

Nursery Stock Approved Treatment Program
Annual Review
2011

This is a summary of the Glassy-winged Sharpshooter (GWSS) Nursery Stock Approved Treatment Program (ATP) for the period of January 1 through December 31, 2011. This report includes analysis or discussions of every element of the ATP including historical viewpoints, statistics, regulatory issues, monitoring activities, chemical evaluations, training and documentation. This document will also discuss adjustments made to the ATP during this period and mention future considerations.

Shipments

Following the approval of the ATP in March of 2008, five nurseries expressed interest in participating in the new program: Bordiers Nursery* and Valley Crest Tree Company of Ventura County, Norman's Nursery and ABC Nursery of Los Angeles County, and Village Nurseries of Riverside County. These five nurseries were actively shipping under the ATP during 2009.

In January 2010, West Covina Nursery joined the ATP program followed by Coiner Nursery in June 2010, bringing the total number of ATP shippers to seven. Both of these ATP nurseries are located in Los Angeles County.

The results below include all ATP shipments from January 1, through December 31, 2011.

Nursery	# of Shipments	# of Plants
Hines Nursery	1,017	705,459
Valley Crest Tree Co.	338	14,855
Norman's Nursery	704	386,925
Village Nurseries	5,389	1,509,644
ABC Nursery	719	105,106
West Covina Nursery	254	51,775
Coiner Nursery	565	48,591
Total	8,986	2,822,355

A total of 37 counties have received shipments under the ATP in 2011. All receiving counties verify the accompanying paperwork and physically inspect the shipments.

**Bordiers Nursery in Ventura County was acquired by Hines Nursery in January 2010, and closed the Ventura County yard in February 2011. Hines Nursery in San Diego County joined the ATP in April 2011.*

Mixed Load Protocol

In March 2011, Nursery C began a pilot program which allowed mixed load shipments of plant material from their ATP yard in Riverside County and their free-from yard in Sacramento County. Under the pilot program, certified shipments could leave the Riverside County ATP yard and move to the Sacramento County yard where additional plant material was added to the loads. These shipments were then sent to their final destination. Any shipments considered a mixed load were stamped as such on the respective invoice. Upon delivery, plants were separated by nursery location to facilitate origin identity.

Implementing this change in shipping practices under a pilot program allowed the Pierce's Disease Control Program (PDCP) and county staff to identify some procedural errors with the documentation of mixed loads. Counties were asked to report any paperwork discrepancies to the program as they occurred. One problem was identified by Monterey County after a residue sample was taken from a shipment from Nursery C. The results of the sample yielded very low residue levels, and upon further investigation it was determined that the load in question was a mixed load, but the paperwork lacked the required stamp.

On July 31, 2011, the pilot program concluded. The PDCP met with the California Agricultural Commissioners and Sealers (CACASA) GWSS Advisory Group to evaluate the program and consider it as an option for the ATP. It was decided that the mixed load protocol, designed for Nursery C, would be accepted and the nursery could continue shipping mixed loads. This opportunity has been extended to all ATP participants, upon submission and approval of a mixed load protocol designed for their respective yards. During 2011, mixed load shipments for Nursery C, totaled 360 comprising 89,941 plants.

Documentation

The Certificate of Quarantine Compliance (CQC), certifying that a treatment application was witnessed by a licensed inspector of the origin county department of agriculture, is issued for each individual delivery of nursery stock. The original document must accompany each lot at each delivery destination. The CQC is valid for five days from the date of issue.

The Blue tag, a shipping permit, must also be issued for each lot of nursery stock delivered to the non-infested areas. It is issued by the shipping nursery and requires the destination receiver to notify the destination county and hold the shipment for inspection.

The CQC and Blue tag are required by each receiving county 24 hours in advance of the shipment leaving the origin nursery. The notification may occur by fax or other agreed upon method: should the counties agree and have the capabilities, the CQC and Blue tag can be scanned and sent by e-mail to the receiving counties. This gives each destination county advance notice of the shipment and allows them to schedule their inspection coverage. Additionally, ATP shipment notifications must be faxed to the PDCP headquarters in Sacramento.

Trapping

Trapping is conducted in ATP nurseries to maintain cleanliness standards. A trap cycle is defined as a trap servicing every two weeks. CDFA and county trap records are forwarded to PDCP at the end of each trap cycle. Originally, ATP nurseries were trapped at four traps per acre. Due to budget constraints, yard trap densities were reduced to two traps per acre in the fall of 2011. This reduction also aligns the ATP trapping density with Program Regulation (GWSS free-from status) nurseries.

The following table summarizes the trapping results for the entire year of 2011:

Nursery	Date ATP	Acreage in Production	Number of Traps*	#of Traps >10
Nursery A	5/15/2008	150	688 **2/1/11	0
Nursery B (Yard 1)	6/6/2008	290	1220 *671	15
Nursery B (Yard 2)	6/6/2008	61 ***Acreage Reduction	469 *128	0
Nursery B (Yard 3)	3/1/2010	25 ****Acreage Increase	109 *56	12
Nursery C (Yard 1)	7/15/2008	126	619 *334	0
Nursery C (Yard 2)	7/28/2008	20	88 **7/13/11	0
Nursery D (Yard 1)	8/15/2008	25	110 *59	0
Nursery D (Yard 2)	8/15/2008	27	122 *65	0
Nursery D (Yard 3)	8/15/2008	1	7 **7/22/11	0
Nursery D (Yard 4)	8/15/2008	6	31 **4/10/11	0
Nursery D (Yard 5)	8/15/2008	10	40 *22	0
Nursery D (Yard 6)	8/15/2008	2	12 *8	0
Nursery D (Yard 7)	8/15/2008	8	34 *19	0
Nursery D (Yard 8)	8/15/2008	9	41 *23	0
Nursery D (Yard 9)	8/15/2008	7	71 *40	0
Nursery D (Yard 10)	8/15/2008	14	59 ** 3/29/11	0
Nursery E (Yard 1)	2/9/2009	11	60 *30	0
Nursery E (Yard 2)	2/9/2009	6	25 *13	0
Nursery E (Yard 3)	2/9/2009	4	24 *12	0
Nursery E (Yard 4)	2/9/2009	8	73 *37	0
Nursery E (Yard 5)	2/9/2009	11	44 *26	0
Nursery E (Yard 6)	2/9/2009	9	36 *20	0

Nursery E (Yard 7)	2/9/2009	6	26 *13	0
Nursery E (Yard 8)	2/9/2009	13	53 *27	1
Nursery E (Yard 9)	2/9/2009	1	10 ** 12/09	0
Nursery E (Yard 10)	2/9/2009	4	19 *10	0
Nursery F (Yard 1)	12/16/2009	7.5	52 *30	0
Nursery F (Yard 2)	12/16/2009	4.5	26 *13	0
Nursery F (Yard 3)	12/16/2009	13	75 *40	0
Nursery F (Yard 4)	12/16/2009	1	8 *4	0
Nursery F (Yard 5)	12/16/2009	7	24 *12	0
Nursery G (Yard 1)	3/25/2009	43	174 *93	0
Nursery G (Yard 2)	3/25/2009	18	67 *36	0
Nursery H	4/4/2011	261	896 *464	0

* Trap density reduction (Includes yard traps, loading dock traps remained the same.)

** Nursery yard closure.

***Nursery acreage reduced.

****Nursery acreage increased.

Hold/Treatments

All nurseries are notified by PDCP or county agricultural staff of traps containing more than 10 suspect GWSS on the day such traps are inspected. A 200-foot radius¹ around each positive trap (>10 GWSS) is placed on hold, pending confirmation of the trapped suspect GWSS by a CDFA or county entomologist. Once confirmation has been received, all areas on hold receive a chemical treatment with a chemical registered for treating GWSS in a nursery setting. All treatment applications for trap areas on hold are supervised by county staff. At times, nurseries will wait two or three trap cycles before treating if citrus harvesting or other activities will lead to re-infestation. Because of citrus harvesting nearby, the nursery may elect to postpone treatment on the hold areas until harvesting activities cease. No plant material is allowed to move from within areas under hold. Once the GWSS pressure is reduced, an insecticide treatment is applied and areas are released from hold after one subsequent trap cycle below the 10 GWSS per trap threshold.

Treatment Monitoring/Improvement

All nursery stock being shipped under this program must be treated with either carbaryl (43.0% a.i.) or fenprothrin (30.0% a.i.). Each treatment must be witnessed by a licensed county inspector throughout the entire process from the mixing/loading to the

¹ In January 2011, the hold/treatment radius was reduced from 300' to 200' after a complete year of data analysis demonstrated there was not a significant difference in pest pressure between the 300' and 200' buffers around >10 GWSS traps. The implementation of this radius reduction has resulted in less pesticide applied at applicable ATP nurseries and less plant material being held from sale. In 2012, the PDCP will conduct the same data analysis for consideration of a reduction of the hold/treatment radius from 200' to 100' around >10 GWSS traps.

spraying of the very last plant. An inspector will then issue the signed CQC with the treatment information, attesting that he/she witnessed the treatment.

Origin counties and nurseries have been working together with CDFA to ensure treatments achieve complete coverage on all plant material destined to non-infested areas. Adjustments have been made to address the spacing of the plant material to ensure thorough coverage. Application methods may vary slightly for each location and combination of plants. The nursery industry has explored the use of treatment wands and pressurized hand guns to produce optimal spray coverage for a myriad of plant material situations. Any new information will be added, by program staff, to the Best Management Practices (BMP) manual found on the PDCP website at:

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

New information is forwarded to the participating nurseries by their respective County Agricultural Commissioner (CAC). Additionally, PDCP staff established an e-mail group to communicate important or immediate changes in the ATP.

Water sensitive paper (wsp) is used to evaluate spray coverage during treatment application. Sheets of wsp are placed strategically within the nursery stock shipment at various heights and at various locations on the plants, such as the outside, middle, and inside of the foliage. At the beginning of the program, wsp was used for each nursery's initial treatment. It is now used by the nurseries as a quality control check. PDCP staff also checks each participating nursery using wsp a minimum of once a month. This is done on an unannounced random basis. For the long term, PDCP is in the process of streamlining this practice by establishing guidelines for staff to ensure verifiable and equitable monitoring of all nurseries.

Water Sensitive Paper (WSP) Quality Control Results June 6, 2010 – December 31, 2010

Number of Inspections	Total Number of WSP Used	Number of Papers Passing Inspection	Number of Papers Failing Inspection
53	157	152	5

During an inspection, if a paper fails an inspection, either a portion or all of the plant material is to be re-treated before the load is certified. During inspections this year the areas failing an inspection were re-treated. A total of five papers failed inspection on five different shipments in 2011. This resulted in the re-treatment of the entire pallet or trailer in the failed area which the plant material was placed for all five shipments.

In conjunction with the increased use of wsp comes the possibility of increased pesticide exposure. Testing to establish a baseline cholinesterase level for staff retrieving the wsp has been completed and monitoring is ongoing for PDCP staff in accordance with requirements for working with Sevin, a carbamate insecticide.

Insect Rearing Sleeves

During training sessions, insect rearing sleeves were offered to any county agriculture department wanting to sleeve egg masses found in ATP shipments. Sleeves were distributed to the following counties: Alameda, Amador, Calaveras, Contra Costa, El Dorado, Imperial, Lake, Mendocino, Monterey, Nevada, Placer, Sacramento, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Shasta, Solano, Sonoma, Stanislaus, Sutter, and Yolo.

Between January 1, 2011 and December 31, 2011, one county sleeved suspect egg masses from ATP shipments. The PDCP will continue to provide sleeves to all interested counties. The results are as follows:

Date Collected	Origin Nursery	Destination County	Host & # of Egg Masses	Treatment	Fate	Date Released
7/29/2011	Nursery F	San Luis Obispo	<i>Ligustrum</i> sp. (1)	Sevin SL	Dead	8/12/2011
8/15/2011	Nursery F	San Luis Obispo	<i>Lagerstroemia</i> sp. (1)	Sevin SL	Dead	8/25/2011

Regulatory Response

One Notice of Rejection (NOR) was issued during this report's time frame for excessive old and fresh GWSS egg masses. This incident did not result in any GWSS emergence.

On January 19, 2011, the PDCP was notified that a shipment of nursery stock from Nursery F, which was certified for a San Luis Obispo County delivery, contained an excessive amount of egg masses and therefore violated nursery stock cleanliness standards. Management at Nursery F opted to return the plants to origin. There were no other violations discovered during this inspection. This shipment was rejected under CCR 6902 for standards of cleanliness and the Nursery Stock Approved Treatment Protocol.

Pesticide Residue Sampling

A few destination counties expressed an interest in conducting random pesticide residue testing to confirm the plants were appropriately treated. Sevin SL (carbaryl) is analyzed by high pressure liquid chromatography (HPLC) and Tame (fenpropathrin) is analyzed by gas chromatography (GC). Counties wishing to conduct residue sampling of ATP plant material can submit their samples to CDFA's Laboratory or to any of the Environmental Laboratory Accreditation Program (ELAP) laboratories found on the California Department of Public Health website at:

<http://www.cdph.ca.gov/CERTLIC/LABS/Pages/ELAP.aspx>.

A standardized sampling protocol is available to any county wishing to submit samples. The cost of analyzing the sample, however, cannot be invoiced against their existing contract.

Chemical Evaluation

Research trials were conducted to evaluate additional insecticides for use with the ATP. The objective of the research trials is to evaluate four additional insecticides for nursery stock treatment against the GWSS. Two of the insecticides, deltamethrin and acetamiprid, were shown to be successful at killing recently-emerged GWSS nymphs in the original trials conducted in 2003-04. However, it was not determined when the mortality occurred. Cyfluthrin was substituted for deltamethrin because it was no longer available to the nursery industry. These trials attempted to establish the timing of nymphal mortality using these chemicals.

Two new chemicals, spirotetramat and spinetoram, were tested for their efficacy against the GWSS. Currently, they are being used in the Asian Citrus Psyllid (ACP) Program and have shown efficacy against a broad spectrum of piercing-sucking insects. Their efficacy against sharpshooter eggs and emerging nymphs is unknown.

Additionally, the trials evaluated:

- The individual and combined effects of insecticide treatments and parasitism.
- The effect of overhead irrigation on insecticide efficacy and parasitism.
- The chemical residue levels of the treated plant material.

In all cases, with all the materials evaluated, there was significant survival and emergence from GWSS eggs. This was the case, even in the presence of treatment insecticides and parasitism. Unfortunately, none of the materials evaluated exhibited the necessary efficacy to be considered as a candidate replacement compound for use in the ATP program. Because none of the materials provided the adequate levels of control, residue data to ensure treatment were not conducted for these compounds.

Additional research trials were conducted to develop a relationship between residual levels and time since treatment for chemicals (carbaryl and fenpropathrin) currently used in the ATP. The objectives of the research trials were two-fold:

- Establish baseline data that can be used to develop the relationship between residual insecticide levels (carbaryl and fenpropathrin) and time since application.
- Establish the relationship between efficacy of treatment for controlling emerging nymphs and time since initial application of material.

This research is useful to develop a relationship between residue levels and time since treatment, so that destination counties, nurseries, and garden centers could be assured that the incoming plant material had been indeed treated in a timely manner with an efficacious treatment.

After the completion of the residue efficacy trials for carbaryl and fenpropathrin, the following conclusions were made:

- Insecticide residues taken at re-entry intervals vary with host plant species and likely condition of the foliage on the plants. The variation can be large.

- The following values are recommended as an initial minimum value of use for determining foliage has been treated.
 - For shrubs: 50 ppm carbaryl, 25 ppm fenpropathrin
 - For trees: 65 ppm carbaryl, 25 ppm fenpropathrin
 - For bedding plants: 50 ppm carbaryl, 20 ppm fenpropathrin
- It is extremely important to realize that many factors can influence residue levels and common sense must play an important factor in determining if plants have been treated. In most cases, adequately treated plants will have larger values than above, but due to a variety of factors (time since treatment, thickness of leaves, adequacy of coverage, quantity of non-treated material in a sample, etc.) it would not be unreasonable to detect somewhat lower concentrations on adequately treated foliage.

County Training

PDCP provides annual nursery inspection and regulatory training to county agriculture departments. The ATP is now part of the annual training presentations. In 2011, 394 staff members from 37 counties received training.

County Workload Issues

Most destination counties have reported minimal changes to their workload since the implementation of the ATP. Counties are still visually inspecting these loads, so the workload differs very little from a typical infested premise nursery shipment. Destination inspection remains optional and PDCP anticipates that as the program evolves over time, workloads at destination will decrease.

Origin counties are saving money with this new program as they are using fewer personnel than with the original infested premise nursery program.

For example, the chart below reflects data for the six-month time periods immediately before and after implementation of ATP for two participating nurseries in Los Angeles County:

	Master Permit Hours	Number of Shipments		ATP Hours	Number of Shipments
	02/15/08 – 08/14/08	02/15/08 – 08/14/08		08/15/08 – 02/14/09	08/15/08 – 02/14/09
Nursery D	5,280 hours	715 shipments		1,218 hours	404 shipments
	7.38 hours/shipment	0.011 hour/plant		3.01 hours/shipment	0.010 hour/plant

	Master Permit Hours 08/23/08 – 02/22/09	Number of Shipments 08/23/08 – 02/22/09		ATP Hours 02/23/09 – 08/22/09	Number of Shipments 02/23/09 – 08/22/09
Nursery E	2,412 hours	271 shipments		736 hours	406 shipments
	8.90 hours/shipment	0.050 hour/plant		1.81 hours/shipment	0.010 hour/plant

The data indicates time expenditure reductions as follows:

Nursery D: 59.2% reduction in per-shipment inspection time

Nursery E: 79.7% reduction in per-shipment inspection time

Changes to Protocol and BMP Manual

The following changes were made to the ATP Protocols during the timeframe of this report:

- The hold and treatment radius were reduced from 300' to 200'. A hold and subsequent treatment is initiated when a trap exceeds the threshold of >10 adults. This radius reduction was monitored by PDCP staff for one year and did not appear to impact GWSS populations within the affected nurseries.
- Plant buy-in procedures and clarification of loading dock thresholds and responses were updated to align the ATP Protocols with the GWSS Nursery Shipping Protocols.
- The reduction of ATP yard trap densities from four to two traps per acre was implemented. Staging area traps remain at four traps per acre.
- The ATP hold period, as a result of a trap exceeding the threshold of >10 adults, was reduced from four to two weeks.

Future Considerations

The PDCP is considering a hold and treatment radius reduction from 200 feet to 100 feet. This issue will be discussed after available data has been reviewed.

Please direct any questions regarding this report to Stacie Oswalt at stacie.oswalt@cdfa.ca.gov or at (916) 900-5024.