

# The NPDN First Detector Training Program: Online training resources

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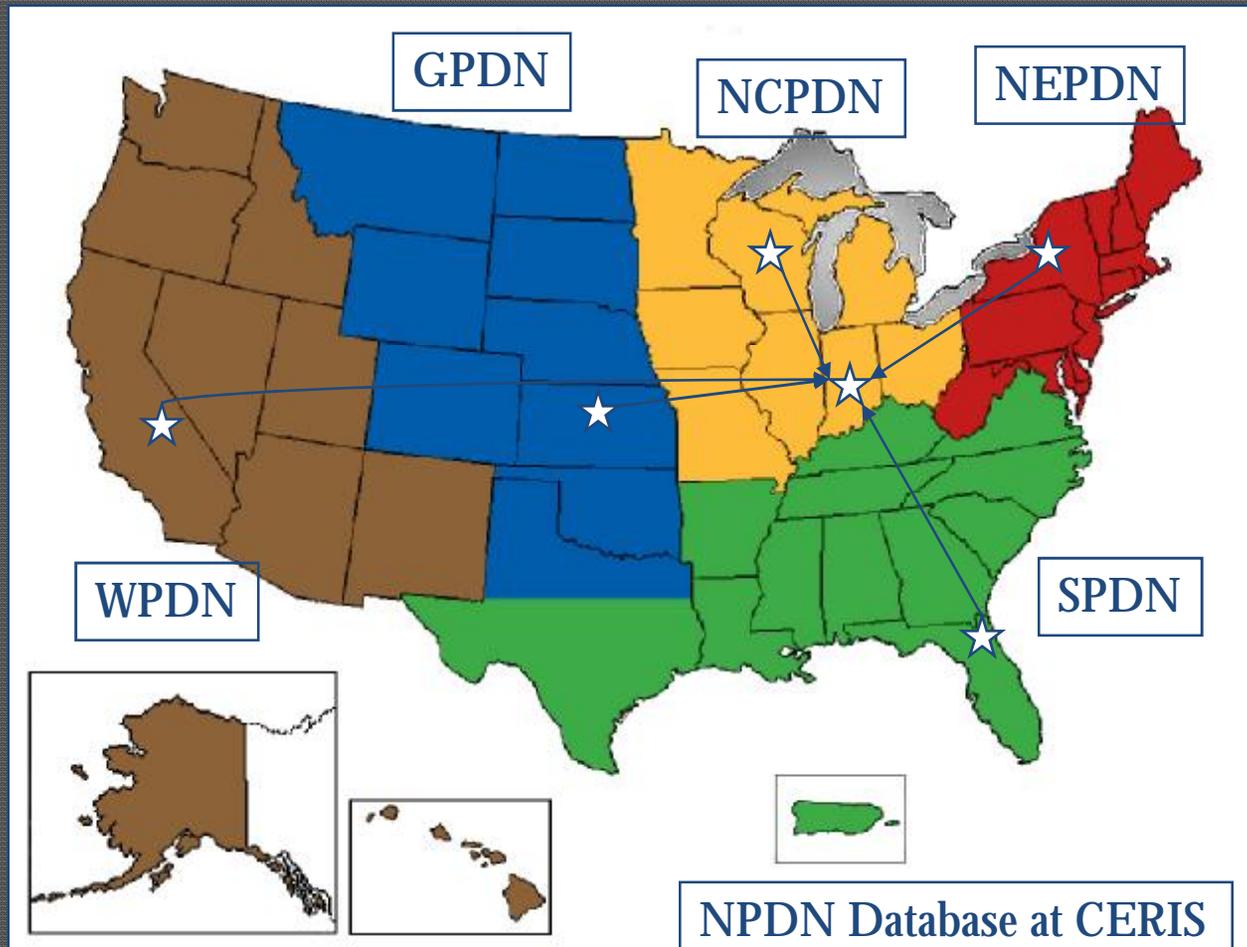
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## 5 Regional Centers: Land Grant University Partners in Every State





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**Mission: Accurate and Rapid Pest Diagnosis**





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## **Mission: First Detector Education**



**2007 First Detector Training: Miami, Florida**  
**Training Coordinators: Mary Lamberts & Adrian Hunsberger**



HTTP://WWW.NPDN.ORG/

News



The screenshot shows the NPDN website homepage with the following content:

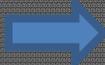
- Header:** National Plant Diagnostic Network logo and navigation links.
- Left Sidebar:**
  - Send us your feedback
  - NPDN Web Ring (GPN, NCPN, NEPN, SPPN, WPPN)
  - NPDN Portal
  - Home
  - Employment Opportunities
  - Exercise Resources
  - First Detector Training & Information
  - Meeting Information
  - National Repository - Purdue University
  - Newsletter
  - Login Panel (FPDS Login, NPDN Login)
  - Image Search
  - User Statement
- Main Content Area:**
  - Emerald Ash Borer Identified in New York** - Add New Announcement
  - 2nd National Meeting of the NPDN** - Add New Announcement
    - Save the date! December 6-10, 2009 Miami, Florida
    - Mark your calendar for the second national meeting of the National Plant Diagnostic Network. Interact with your colleagues from other states, regions, disciplines, or agencies. Click here for more information.
    - Abstract submission now open. Click here for details.
  - First Detector Training** - Add New Announcement
    - Training
    - Image of a person working with plants
    - First Detector Training promotes awareness and early detection of exotic pests in the field. NPDN recently released a free online professional development program that teaches how to monitor and respond to high-risk insects, weeds, and plant pathogens in crops including food, horticultural, and ornamental growing systems. Go to First Detector Training for more information.
  - NPDN** - Add New Announcement
    - This webpage was created to inform the general public of the existence of the National Plant Diagnostic Network (NPDN) and to facilitate NPDN committee function, activities, and organization.
    - Information available to the general public resides on this home page. Additionally, each of the 5 regions has their own regional website that may contain regionally specific information. Regional websites can be accessed by selecting the regional acronym from the "NPDN web ring" box located on the left-hand side of the screen.
    - Questions about this program from the public should be directed to the following contacts:
      - Ray Hammerschmidt, Director, NCPDN, Michigan State University
      - Kelly Carlisle, National Program Leader, CSREES, USDA
      - Carme Hammon, Secretary NPDN, University of Florida
    - For more information about accessibility of this web site click here.
  - Diagnostic Laboratories** - Add New Announcement
    - Diagnostic Laboratories by State
    - For multiple laboratory listings by state, please refer to each regional web site.
    - Grid of regional links:
 

GPN-Great Plains	NCPDN-North Central	NEPN-Northeast	SPPN-Southern	WPPN-Western
Alabama (SPPN)			Maryland (NEPN)	Oregon (NPDN)
Alaska (WPPN)			Massachusetts (NEPN)	Pennsylvania (NEPN)
Arizona (WPPN)				Puerto Rico (SPPN)
- Right Sidebar:**
  - Upcoming Events** - Add New Event
    - APN Annual Meeting Portland, Oregon July 2-5, 2009
    - 6th IT/Plant Protection Meeting Purdue University, West Lafayette, IN October 14-15, 2009
    - APN Diagnostician Basic Techniques Workshop The Pennsylvania State University, State College, PA May 18-20, 2010
  - NPDN Five Year Review Documentation** - Add New Document
    - Table of Contents for Five Year Review Document ( pdf, 48 KB)
    - CSREES NPDN Five Year Review ( pdf, 9 MB)
    - Summary of Recommendations from Review Team ( pdf, 71 KB)
  - Collaborators** - Add New Collaborator
    - Homeland Security
    - USDA-ARS Cereal Disease Laboratory
    - National Plant Board
    - CSREES logo

First Detector Page



Member Newsletter



Events



Outcomes



State Diagnostic Lab Links



# First Detector Newsletter




**SPDN**  
Southern Plant Diagnostic Network

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**NPDN Regions**  
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NEPDN  
NCPDN  
SPDN  
WPDN

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Florida Plant Diagnostic Network  
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PDIS

**In The News**

- Interested in more NPDN First Detector and general interest news? Start following the new NPDN twitter site 7-20-09 [More...](#)
- Cactus moth, *Cactoblastis cactorum*, male genitalia slide-mounting video available 7-20-09 [More...](#)
- NPDN National Meeting Abstract Submission Open, 7-15-09 [More...](#)
- Puerto Rico Scale Insect Workshop photos posted, 7-15-09 [More...](#)
- New thrips, *Caliothrips* sp., damaging thrips in south Texas, 7-8-09 [More...](#)
- Cactus moth, *Cactoblastis cactorum*, confirmed in Louisiana, 7-2-09 [More...](#)
- Adult and larval dermestid beetle training tutorial by Dr. Charles Brodel, USDA-APHIS-PPQ. Posted 7-1-09 [More...](#)
- Confirmation of Citrus Greening in Chatham County, Georgia. 6-9-09. [More...](#)

**About SPDN**

The mission of the network is to enhance national agricultural security by quickly detecting introduced pests and pathogens. This is achieved through a functional nationwide network of public agricultural institutions with a cohesive, distributed system to quickly detect high consequence, biological pests and pathogens into our agricultural and natural ecosystems, by providing means for quick identifications and establishing protocols for immediate reporting to appropriate responders and decision makers.

Our goal is to (i) support a secure regional network for the detection and diagnosis of plant health problems, (ii) extend and

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The following institutions make up the SPDN:

- University of Florida (regional center and hub lab)
- University of Arkansas, AR
- Auburn University, AL
- Clemson University, SC
- University of Georgia, GA
- University of Kentucky, KY
- Louisiana State University, LA
- Mississippi State University, MS
- North Carolina State University, NC
- University of Puerto Rico, PR
- University of Tennessee, TN
- Texas A&M University, TX
- University of the Virgin Islands, USVI
- Virginia Polytechnical and State University, VA

First Detectors: Submit your Successes to the Newsletter!

## Regional and National Pest Alerts

### Regional Pest Alert

#### Cycad Aulacaspis Scale

*Aulacaspis yasuniata* Takagi

**Origin and Distribution of Cycad Aulacaspis Scale**

The cycad aulacaspis scale (CAS), native to Thailand, was first reported in Miami, Florida in 1986. Despite extensive regulatory efforts, CAS has subsequently spread to 43 of 67 counties and is continuing to establish within Florida. CAS was also reported from Hawaii in 1988. Invasions of CAS in the United States occurred in Texas in 2002 and 2004 and in Georgia in 2004. Unpublished reports also indicate that CAS has subsequently established in Texas (Brazos Verde Valley). Other known distributions of CAS include China, Singapore, Hong Kong, Cayman Islands, Puerto Rico, and the Virgin Islands, and the U.S. Virgin Islands. In 2004, CAS was detected in the Cayman Islands and the identity of CAS was confirmed in 2005. The introduction of this scale into Guam is not only impacting the ornamental landscape trade but also is threatening native cycad species.

**Host Plants**

151 plant species are reported to be hosts of CAS in the Hawaiian Islands. In Florida, CAS is reported to be established on 15 plant species. In the United States, CAS is reported to be established on 15 plant species. In the United States, CAS is reported to be established on 15 plant species.

**Description of CAS**

Small, white, oval-shaped, scale-like insects that are difficult to see with the naked eye. They are found on the underside of leaves and stems. The female body is oval-shaped and measures 1.5-2.0 mm in length and may be pear-shaped (ovoid) to triangular.

**Life Cycle**

The life cycle of CAS is similar to that of other scale insects. The life cycle of CAS is similar to that of other scale insects. The life cycle of CAS is similar to that of other scale insects.

### National Pest Alert

#### Scirtothrips dorsalis Hood

chilli thrips, castor thrips, assam thrips, yellow tea thrips, strawberry thrips

**Origin and Distribution**

Scirtothrips dorsalis was first reported in Florida in 2007. It is a pest of many ornamental plants and is spreading rapidly. It is a pest of many ornamental plants and is spreading rapidly.

**Host Plants**

Scirtothrips dorsalis is a pest of many ornamental plants and is spreading rapidly. It is a pest of many ornamental plants and is spreading rapidly.

**Description of Scirtothrips dorsalis**

Field identification of S. dorsalis is extremely difficult and often times impossible to differentiate from other thrips. The body is dark brown with a pale head and legs. The body is dark brown with a pale head and legs.

**Life Cycle**

The life cycle of S. dorsalis is similar to that of other thrips. The life cycle of S. dorsalis is similar to that of other thrips.

Go to: <http://www.ncipmc.org/alerts/index.cfm> for listing of pest alerts.  
 Color Copies of Many Pest Alerts Available Upon Request.

## Regional and National Pest Alerts

### National Pest Alert

#### Tospoviruses (Family *Bunyaviridae*, Genus *Tospovirus*)

Viruses in the genus *Tospovirus* cause significant worldwide crop losses. The genus name is derived from the name of its first member, tomato spotted wilt virus (TSWV), first observed in Australia in 1915; the spotted wilt disease of tomato was later shown to be of viral origin. The causal agent was designated TSWV, and considered to be the sole member of the genus spotted wilt group of plant viruses until the identification and characterization of several similar viruses, including impatiens necrotic spot virus (INSV) in the early 1980s. More than a dozen tospoviruses have since been identified and characterized. Three tospoviruses, TSWV, INSV and its yellow spot form (YSWV), are known to occur in the United States.

**Transmission and Biology**

Tospoviruses are transmitted from plant to plant in a very specific manner by ten species of thrips, *Frankliniella* spp. (Western flower thrips) is a major vector of tospoviruses worldwide including those currently present in the United States (TSWV, INSV and YSWV), although under certain conditions *F. fusca* (tabacco thrips) and *F. schultzei* (onion thrips) may have a more significant role as a vector than *F. occidentalis*. These and other thrips species may be seasonal biotransmitters as vectors on a regional basis within the United States or in other parts of the world. In the case of TSWV, thrips can only transmit the virus if it is acquired during their larval stages although both larval and adult thrips are able to transmit the virus. Seed transmission is not known to occur.

**Host Range**

The host range of tospoviruses varies greatly with the virus species. TSWV has one of the widest host ranges of any plant virus, infecting more than 400 plant species, both dicots and monocots, in more than 80 plant families. The Solanaceae and Asteraceae families contain the largest number of TSWV susceptible plant species. Major crops susceptible to TSWV include tomato, pepper, lettuce, potato, maize, peanut, tobacco and citrus thistles. TSWV also infects 15 thrips species. Its closest relative, INSV, has a relatively restricted host range and is currently found only in monocots such as wheat, clove and rice. INSV has a more intermediate host range, commonly infecting annual and perennial dicotyledonous crops. Many tospovirus species also infect weeds, which are colonistically important hosts.

**Symptoms and Disease Development**

Leaf symptoms caused by most tospoviruses consist of necrotic (brown) and/or chlorotic (yellow) rings or ring patterns on many hosts (Fig. 1A, D-E). Necrotic and/or chlorotic lesions may also form on stems and wilting of leaves and stems can occur. Young leaves of TSWV-infected plants develop yellow mosaic and leaf drooping symptoms appear. Dark brown lesions (Fig. 1A). TSWV-infected plants may develop a one-sided growth habit or die; entire plants may be stunted with drooping leaves suggestive of a vascular wilt. Growing tips may also die. Plants infected early in the season may produce no fruit, whereas plants infected after fruit set may experience produce yields with reductions, or even total crop loss. In tomatoes, growing fruit have slight raised areas with faint concentric rings (Fig. 1B) on the fruit. These rings often obscure rings which become red and yellow-white (Fig. 1C). The chlorotic lesions are difficult to observe at the "breaker" stage of picking but are highly visible at full color. Similar undulating red color also may be observed with TSWV infection of pepper. INSV infection induces chlorotic or necrotic ring spots on leaves and stems (Fig. 1E). YSWV infection leads to chlorotic (sometimes with a distinct diamond shape) or necrotic lesions on the seed stalk and both leaves of onion, clove and rice (Fig. 1G).

**Identification of Tospoviruses**

Viruses in general and tospoviruses in particular can cause very similar symptoms requiring identification of the causal virus through the use of serological (antibody-based) or molecular biology tests at a disease diagnostic laboratory. It is important to consider that a single tospovirus species may vary greatly around the world. Thus, strains from different areas may differ in their relative susceptibilities against serological and molecular biology tests. Light microscopy of viral inclusions bodies is also useful for rapid presumptive diagnosis.



### National Pest Alert

#### Sudden Oak Death *Phytophthora ramorum*

The water mold *Phytophthora ramorum* is the causal agent of several plant diseases, including ramorum leaf blight, or more commonly called, *Phytophthora* canker disease, and the most well known, sudden oak death. The disease was first observed in 1993 in Germany and The Netherlands on ornamental rhododendrons and viburnum. In the United States, *P. ramorum* was first detected in Mill Valley, California, on tanoak in the mid-1990s. Since its discovery in the United States, *P. ramorum* has been confirmed in forests in California and Oregon and in nurseries in California, Oregon, Washington, and British Columbia. In 2004, distribution of infected nursery stock resulted in detections in 21 states.

**Origin**

The geographic origin of *P. ramorum* is unknown. Before the mid-1990s, there were no reports of this species in the United States or Europe. *P. ramorum*'s limited known geographical distribution in relation to its hosts' distribution and genetic makeup suggests it was recently introduced into the United States. The European and North American populations are thought to be distinct populations translocated independently from another location, perhaps the site of origin.

**Host Range**

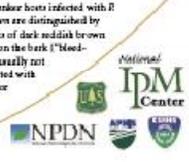
*P. ramorum* causes two types of disease, bark cankers that may kill the host and foliar blight that may serve as a reservoir for the pathogen. In response to the identification of *P. ramorum* in the United States, Department of Agriculture Animal and Plant Health Inspection Service (USDA, APHIS) has developed a list of regulated and associated hosts. As of January 2005, 31 plant species or genera are considered hosts and another 57 plant species are awaiting experimental confirmation. To view the current list of regulated and associated hosts, please visit [http://www.aphis.usda.gov/ipp/ramorum/ramorum.php#\\_ftoc\\_toc4141.pdf](http://www.aphis.usda.gov/ipp/ramorum/ramorum.php#_ftoc_toc4141.pdf).

**Transmission**

The spread of *P. ramorum* likely occurs by movement of infected plant material, wind-blown rain, and contaminated irrigation water. Dispersal by soil and putting mix is under investigation. Moist, cool, windy conditions are conducive to pathogen spread via dispersing spores from the leaves of foliar hosts. Certain foliar hosts support abundant spore production, and these plants may play an important role in *P. ramorum* transmission to bark canker hosts. Shipments of infected nursery stock have inadvertently disseminated *P. ramorum* throughout the United States.

**Symptoms and Identification**

Bark canker hosts infected with *P. ramorum* are distinguished by droplets of dark reddish brown liquid on the bark ("bleeding"), usually with associated white cracks or insect



Go to: <http://www.ncipmc.org/alerts/index.cfm> for listing of pest alerts.  
Color Copies of Many Pest Alerts Available Upon Request.

## Regional and National Field Identification Decks

### Mealybugs & Mealybug Look-Alikes of the Southeastern United States

Pink Hibiscus Mealybug  
*Maconellicoccus hirsutus*



**001**  
EXOTIC

#### Pink Hibiscus Mealybug

*Maconellicoccus hirsutus*

##### Field Recognition

Body pink, about 3 mm long, no to few lateral (side) wax filaments, body fluid red to pink. Ovisacs are present covering pink to orange eggs. Feeding from pink hibiscus mealybug can cause twisted or distorted foliage. High populations may result in leaf drop.

##### Known Southeastern Distribution

Established in Florida (2002) and limited populations detected in Louisiana (2006) and Texas (2007).

##### Common Hosts

More than 200 known hosts occur, but the most common host detected to date is hibiscus. Pink hibiscus mealybug could be a problematic pest for some of major agronomic crops in the southeastern United States if established populations are nearby. Cotton, a close relative of hibiscus, is of particular concern.

2008

40 topics, 113 pages

<http://www.ncipmc.org/alerts/phmb/mealybugs.pdf>

### Pest Thrips of the United States: Field Identification Guide

**004**  
NATIVE

#### Florida Flower Thrips

*Frankliniella bispinosa*

##### Field Recognition

Adult female: 1 mm, pale yellow with gray bands or spots on abdominal segments. Adult male: smaller than female, white to pale yellow. Florida flower thrips are typically found at the base of flower petals. Well-developed hairs or setae are present on the anterior part of the thorax for all *Frankliniella* species and absent in *Thrips* species, including onion thrips.

##### May be Confused with

Onion thrips and other *Frankliniella* species, especially western flower thrips and eastern flower thrips.

Florida Flower Thrips  
*Frankliniella bispinosa*



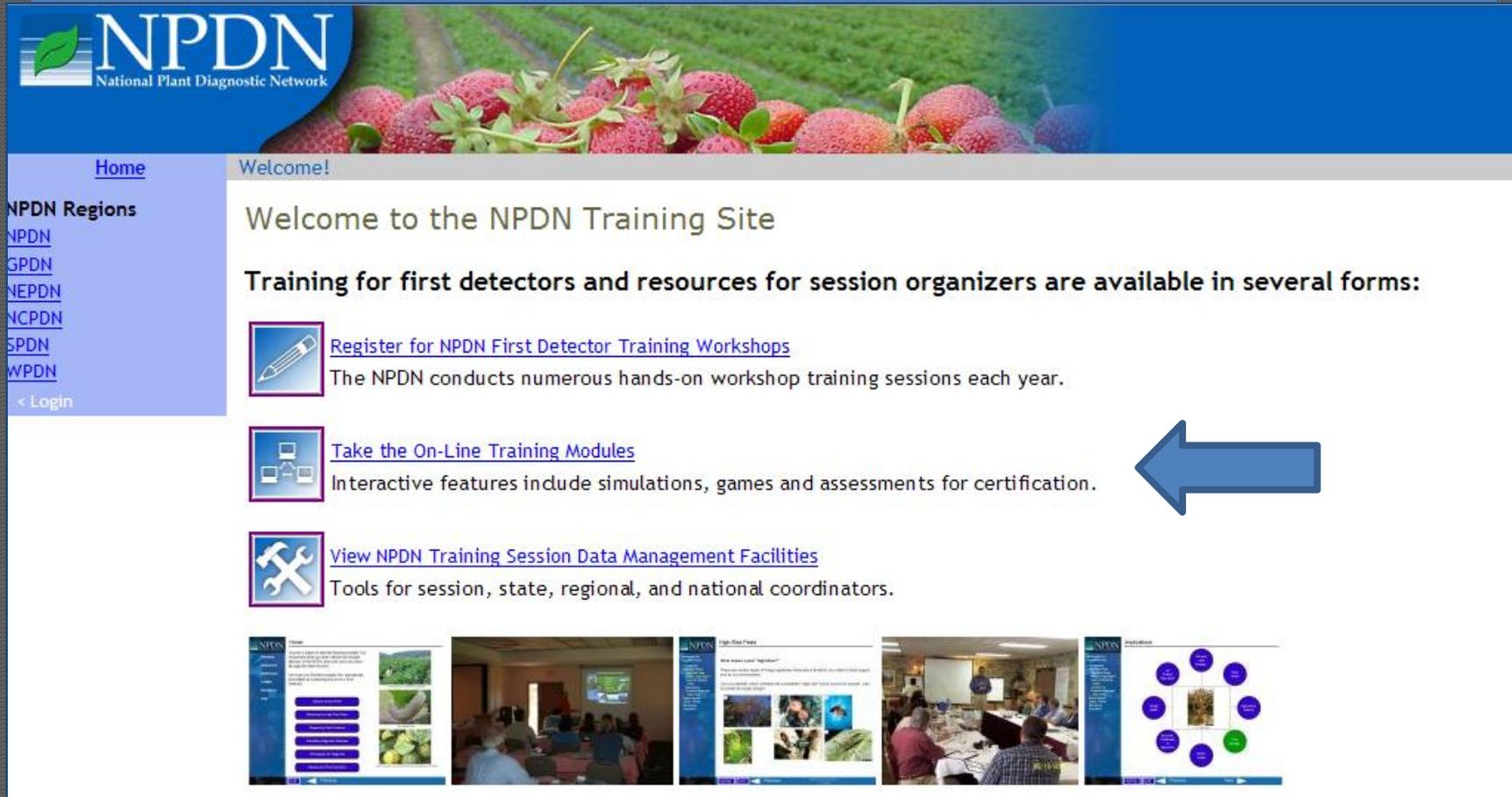
damage fruit when population densities are high. Damage may occur on fruits of certain varieties of grapefruit as a secondary vector for TSWV.

plants, and several vegetable crops such as the roses, and ornamental cut flowers, such as yellow it is suspected that Florida flower thrips moves to pines, pines, and oak.

2009

28 topics, 143 pages

Weblink Available Soon!



Home

Welcome!

**NPDN Regions**

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- [GPDN](#)
- [NEPDN](#)
- [NCPDN](#)
- [SPDN](#)
- [WPDN](#)

< Login

Welcome to the NPDN Training Site

**Training for first detectors and resources for session organizers are available in several forms:**

-  [Register for NPDN First Detector Training Workshops](#)  
The NPDN conducts numerous hands-on workshop training sessions each year.
-  [Take the On-Line Training Modules](#)  
Interactive features include simulations, games and assessments for certification.
-  [View NPDN Training Session Data Management Facilities](#)  
Tools for session, state, regional, and national coordinators.



[HTTP://CBC.AT.UFL.EDU/](http://CBC.AT.UFL.EDU/)



# E-Learning



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Login here using your username and password:

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Password:

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Forgotten your username or password?

**Is this your first time here?**

Welcome! For full access to workshops, courses, and other information offered in the NPDN Training Site, you will need to take a minute to create a new account for yourself. Here are the steps:

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2. An email will be sent immediately to your email address to confirm your account, and then you can log in NPDN Training site

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**Login to Complete eLearning Modules.**

**Easy Instructions for Creating an Account.**

# E-Learning



**Anytime Learning**

**Peer & Annual Review of Content.**

**Possible CEUs national CCA Credits in Fall 2009 (pending approval). State-based CEUs currently available for California and Alaska.**



# E-Learning

## Complete Core NPDN Crop Biosecurity Training (CBC)

### Download and Print Your Certificate of Completion



Your State  
& Date of  
Certificate  
Download

Your Name Here  
Upon completion  
of CBC Training  
at 70% level

# E-Learning

## Core CBC Module: Mission of the NPDN

 **NPDN**  
National Plant Diagnostic Network

**Mission of the NPDN**

- Introduction
- Crop Biosecurity and its Importance
- NPDN and its Partner Agencies
- First Detector's Role Evaluation

### Introduction

This module will introduce you to the origin and mission of the National Plant Diagnostic Network (NPDN).



Oaks affected by Sudden oak death, *Phytophthora ramorum*. Rhododendron leaf shows Sudden oak death symptoms and serves as a host in the spread of this pathogen.

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## Core CBC Module: Monitoring for High Risk Pests



**Monitoring For High-Risk Pests**

- Introduction
- High-Risk Pests
- Select Agents
- USDA - APHIS
- Monitoring
  - Effective Monitoring
  - Specific Organisms
  - Scouting
  - Spatial Distribution
  - Incidence and Severity
  - Summary
  - Evaluation

### Incidence and Severity

Do you know the difference?

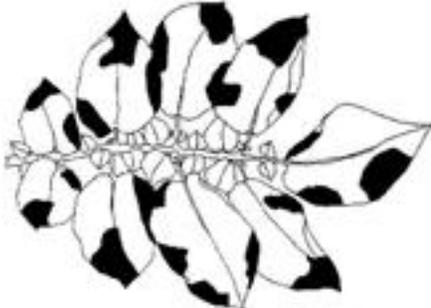
Measuring Incidence and Severity

**"Incidence"** refers to the percentage of a crop that is affected by the plant pathogen. For example, 5% of a crop may be affected by a particular pathogen.

**"Severity"** refers to the percentage or degree of a plant area affected. For example, the severity of one pathogen could be serious, at 70% of the plant's overall area being affected.



Out of 10 lettuce plants shown in this photo, 3 are diseased (30% incidence) with lettuce drop (caused by *Sclerotinia sclerotiorum*).



Potato leaf with 25% disease severity (i.e., 25% of the leaf affected with disease, as shown in black)

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## Core CBC Module: Diagnosing Plant Problems



**Diagnosing Plant Problems**

- Learning Objectives
- U.S. Plant Diseases
- Regional Knowledge
- Planting Practices
- Chemical Usage
- Disease Triangle
- Plant Pathogens and Pests
- ☐ Disease Signs and Symptoms
- ☐ Insect Signs and Symptoms
- Types of Damage
- Tissue Necrosis
- Feeding
- Pest Groups
- Beneficial Vs. Pest
- Evaluation

### Signs of Damage

Can you recognize the signs of damage?






Stippling damage on an ash leaflet

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Select All Correct Answers To Proceed

## Core CBC Module: Submitting Diagnostic Samples

 **NPDN**  
National Plant Diagnostic Network

**Submitting Diagnostic Samples**

- Introduction To Submitting Diagnostic Samples
- Submitting Samples
  - Submitting Your Samples
  - A Diagnostic Sample Includes...
  - Submission Question
  - Plant Samples**
  - Insect Samples
  - Weed Samples
  - Select Vs Non-Select Agents
- Communicating With Regulatory Officials Evaluation

### Packaging Samples 1

Diagnostic labs receive thousands of specimens each year. Below, and on the next few screens, you can compare poorly-packed and well-packed samples.



Read on to learn what is right/wrong with these clinic specimens.

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## Core CBC Module: Photography for Diagnosis



**Photography For Diagnostics**

- Learning Objectives List
- Introduction
- Bad Photos
- Good Photos
- Getting Started With Digital Photography
- Taking Photos in the Field
- Identify the Subject
  - What Do I Photograph?**
  - How To Take the Best Possible Photos
  - Capturing Close-ups
  - Additional Tips
- Saving and Submitting Your Photos
- Evaluation

### Photograph Examples

Take a series of photos...



Photo shows the cultural system and environment for growing cabbage.



This photo shows the entire plant and the distribution of the problem on the plant (i.e., lower leaves).



Cabbage leaf with ruler indicates size and extent of leaf damage.



Close-up of plant damage with thumb used to show size/scale.

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## Core CBC Module: Disease and Pest Scenarios



**NPDN**  
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### Learning Objectives

The purpose of this module is to allow you to test your skills as a first detector. In this module you should be able to demonstrate the following:

- How to scout a field for a plant pest, plant pathogen, or weed problem.
- What is considered a high-risk plant pest, plant pathogen, or weed and when to collect a sample for submission.
- How to properly collect, package and send a high-risk plant pest, plant pathogen, or weed sample.
- How to conduct proper chain of communication and custody when submitting a high-risk plant pest, pathogen, or weed for diagnosis.



First Detectors discussing pest control in a field of staked tomatoes

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# E-Learning

**New, Pest-Focused NPDN eLearning Modules**

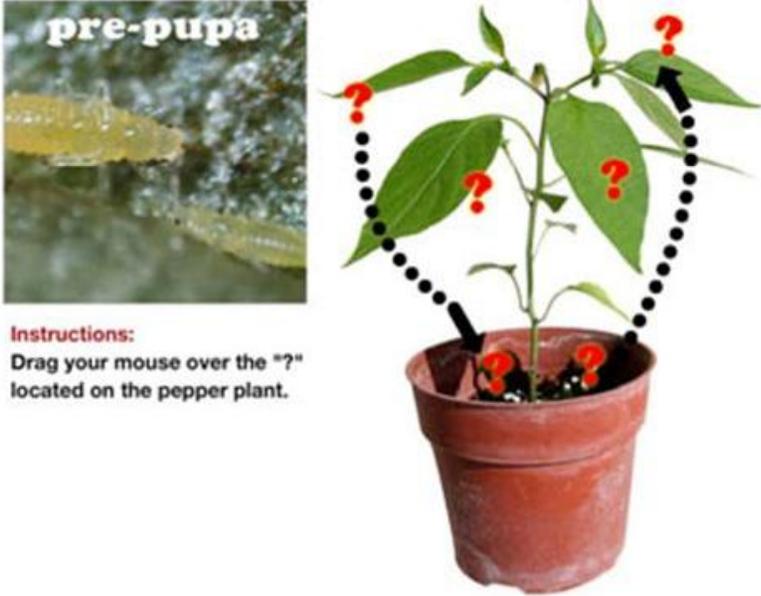
**Modules review complete and modules released,  
September 2009**

## Special Topic Module: Chilli Thrips

**Life Cycle**

**Chilli Thrips Life Cycle**

**pre-pupa**



**Instructions:**  
Drag your mouse over the "?" located on the pepper plant.

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# E-Learning

## Special Topic Module: *Ralstonia solanacearum*

**Introduction**



*Ralstonia solanacearum*  
Race 3 biovar 2  
USDA-NRI program

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## Special Topic Module: *Ralstonia solanacearum*



**Introduction**

- Welcome
- Program Overview
- Select Agents
- Ralstonia Project

**Training Module**

- Thank You

### Welcome

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Welcome to this *Ralstonia solanacearum* - Bacterial wilt dedicated program !

*R. solanacearum* causes bacterial wilts on a wide range of crops and ornamentals, including potato, tomato, and geranium.

It is one of the most damaging plant pathogenic bacterium worldwide, responsible for \$ billion US losses yearly.

One subgroup of *R. solanacearum* called Race 3 biovar 2 (R3bv2) is not present in the United States, but is of high risk of introduction through infected geranium cuttings imported from off-shore production sites. If introduced in the US, R3bv2 could seriously affect the potato industry and, for this reason, is considered a Select Agent and is subject to the strictest biosecurity regulations.



Bacterial wilt of tomato



Brown rot of potato



Southern wilt of geranium

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# NPDN Training Questions???

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