

# NPDN News

Volume 8 Issue 3, March 2013

## THE SENTINEL PLANT NETWORK KICKS OFF A SECOND ROUND OF WORKSHOPS IN LAS VEGAS Rachel McCarthy, Department of Plant Pathology and Plant-Microbe Biology, Cornell University and Dan Stern, American Public Gardens Association

On March 27, the Sentinel Plant Network (SPN) kicked off its second series of professional development workshops for public garden professionals in Las Vegas, NV. Over 30 people from 16 APGA gardens, with guests from Nevada's Department of Agriculture and Division of Forestry, participated in the workshop. The two-day training took place at the Botanical Gardens at the Springs Preserve—a historic 180 acres built around the original Las Vegas Springs. The gardens and museum opened in 2007 and feature eight acres of desert botanical collections including the largest collection of Mojave Desert cacti and succulent

plants and a series of walking trails that meander through a wetland habitat.

APGA has been recruiting gardens to participate in the SPN since 2011. At present, there are 134 member gardens in the network from 33 states, DC and three Canadian providences. SPN engages public garden professionals, volunteers and visitors of

...a participant announced that the FY13 Farm Bill spending plan had been released and SPN was included...the announcement was followed by applause and cheers...

their gardens in the detection of high-consequence pests and pathogens. During phase I, content for the workshops mainly targeted frontline horticulture and



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On the pest/pathogen tour at the Springs Preserve, Dr. Shouhua Wang demonstrates virus sampling in the field using an ImmunoStrip.

Farm Bill FY13  
Spending Plan  
Released



## Issue Highlights

- Star-D auditing exercise and GAP audit at Kansas State
- Diagnostic tip: literature references
- Asian longhorned beetle eradicated in NJ
- Zebra chip report from Texas
- National Repository tip: selectable fields report
- *In Regional News*: CBS and ACP federal orders

IPM professionals, however, the phase II workshops feature content geared more toward education and outreach professionals so that they may begin to



© Dan Stern, American Public Gardens Association

One of the livelier portions of the program was a break-out session dedicated to developing activity guides for the Plant Heroes youth education program.

engage volunteers and visitors in this early detection effort.

During the workshop we debuted SPN’s latest outreach and interpretive resources and demonstrated how members can access the existing SPN and NPDN First Detector training materials. The new outreach and interpretive materials are intended to raise awareness of the issues invasive species pose to our plant communities and feature one key pest/pathogen within each region to make the case. Dr. Shouhau

Wang, from the Nevada Department of Agriculture, provided a pest/pathogen tour through the collections to demonstrate scouting techniques that can sharpen one’s observations skills and explained how to collect proper samples to send to NPDN labs for diagnosis.

One highlight of the workshop was when we learned that the SPN will be funded for Phase III after a participant announced that the FY13 Farm Bill spending plan had been released and SPN was included in that spending plan. The announcement was followed by applause and cheers from the entire group.

The next workshop is scheduled for April 25–26 at the Birmingham Botanical Gardens in Birmingham, AL. For more information please contact Rachel McCarthy ([rachel.mccarthy@cornell.edu](mailto:rachel.mccarthy@cornell.edu)). 

### Upcoming SPN workshops

Southeast Region: April 25–26  
Birmingham Botanical Gardens, Birmingham, AL

Northeast Region: June 24–25  
Frelinghuysen Arboretum in Morristown, NJ

Central Region: July 9–10  
Lauritzen Gardens in Omaha, NE

Northwest Region: July 24–25  
Bloedel Reserve in Bainbridge, WA

## NPDN STAR-D Auditing Exercise and GAP Audit at Kansas State University and the Plant Diagnostic Laboratory

*Karen Snover-Clift and Dawn Dailey O’Brien, Department of Plant Pathology and Plant-Microbe Biology, Cornell University*

An NPDN STAR-D auditing exercise was conducted at the Kansas State University Plant Disease Diagnostic Laboratory (KSU PDDL) in Manhattan, Kansas on March 19–21, 2013 and was hosted by Dr. Judy O’Mara. This was the final of four scheduled STAR-D auditing exercises that are being made possible through a Farm Bill grant that includes further development of the STAR-D program. The focus of this year’s grant is to further develop the auditing skills of the nine members of the NPDN STAR-D auditor’s pool through

conducting gap audits at locations that have begun developing their STAR-D requirements and standards protocols; Cornell University, Nevada Department of Agriculture, University of Florida and this audit at Kansas State University. To prepare for real world audits, we are requiring that our auditors pass the ISO-17025 Auditor Training Course (our current group did this in September of 2011) and participate in at least two of the four (so far) auditing exercises.

Kathy Burch, Senior Quality Manager of USDA-APHIS-PPQ-CPHST, served as the lead auditor for this exercise. The remaining auditors were divided into groups and although all auditors were present for all aspects of the audit, each group focused on sections of the KSU PDDL STAR-D system and were responsible for writing up their areas in the auditor’s checklist

and associated documents that, in real world audits, would be submitted to the NPDN STAR-D Board for their use in determining the laboratory's accreditation status. Group A focused on organizational and quality management, document control, customer feedback, non-conformances, corrective and preventive actions, records, internal audits and management reviews and was comprised of Dawn Dailey O'Brien (Cornell University), Jason French (New Mexico State University), and Geoff Dennis (USDA-APHIS-PPQ-CPHST). Group B focused on technical requirements, accommodations & environmental conditions, test methods & method validation, equipment, reference materials, and test result quality control and was comprised of Kathy Burch and Shouhua Wang (Nevada Department of Agriculture). Group C focused on review of requests and agreements, subcontracting of tests, purchasing, personnel, sample & sample handling, and test result reporting and was comprised of auditors Karen Snover-Clift (Cornell University), Pat Shiel (USDA-APHIS-PPQ-CPHST), Sharon Dobesh (Kansas State University) and Craig Webb (USDA-APHIS-PPQ, Western Region Laboratory).

The training session occurred over a three day period. On the first day of the auditing exercise, the group reviewed the KSU PDDL STAR-D laboratory accreditation documents to develop the auditor's checklist and included an opening meeting where the lead auditor, Kathy Burch, thanked the laboratory members and administrators for allowing us to conduct this session at their site and informed them of how the auditors would proceed with the process. The second day was the official day of the audit. The auditors used the checklist they developed to collect evidence of compliance and to document good laboratory practices. The third day began with the entire group developing lists of good procedures observed, suggestions for continued development of their STAR-D program, and nonconformance observations. The participants then divided back into their groups to prepare their final audit reports and to fill out their nonconformance forms. In a real audit, auditors would create all these documents and the lead auditor would submit them to the National Quality Manager who would format, edit, send for review, and produce a package for STAR-D board members to review and decide on accreditation status. At the end of the day, Kathy conducted a closing meeting with the laboratory members and administrators.

Throughout our four exercise programs, we understood that the main purpose of the exercises was to develop

the skills of the auditor pool members and the members indicated this was accomplished. However, we also found that the staff from each laboratory felt they received a very comprehensive review and input on the development of their STAR-D laboratory



© Karen Snover-Clift, Cornell University



© Dawn Dailey O'Brien, Cornell Univ.

Kathy Burch asks Fanny Iriate, GPDN regional diagnostician, questions about the KSU lab's work instructions while Dawn and Shouhua look on (top) and Judy O'Mara explains some of her lab's QMS documents (bottom).

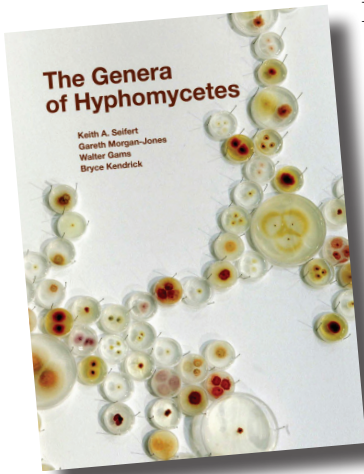
accreditation system and that this feedback from the auditors was extremely helpful in their mission to implement STAR-D into their laboratory practices. 🌿

## QMS WORKSHOP UPDATE

Many of you may remember that we were planning a second Quality Management System (QMS) workshop for the April-June 2013 timeframe. You may also remember the survey for information that was sent to the NPDN membership several months ago. We had plans for a repeat of the first QMS workshop that was held in Ames, Iowa in April of 2011. Unfortunately, we were unable to secure funding to cover the travel expenses of the 25+ participants. We have submitted funding requests and are now waiting to hear if we can plan for this meeting for this fall or the spring of 2014. Keep your fingers crossed!

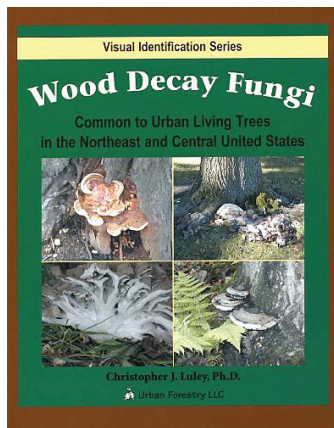
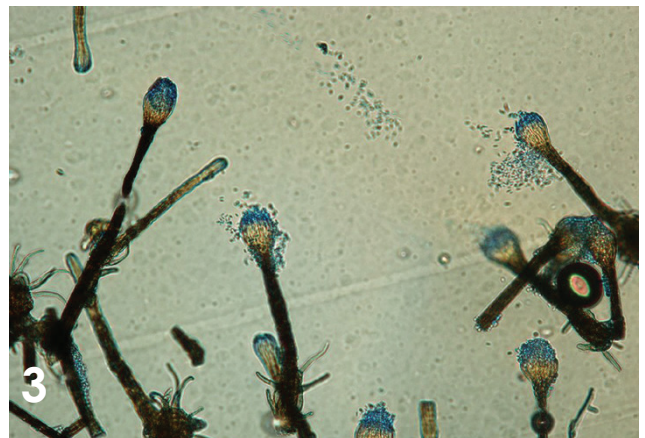
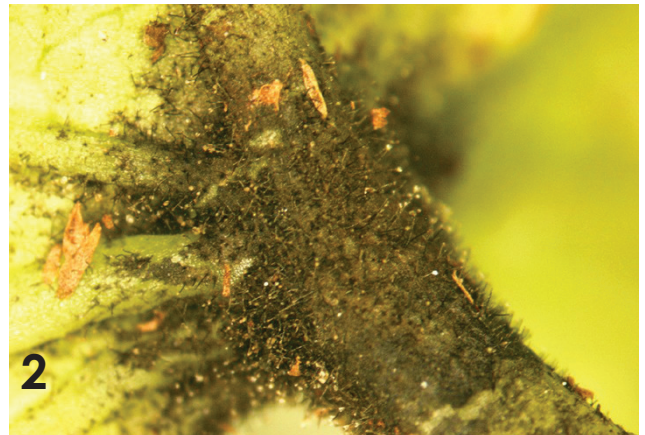
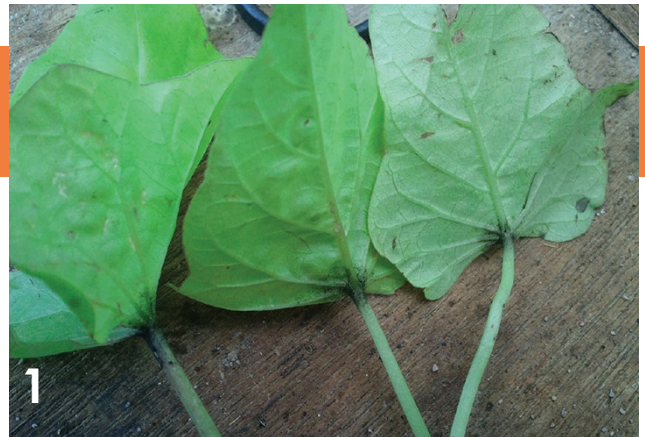
## TIP OF THE MONTH

### Useful Literature References



For identification of fungi that form synnemata, including some of the sooty mold fungi, try Seifert & Okada's key to synnematous hyphomycete genera in the 2011 book "The Genera of Hyphomycetes". A black fungus observed growing at the bases of leaf blades and tops of petioles of greenhouse-grown ornamental sweetpotato leaves submitted to a diagnostic lab (figures 1, 2, 3) was identified using this reference and also matched the

generic description of a sooty mold identified as genus *Leptoxyphium* on pp.777-782 of Hughes' 1976 paper on sooty molds (*Mycologia* 68 (4):693-820).



A good visual resource for identification of wood rotters is "Wood Decay Fungi Common to Urban Living Trees in the Northeast and Central United States" by Christopher J. Luley ISBN 0-9767129-1-1. 🌿

## ASIAN LONGHORNED BEETLE ERADICATED IN NEW JERSEY!

On March 14, APHIS declared eradication of the Asian longhorned beetle (ALB) in Middlesex and Union Counties, NJ, thereby releasing them from quarantine. Since 2004, APHIS has worked with its State partners to complete extensive survey, control and regulatory activities in these areas to eradicate ALB from New Jersey.

APHIS determined that these counties can be removed from quarantine after program efforts resulted in three years of negative surveys of host plants within the regulated areas. There are no remaining ALB regulated areas in New Jersey. Read the [official announcement here](#).



## Zebra Chip: New Report from Texas

*Drs. Arash Rashed and Charlie Rush, Texas A&M AgriLife Research and Extension Center, Department of Agricultural Sciences, West Texas A&M University*

Zebra chip is an emerging disease in potatoes, associated with a bacterial pathogen called '*Candidatus Liberibacter solanacearum*' (Lso). Zebra chip reduces both yield and quality in all market classes of potato, and has been challenging the US potato industry since it was first reported in the lower Rio Grande Valley (TX) in 2000. Subsequently, it was reported from other Great Plains potato growing states, most recently in Idaho, Oregon and Washington, in the Pacific Northwest (PNW).



A healthy potato (right) and two zebra chip-affected tubers.

© Dr. Charlie Rush, Texas A&M University

Lso is transmitted by the tomato/potato psyllid, *Bactericera cockerelli* (Hemiptera: Trioizidae). Since the 1930s, it has been widely reported that potato psyllids migrate every year from warmer over-wintering/breeding sites in northern Mexico to the Canadian border. However, recent reports of their cold tolerance and the presence of local over-wintering populations in the PNW, drew attention to investigating the possibility that psyllid populations may survive in localities with harsh winters

Supported by the Texas Department of Agriculture, a study was initiated to closely monitor changes in psyllid numbers in wild vegetation and in relation to potato emergence time, in several locations across Texas. First year findings revealed that psyllid appearance was not associated with the presence of the potato crop. Psyllids were collected on yellow sticky traps which were placed in natural vegetation adjacent to potato fields weeks before potato emergence. In

most locations, however, psyllid numbers declined in natural vegetation as cultivated potatoes emerged. The psyllids disappeared after potato harvest. Interestingly, in some sampling locations in northwest Texas, psyllids reappeared after a few weeks and



An adult potato psyllid, *Bactericera cockerelli*.

© Dr. Don Henne, Texas A&M AgriLife Research

were constantly present during fall and snowy winter months, even when cultivated winter wheat was the only green vegetation in the area.

We also have found a higher percentage of psyllids that carry the pathogen compared to 2012. While our last year estimation of Lso in potato psyllid populations never exceeded 2.5%, this year we had occasions when 10-45% of the examined psyllids tested positive for the pathogen. However, with the limited data available at present, predicting disease prevalence based on psyllid populations is not possible. Luckily the observed high percentages of Lso-positive psyllids in the last couple of months did not last, and recently, in most locations, no positive psyllids were observed.

For most potato growing regions, planting time is just around the corner. Now is the time to place yellow sticky traps in natural vegetation next to your fields. The yellow sticky traps are good at catching insects that are on the move. The numbers collected by sticky traps may not be a good representation of the actual psyllid numbers that are already established. In such cases, a combination of sweep net/D-vac vacuum sampling and visual inspection would help improve estimations of psyllid eggs, nymphs and adult numbers. Regardless of the relatively recent discovery of potato psyllid's association with Lso, potato psyllids have always been a pest of potato plants as they are known to induce another defect in the crop known as 'psyllid yellows' by simply feeding on the crop. For this reason, monitoring and managing psyllid numbers is important to commercial potato farmers, whether or not the psyllids are carrying Lso. 🌱

## Ask the Expert: Kathy Burch, USDA-APHIS-PPQ-CPHST

*Karen Snover-Clift and Dawn Dailey O'Brien,  
Department of Plant Pathology  
and Plant-Microbe Biology,  
Cornell University*



(Q:) Developing the NPDN STAR-D (System for True, Accurate and Reliable Diagnostics) laboratory accreditation, quality management system (QMS) for plant laboratories has been a challenging task. How do you think the STAR-D QMS compares to other systems and to the very strict, very expensive ISO-17025 system?

(A:) I think that the NPDN has done a fabulous job developing the STAR-D requirements based on the guiding principles of a quality management system, namely:

- Customer focus
- Leadership
- Involvement of people
- Process approach
- Continual improvement
- Factual approach to decision making

The NPDN has benchmarked other quality management system guidelines, including the ISO 17025:2005 as well as the American Association of Veterinary Laboratory Diagnosticians (AAVLD) Requirements document as they prepared the STAR-D requirements. The STAR-D requirements are able to uniquely address the needs of the NPDN while providing assurance that laboratories accredited to these requirements are operating in a systematic manner with a goal of customer satisfaction and continual improvement.

(Q:) What would you say to our members that look at the NPDN Requirements and Standards and the document templates available on the NPDN Laboratory Accreditation webpage and get overwhelmed with the idea of where to get started?

(A:) To those who are overwhelmed with the thought of implementing a quality management system, I would give the same advice that my mentor first gave me when I was tasked with this same undertaking, and that is “Eat the elephant one bite at a time”. I am sure that you think this to be an odd piece of advice, but if you think about it, it makes perfect sense. Developing and implementing a quality management system is

Meg Williamson, diagnostician in the Clemson University Plant Problem Clinic, recently traveled to Phnom Penh, Cambodia to attend the Annual Regional Workshop on Evaluation and Planning as a part of the IPM Collaborative Research Support Program. A group of faculty and emeritus faculty from Clemson have been doing IPM research and demonstration projects in South East Asia for a number of years. They’ve found that while expertise in entomology is good in the region, plant pathology expertise is somewhat lacking. Clemson Fruit Pathologist, Dr. Guido Schnabel, was asked to join the group and last year, he invited Meg to participate. After the regional update, Guido and Meg held a short Diagnostic Workshop, with assistance from other university faculty from various universities in South East Asia. Lectures on basic plant pathology topics were presented during the morning of the first day and then participants visited a local farm and collected samples. These were examined in the field and then examined in a lab setting the following morning. Around fifty agricultural advisors from the General Directorate of Agriculture (like our USDA) participated in the training. A four day Diagnostic Training is now scheduled for April 23-26, 2013 in Phnom Penh. There will be a Basic Training with lectures, followed by an Advanced Training which is geared towards those who may wish to set up or work in a diagnostic lab.



a huge, daunting task (the elephant). If you look at it in terms of “how will I ever complete this”, you may become so overwhelmed that it may become difficult to even start the process. However, if you break the overall-task down into manageable (bite-size) sub-tasks, you will find that you can step-by-step complete the stages necessary to implement a complete quality management system.

Remember that the templates available on the NPDN website are the result of years of hard work by many dedicated diagnosticians. Use the resources provided, ask for help when needed, talk to those who are currently in the process of developing their own systems and you will soon find that you can indeed “Eat the elephant one bite at a time”.

(Q:) What would you say to our members that are concerned with the complexity of the system and getting everything in place before their first audit?

(A:) First, I want to remind everyone that the purpose of auditing (internal or external) is to find evidence of conformance to a process; the auditors will be there to document how your lab is conforming to your quality management system with the goal of continual improvement. With that being said, I think that it is human nature to want to have everything perfect

before you invite someone else to come and review your work (accreditation audit). The problem with this approach is that nothing is ever “perfect” and if we try to wait until our documented systems are perfect before we allow ourselves to be audited, then the accreditation audit may never actually happen. My advice would be, to just get started!! Get things written down, perform your own internal audits and use those audit results to improve your processes. There is nothing wrong with finding non-conformances during an audit; on the contrary, that is exactly what needs to happen so that we know where improvements to our processes are needed. 🍃

### About Kathy

Kathy Burch is the USDA-APHIS-PPQ-CPHST Senior Quality Manager. She received her MSQA (Master of Science in Quality Assurance degree) from Southern Polytechnic State University and has 20+ years of quality management system experience. Kathy is a vital resource for the NPDN STAR-D staff and working group members. She has provided guidance during the development and design of the NPDN STAR-D program and has been an essential participant and leader in the training exercises for the first group of NPDN auditors.

## IT NEWS



### National Repository CERIS

### Selectable Fields Report

Mike Hill and Eileen Luke, CERIS,  
Purdue University

In last month’s newsletter we described how to use the Summary Data report. In this issue we will describe the features of the recently updated Selectable Fields report. The selectable fields report provides you with the flexibility to create a report that contains any combination of fields that you desire. Figure 1 shows an example of the input form for the selectable fields report.

**NPDN Selectable Fields Report**

Phase 1 Fields: [\[+\] Check All](#) [\[-\] Clear All](#)

<input type="checkbox"/> Confidence	<input type="checkbox"/> Enter User Id	<input checked="" type="checkbox"/> Lab Method	<input checked="" type="checkbox"/> Pest Scientific Name	<input type="checkbox"/> User Id
<input checked="" type="checkbox"/> County	<input type="checkbox"/> Fps Code	<input type="checkbox"/> Observation Date	<input type="checkbox"/> Process Date	<input type="checkbox"/> Zip Code
<input type="checkbox"/> Diagnosis Number	<input type="checkbox"/> Host Code	<input type="checkbox"/> Pest Classification	<input type="checkbox"/> Sample Date	
<input type="checkbox"/> Diagnostic Lab	<input checked="" type="checkbox"/> Host Common Name	<input type="checkbox"/> Pest Code	<input type="checkbox"/> Sample Id	
<input type="checkbox"/> Enter Date	<input checked="" type="checkbox"/> Host Scientific Name	<input checked="" type="checkbox"/> Pest Common Name	<input type="checkbox"/> State	

Phase 2 Fields: [\[+\] Check All](#) [\[-\] Clear All](#)

<input type="checkbox"/> Aspect	<input type="checkbox"/> Elevation	<input type="checkbox"/> Moisture	<input type="checkbox"/> Nematode Life Stage	<input type="checkbox"/> Situation
<input type="checkbox"/> Diagnostic Incidence	<input type="checkbox"/> Exposure	<input type="checkbox"/> Museum	<input type="checkbox"/> Pipe Site Id	<input type="checkbox"/> Submission Purpose
<input type="checkbox"/> Distribution	<input type="checkbox"/> First Observed Date	<input type="checkbox"/> Nematode Density	<input type="checkbox"/> Program	<input type="checkbox"/> Terrain

Search Criteria

Sample Dates:  to

Enter Dates:  to

Pest:  Species  Sub-Species

Host:  Species  Sub-Species

State:

[\[+\] Show Advanced Criteria](#)

Figure 1: Selectable fields search criteria form

There are many features available on the form which are broken down into three categories consisting of:

1. Phase 1 Fields
2. Phase 2 Fields
3. Search Criteria




The Phase 1 Fields section provides a listing of all phase 1 fields that are available within reports. The fields that are selected are indicated by a checkmark and are highlighted in green. There is a **[+] Check All** and a **[-] Clear All** option that will either check all phase 1 fields or clear all phase 1 fields when clicked. The Phase 2 Fields section is very similar to the Phase 1 Fields section except that it shows all phase 2 fields that can be included in the report.

After determining which fields you want included on the report you can then specify search criteria to limit the number of records that are included in the results. Please note there is also a **[+] Show Advanced Criteria** option to select additional fields to further limit the number of records included in the results.

After the fields and search criteria have been selected, click the **Generate Report** button to display the report results. Figure 2 shows an example of the results, using

of the report the user is presented with summary information that describes the search criteria used along with a summary of how many records were returned and a description of how the data is sorted. The sort order can be changed by clicking on any of the table headings. Clicking the same table heading again will reverse the sort order and show the results in descending order.

In the top right-hand corner of the results screen there are options for outputting the results in one of three formats:

-  Outputs data in excel format
-  Outputs data in text format
-  Outputs data in printer-friendly format

In the middle is the html table containing the results. To the left are the page numbers 1–9. Pages can be changed by clicking on any of the numbers. To the far right is a selection box which allows you to change the number of results per page. The results can be scrolled using either the top or bottom scrollbar.

If you need to return to the input form you can click on the back button in your browser or click on Reports →


Figure 2: Example of search results based on completely fictional data

fictional data, based on the search criteria specified in Figure 1.

Now we will examine the results and describe the information being provided. In the top left corner

Selectable Fields in the menu bar. Don't worry either way your previous search results will be available. In fact the search results will be available until you have logged out. However, if you want to reset the search results to their default values simply click the **Reset** button shown in Figure 1.

We hope this has helped demonstrate the functionality that is available within the Selectable Fields report. Just as a reminder the National Repository now uses the NPDN Portal ([www.npdn.org](http://www.npdn.org)) login credentials for authentication. If you have any questions about your

account or how to use the Selectable Fields report please contact Mike Hill ([mikehill@purdue.edu](mailto:mikehill@purdue.edu)) at (765) 494-9854 or Eileen Luke ([lukee@purdue.edu](mailto:lukee@purdue.edu)) at (765) 494-6613. 



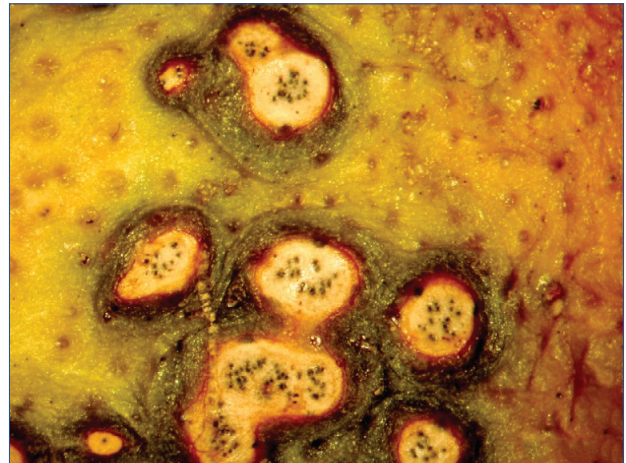
## APHIS Expands Citrus Black Spot Regulated Area in Florida

On March 22, APHIS announced the expansion of the regulated area in Florida for *Guignardia citricarpa*, the causal agent of citrus black spot (CBS). Due to additional detections of CBS during ongoing surveys conducted by APHIS and the Florida Department of Agriculture and Consumer Services, Division of Plant Industry (DPI), the regulated area will expand by nine sections in Collier County, eight sections in Hendry County and one section in Polk County.

Regulated articles from the expanded regulated area are subject to all interstate movement conditions outlined in a Federal Order that was previously issued on March 16, 2012. The requirements of the Federal Order are parallel to DPI's State-interior quarantine. Pursuant to guidelines that were established via the March 16, 2012 CBS Federal Order, APHIS will update its website (listed here) with the date and description of the changes to the CBS regulated areas. In addition, APHIS will publish a notice in the *Federal Register*.

The Federal Order, APHIS-Approved Packinghouse Procedures for *Guignardia citricarpa*, and list of CBS regulated areas can be found on the CBS website at: [http://www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/citrus/black\\_spot.shtml](http://www.aphis.usda.gov/plant_health/plant_pest_info/citrus/black_spot.shtml).

Click to read the [full announcement](#) including additional contact information. 🍃



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Hard, recessed spots with brown to black margins and gray necrotic tissue in the center. Pycnidia could be present in the spots.



Western Plant Diagnostic Network

## Citrus Psyllid Regulated Area Expanded in Arizona

On March 27, APHIS expanded the Asian citrus psyllid (ACP) regulated area to include portions of La Paz and Mohave counties in Arizona. APHIS will publish a notice of this regulatory change in the Federal Register and will publish a description of the revised ACP regulated area at: [www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/citrus\\_greening/downloads/pdf\\_files/national-quarantine-bound.pdf](http://www.aphis.usda.gov/plant_health/plant_pest_info/citrus_greening/downloads/pdf_files/national-quarantine-bound.pdf)

On February 18, the Arizona Department of Agriculture (ADA), Plant Services Division issued an administrative order to update the State's interior quarantine for ACP. APHIS is working cooperatively with ADA to survey for ACP and to prevent further spread of the pest.

Read the [full announcement](#) here. 🍃



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Asian citrus psyllid in profile on leaf.

## UPCOMING EVENTS

### National Events

August 4–8, 2013  
National Plant Board 2013 Annual Meeting  
Louisville, KY

August 10–14, 2013  
2013 APS-MSA Joint Meeting  
Austin, TX

November 10–13, 2013  
Entomology 2013  
Austin, TX

### Regional Events

June 24–27, 2013  
4<sup>th</sup> Int'l. Symposium on Tomato Diseases  
& 28<sup>th</sup> US Annual Tomato Disease Workshop  
Orlando, FL

## PHOTO OF THE MONTH

Symptoms of  
peanut mottle virus  
*Potyvirus PeMoV*  
on clover



Clemson University - USDA  
Cooperative Extension Slide Series,  
Bugwood.org, 1436038

[www.bugwood.org](http://www.bugwood.org)

## CONTRIBUTE

### Share Tips and News with Your Colleagues

Recently write an article for a trade journal? Do you have a tip, announcement, regional news or network update you would like to include in the *NPDN News*? Email Rachel McCarthy at [rachel.mccarthy@cornell.edu](mailto:rachel.mccarthy@cornell.edu)



Have a tip you would like to share with your fellow diagnosticians? Or a technique you would like to learn more about?

Email Gail Ruhl at [ruhlg@purdue.edu](mailto:ruhlg@purdue.edu)

Rachel McCarthy, Editor  
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