection with South Fowler Avenue; then, continuing southerly along said avenue to its intersection with East Jensen Avenue; then, westerly along East Jensen Avenue to its intersection with South Willow Avenue; then, northerly along South Willow Avenue to the point of beginning.

That portion of Fresno County in the Fresno area bounded by a line drawn as follows: Beginning at the intersection of North Cedar Avenue and East Clinton Avenue; then, westerly along East Clinton Avenue to its intersection with North Palm Avenue; then, northerly along North Palm Avenue to its intersection with East Dakota Avenue; then, westerly along East Dakota Avenue to the point it becomes West Dakota Avenue; then, continuing on West Dakota Avenue to its intersection with North Hughes Avenue; then, northerly along North Hughes Avenue to its intersection with West Ashlan Avenue; then, westerly along West Ashlan Avenue to its intersection with North Marks Avenue; then, northerly along North Marks Avenue to its intersection with West Herndon Avenue; then, easterly along West Herndon Avenue to its intersection with North Van Ness Boulevard; then, northerly along said boulevard to its intersection with Riverbottom Road; then, due north from said intersection along an imaginary line to its intersection with the San Joaquin River; then, northeasterly along said river to the point where an imaginary line drawn due north from the intersection of North Cedar Avenue and Herndon Avenue intersects said river; then, south from said point along said line to the intersection of North Cedar Avenue and Herndon Avenue; then southerly along North Cedar Avenue to the point of beginning.

That portion of Fresno County in the Clovis area bounded by a line drawn as follows: Beginning at the intersection of Maple Avenue and Shepherd Avenue; then, easterly along Shepherd Avenue to its intersection with Fowler Avenue; then, southerly along Fowler Avenue to its intersection with Herndon Avenue; then, easterly along East Herndon Avenue to its intersection with North Locan Avenue; then, southerly along North Locan Avenue to its intersection with East Shaw Avenue; then, westerly along East Shaw Avenue to the point it becomes Shaw Avenue; then, continuing westerly along said avenue to its intersection with Fowler Avenue; then, southerly along Fowler Avenue to its intersection with Ashlan Avenue; then, westerly from said intersection along an imaginary line to the intersection of Peach Avenue and Ashlan Avenue; then, westerly along Ashlan Avenue to its intersection with Cedar Avenue; then, northerly along Cedar Avenue to its intersection with Herndon Avenue; then, easterly along Herndon Avenue to its intersection with Maple Avenue; then, northerly along Maple Avenue to the point of beginning.

APPENDIX B

GWSS Infested Areas

The GWSS infested areas are the entire counties of Los Angeles, Orange, Riverside, San Bernardino, San Diego, Ventura, and portions of Fresno, Imperial, Kern, Sacramento, Solano, Santa Barbara, Santa Clara, and Tulare counties (see details below). Intrastate shipments found infested with this pest can be rejected under California Food and Agricultural Code Section 6521.

[Please note: Nursery stock from the infested states of Alabama, Arkansas, Florida, Louisiana, Mississippi, Nevada, North Carolina, South Carolina, and Texas already enters California under a Quarantine Warning Hold Notice (008). GWSS is also known to occur in Mexico. Interstate shipments found infested with this pest can be rejected under California Food and Agricultural Code Section 6461.5.]

- **Fresno** That portion of Fresno County in the Fresno area bounded by a line drawn as follows: Beginning at

That portion of Fresno County in the Kingsburg area bounded by a line drawn as follows: Beginning at the intersection of Golden State Boulevard and Stroud Avenue; then, easterly along said avenue to its intersection with Eighteenth Avenue; then, southerly along Eighteenth Avenue to its intersection with the Fresno County Line; then, southwesterly along said line to its intersection with Indianola; then, northerly along Indianola to its intersection with Elkhorn Avenue; then, easterly along Elkhorn Avenue to its intersection with Indianola; then, northerly along Indianola to its intersection with Kamm Avenue; then, easterly along Kamm Avenue to its intersection with Bethel Avenue; then, northeasterly along Bethel Avenue to its intersection with Golden State Boulevard; then southerly along said boulevard to the point of beginning.

- **Imperial** That portion of Imperial County in the Desert Shores, Salton Sea Beach, and Salton City area bounded by a line drawn as follows: Beginning at the intersection of State Highway 86 and Coolidge Springs Road; then, due east along an imaginary line to its intersection with the Salton Sea; then, southeasterly along the shore of the said sea to its intersection with Arroyo Salada Stream; then, southwesterly along said stream to its intersection with State Highway 86; then, northerly along State Highway 86 to its intersection with Sea View Drive; then, southwesterly along said Sea View Drive to its end; then, northerly from said end along an imaginary line drawn to the western end of Lakeview Court and the point it intersects with Borrego Salton Seaway; then, northwesterly from said point along an imaginary line drawn to the intersection of Marina Drive and Impala Court; then, northeasterly along Marina Drive to its intersection with State Highway 86; then, northwesterly along said highway to its intersection with Tonalee Ditch; then, southwesterly along said ditch to an imaginary line drawn southward from the end of Coolidge Springs Road; then, northerly along said imaginary line and road to the point of beginning.
- **Kern** That portion of northern Kern County between Bakersfield and the Kern – Tulare County line which incorporates a section of Highway 65 and is bounded by a line drawn as follows: Beginning at the intersection of Zachary Avenue and the Kern – Tulare County line; then, easterly along the Kern – Tulare County line to its intersection with Old Stockton Los Angeles Stage Road; then, due south along an imaginary line drawn to Highway 155; then, southwesterly along an imaginary line drawn to the intersection of Famoso Woody Road and Sherwood Avenue; then, continuing southwesterly along Famoso Woody Road to its intersection with Highway 65; then, southerly along Highway 65 to its intersection with Merced Avenue; then, eastward along Merced Avenue to its end; then, southerly along an imaginary line drawn to the end of the Lerdo Highway; then, westerly along Lerdo Highway to its intersection with Highway 65; then, southerly along Highway 65 to its intersection with James Road; then, due east along an imaginary line drawn to the county line; then, following said county line to its intersection with an imaginary line drawn due west from the end of the intersection of Bear Mountain Road and Coles Levee Road; then, easterly along said imaginary line to the aforementioned intersection of Bear Mountain Road and

Coles Levee Road; then, continuing eastward on Bear Mountain Road to its intersection with Highway 99; then, northerly along said highway to its intersection with Curnow Road; then, westerly along said road to its intersection with Wibble Road; then, northerly along Wibble Road to its intersection with the Taft Highway; then, westerly along said highway to its intersection with Stine Road; then, northerly along said road to its intersection with Mccutchen Road; then, westerly along Mccutchen Road to its intersection with Gosford Road; then, northerly along Gosford Road to its intersection with Panama Lane; then, westerly along said lane to its intersection with Buena Vista Road; then, northerly along said road to its intersection with the Pessinger Road; then, due west along Pessinger Road to its intersection with South Allen Road; then, northwesterly along an imaginary line drawn to the southern end of Locksley Lane; then, northerly along said lane to its intersection with the Stockdale Highway; then, westerly along said highway to its intersection with Nord Avenue; then, northerly along said avenue to its intersection with Palm Avenue; then, westerly along Palm Avenue to its intersection with Greely Road; then, northerly along said road to its northern end; then, continuing northerly along an imaginary line drawn to the intersection of Santa Fe Way and Los Angeles Street; then, northerly along Los Angeles Street to its intersection with Orange Street; then, westerly along Orange Street to its intersection with Magnolia Avenue; then, northerly along said avenue to its intersection with Mccombs Avenue; then, easterly along Mccombs Avenue to its end; then, continuing due east along an imaginary line drawn to the intersection of Famoso-Porterville Highway and Mccombs Avenue; then, continuing easterly on said avenue to its intersection with Driver Road; then, northerly on said road to its intersection with Phillips Road; then, easterly on Phillips Road to its intersection with Zachary Avenue; then, northerly on said avenue to its intersection with Hanawalt Avenue; then, westerly on Hanawalt Avenue to its intersection with the Famoso-Porterville Highway; then, northeasterly along said highway to its intersection with Sherwood Avenue; then, westerly on said avenue to its intersection with Zachary Avenue; then, northerly along said Zachary Avenue to the point of beginning.

- **Sacramento** That portion of Sacramento County in the Rancho Cordova area bounded by a line drawn as follows: Beginning at the intersection of Sunrise Boulevard and South Bridge Street; then, easterly along said street to its intersection with Perdeta Lane; then, southeasterly from said intersection along an imaginary line to the intersection of Country Rock and Mother Lode Circle; then, southerly along Country Rock to its intersection with Mother Lode Circle; then, northeasterly along said circle to its intersection with Tailrace Drive; then, southerly along said drive to its intersection with Gold Country Boulevard; then, easterly along said boulevard to its intersection with Prospect Hill Drive; then, due south from said intersection along an imaginary line to White Rock Road; then, westerly along said road to its intersection with Luyung Drive; then, southwesterly from said intersection along an imaginary line to the east end of Sanders Drive; then, westerly along said drive to its intersection with Sunrise Boulevard; then, westerly from said intersection along an imaginary line to the intersection of Prospect Park Drive and Disc Drive; then, northerly along Prospect

Park Drive to its intersection with White Rock Road; then, westerly along said road to its intersection with Prospect Park Drive; then, northerly along Prospect Park Drive to its intersection with Gold Center Drive; then, westerly along Gold Center Drive to its intersection with Zinfandel Drive; then, northerly along Zinfandel Drive to its intersection with Olson Drive; then, westerly along Olson Drive to its intersection with Gwendolyn Way; then, northwesterly from said intersection along an imaginary line to the intersection of Malaga Way and Aramon Drive; then, northeasterly along said drive to its intersection with Chassella Way; then, northwesterly along said way to its intersection with Dolecetto Drive; then, northerly along said drive to its intersection with Chardonay Drive; then, northwesterly along Chardonay Drive to its intersection with Coloma Road; then, northeasterly along said road to its intersection with Georgetown Drive; then, westerly along said drive to its intersection with Riveredge Way; then, westerly along said way to its intersection with Ambassador Drive; then, due northwest from said intersection along an imaginary line to the American River; then, northeasterly along said river to the point where an imaginary line drawn due south from the intersection of Clinton Way and Alexander Court intersects said river; then, easterly from said point to the point of beginning.

That portion of Sacramento County in the Foothill Farms area bounded by a line drawn as follows: Beginning at the intersection of Fenwick Way and Longdale Drive; then, northeasterly along said drive to its intersection with Keema Avenue; then, due east from said intersection along an imaginary line to the intersection of Roseville Road and Tacomac Drive; then, continuing northeasterly along said road to its intersection with Andrea Boulevard; then, northeasterly along said boulevard to the point where it meets Elkhorn Boulevard; then, southeasterly along Elkhorn Boulevard to its intersection with Highway 80 and Greenback Lane; then, southeasterly along said lane to its intersection with Verner Avenue; then, southeasterly from said intersection along an imaginary line to the intersection of Oak Hill Drive and Red Cliff Drive; then, continuing southerly from said intersection along an imaginary line to the intersection of Auburn Boulevard and Manzanita Avenue; then, south along said avenue to the point where it intersects Nonnie Avenue; then, west along said avenue to its intersection with Hackberry Lane; then, south along said lane to its intersection with Madison Avenue; then, west along said avenue to its intersection with Garfield Avenue; then, southerly along Garfield Avenue to its intersection with Marmith Avenue; then, southwesterly from said intersection along an imaginary line to the intersection with Hemlock Street and Damon Avenue; then, westerly along said avenue to the point where it intersects Holyoke Way; then, due west from said point along an imaginary line drawn to the intersection of College Oak Drive and Ferigo Lane; then, northwesterly from said intersection along an imaginary line to the intersection of Madison Avenue and Hillsdale Boulevard; then, northerly along said boulevard to its intersection with Frizell Avenue; then, northwesterly from said intersection along an imaginary line to the intersection of Palm Avenue and Roseville Road; then, northeasterly along said road to its intersection with Walerga Road; then, northerly along Walerga Road to its intersection with Longdale Drive; then, northeasterly along Longdale Drive to the point of beginning.

- **Santa Barbara** That portion of Santa Barbara County lying south of a line drawn as follows: Beginning at the Point Arguello lighthouse; then easterly along an imaginary line to the summit of El Tranquillon Mountain; then southeasterly along an imaginary line to the point of intersection of Jalama Creek and Escondido Creek; then easterly along an imaginary line to the point of intersection of Gaviota Creek and the summit of the Santa Ynez Range; then easterly along the summit of the Santa Ynez Range to the east Santa Barbara County boundary line.
- **Santa Clara** That portion of Santa Clara County in the south San Jose area bounded by a line drawn as follows: Beginning at the intersection of Koch Lane and Meridian Avenue at the NW; then, easterly along Koch Lane to its intersection with Almaden Expressway; then southerly along Almaden Expressway to its intersection with Hillsdale Avenue; then, easterly along Hillsdale Avenue to its intersection with Highway 87; from this intersection southerly along Highway 87 to its end; then, continues southerly along Santa Teresa Boulevard to its intersection with Blossom Hill Road; then, westerly along Blossom Hill Road to its intersection with Winfield Boulevard; then, southerly along Winfield Boulevard to its intersection with Coleman Road; then, following Coleman Road in a southwesterly direction to its intersection with Meridian Avenue; then northerly along Meridian Avenue to the point of beginning.

That portion of Santa Clara County in the south San Jose area bounded by a line drawn as follows: Beginning at the intersection of Branham Lane and Snell Avenue at the NW; then, easterly along Branham Lane to its intersection with Monterey Highway; then, due northeast from the intersection of Branham Lane and Monterey Highway along an imaginary line to the intersection of Highway 101 and Coyote Road; then, easterly along Coyote Road to its first intersection with Scarlett Way; then due east from this point along an imaginary line across Coyote Creek to Hellyer Road; then, follows southeasterly along Hellyer Road to its intersection with Silver Creek Valley Road; then, southwest from the intersection at Hellyer Road and Silver Creek Valley Road along an imaginary line to the intersection of Highway 85 and Perimeter Road; then, due southwest from the intersection at Highway 85 and Perimeter Road along an imaginary line to the intersection of Cottle Road and Curie Road; then, due northwest from the intersection of Cottle and Curie along an imaginary line to the intersection of Santa Teresa Boulevard and Snell Avenue; then northerly along Snell Avenue to the point of beginning.

That portion of Santa Clara County in the Evergreen area bounded by a line drawn as follows: Beginning at the intersection of Capitol Expressway and Tully Road; then, easterly on Tully Road to its intersection with South White Road; then, southerly along South White Road to the point of intersection with Aborn Road; then, west on Aborn Road to its intersection with Thompson Creek; then, southeasterly following Thompson Creek to its intersection with Cadwallader Avenue; then, southerly along said avenue to its end; then, from said end along an imaginary line drawn to the intersection of

Neiman Boulevard and Quail Bluff Lane; then, southeasterly along Neiman Boulevard to its intersection with Yerba Buena Road; then, westerly along said road to its intersection with Baronet Court; then, southwesterly from said intersection along an imaginary line drawn to the intersection of Trestlewood Drive and Hassler Parkway; then, continuing westerly from said point along an imaginary line drawn to the intersection of Tuers Road and McLaughlin Avenue; then, westerly along Tuers Road to its intersection with Yerba Buena Road; then, southwesterly along Yerba Buena Road to its intersection with Grandbrook Way; then, following said way to its intersection with Brodie Drive; then, westerly along Brodie Drive to its intersection with Singleton Road; then, northeasterly along said road to its intersection with Locke Drive; then, northwesterly along Locke Drive to its end; then, northwesterly from said end along an imaginary line drawn to the west end of Pinto Drive and its intersection with Long Bluff Way; then, northwesterly along Long Bluff Way to the point of intersection with Platte River Court; then, northerly from said point along an imaginary line drawn to the intersection of Tuers Road and Cheswick Drive; then, northeasterly along Cheswick Drive to its intersection with Sherlock Drive; then, northwesterly along Sherlock Drive to its intersection with Idlewood Drive; then, northeasterly along Idlewood Drive to its intersection with McLaughlin Avenue; then, northwesterly along said avenue to its intersection with Tully Road; then, northeasterly along Tully Road to the point of beginning.

- **Tulare** That portion of Tulare County which incorporates a section of Highway 65 and is bounded by a line drawn as follows: Beginning at the intersection of Road 216 and Avenue 180; then, westerly along Avenue 180 to its intersection with Road 208; then, northerly along Road 208 to its intersection with Avenue 184; then, westerly along Avenue 184 to its intersection with Road 196; then, northerly along Road 196 to its intersection with Avenue 206; then, westerly along Avenue 206 to its intersection with Road 188; then, northerly along Road 188 to its intersection with Avenue 224; then, easterly along Avenue 224 to its intersection with Road 200; then, northerly along Road 200 to its intersection with Avenue 228; then, northeasterly from said intersection along an imaginary line drawn to the intersection of Road 224 and Avenue 248; then, due east from said point along an imaginary line drawn to its intersection with Road 244; then, southeasterly from said intersection along an imaginary line drawn to the intersection of Avenue 230 and Holworthy; then, continuing southeasterly along an imaginary line drawn to the point of intersection with an imaginary line drawn due north from the intersection of Frazier Highway and Road 276; then, southerly along Road 276 to its intersection with Avenue 176; then, easterly along Avenue 176 to its intersection with Road 288; then, northerly along Road 288 to its end; then, southeasterly from said end to the point of intersection between Road 320 and Blue Ridge; then, easterly along Blue Ridge to its intersection with State Highway 190; then, southerly along State Highway 190 to its intersection with Globe; then, following Globe southerly to its intersection with Tule Oak; then, southwesterly from said intersection along an imaginary line drawn to the intersection of Success Valley and Dillon Ranch Road; then, continuing southwesterly along an imaginary line drawn to the intersection of Reservation and Road 298; then

southerly along Road 298 to its intersection with Mountain Road 118; then, southwesterly along an imaginary line drawn to the intersection of Avenue 120 and Road 288; then, continuing on an imaginary line due south to its intersection with Avenue 56; then continuing southerly along said imaginary line to the end of Road 272; then, continuing southerly along Road 272 to its intersection with Mountain Road 33; then, continuing southeasterly along Mountain Road 33 to its intersection with Old Stockton Los Angeles Stage Road; then, southerly along said road to its intersection with the Tulare-Kern County line; then, due west along said county line to its intersection with Road 192; then, northerly along Road 192 to its intersection with Avenue 96; then, easterly along Avenue 96 to its intersection with Road 208; then, northerly along Road 208 to its intersection with Avenue 136; then, easterly along Avenue 136 to its intersection with an imaginary line heading due north from the end of Road 212; then, northerly along said imaginary line to its intersection with Avenue 144; then easterly along Avenue 144 to its intersection with Road 216; then, northerly along Road 216 to its end; then northerly from said end along an imaginary line drawn to the point of beginning.

COUNTY RESTRICTIONS ON GLASSY-WINGED SHARPSHOOTER

Foreword

Several counties notified the Department that they hold exemption authorized by Food and Agricultural Code Section 6504 is waived for shipments of specific kinds of nursery stock. This action was taken to protect the counties' agricultural industry, particularly the grape industry, from the introduction of *Homalodisca coagulata*, the glassy-winged sharpshooter (GWSS), which is a vector of *Xylella fastidiosa*, the causal agent of Pierce's disease, from GWSS infested areas.

Counties Enforcing Restrictions

Alameda, Amador, Butte, Calaveras, Colusa, Contra Costa, El Dorado, Fresno, Glenn, Humboldt, Imperial, Kern, Kings, Lake, Madera, Marin, Mariposa, Mendocino, Merced, Monterey, Napa*, Nevada, Placer, Sacramento, San Benito, San Francisco, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Shasta, Solano, Sonoma*, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, and Yuba.

*See Appendix A for additional restrictions.

Regulated Articles

"Host material" shall mean all nursery stock or food host plants as referenced in Appendix A of State Miscellaneous Rulings: Pierce's Disease Control Program, pages 454.3 through 454.7.

Infested Regulated Areas

The GWSS infested areas are referenced in Appendix B of the State Miscellaneous Ruling: Pierce's Disease Control Program, pages 454.7 through 454.10.

Restrictions

California Nursery Stock Certificates shall not accompany shipments of host material shipped to un-infested areas of enforcing counties nor to infested areas undergoing suppression or control. All shipments of host material to un-infested or suppression areas of enforcing counties from GWSS infested areas must be shipped under "blue tag" and held for inspection at destination.

[Please note: Nursery stock from the infested states of Alabama, Arkansas, Florida, Louisiana, Mississippi, Nevada, North Carolina, South Carolina, and Texas already enters California under a Quarantine Warning Hold Notice (008). GWSS is also known to occur in Mexico. Interstate shipments found infested with this pest can be rejected under California Food and Agricultural Code Section 6461.5.]

Compliance Agreements

The standards for plants and the authority for use of nursery stock compliance agreements are outlined under the Pierce's Disease Control Program. Please refer to www.cdfa.ca.gov/phpps/pdcp or your local County Agricultural Commissioners office for respective details.

Appendix A As provided by Section 3651 of the Pierce's Disease Control Program (PDCP; page 454.1), the Department has allowed the following County to establish variations from the standards set forth in the PDCP

regulations. The definitions and additional restrictions are provided below.

Napa and Sonoma Counties:

Definitions.

"Commercial Entity" shall include any and all nurseries, landscapers, gardeners, landscape architects, contractors and/or any other individual or entity that buys, sells or deals in the commercial purchase, sale or movement of host materials of any kind in any way whatsoever.

"Commissioner" shall mean the Napa and/or Sonoma County Agricultural Commissioner, or designee, unless otherwise stated.

"County" shall mean the County of Napa and/or Sonoma, a political subdivision of the State of California.

"Host Material" shall mean shipments of bulk grapes and all plant/nursery stock identified as a glassy-winged sharpshooter (GWSS) oviposition or food host plant by the California Department of Food and Agriculture (CDFA), except when in the form of seeds, bulbs, stolons, tubers, corms, pips, buds, or when otherwise specified by CDFA.

"Infestation" shall mean the detection of five or more adult GWSS within any five-day period and within a 300-yard radius, or if a viable GWSS egg mass or nymph is found other than in association with a shipment of plant material, or if multiple GWSS life stages are present in a non-regulatory situation. If no additional GWSS are detected within one complete GWSS life cycle, the infestation designated may be removed by CDFA.

"Infested Area" shall mean that area within one (1.0) mile of a GWSS infestation, unless a greater geographic area is determined appropriate by CDFA.

"Mixed Shipment" shall be defined as any shipment that is comprised of host material that originated from both infested and non-infested areas.

"Non-infested Area" shall mean one in which no infestations have been detected after survey in a manner approved by the Department to detect GWSS or where the infestation designation has been removed.

"Non-infested premise" shall mean a non-infested nursery or portion of a non-infested nursery and must be at least 300 yards from an infestation. A non-infested premise or non-infested portion of a premise must be free of GWSS (viable) egg masses, live nymphs and with no more than three adults found in the same 1/2 acre in a two-week period.

"Person" shall include any individual, firms, corporations, companies, associations or any other entity.

"Shipment" shall mean any article or thing, which is, may be, or has been transported from one place to another place.

1. Restrictions on Movement of Plant/Nursery Stock from Infested Areas.

No person shall move or ship into the County any host material from an infested area, except under the following conditions:

a. The shipment is transiting the County with proper safeguards to prevent dispersal of GWSS life stages to a

destination outside of the County without delay or diversion; or,

b. The shipment originates from a non-infested premise or non-infested portion of a premise; or,

c. The shipment has been treated under the supervision of the origin county agricultural commissioner within the efficacious period with a registered pesticide approved by CDFA to eliminate all life stages of GWSS following label requirements; or,

d. Until a treatment is approved by CDFA, the shipment shall be foliar treated with an insecticide, shown in preliminary laboratory tests to apparently be effective against all life stages of GWSS, such as:

1. fenprothrin (Tame®), or
2. carbaryl (Sevin®); and

The agricultural commissioner of the origin county has fully inspected and found the shipment free of GWSS.

(Any reference to the trade or chemical names listed above is based upon current preliminary scientific data and should not be construed as an endorsement of these products or companies by the County).

e. Each shipment, except transiting shipments, shall be accompanied by a CDFA approved written certificate issued by the agricultural commissioner of the origin county which attests that the shipment is in compliance with the requirements of this plan. Shipments under compliance agreements from persons who are under compliance with the provisions of this work plan and who have not shipped any viable life stages of GWSS out of the infested area within the past six (6) months, may ship using a stamp or sticker certificate format, when approved by the County Agricultural Commissioner. The origin county or person under compliance agreement shall fax the certificate to the Napa and Sonoma County Agricultural Commissioner before shipping and;

f. Each incoming shipment may be inspected by the County Agricultural Commissioner at destination or at a site designated by the Commissioner, as agreed upon by CDFA and the Commissioner.

g. The Commissioner shall have the authority to destroy any infested plants with apparently viable life stages found on them and take whatever action the Commissioner feels is an appropriate disposition for the remainder of the shipment, including the destruction of all plant materials; and

h. If appropriate, any shipments may be treated at the point of destination within the County, destroyed and/or returned to the origin county, as determined necessary by the Commissioner.

2. Napa and Sonoma County Activities Related to the Movement of Plant/Nursery Stock from Non-infested Areas.

The County has an interest in the inspection of mixed shipments of GWSS host plants. The County may inspect these shipments. The following shall serve as guidelines for implementation of this local program: No person shall import into the County any host material from a non-infested area, except under the following conditions:

a. The County Agricultural Commissioner may enter into a compliance agreement with each commercial entity receiving host material. The Commissioner may make exceptions to this requirement as determined appropriate.

b. Each shipment may be inspected by the County Agricultural Commissioner at the destination or at a site designated by the Commissioner; and

c. The Commissioner may treat any shipments inspected at the point of destination within the County, as determined necessary.

d. The Commissioner has the authority to destroy any infested plants with apparently viable life stages found on them and take whatever action the Commissioner feels is an appropriate disposition for the remainder of the shipment, including the destruction of all plant materials.

3. Abatement of the Glassy-winged Sharpshooter.

Shipments of regulated host material arriving without certification shall be rejected. Any shipment in which an apparently viable GWSS life stage (including adults, nymphs and egg masses) is detected, shall be treated or destroyed under the supervision of the Commissioner. The owner of the shipment is responsible for all costs of the aforementioned option. The Commissioner may charge the owner of the shipment for the cost of supervising the treatment or destruction of the shipment.

If a GWSS infestation is detected in any agricultural setting within the County, including but not limited to vineyards, orchards, or production or retail nurseries, the pest shall be treated at the cost of the property owner or leaseholder, in a manner approved by and under the supervision of the Commissioner. If the aforementioned treatment is not conducted as required by the Commissioner, the pest shall be abated as provided in Section 5401 et seq. of the Food and Agricultural Code of California.

If a GWSS infestation is detected in urban or residential areas of the County, the infestation will be delimited and eradicated where feasible. If eradication is not feasible, the perimeter of the infestation will be monitored and the infestation will be contained within the smallest possible area, as determined necessary by the County Agricultural Commissioner.

4. Movement of Host Material from Infested Locations within the County of Napa or Sonoma.

Movement of infested host materials, as identified by the CDFA, from a nursery, vineyard, orchard, or other area within the County, in which a GWSS infestation has been detected is prohibited from said location unless the host material is treated, handled, or processed under the supervision of the County Agricultural Commissioner. The Commissioner may charge the owner of the shipment for the cost of supervising said activities.

5. Criminal Law Enforcement of Workplan.

The County, by and through the Agricultural Commissioner, shall refer any violation[s] of the Regulations or this Workplan which include[s] criminal penalties to the County District Attorney for prosecution.

Nursery Stock Approved-Treatment Protocol

February 22, 2008

Shipping of nursery stock by a nursery operator from an area infested with glassy-winged sharpshooter (GWSS) to a non-infested area, partially infested area, or area under active control is permissible under the following conditions:

1. Compliance Agreement

- a. Each shipping nursery facility (each individual site) shall enter into an approved treatment protocol compliance agreement with the shipping County Agricultural Commissioner (CAC). Portions of the BMP's, as specified by the shipping CAC and/or CDFA, shall be mandated as components of the facility's GWSS Pest Management Plan and Treatment and Safeguarding procedures, as applicable, and those BMP's shall be enforceable as a part of the compliance agreement. The compliance agreement will be reviewed and renewed annually.
- b. To qualify for an approved treatment protocol compliance agreement, a nursery must establish a written GWSS Pest Management Plan.
- c. The GWSS pest management plan is subject to approval by the shipping CAC.
- d. The nursery must comply with all compliance agreement and protocol requirements.

2. GWSS Pest Management Plan

- a. The plan shall be designed to minimize GWSS pest pressure in the growing area.
- b. The plan shall utilize concepts and principles of pest management at all times and implement and maintain BMP's as currently posted at CDFA's website www.cdfa.ca.gov/pdcp/Nursery.html. When any changes occur in the BMP's, the shipping CAC will notify the nursery. Any new changes will be forwarded electronically or by other means to the nursery.
- c. The plan shall include an ongoing pest-monitoring program. This includes the placement and monitoring of yellow panel sticky traps evenly spaced throughout the nursery growing areas at a density of not less than (2) trap(s) per ½ acre, and at nursery shipping docks. These traps will be inspected a minimum of once every two weeks by a shipping CAC inspector.
- d. The required number of traps may be increased based on pest pressure as determined by the shipping CAC and CDFA.
- e. Under this protocol, the current threshold for GWSS in shipping nurseries is no more than 10 GWSS trapped in a single yellow panel trap in the same ½ acre within a two-week period. If this threshold is exceeded, all host material, within a 300' radius around the trap(s) indicating greater than 10 adults, shall be suspended from being shipped and must receive a chemical application. If after two trap servicings the pest pressure is below the threshold level and with the approval of the shipping CAC, then the suspension can be lifted and shipping can resume.

3. Record-Keeping

- a. Growing area treatment records must be maintained and available on-site for a minimum of two years plus the current year.
- b. Treatment and personnel training records must be made available to CDFA or the shipping CAC upon request.

4. Treatment and Safeguarding

- a. The nursery must demonstrate to the origin (shipping) CAC that all plant material in each shipment intended for non-infested counties, partially infested counties, and areas under active control within California has originated from growing grounds under a compliance agreement. In addition, the nursery must apply the standards of cleanliness as directed in CCR 3060.2a and FAC 6902 (a-d) to maintain minimal levels of pest presence within the nursery.
- b. All plants and plant material destined for non-infested counties, partially infested counties, and areas under active control within California shall be treated with CDFA-approved pesticides (currently Sevin SL or Tame) within 72 hours of shipment and at rates and methods as specified in the approved treatment protocol compliance agreement. Pesticide applications shall be made by an individual trained in accordance with item 7. Applications shall be made to meet label requirements and proper application techniques for Sevin SL and Tame.
- c. Nursery stock foliage shall be generally free from surface moisture at the time of treatment.
- d. Treatments shall be conducted in the presence of a licensed shipping CAC inspector.
- e. Nursery personnel shall ensure that treated nursery stock is safeguarded to prevent re-infestation prior to shipping. Safeguarding steps shall include isolating the shipment and ensuring that no plants are added to or removed from the shipment after treatment.
- f. Nursery stock shall not receive overhead irrigation following treatment and prior to shipment due to risks of pesticide degradation. Irrigation of nursery stock following treatment and prior to shipping shall be conducted through the use of a watering wand or hose with water applied only to the planting medium and avoidance of wetting foliage.

5. Certification

- a. Shipments receiving approved treatments shall be certified via a Certificate of Quarantine Compliance (CQC, CDFA Form 66-079) issued by the shipping CAC.
- b. The CQC shall indicate:
 - The name and complete physical address of the nursery facility from which the nursery stock is shipped
 - Nursery approved treatment protocol compliance agreement number
 - The approved treatment material used
 - The application rate
 - The date of treatment
 - The signature of the inspector who witnessed the treatment
- c. CQC's shall be prepared for each delivery (drop). Each CQC shall contain the following statement: "This shipment is being shipped under the approved treatment protocol".
- d. The CQC shall expire at the end of the third day after being issued.

6. Notification

- a. Shipping nursery personnel shall provide receiving CAC's with no less than 24 hours notice when certified treated shipments are being sent to that receiving county.

7. Training

- a. The nursery shall have personnel trained in the GWSS Pest Management Plan and the effective application of the Approved Treatment Protocol on staff at all times.
- b. All nursery staff shall receive training on the GWSS Pest Management Plan and the Approved Treatment Protocol at least annually. Pesticide training will be conducted at least annually and appropriate update training shall be conducted at any time which any new chemicals or spray techniques are implemented. All new employees shall be trained prior to participating in the program. The training shall be in addition to the required pesticide safety training.
- c. The training materials and curriculum shall be updated annually.
- d. Treatment personnel shall be trained in effective application techniques for GWSS control as outlined in Appendix A (GWSS Pesticide Application Techniques)...
- e. All training provided shall be documented through written records.
- f. All of the above must be documented and available for review at any time by the CAC and/or CDFA.

8. Origin Inspection Authority

- a. CDFA, origin CAC inspectors, and shipping CAC inspectors shall be afforded access to nursery growing areas, shipping docks, and treatment and training records for inspection.

9. Destination Inspection Authority

- a. Arriving nursery stock shipments are subject to inspection by the receiving CAC, at his/her discretion. The receiving CAC may require hold orders on such shipments.
- b. Arriving certified nursery stock shipments shall be subject to sampling by CDFA and receiving CAC inspectors for pesticide residues.

10. Enforcement Actions and Authority

- a. Any certified nursery stock shipment found at destination to have live nymphal or adult GWSS will be destroyed on-site or returned to origin, as ordered by the receiving CAC. The shipping CAC and CDFA shall suspend the approved treatment protocol compliance agreement of any shipping nursery with a nymph or adult life stage rejection until the problem has been mitigated to satisfaction of the shipping CAC and CDFA.
- b. Nursery stock shipments lacking a valid CQC shall be held at destination until such documentation can be produced. The receiving CAC may reject the entire load if such documentation cannot be immediately produced.
- c. Failure to meet any approved treatment protocol compliance agreement requirement may result in the suspension or cancellation of both the approved treatment protocol compliance agreement and the authorization to ship nursery stock to non-infested areas under this agreement. The suspension or cancellation will continue until the deficiencies are corrected, as determined by CDFA and the shipping CAC.
- d. Repeated failures to meet approved treatment protocol compliance agreement requirements may result in the revocation of the approved treatment protocol compliance agreement for a period of up to one year or until CDFA or shipping CAC determine the nursery facility is in compliance with the conditions of the approved treatment protocol compliance agreement.
- e. The destination CAC shall have the authority to hold plant material with excessive egg masses and will immediately initiate discussion with shipping CAC and CDFA to discuss the next action. This authority is at the discretion of the destination CAC.

11. Annual Review

- a. An initial review of this Nursery Stock Approved Treatment Protocol will be conducted six months subsequent to adoption and annually thereafter. The purpose of the review is to examine the effectiveness of the protocol in its current form. The review will be by committee, chaired by CDFA.