The Protect U.S. Train-the-Trainer Webinar will begin at 3:00pm.

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Protect US:

What's it about?

Martin A. Draper

National Program Leader

National Institute of Food and Agriculture

protect u.s.

community invasive species network

First Detectors Protecting U.S. from Pests

Spotted wing Drosophila larvae emerging from blueberry fruit (D. Bruck)

Recognizing threats!

- Opportunity created in the Food, Conservation and Energy Act of 2008 (Farm Bill).
- Enhancing pest detection to protect US agriculture.
- An organizational partnership withAPHIS-PPQ, Land-grant universities, and NIFA
- And many other contributors and partners…

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Some of our Partners

National Institute of Food and Agriculture (NIFA)

Center for Invasive Species and Ecosystem Health

Local and Regional Integrated Pest Management programs (IPM)

U.S. Department of Homeland Security (DHS)

USDA-APHIS-PPQ

Extension Disaster Education Network (EDEN)

U.S. Forest Service

Cooperative Agriculture Pest Survey Program (CAPS)

National Plant Board (NPB) and State Departments of Agriculture

National Plant Diagnostic Network

USDA Agricultural Research Service

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Responding Appropriately

- Pests are entering the country at increasing and alarming rates.
- Citizen scientists are a critical and underused resource.
- The First Detector Network is a part of the NPDN – Protect US will be an extension of that effort.
- This network will extend training to less traditional audiences.

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Responding Appropriately

- Early recognition is improved with more eyes!
- We need every set of eyes we can “enlist.”
- Do you know when something looks “*funny*”?
- What should you do next?
- A rapid public response can save crop loss!

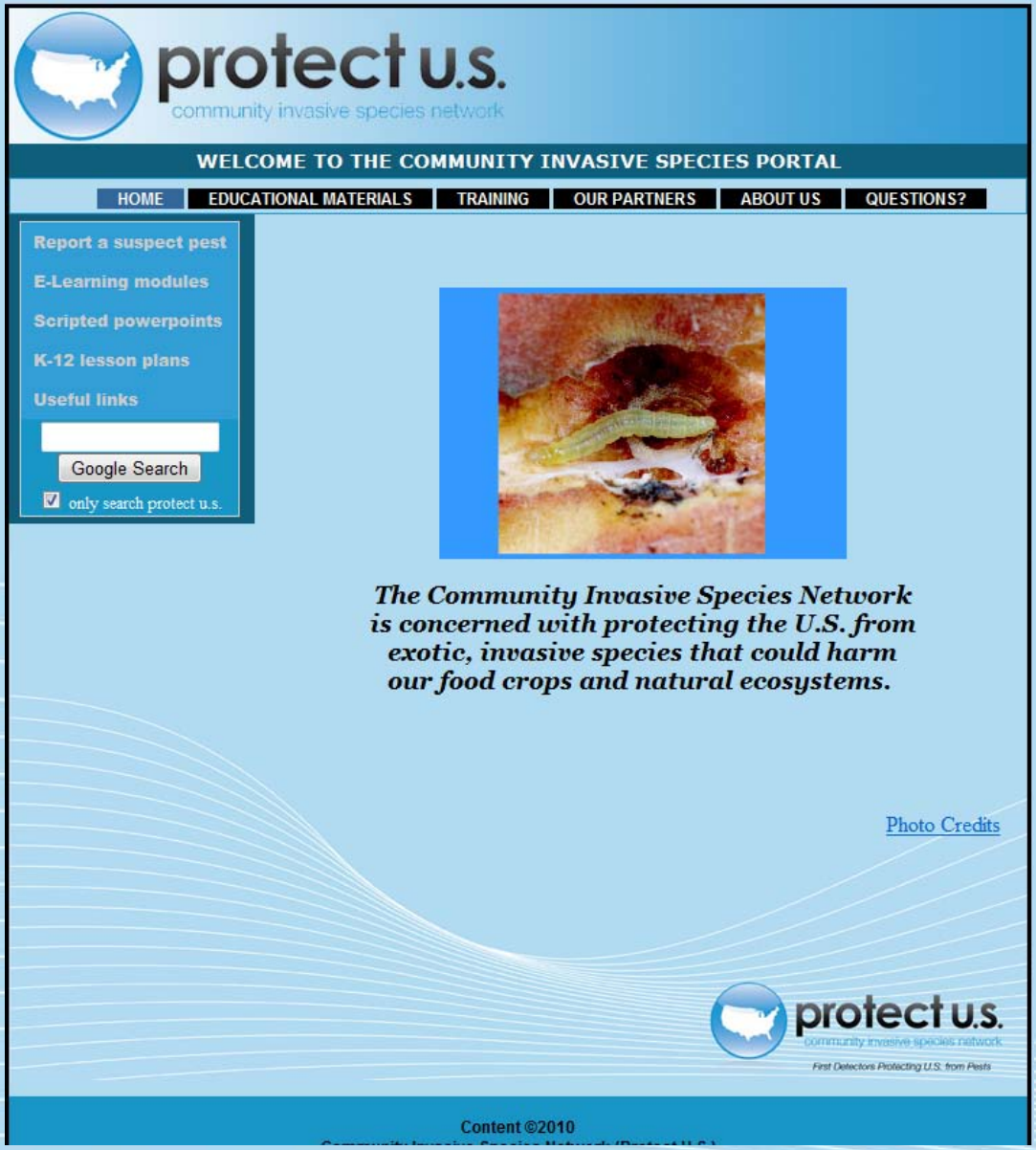
protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Responding Appropriately

- Early recognition is improved with more eyes!
- We need every set of eyes we can “enlist.”
- Do you know when something looks “*funny*”?
- What should you do next?
- A rapid public response can save crop loss!

… and money!

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests



Protect U.S. Web Overview

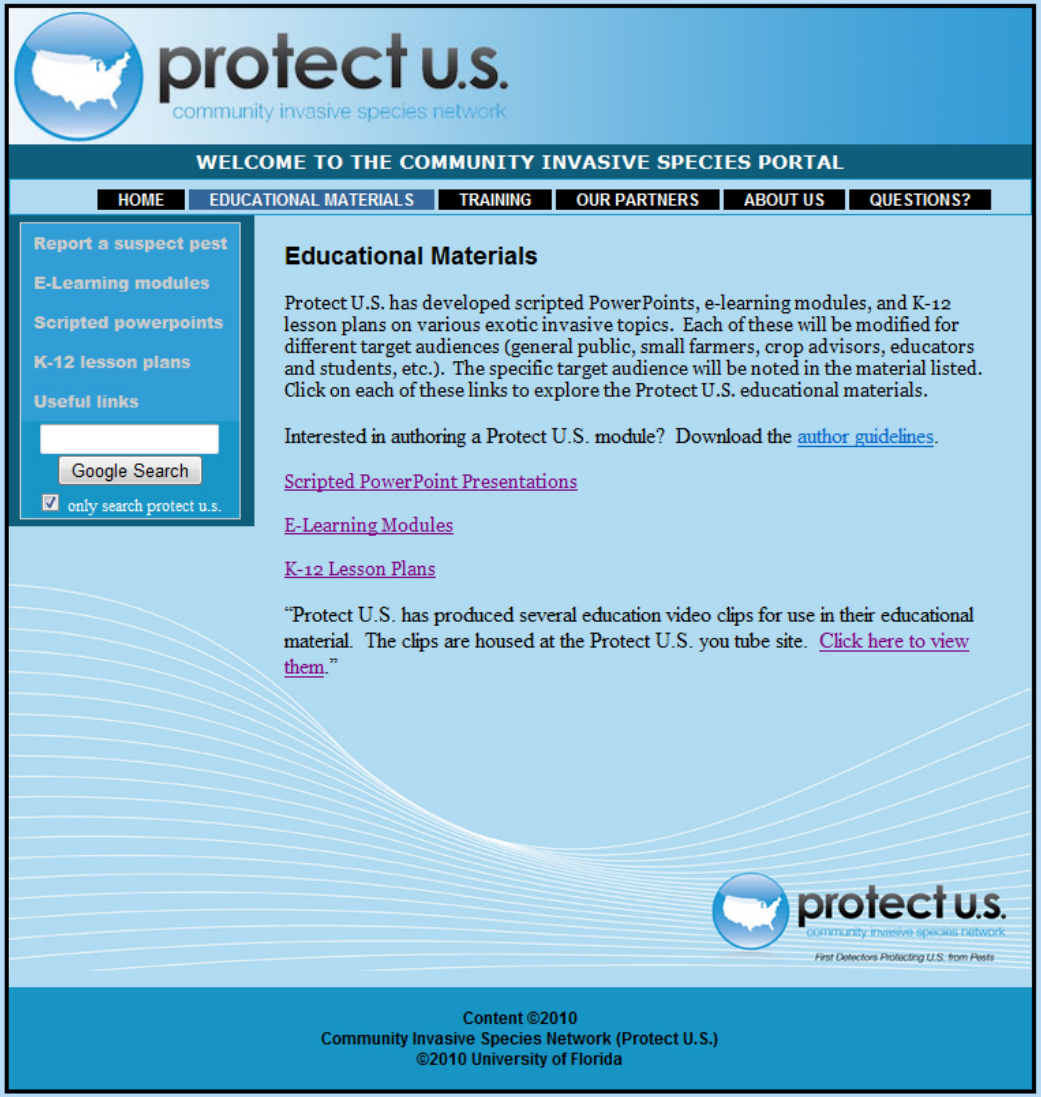
Protect U.S.

The Community Invasive Species Network

www.protectingusnow.org

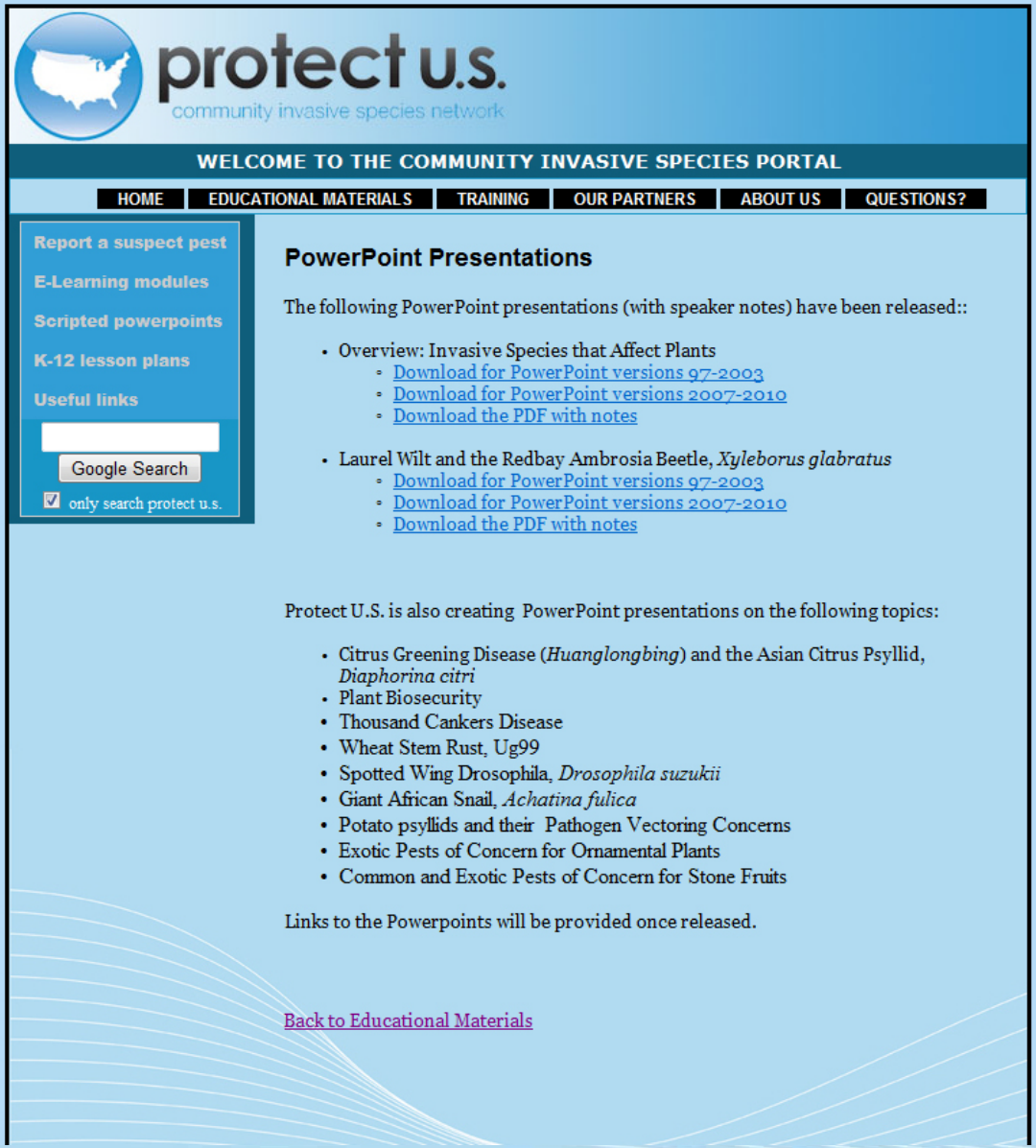
Stephanie Stocks
Protect U.S. Coordinator
University of Florida

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests



Educational Materials

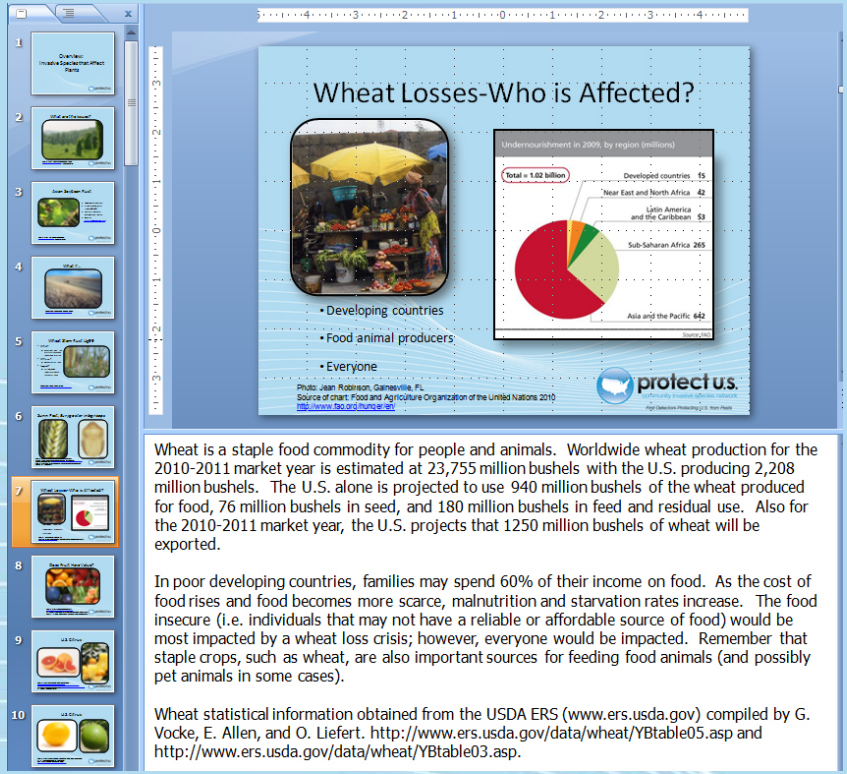
protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests



Scripted Presentations

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Scripted Presentation: Overview: Invasive Species that Affect Plants

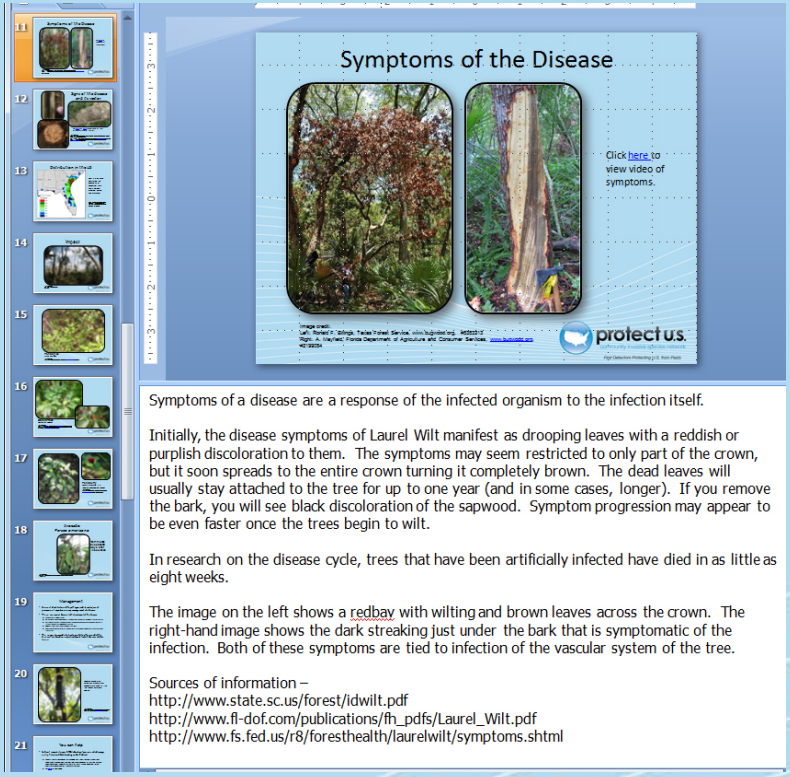


Wheat is a staple food commodity for people and animals. Worldwide wheat production for the 2010-2011 market year is estimated at 23,755 million bushels with the U.S. producing 2,208 million bushels. The U.S. alone is projected to use 940 million bushels of the wheat produced for food, 76 million bushels in seed, and 180 million bushels in feed and residual use. Also for the 2010-2011 market year, the U.S. projects that 1250 million bushels of wheat will be exported.

In poor developing countries, families may spend 60% of their income on food. As the cost of food rises and food becomes more scarce, malnutrition and starvation rates increase. The food insecure (i.e. individuals that may not have a reliable or affordable source of food) would be most impacted by a wheat loss crisis; however, everyone would be impacted. Remember that staple crops, such as wheat, are also important sources for feeding food animals (and possibly pet animals in some cases).

Wheat statistical information obtained from the USDA ERS (www.ers.usda.gov) compiled by G. Vocke, E. Allen, and O. Liefert. http://www.ers.usda.gov/data/wheat/YBtable05.asp and http://www.ers.usda.gov/data/wheat/YBtable03.asp.

Scripted Presentation: Laurel Wilt and the Redbay Ambrosia Beetle, *Xyleborus glabratus*



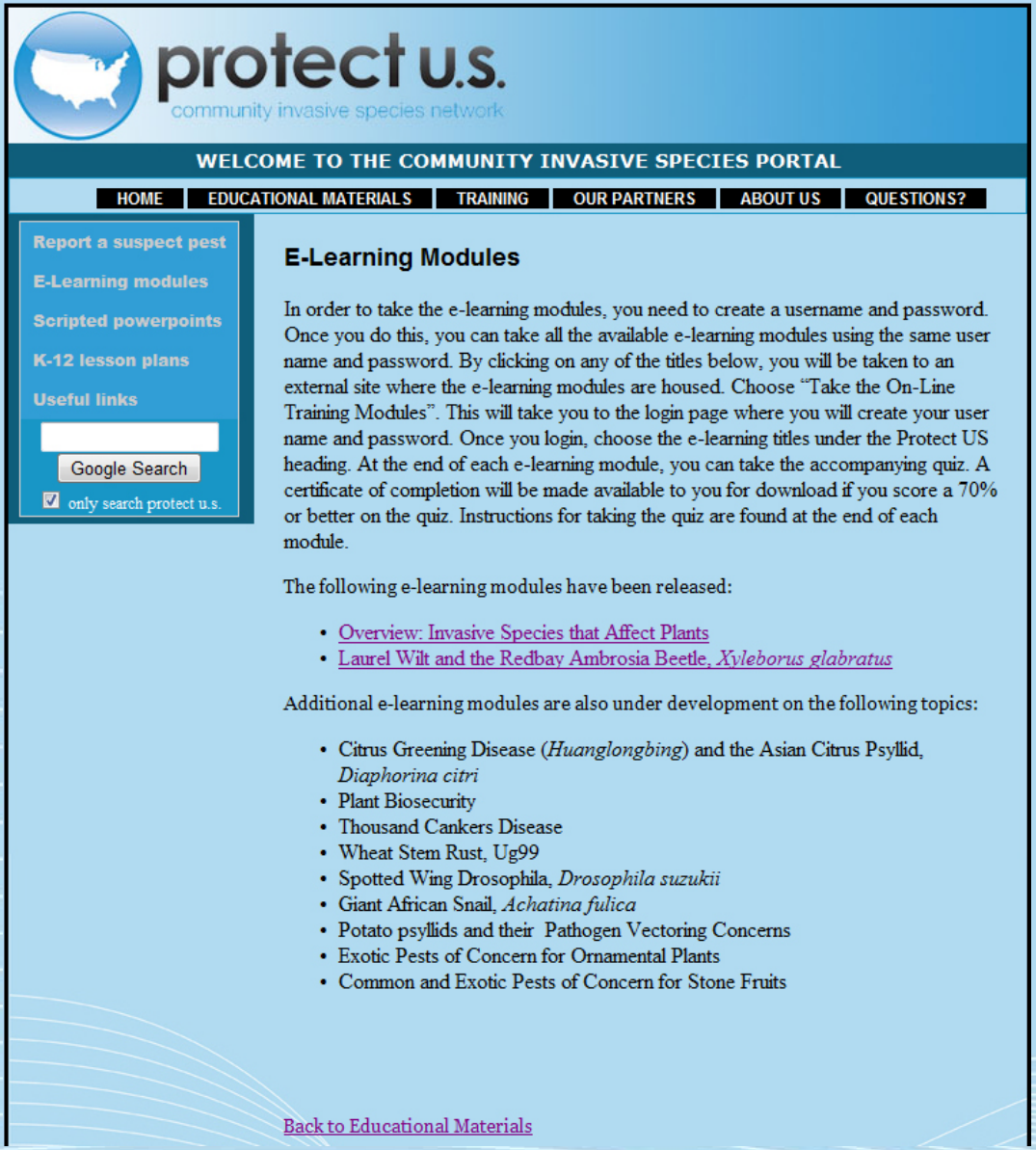
Symptoms of a disease are a response of the infected organism to the infection itself.

Initially, the disease symptoms of Laurel Wilt manifest as drooping leaves with a reddish or purplish discoloration to them. The symptoms may seem restricted to only part of the crown, but it soon spreads to the entire crown turning it completely brown. The dead leaves will usually stay attached to the tree for up to one year (and in some cases, longer). If you remove the bark, you will see black discoloration of the sapwood. Symptom progression may appear to be even faster once the trees begin to wilt.

In research on the disease cycle, trees that have been artificially infected have died in as little as eight weeks.

The image on the left shows a redbay with wilting and brown leaves across the crown. The right-hand image shows the dark streaking just under the bark that is symptomatic of the infection. Both of these symptoms are tied to infection of the vascular system of the tree.

Sources of information –
http://www.state.sc.us/forest/idwilt.pdf
http://www.fl-dof.com/publications/fh_pdfs/Laurel_Wilt.pdf
http://www.fs.fed.us/r8/foresthealth/laurelwilt/symptoms.shtml

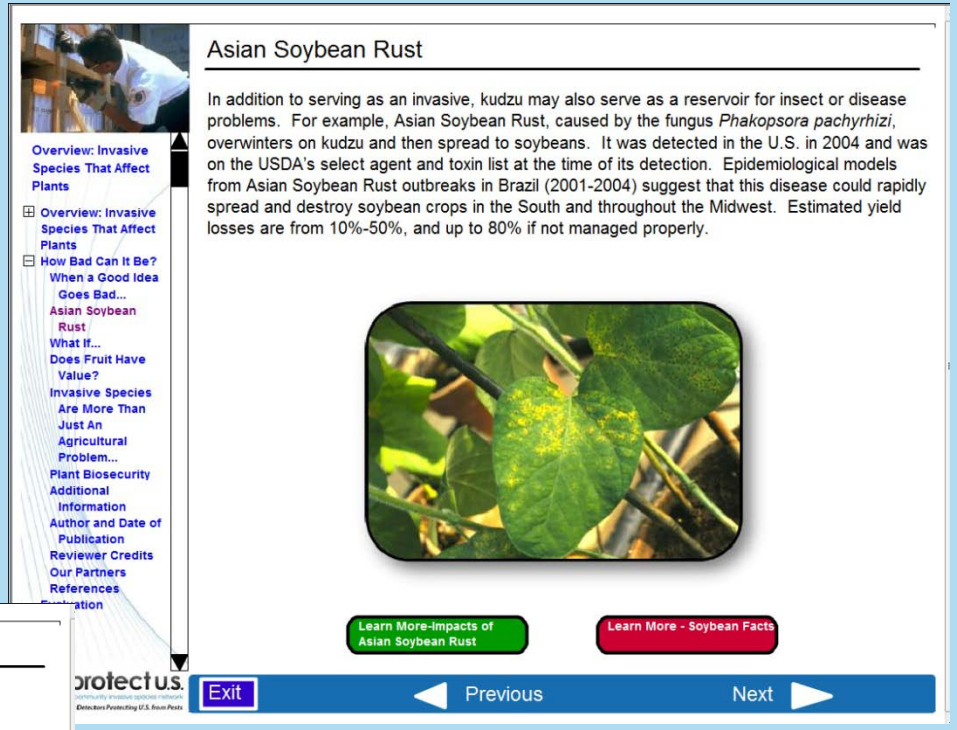


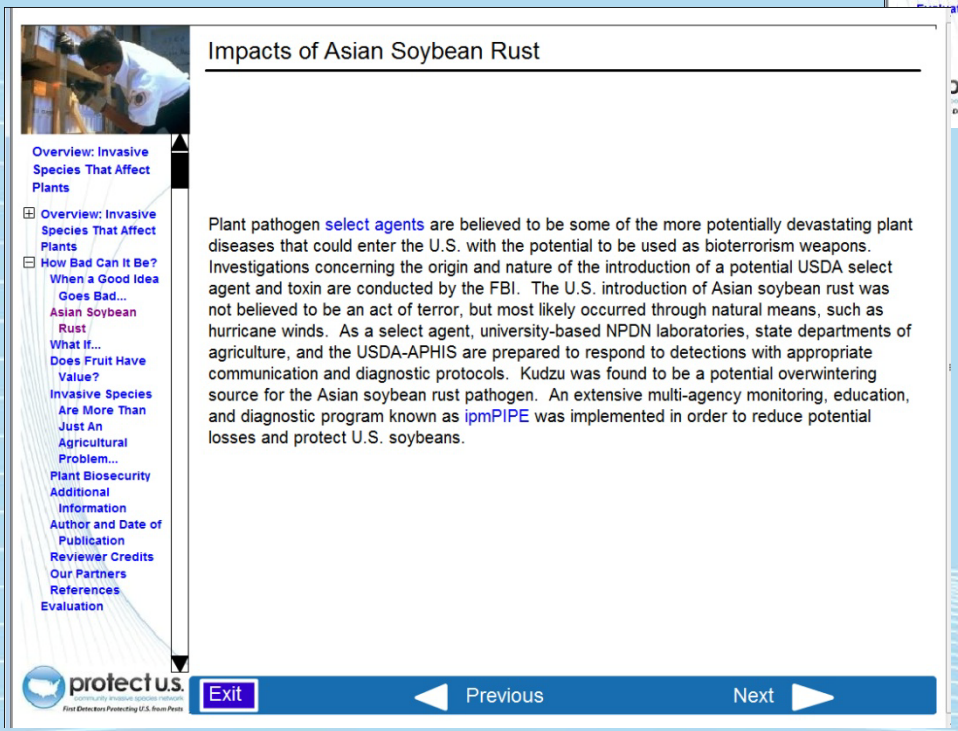
E-Learning Modules with interactives and certificates of completion

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

E-Learning Module: Overview: Invasive Species that Affect Plants

Learn More Buttons

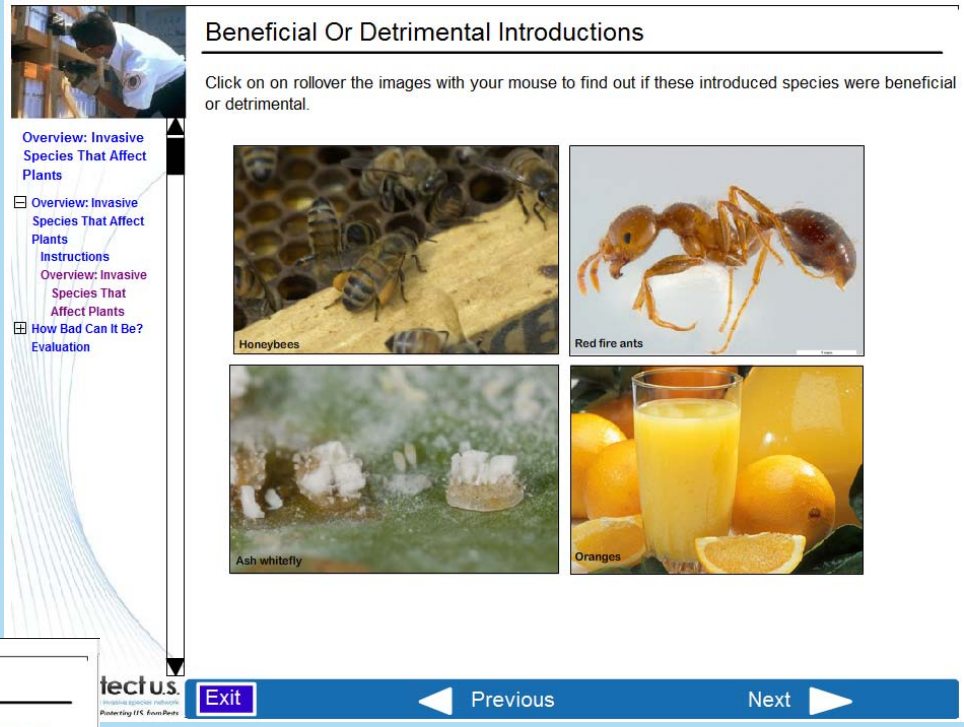


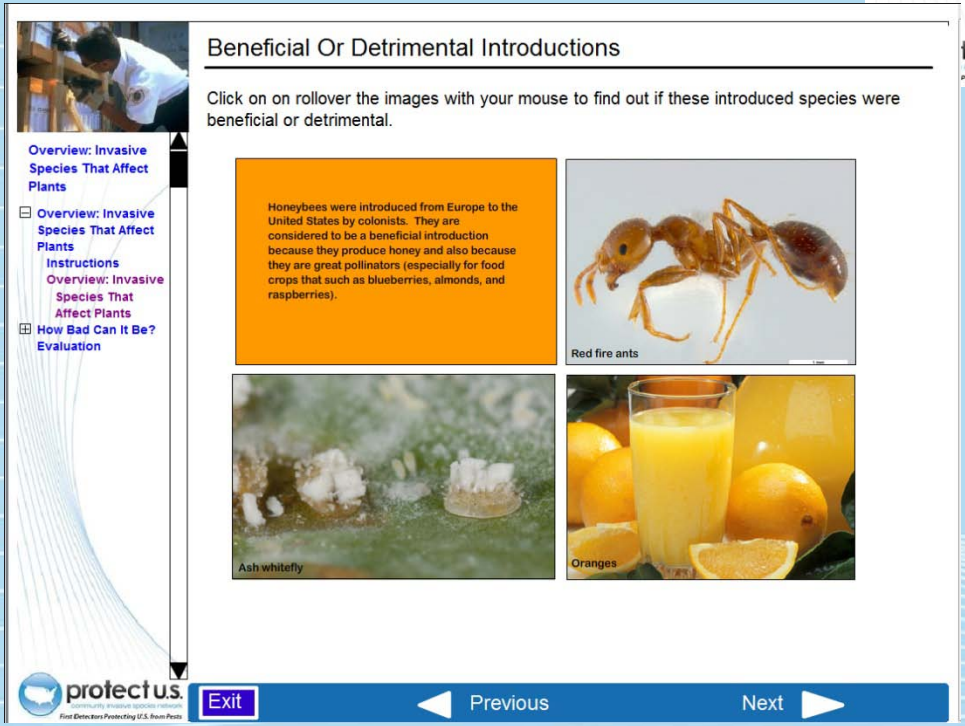


protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

E-Learning Module: Overview: Invasive Species that Affect Plants

Rollover to Find Answers

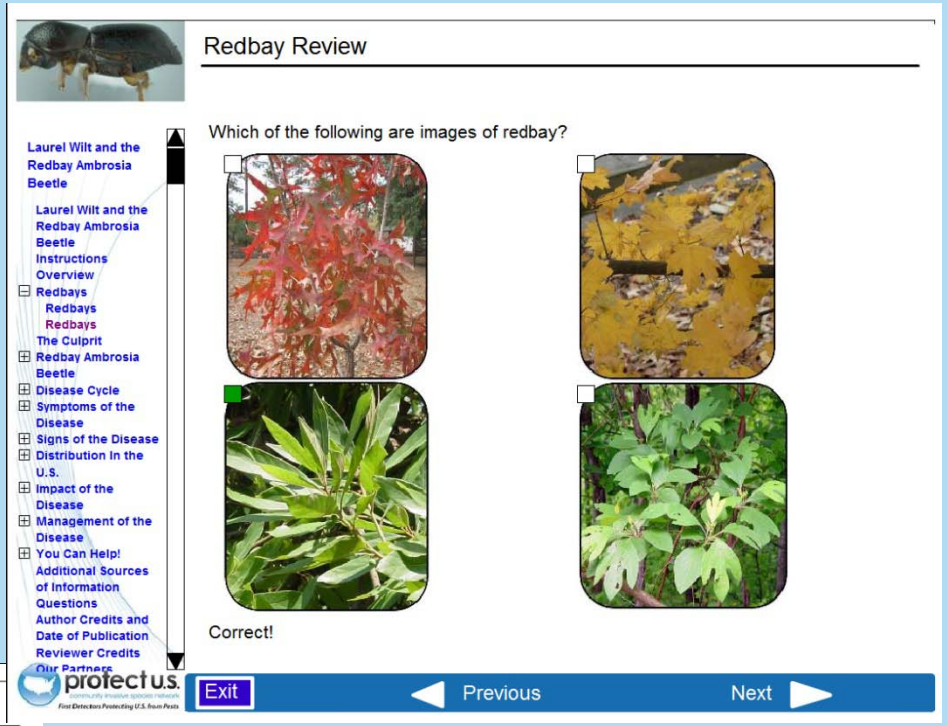


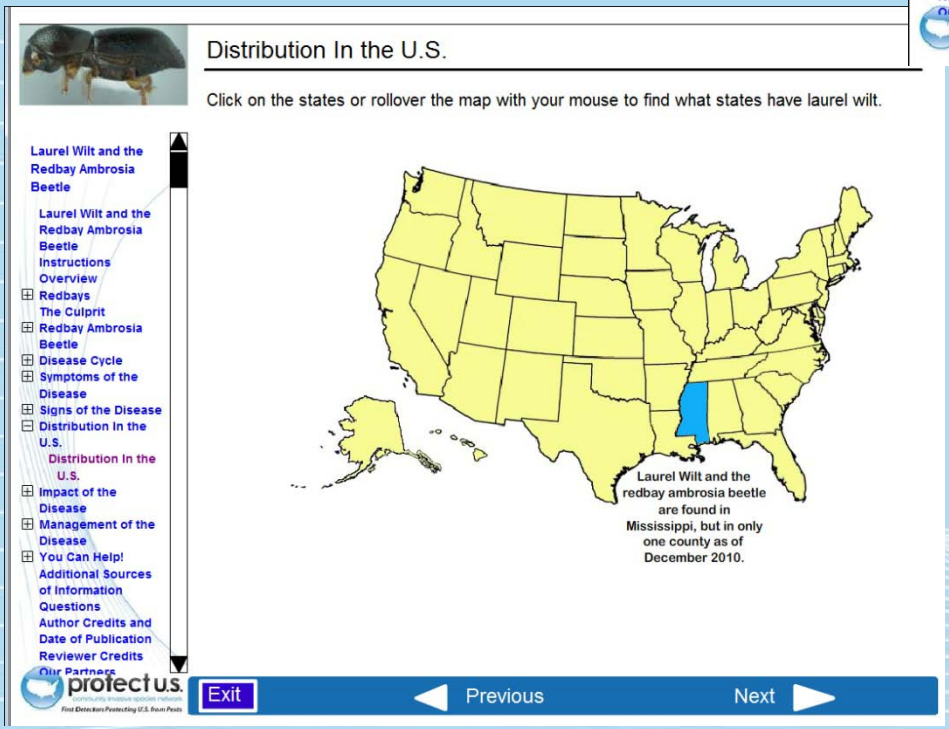


protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

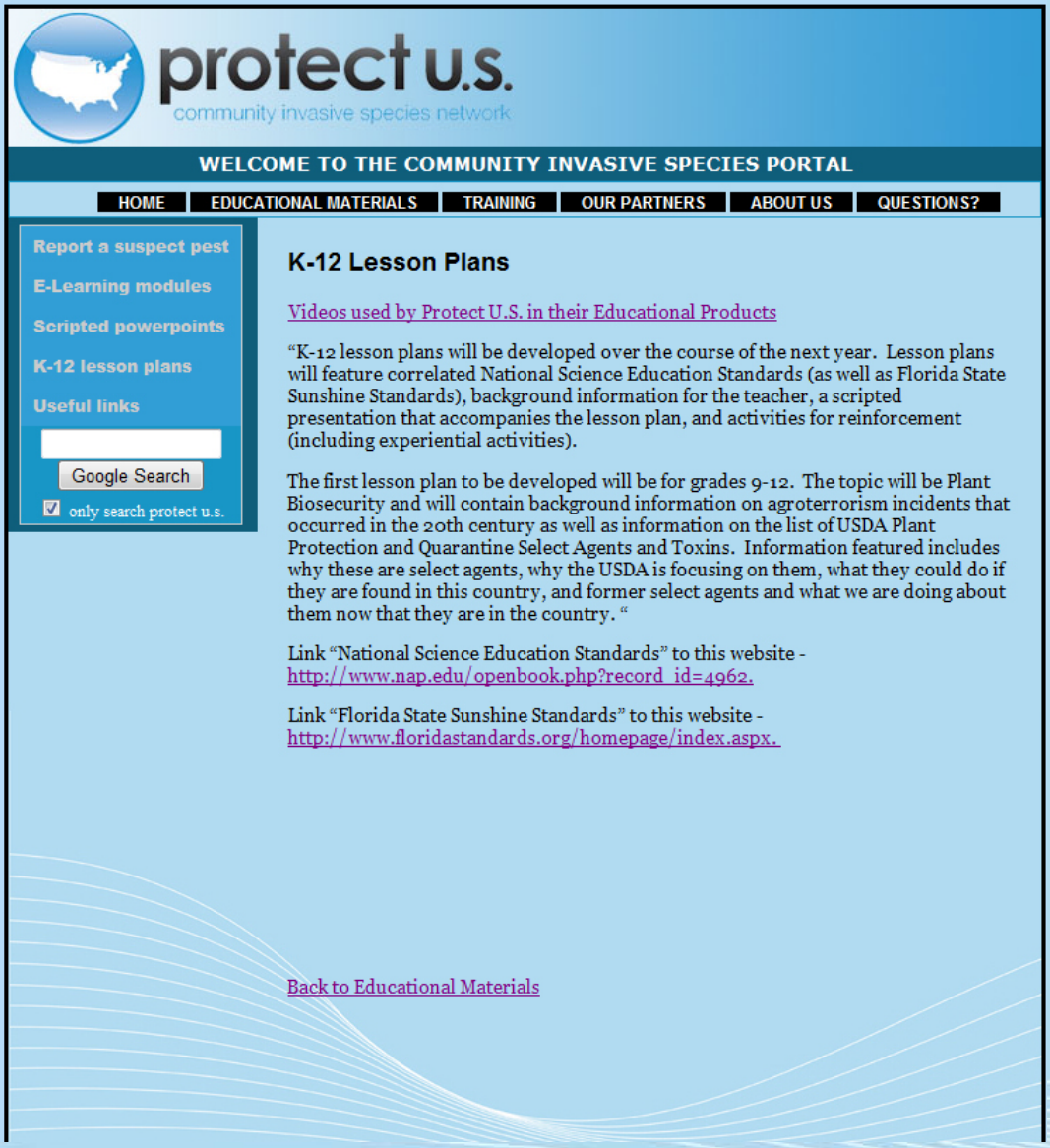
E-Learning Module: Laurel Wilt and the Redbay Ambrosia Beetle, *Xyleborus glabratus*

Distribution Maps and Quiz Questions





protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

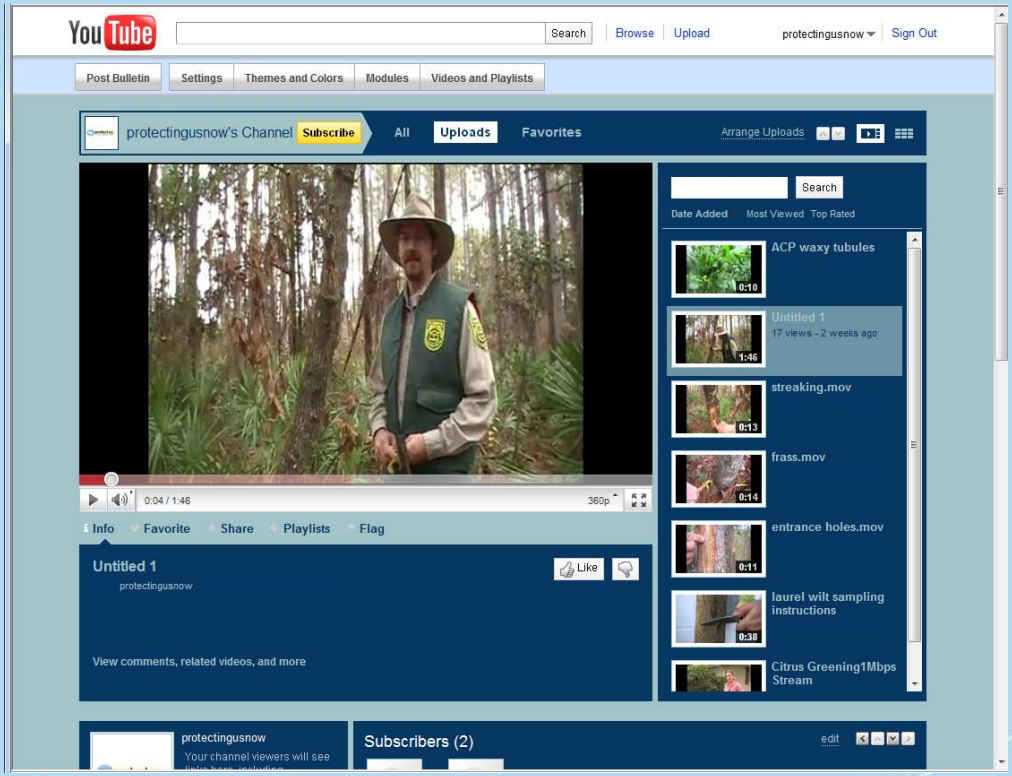


K-12 Lesson Plans

- Target grades listed
- Correlated with NSES
- Scripted presentation for teacher to use or modify
- Student handout(s)
- Experiential activity
- E-learning module for the students with associated quiz

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Educational Videos



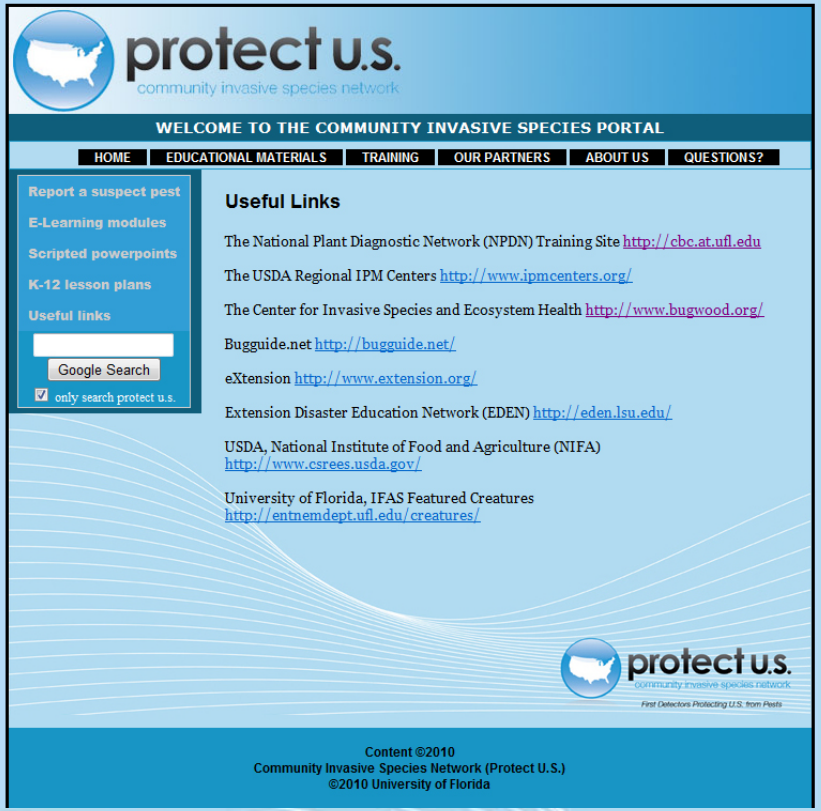
Protect U.S. You Tube Channel –
http://www.youtube.com/user/protectingusnow#p/a

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

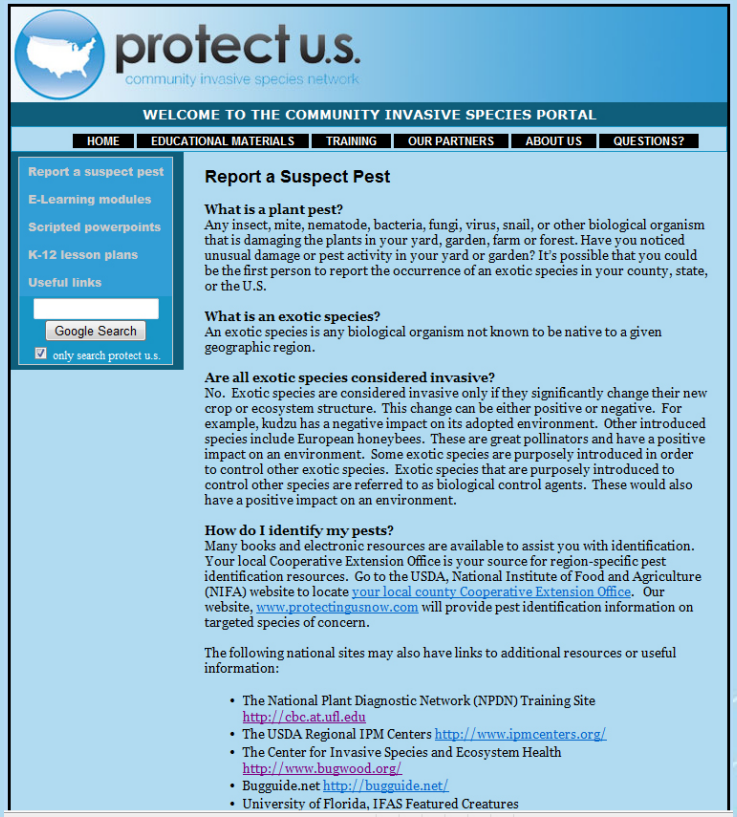
Training

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Useful Links



Report a Suspect Pest



protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Statistics

Home page	1204
Educational material page	323
Scripted powerpoint page	267
Invasive presentations (pdf, ppt, pptx)	2374
E-learning page	200
K-12 lesson plans page	107
Webinar announcement	269

As of February 3, 2011 at 1:15 pm ET.
Invasive presentation posted mid-October
Invasive e-learning module posted late January
Laurel wilt presentation and e-learning module posted late January

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Please allow us a few minutes to load the next batch of presentations

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

NPDN: First Detector Training Overview

Amanda Hodges, Ph.D.
NPDN Training & Education,
Program Area Manager

NPDN
National Plant Diagnostic Network

EDUCATE to DETECT

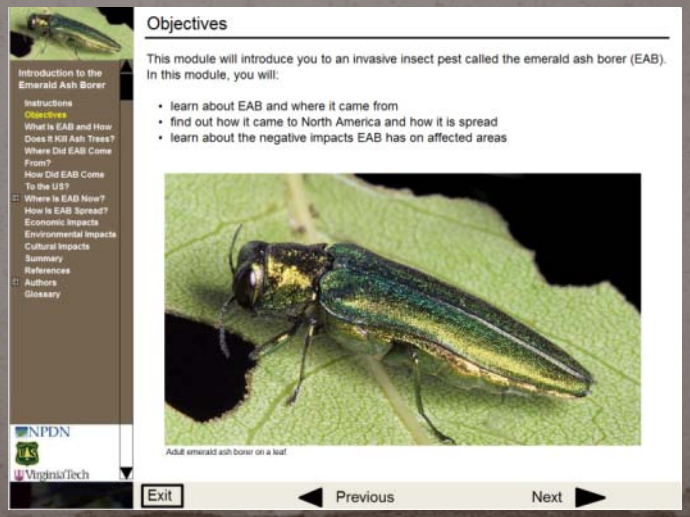
Who is a First Detector?

- Cooperative Extension Personnel
- Crop Consultants
- Growers
- Master Gardeners
- Anyone Interested in Plant Management
- You!

Adrian Hunsberger, UF/IFAS,
Miami-Dade County Extension
Photo Credit: Julieta Brambila, USDA-APHIS-PPQ

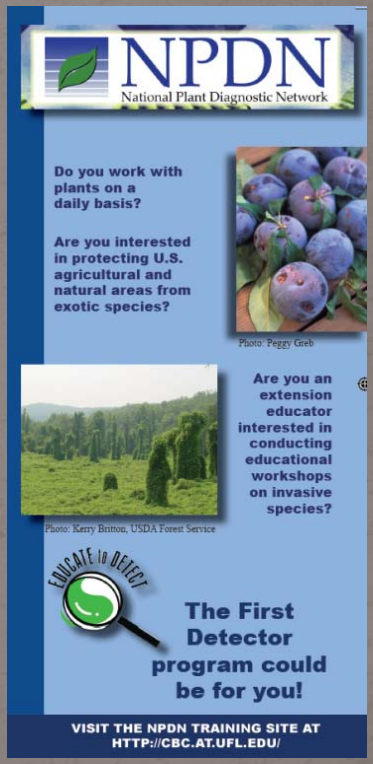
Training Delivery

- Traditional
  - Workshops
  - Field Days
  - Handouts
  - 2003-current
  - Over 11,000 Trained
- E-Learning
  - Asynchronous at-your-own-pace learning
  - 2008-current



Traditional Training Resources

- PowerPoint presentations http://www.npdn.org/first_detector
- Brochures
- NPDN Rulers
- Online Registration http://cbc.at.ufl.edu/
- First Detector Newsletter http://www.sepdn.org/
- Certificates of Completion
- Collaborative Pest Alerts and Identification Guides



Regional Training & Education Contacts

Name	Role	Office	Cell
Sharon Dobesh	GPDN Regional Educational Coordinator		
Amanda Hodges	SPDN Regional Educational Coordinator	352-273-3957	
Dick Hoenisch	WPDN Regional Educational Coordinator		
Rachel McCarthy	NEPDN Regional Educational Coordinator	607-255-4162	
Amy Peterson Dunfee	NCPDN Regional Educational Coordinator		

First Detector Training & Information

NPDN Training Site News

- New! Thousand Cankers Disease, *Geosmithia morbida* Picture Clues **Download PDF (4.6 MB file)**
- **New! Sceening Aid to Pest of Palms, LUCID® Key**
- The NPDN Training and Education Website (**http://cbc.at.ufl.edu/**) is under construction. Expect major changes to the web interface in September/October of 2010. More information regarding the learning objectives and purpose of the modules (available after you login) will be provided on the site. Also, traditional PowerPoint training modules will be moving from NPDN (**http://www.npdn.org/**) to the NPDN Training Site (**http://cbc.at.ufl.edu/**). Cross-posting will occur during the transitional period.
- Did you know that the NPDN crop biosecurity course and the NPDN chilli thrips, *Scirtothrips dorsalis*, module have been approved for continuing education credits with the Certified Crop Advisors (CCA) program? You can view the approval documentation **here**. For further questions, contact the NPDN Training and Education Program Area Coordinator, **Amanda Hodges**.
- Authors from Virginia Tech have partnered with NPDN to release a series of e-learning modules on the Emerald Ash Borer, *Agrilus planipennis*. The Emerald Ash Borer series of modules should be available on the NPDN Training Site (**http://cbc.at.ufl.edu/**) by September of 2010.
- The NPDN is a partner in a new community-based educational program, Protect U.S., that will be releasing several e-learning modules in 2010 and 2011. To learn more about Protect U.S., go to **http://www.protectingusnow.com/**

NPDN E-Learning Author Guidelines

NPDN E-Learning Authorship Guidelines Revised, August 2010. **E-Learning Authorship Guidelines**

About the First Detector Information Page

Questions Regarding First Detector Training?

Your state and regional contacts are your first source of information for First Detector training questions. National questions, in particular concerning the online crop biosecurity course (**http://cbc.at.ufl.edu**) can be directed to Amanda Hodges (**achodges@ufl.edu**).

What's Available on the First Detector Information Page?

NPDN
National Plant Diagnostic Network

NPDN Regions

NPDN
GPDN
NEPDN
NCPDN
SPDN
WPDN

Your Account

< Logoff
< Change password
< Edit User Profile

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.





For the latest updates on the NPDN First Detector Program, visit the NPDN First Detector Information page. Also, you may signup for the NPDN First Detector newsletter by e-mailing Carrie Harmon.

Questions?? Please direct questions, comments, or suggestions relating to the NPDN First Detector Training program to Amanda Hodges

In the News

form fields using the Hand tool

First Detector Network News

NPDN National Plant Diagnostic Network

January 2011
Volume 6, Issue 1

New Educational Resource on Invasive Species Launched

Stephanie Stocks, Department of Entomology and Nematology, University of Florida

Protect U.S., the Community Invasive Species Network, was launched in October 2010. It is concerned with protecting the U.S. from exotic, invasive species through education. It is a collaborative partnership between the National Plant Diagnostic Network (NPDN), Regional Integrated Pest Management Centers, United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (USDA-APHIS-PPQ), National Institute of Food and Agriculture (NIFA), the National Plant Board (NPB), your local Land Grant University Cooperative Extension Service, and other organizations involved in exotic species extension and regulatory activities. During 2010-2011, e-learning modules (for the general public) and scripted presentations (for educators) will be available on eleven invasive species (featuring some that are already in the U.S. and others that are not here, but for which we need to be aware), plant biosecurity, and select pest and pathogen topics (such as Laurel Wilt and the Redbay Ambrosia Beetle). E-learning modules include games, interactive quizzes, and certificates of completion. K-12 lesson plans will also be available on select topics. These lesson plans will be correlated to the National Science Education Standards (NSES) as well as the Florida State Department of Education Sunshine State Standards. They will include background information and a scripted presentation for the teacher and an age appropriate experiential learning activity and handout(s) for the students along with a modified version of an e-learning module specifically designed for student use. Please check out their website at www.protectingusnow.org for more information and to view a complete list of invasive species topics. Protect U.S. will also hold a train-the-trainer introductory webinar on Tuesday, February 8, at 3:00 p.m. ET, 2:00 CT, etc. Click here for a description of the webinar. See the training announcement on page four for information on registering for the webinar.

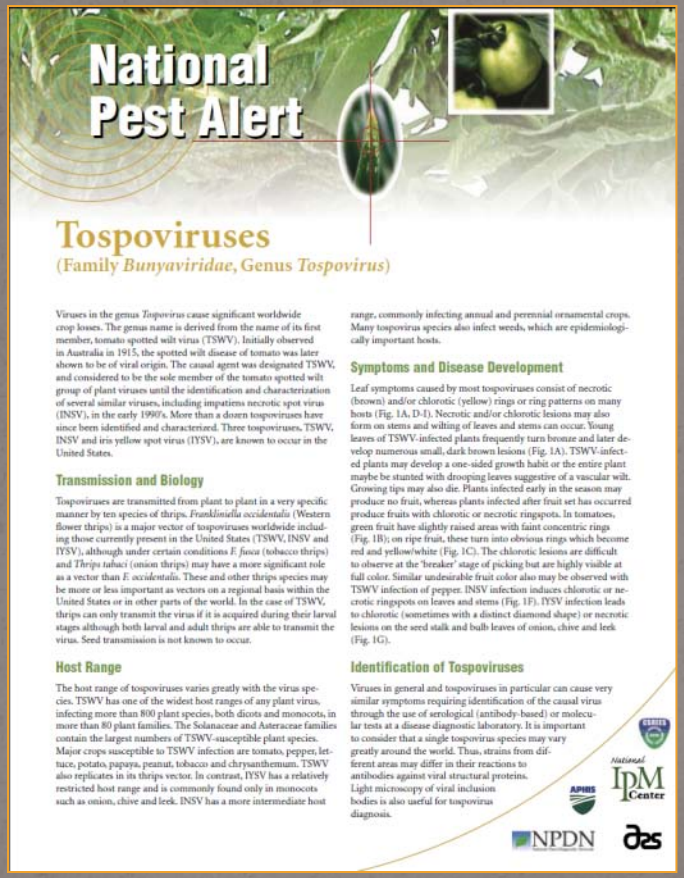
Editors Note:

Happy New Year! You may have noted that the First Detector Newsletter was not sent out in November or December of 2010. We apologize for the inconvenience. Rachel Brown, one of the editors, has moved on to other responsibilites. We wish her all the best and thank her for all her hard work. Stephanie Stocks will be taking over Rachel's duties on the newsletter. If you have any question, comments, or content to put in the newsletter, please contact her at sstocks@ufl.edu or 352-273-3958.

Highlights:

- Protect U.S. website launched
- ID Source, a Gateway to Identification Resources on the Internet
- CPHST Announces Release of New Identification Tools
- SOS Detections in Texas and Louisiana
- Updated EAB Quarantines

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). Initially 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 tomato spotted wilt group of plant viruses until the identification and characterization of several similar viruses, including impatiens necrotic spot virus (INSV), in the early 1990's. More than a dozen tospoviruses have since been identified and characterized. Three tospoviruses, TSWV, INSV and iris yellow spot virus (IYSV), 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 occidentalis* (Western flower thrips) is a major vector of tospoviruses worldwide including those currently present in the United States (TSWV, INSV and IYSV), although under certain conditions *F. fusca* (tobacco thrips) and *Thrips tabaci* (onion thrips) may have a more significant role as a vector than *F. occidentalis*. These and other thrips species may be more or less important 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 800 plant species, both dicots and monocots, in more than 80 plant families. The Solanaceae and Asteraceae families contain the largest numbers of TSWV-susceptible plant species. Major crops susceptible to TSWV infection are tomato, pepper, lettuce, potato, papaya, peanut, tobacco and chrysanthemum. TSWV also replicates in its thrips vector. In contrast, IYSV has a relatively restricted host range and is commonly found only in monocots such as onion, chive and leek. INSV has a more intermediate host range, commonly infecting annual and perennial ornamental crops. Many tospovirus species also infect weeds, which are epidemiologically 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-I). Necrotic and/or chlorotic lesions may also form on stems and wilting of leaves and stems can occur. Young leaves of TSWV-infected plants frequently turn bronze and later develop numerous small, dark brown lesions (Fig. 1A). TSWV-infected plants may develop a one-sided growth habit or the entire plant maybe 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 has occurred produce fruits with chlorotic or necrotic ringspots. In tomatoes, green fruit have slightly raised areas with faint concentric rings (Fig. 1B); on ripe fruit, these turn into obvious 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 undesirable fruit color also may be observed with TSWV infection of pepper. INSV infection induces chlorotic or necrotic ringspots on leaves and stems (Fig. 1F). IYSV infection leads to chlorotic (sometimes with a distinct diamond shape) or necrotic lesions on the seed stalk and bulb leaves of onion, chive and leek (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 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 reactions to antibodies against viral structural proteins. Light microscopy of viral inclusion bodies is also useful for tospovirus diagnosis.

National Pest Alert

Scirtothrips dorsalis Hood

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

Origin and Distribution

Scirtothrips dorsalis was first detected in Highlands County, Florida, in 1991. Sampling indicated *S. dorsalis* had not established a population. Subsequently, *S. dorsalis* was detected on roses from Palm Beach County, Florida in 2005. As of January 2007, *S. dorsalis* have been detected in Florida from Alachua County to Monroe County and South Texas. In the Western Hemisphere, *S. dorsalis* have also been detected in Hawaii and the following locations in the Caribbean: Barbados, Jamaica, St. Lucia, St. Vincent, Tobago and Trinidad.

Host Plants

Scirtothrips dorsalis is a polyphagous species and has been documented to attack more than 100 recorded hosts from about 40 different families. As this pest expands its geographical range additional plants are added to its host range. A summary, by crop type, of some North American hosts is available (Table 1).

Table 1: Host List by Crop Type

Ornamentals	Orchard Crops	Field Crops
Castor Bean	Banana	Asparagus
Celosia	Cashew	Bean
Chrysanthemum	Cherry	Buckwheat
Coleus	Citrus	Cotton
Crape myrtle	Cocoa	Grape
Dahlia	Edible fig	Habanero or scotch bonnet pepper
Euonymus	Ginkgo	Japanese pepper
Geranium	Japanese apricot	Levant cotton
Gerber daisy	Japanese persimmon	Peanut
Camellia	Japanese plum	Soybean
Japanese holly	Mango	Strawberry
Ligustrum	Rubber	Tomato
Lisianthus		
Maple		
Mexican heather		
Petunia		
Pittosporum		
Poinsettia		
Rhododendron		
Rose		
Snapdragon		
Sweet Basil		
Verbena		
Viburnum		
Zinnia		

Description of *Scirtothrips dorsalis*

Field identification of *S. dorsalis* is extremely difficult and often times impossible to differentiate from other thrips in the field. Adults have a pale body with dark wings and are less than 2 mm in length. Immature *S. dorsalis* thrips are pale in color as are the immatures of many other thrips species. Some of the distinguishing characteristics of *S. dorsalis* are as follows: antennae are 8-segmented with segments I–II pale, III–VIII dark; head is pale in color with three pairs of ocellar setae; one pair of ocellar setae occurring between the hind ocelli; one pair of long postocular setae behind the hind ocelli; brown antecostal line and brown area behind line in median ⅓ of abdominal tergites; abdominal sternites with brown antecostal line near anterior margin; forewings brown, paler distally; abdomen with numerous fine microtrichia.

Thrips damage on basil, ivy, and rose.

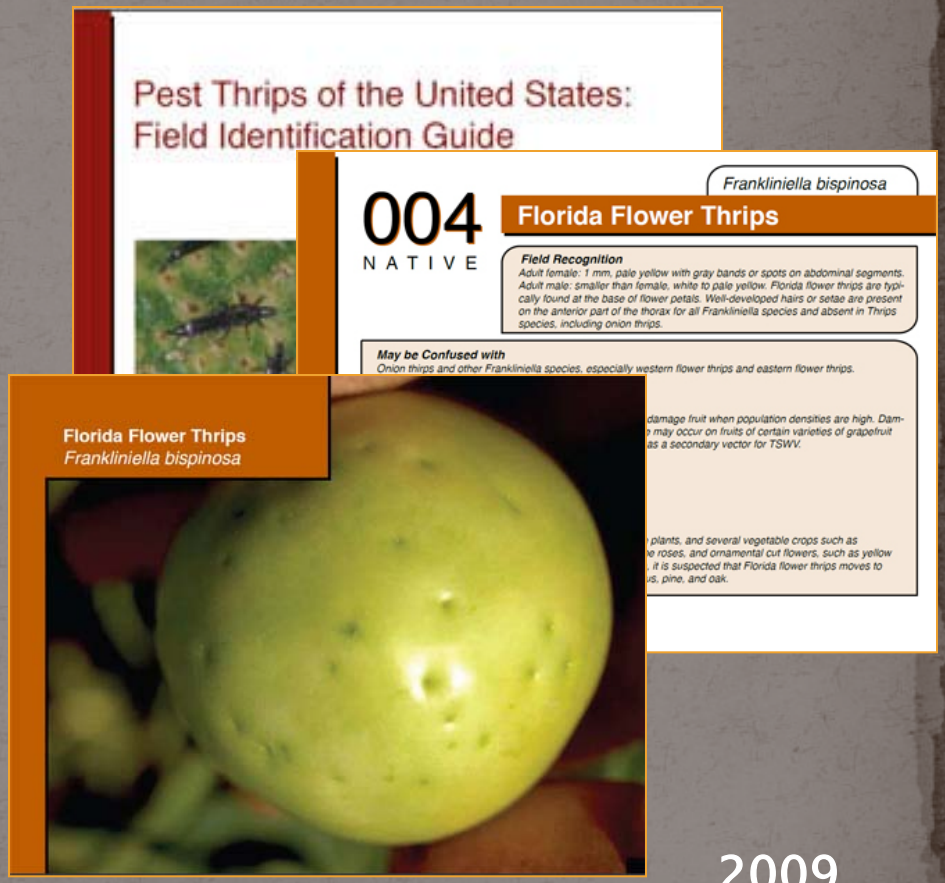
Life Cycle

The life cycle for *S. dorsalis* is similar to that of western flower thrips. Female *S. dorsalis* insert their eggs inside plant tissue. The eggs hatch in 6–8 days. They pass through two larval stages (1st and

Go to: http://www.ncipmc.org/alerts/index.cfm for listing of pest alerts.

Color Copies of Many Pest Alerts Available Upon Request.

Field Identification Decks



2008

40 topics, 113 pages

2009

28 topics, 143 pages

Go to http://www.npdn.org/first_detector

LUCID® Keys

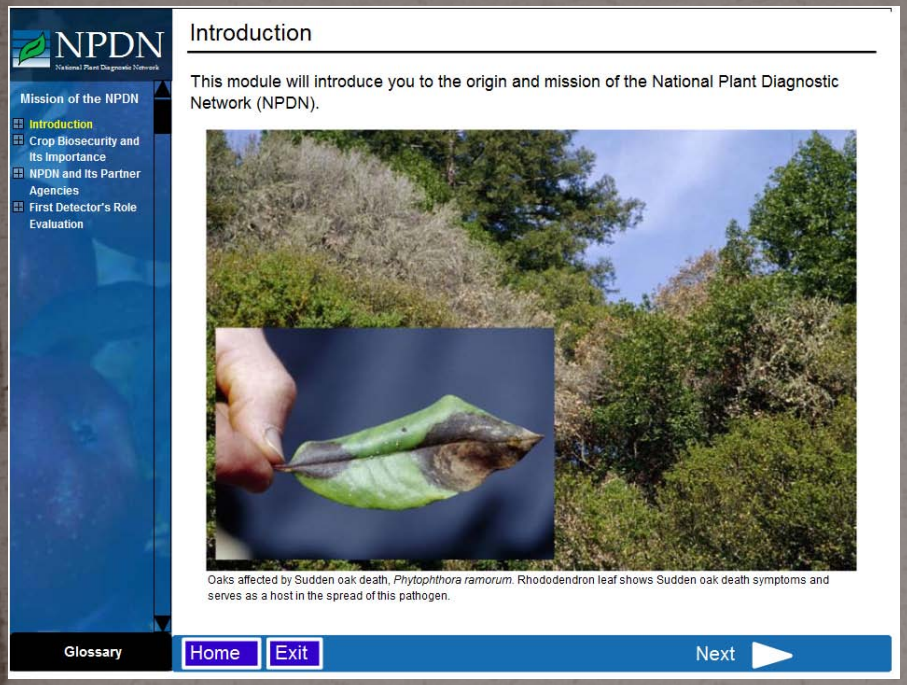
http://itp.lucidcentral.org/id/palms/sap/

NPDN E-Learning

- Crop Biosecurity Course, 2008

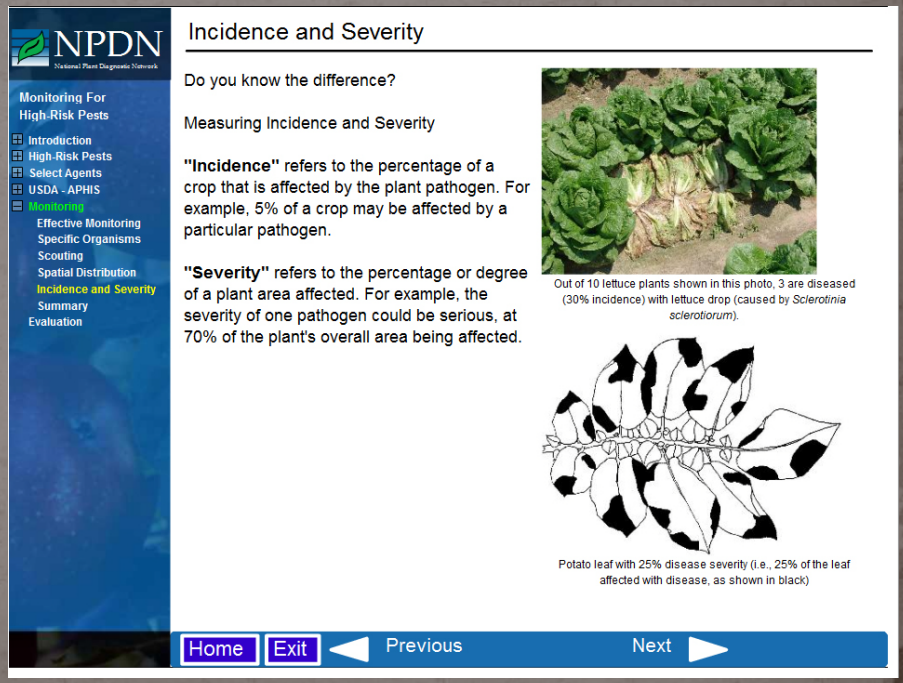
- Special Topic Modules
  - Chilli thrips, *Scirtothrips dorsalis*, 2009
  - *Ralstonia solanacearum* Race 3, biovar 2, 2010
  - Emerald Ash Borer, *Agrilus planipennis,* 2010
  - Entomology Diagnostics Modules, December 2011
- Online at: http://cbc.at.ufl.edu/

Mission of the NPDN



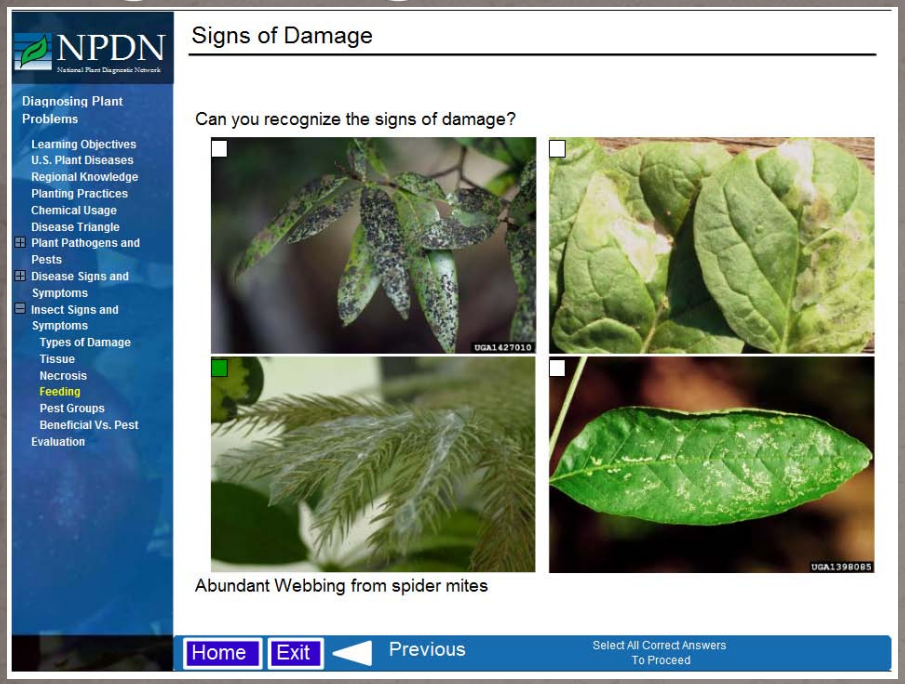
703 Participants

Monitoring for High Risk Pests



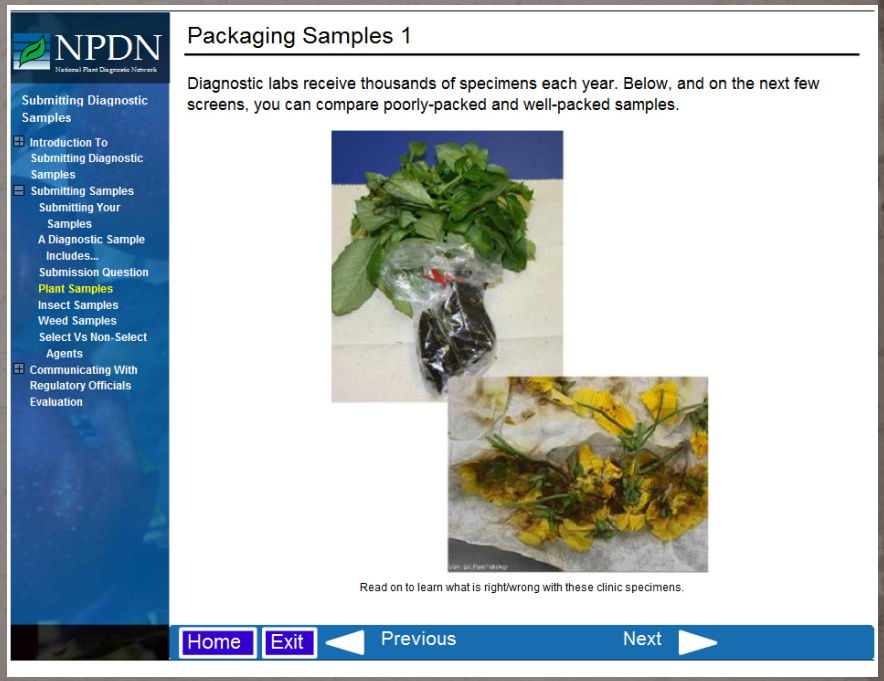
570 Participants

Diagnosing Plant Problems



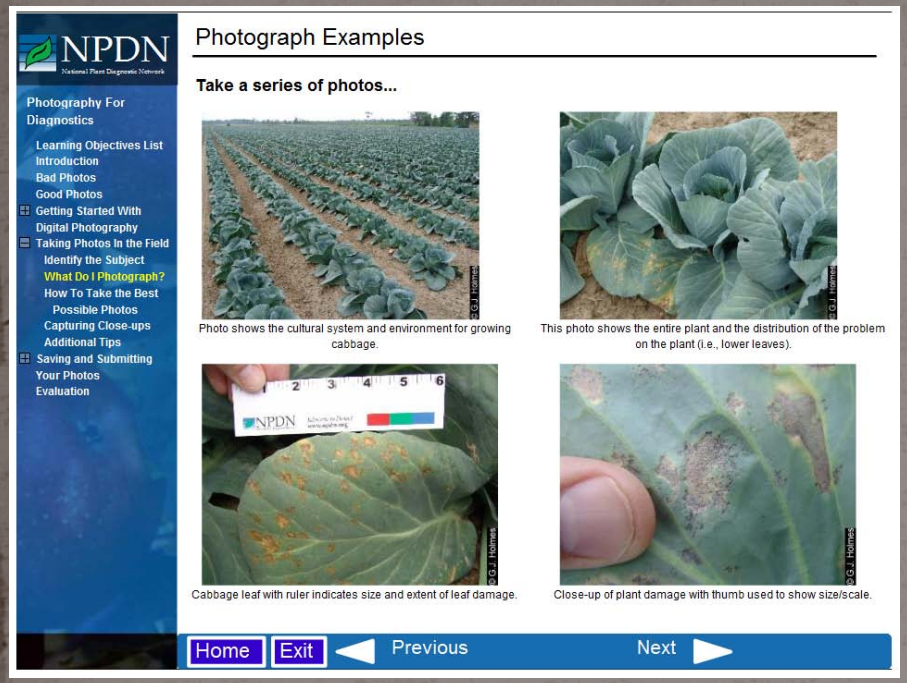
537 Participants

Submitting Diagnostic Samples



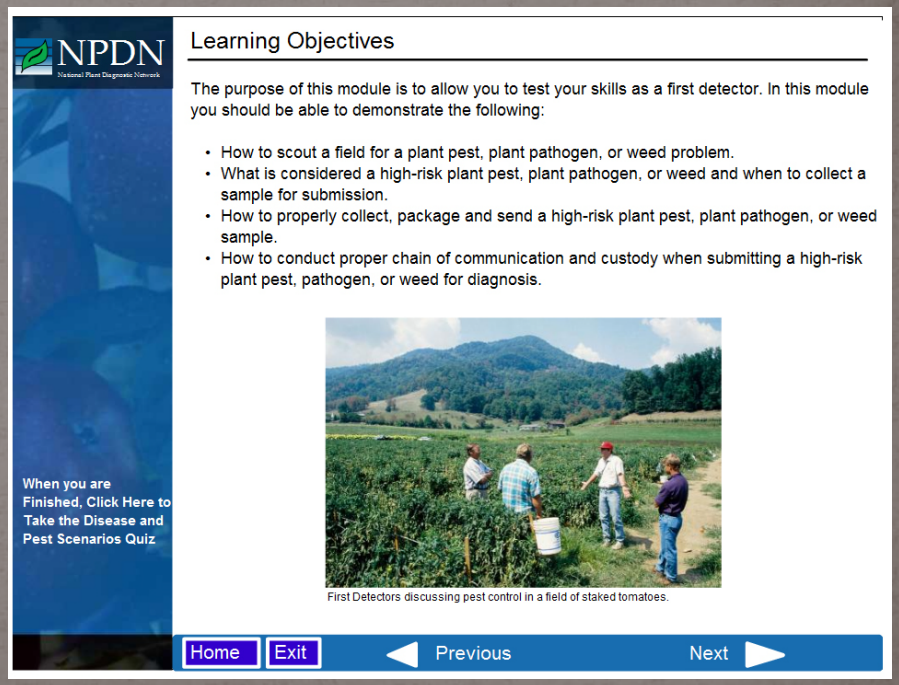
504 Participants

Photography for Diagnosis



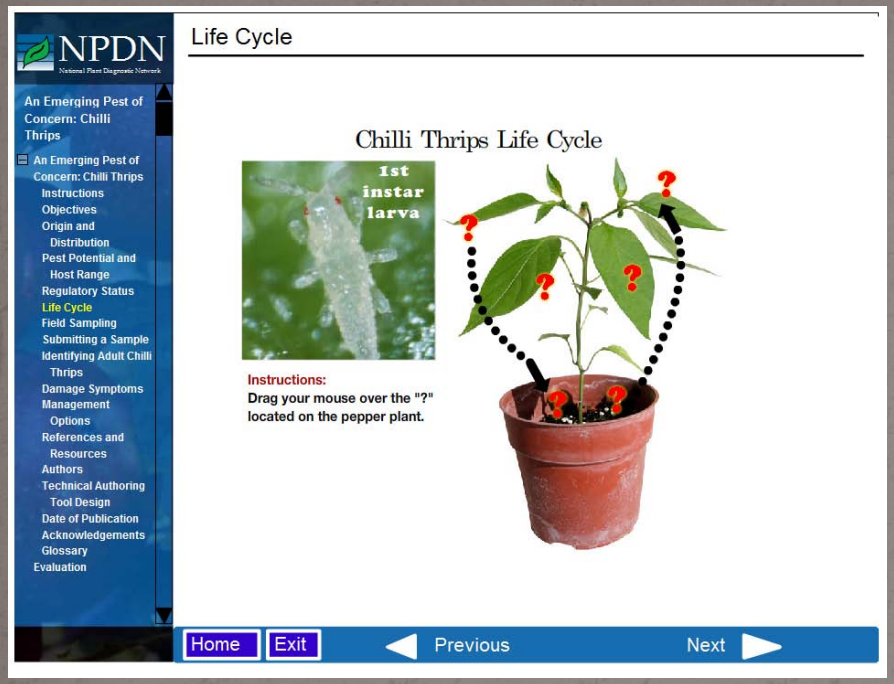
494 Participants

Disease and Pest Scenarios



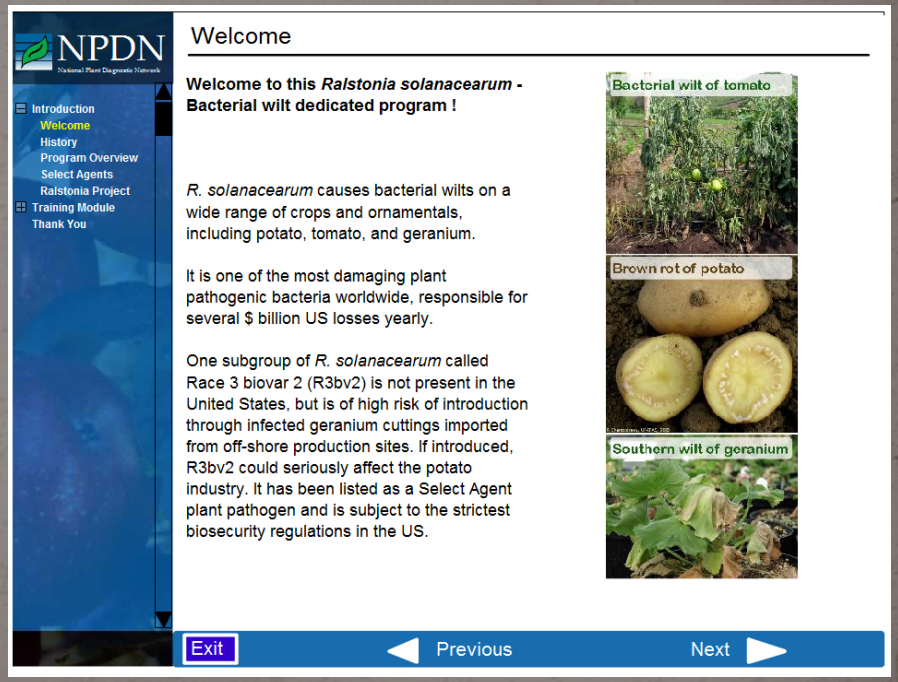
271 Participants

Chilli Thrips



122 Participants

Ralstonia solanacearum



84 Participants

NPDN Training Questions???

Amanda Hodges, Ph.D.
SPDN Associate Director
Assistant Extension Scientist
Entomology & Nematology Department
University of Florida
Office: (352) 273-3957
achodges@ufl.edu

Overview:
Invasive Species that Affect Plants

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Author Credits

- Amanda Hodges, PhD, SPDN Associate Director, NPDN Training and Education Program Area Manager, University of Florida, achodges@ufl.edu
- Stephanie D. Stocks, MS, Protect U.S. Coordinator, University of Florida, sstocks@ufl.edu

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Reviewer Credits

- Stephanie Bloem, Ph.D.
  Risk Analyst - Training Specialist
  USDA-APHIS-PPQ-CPHST
- Rachel L. McCarthy
  Education and Training Coordinator-Northeast Plant Diagnostic Network
  Department of Plant Pathology and Plant-Microbe Biology
  Cornell University
- Julieta Brambila
  Entomologist
  USDA-APHIS-PPQ

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Terminology

- Invasive
- Introduced
- Beneficial
- Non-Native
- Native
- Exotic
- Pest
- Plant Biosecurity

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Native Or Introduced

Click on on rollover the images with your mouse to find out if they are native or introduced.

Exit | Previous | Next

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Learning Objectives

- Name and briefly describe examples of exotic, invasive species that have caused significant damage to U.S. agricultural and natural areas.
  - Weeds
  - Plant Pathogens
  - Arthropods

What are the Issues?

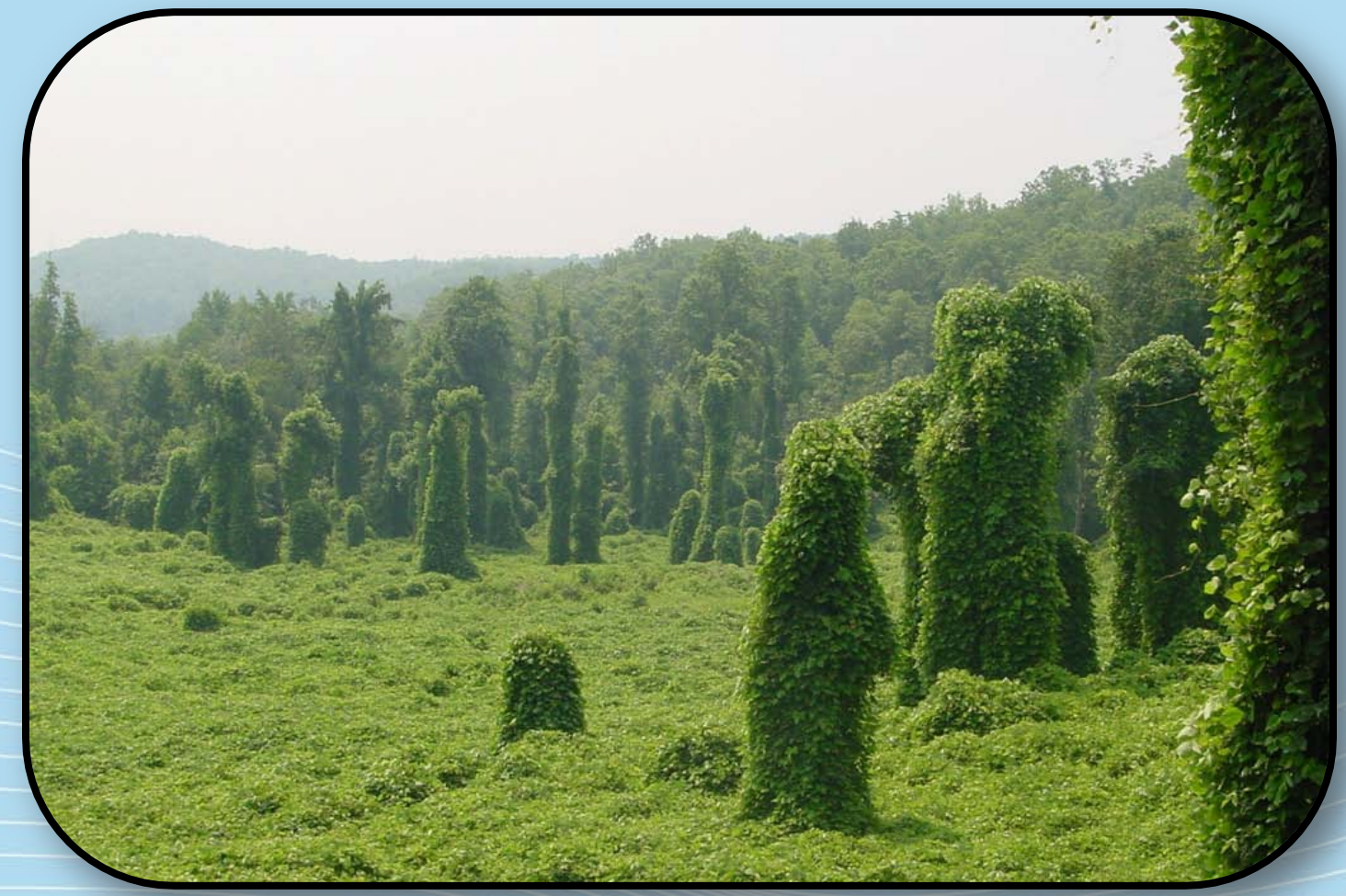


Photo Credit: Kerry Britton, USDA Forest Service
http://www.forestryimages.org/ , Image No. 0002156

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Asian Soybean Rust

- 2004-Detected in U.S.
- Estimated yield losses from 10%-50%
- Kudzu as a potential overwintering source
- ipmPIPE http://www.ipmpipe.org/

Photo Credit: Reid Frederick, USDA ARS
http://www.bugwood.org/, Image No. 1265017

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Emerald Ash Borer
Agrilus planipennis

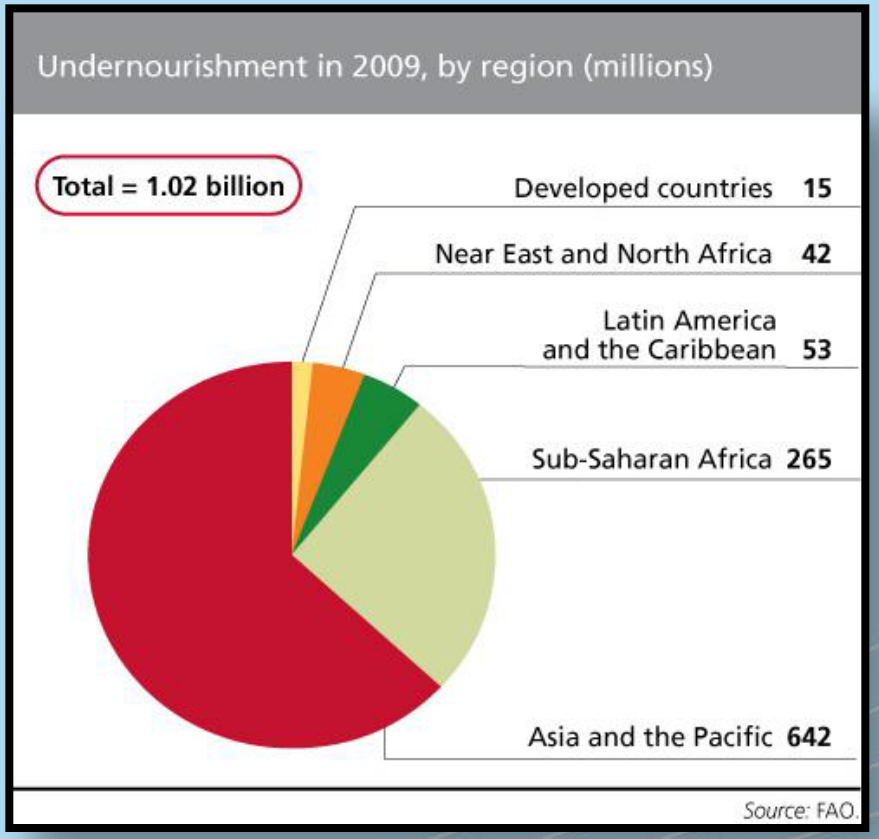
Photo Credit:
Damaged ash trees: Daniel Herms, The Ohio State University, http://www.invasive.org/ Image No. 5171038
Beetle: David Cappaert, Michigan State University, ww.bugwood.org, #2106098

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Learning Objectives

- Overall costs.
- The impact of invasive species on natural areas.
- The importance of exotic, agronomic pests to individuals not involved in the farming profession.
  - Be familiar with exotic pests that could threaten U.S. wheat as an example crop.

Wheat Losses-Who is Affected?



- Developing countries
- Food animal producers
- Everyone

Photo: Jean Robinson, Gainesville, FL
Source of chart: Food and Agriculture Organization of the United Nations 2010
http://www.fao.org/hunger/en/

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Learning Objectives

- Understanding the responsibilities and agencies involved in the following:
  - Regulatory
  - Cooperative Extension
  - Research

Plant Protection in the US- Begins at the Border, Ends with You!

Photo Credit: Department of Homeland Security, Customs and Border Patrol
http://www.cbp.gov/xp/cgov/newsroom/news_releases/archives/2008_news_releases/december_2008/12232008_2.xml

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Learning Objectives

- Understand the importance of the private sector and the general public.

Finding the Module…

- Scripted Presentation
  - http://www.protectingusnow.org/
- E-Learning
  - Link available at: http://www.protectingusnow.org/
  - Module located under “Protect U.S.” at: http://cbc.at.ufl.edu/

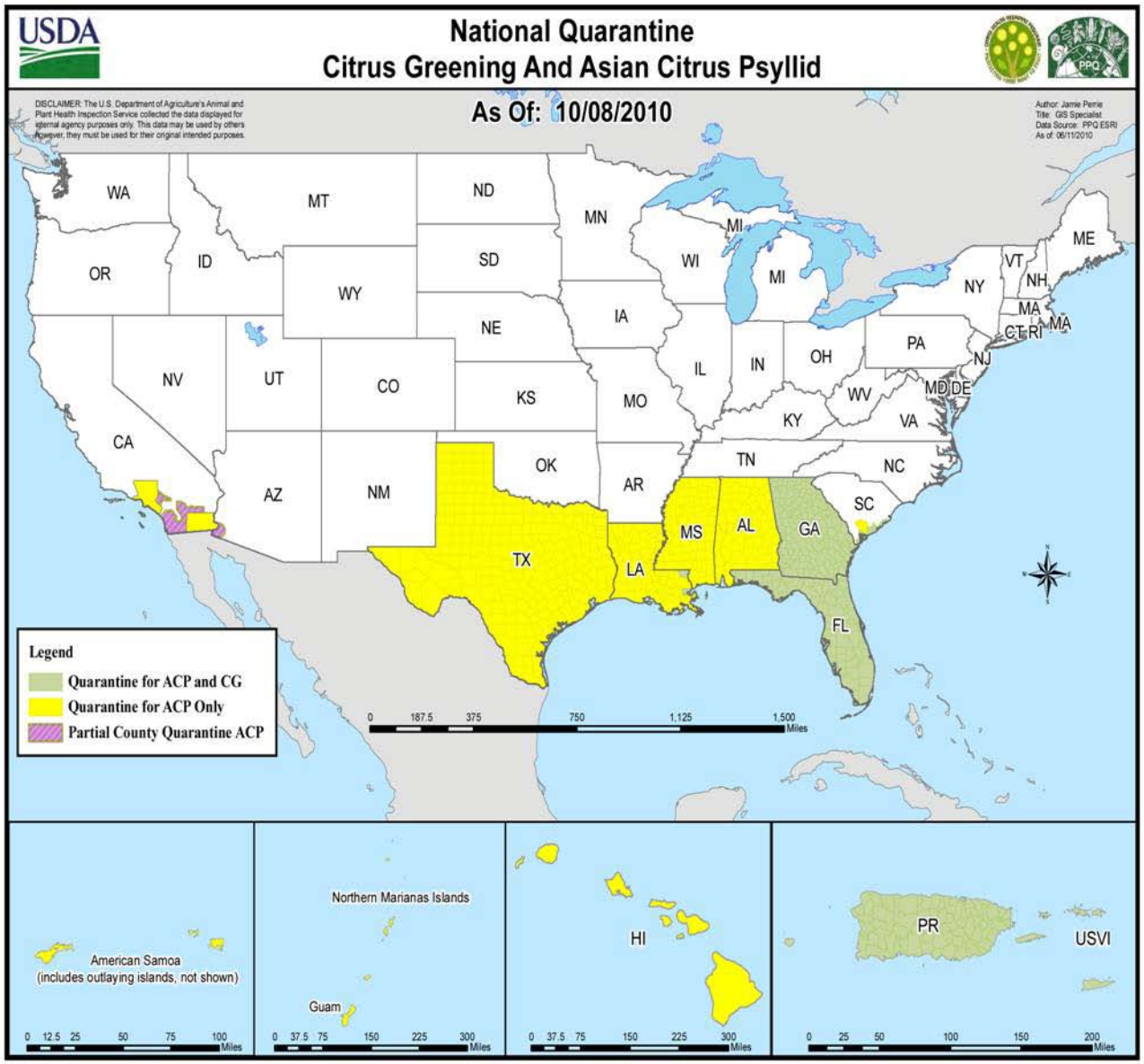
protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

The Asian Citrus Psyllid & Huanglongbing

Natalie Hummel, Ph.D.
Assistant Professor
Extension Specialist
Department of Entomology
LSU AgCenter

LSU AgCenter Research & Extension

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests



Map:
http://www.aphis.usda.gov/plant_health/plant_pest_info/citrus_greening/downloads/pdf_files/nationalquarantinemap.pdf

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Introduction to the disease

- Causal organism and history
- Symptoms in fruit, trees, leaves
- How to distinguish from nutritional deficiencies

Huanglongbing (HLB)

“Yellow dragon” or
“yellow shoot” disease

Dramatic “greening” on fruit

Image credits:
Tree: APS Compendium of Citrus Diseases 2nd edition, used with permission
Fruit: Gottwald et al., used with permission

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Introduction to the vector

- Images of all life-stages
- The lifecycle
- Current range in the United States
- Other vectors of the disease
- How to distinguish from other common citrus pests
- Other hosts for disease
- Scouting video

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Asian Citrus Psyllid

Diaphorina citri

Wings held at 45^{o}angle to leaf/stem

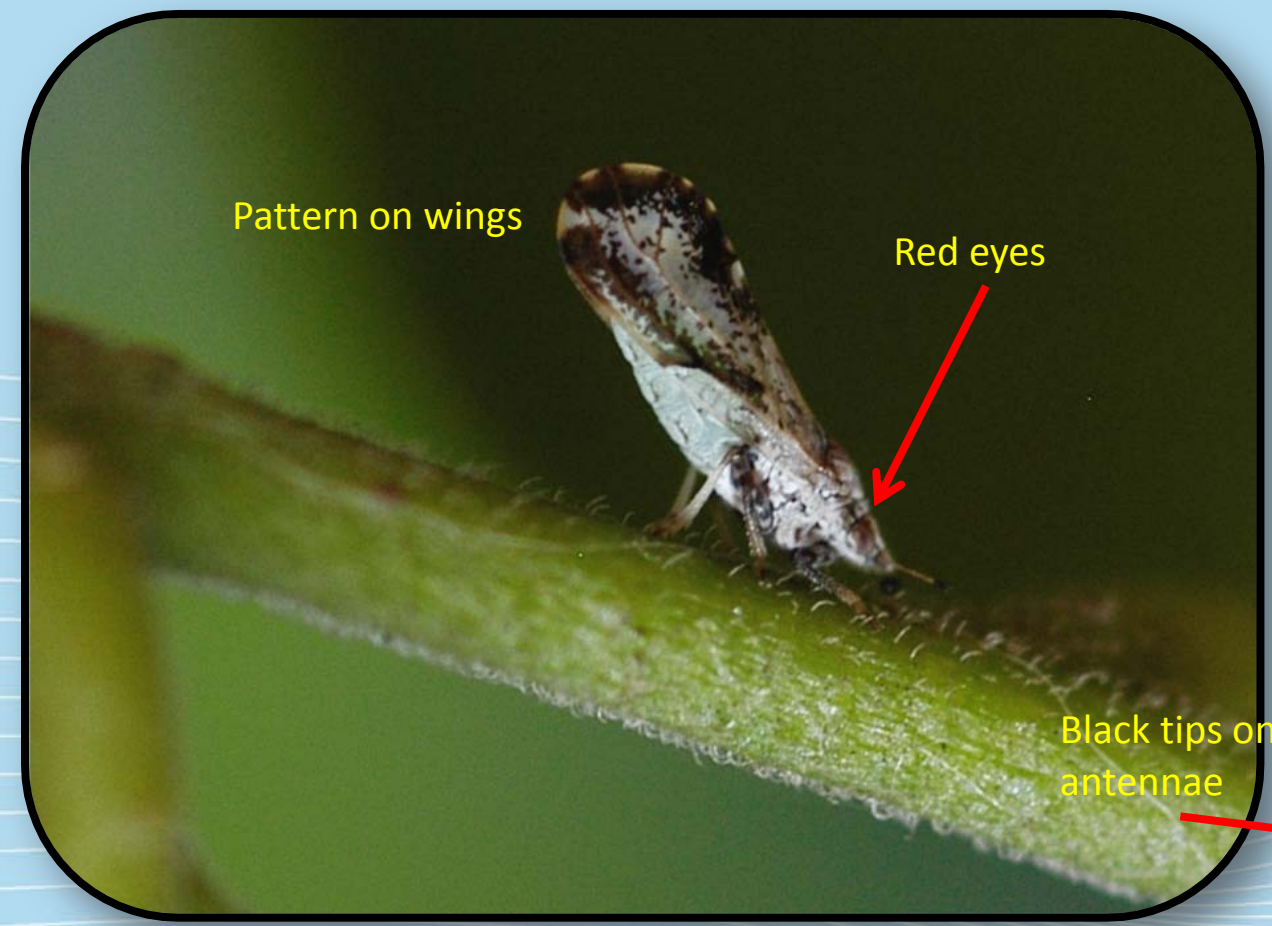


Image credits:
Left: Natalie Hummel, LSU AgCenter
Right: Jeff Lotz, Florida Department of Agriculture and Consumer Services, www.bugwood.org, #5196081

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

There are other insects that attack citrus

Green scale nymph

citrus black fly nymph

Asian citrus psyllid nymph

citrus white fly nymph

Image credits:
Asian citrus psyllid nymph – David Hall, USDA Agricultural Research Service, www.bugwood.org, #5006084
Green scale nymph - Jeffrey W. Lotz, Florida Department of Agriculture and Consumer Services, www.bugwood.org, #5385208
citrus whitefly nymph and citrus blackfly nymph – Florida Division of Plant Industry Archive, www.bugwood.org, #5194033 and #5194011

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Scouting flush for Asian citrus psyllid

Click here to view the video.

Image credits: Stephanie Stocks, University of Florida

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Management of vector

- Basic principles
- IPM strategies
  - Biological control
  - Cultural control
  - Chemical control
  - Organic strategies

Regional control programs

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

What to do if you suspect CG?

- Contact information for federal agencies
- Reporting process

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

References provided

- Also provide contact information for NPDN
- Authors listed – contact us with any questions
- Content reviewer listed

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Benefit of participating with Protect US

- Central portal for information
  - Improves efficiency
- Support to developing online training
  - Updateable
  - Can be accessed at any time by users
  - Provides user feedback

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Questions?

- For more information, check out www.protectingusnow.org

- You can also contact:
  - Stephanie D. Stocks, University of Florida, sstocks@ufl.edu
  - Amanda Hodges, SPDN, University of Florida, achodges@ufl.edu

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Author Credits

- Natalie Hummel, Ph.D
  Assistant Professor
  LSU AgCenter

- Don Ferrin, Ph.D.
  Associate Professor
  LSU AgCenter

- Edited by Stephanie Stocks, Protect U.S. Coordinator, University of Florida

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Recognizing and Responding to Wheat Stem Rust

Erick De Wolf

Kansas State University

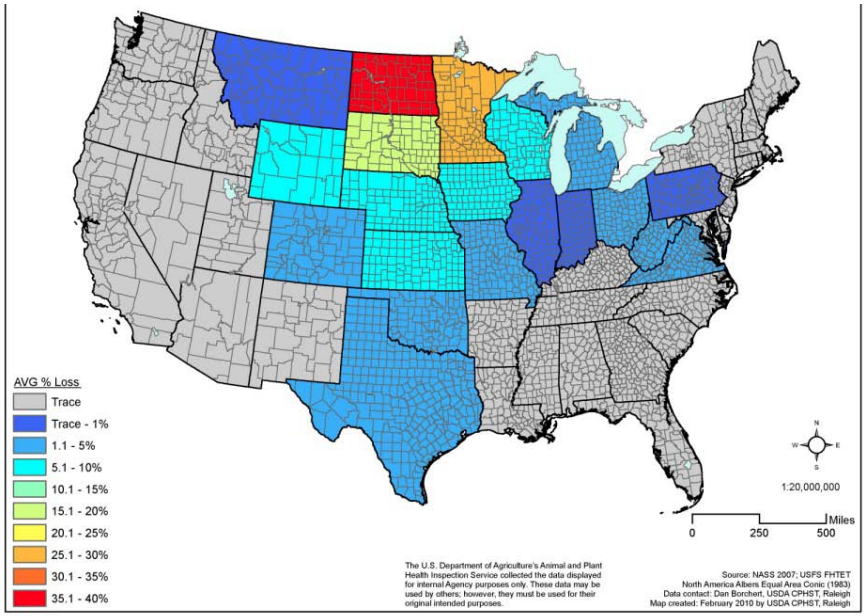
Department of Plant Pathology

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

History of Stem Rust

– Between 1900 and 1960, several severe outbreaks of stem rust occurred in the Great Plains, many Midwestern states, and Canada.

Average crop losses from wheat stem rust in 1919, 1935, and 1954



protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

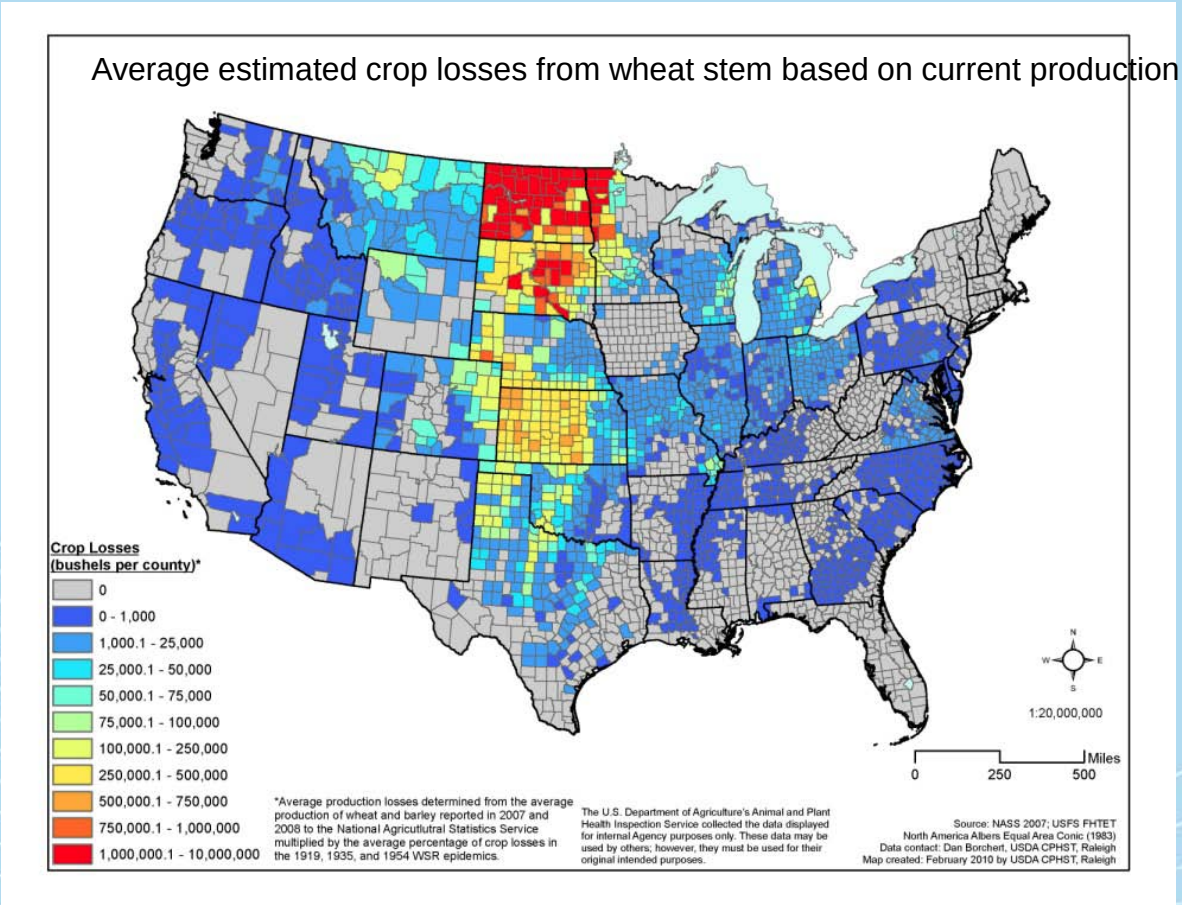
Recent Problems with Stem Rust

- In 1985-1986 more localized outbreaks affected wheat production the southern Great Plains.
- Stem rust also affects barley with recent epidemics occurring in northern Great Plains in1989 and early 1990's

Remerging Threats Stem Rust

- Stem rust has been effectively managed for several decades with genetic resistance
- Each of these historical outbreaks was associated with a change in the population of the fungus that causes stem rust.
- New variants of stem rust have emerged in Africa

Current Estimate of Disease Risk



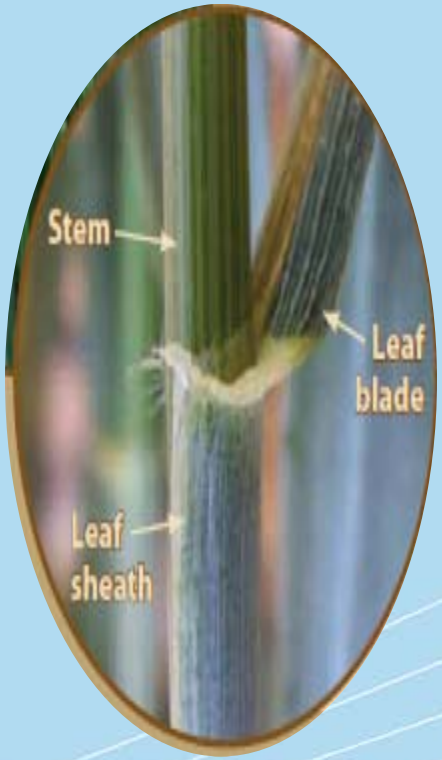
protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Recognizing Stem Rust

- Early detection of stem rust critical to the response in North America
  - Impact wheat breeding priorities and strategies
  - Influence in-season disease management

Recognizing – *Identification of Rust Diseases*

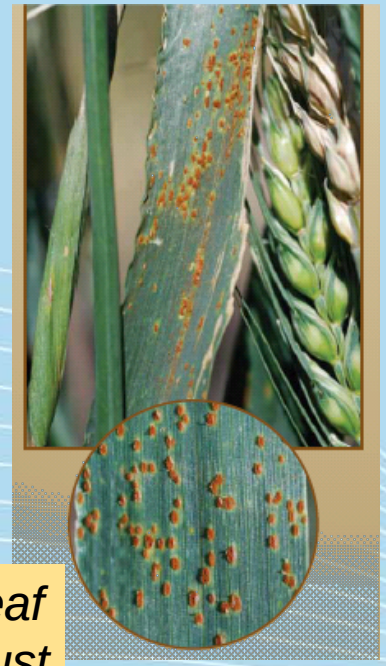
- The vegetative parts of the plant include the:
  - Stem
  - Leaf
  - Leaf sheath
- The leaf sheath wraps around the stem



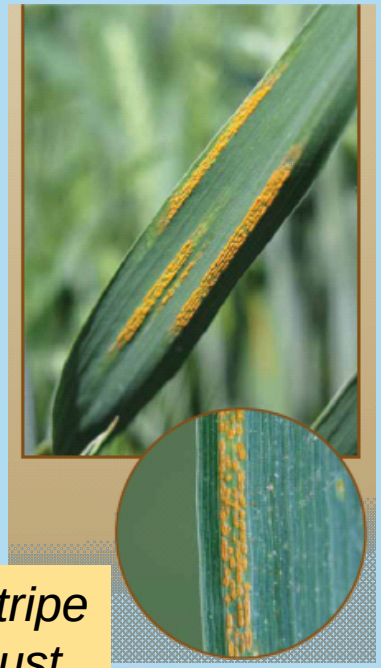
protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Recognizing – *Identification of Rust Diseases*

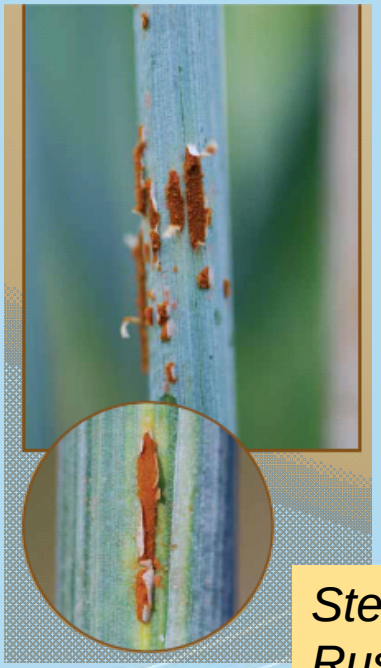
- There are three cereal rusts of concern:



Leaf Rust



Stripe Rust



Stem Rust

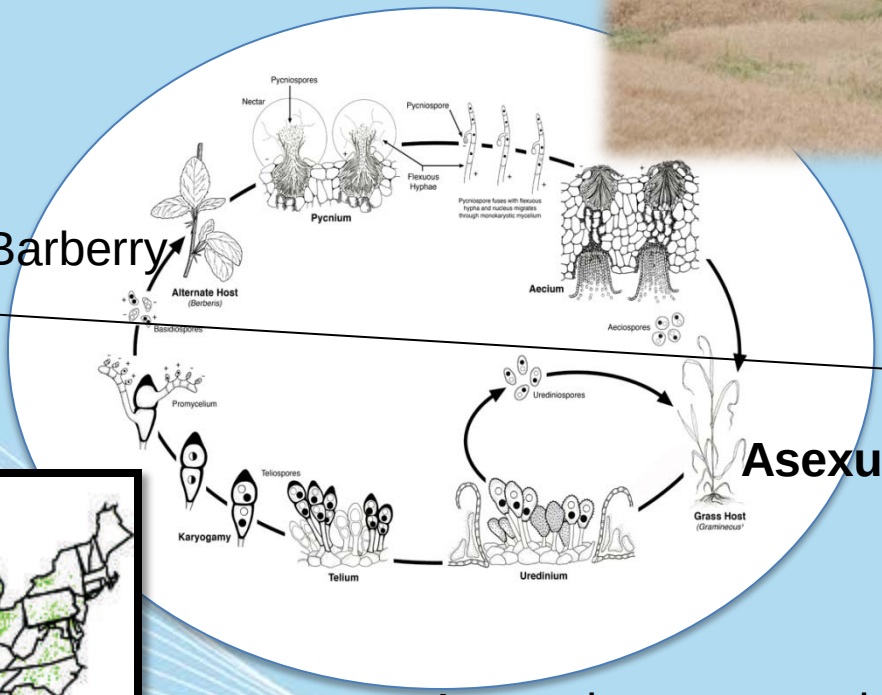
protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Recognizing the Threat –
Wheat Stem Rust Life Cycle

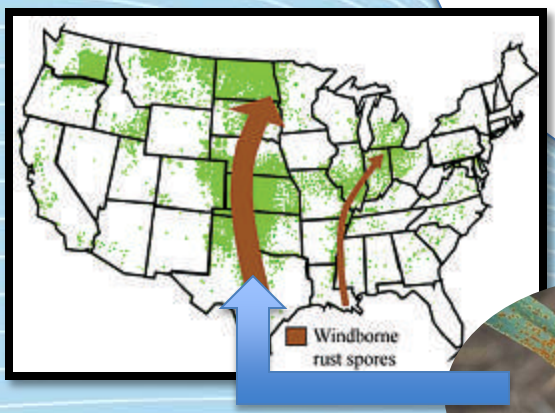
- Two Critical Stages

Barberry in a fencerow between wheat fields.

Sexual stage: on Barberry



Asexual stage: on Wheat and Ba



Asexual spores can blown northward relatively quickly, moving from Texas to North Dakota in two to three months

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Responding

- For additional assistance identifying diseases of wheat or barley contact the state partner lab to NPDN or your local county extension office
- You can find a your state's NPDN lab by linking here:

NPDN National Plant Diagnostic Network

http://www.npdn.org
(the list is near the end of the page)

- You can find your local count extension office my linking here:

USDA United States Department of Agriculture
National Institute of Food and Agriculture

http://nifa.usda.gov/Extension/index.html

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Responding

- Early recognition and reporting of suspicious samples will allow appropriate grower responses to minimize spread and crop loss!

Enabling the deployment of Squirrel Force 7

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Additional information resources

- For states of the U.S. that grow wheat and barley:
- Other sources if information:
  - USDA Cereal Disease Lab, St. Paul, MN
  - Borlaug Global Rust Initiative

Questions?

- For more information, check out www.protectingusnow.org

- You can also contact:
  - Stephanie D. Stocks, University of Florida, sstocks@ufl.edu
  - Amanda Hodges, SPDN, University of Florida, achodges@ufl.edu

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Please allow us a few minutes to load the next batch of presentations

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Laurel Wilt and the Redbay Ambrosia Beetle: A new threat to southern ecosystems and guacamole

Carrie Lapaire Harmon

Southern Plant Diagnostic Network

and

University of Florida Department of Plant Pathology

What you need to know now

- Laurel Wilt affects redbay (*Persea borbonia),* an important species for coastal wildlife, and avocado (*Persea americana*), an important subtropical world crop.

- The disease is associated with an exotic ambrosia beetle (*Xyleborus glabratus)* and caused by a fungus (*Raffaelea lauricola).*

- Symptoms and signs of the disease and insect include wilted foliage, vascular discoloration, and sawdust tubes.

- The disease has been detected in Georgia, South Carolina, Florida, and Mississippi.

- No effective management tools currently exist for complete control of the disease

The host: Redbay *Persea borbonia*

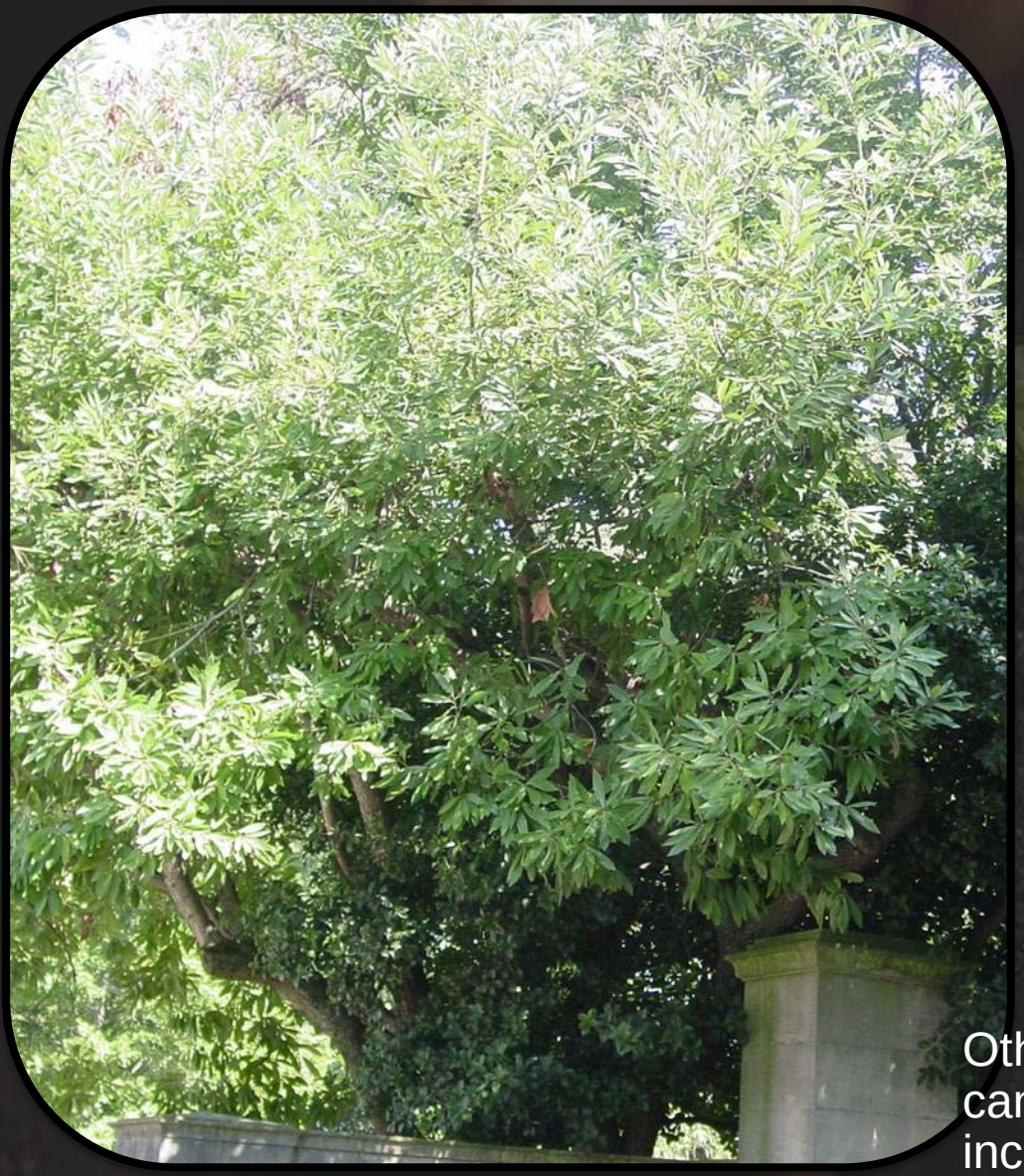


Image credit:
Gary Wade, University of Georgia

Image credit:
Ann Murray, University of Florida

Other members of the Lauraceae family can also be affected by the disease including: sassafras (*Sassafras albidum)*, spicebush (*Lindera benzoin*), and swamp bay (*Persea palustris*).

Infected redbays, starting in 2003

Image credit:
James Johnson, Georgia Forestry Commission, www.bugwood.org, #2110024

Save the guac!

Avocado, *Persea americana*

"Simmonds" avocado 20 days after inoculation

Image credit:
Florida Department of Agriculture and Consumer Services, Division of Plant Industry

http://www.savetheguac.com/

Impact

Image credit:
CL Harmon, University of Florida

15 weeks

New! *Raffaelea lauricola*

The fungal pathogen on APDA at 2 weeks

Image credit:
CL Harmon, University of Florida

Redbay ambrosia beetle *Xyleborus glabratus*

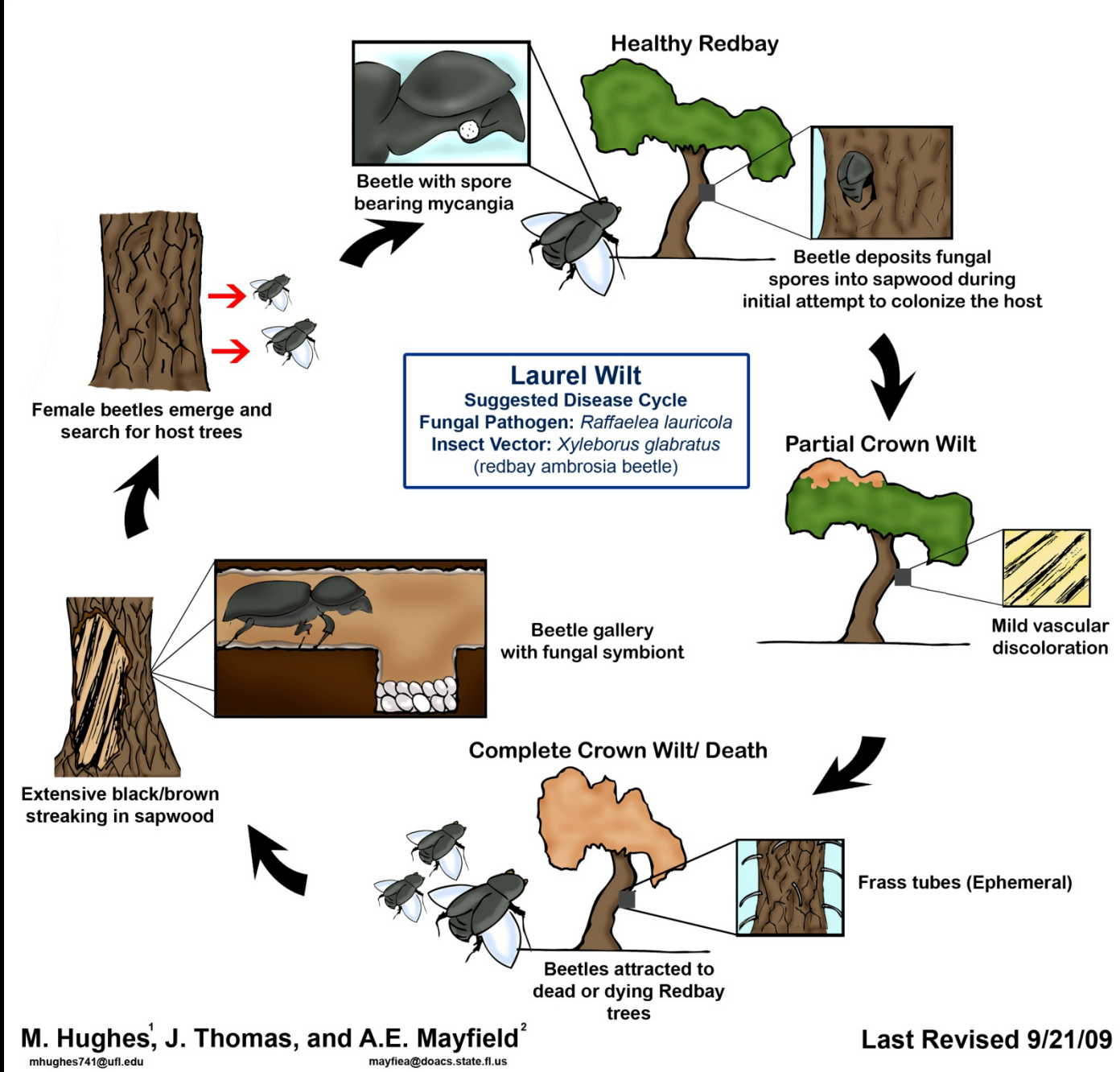
- Exotic beetle from Asia
- Native hosts include:
  - Lauraceae : *Phoebe lanceolata, Lindera latifolia, Litsaea elongata*
  - Fagaceae: *Lithocarpus edulis*
  - Fabaceae: *Leucaena glauca*
  - Dipterocarpaceae: *Shorea robusta*

Redbay ambrosia beetle
Xyleborus glabratus

Image credit:
Top right: M. C. Thomas, Florida Department of Agriculture and Consumer Services, www.bugwood.org, #1413004
Bottom Right: Andrew Derksen, Florida Department of Agriculture and Consumer Services, www.bugwood.org, #5411465
Left: M. C. Thomas, Florida Department of Agriculture and Consumer Services, www.bugwood.org, #1413003

Image credit:
Jeffrey Lotz, Florida Department of Agriculture and Consumer Services, Division of Plant Industry

Disease Cycle

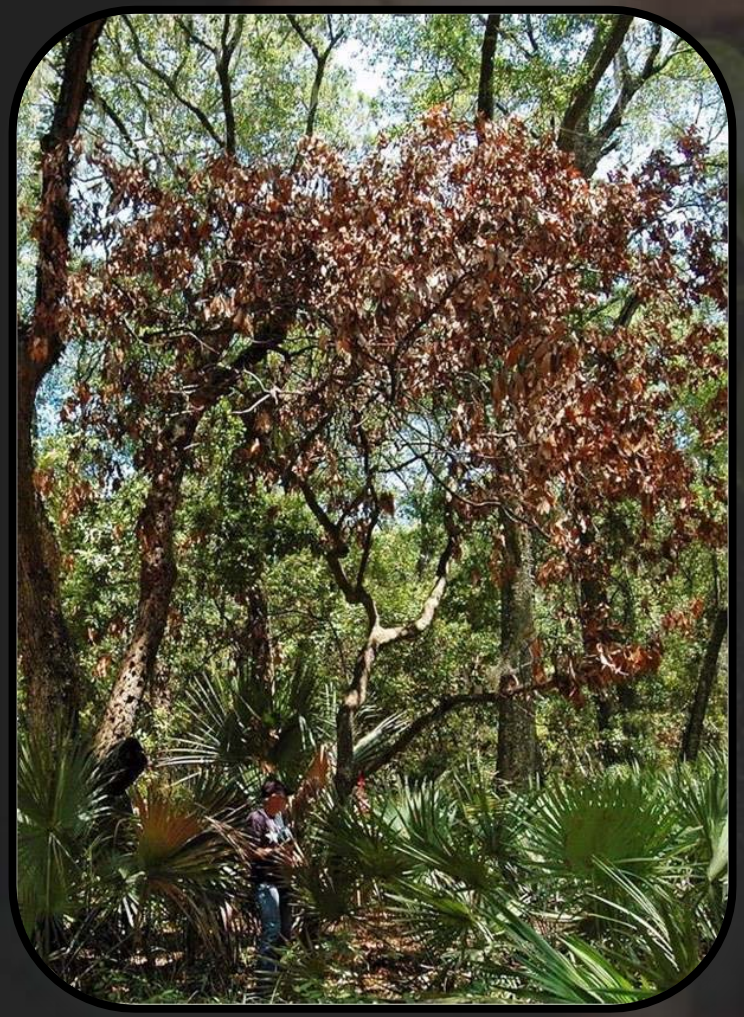


M. Hughes[1], J. Thomas, and A.E. Mayfield[2]
mhughes741@ufl.edu
mayfiea@doacs.state.fl.us

Last Revised 9/21/09

[1]University of Florida, Institute of Food and Agricultural Sciences, Department of Plant Pathology, P.O. Box 110680, Gainesville, FL 32611
[2]Florida Department of Agriculture and Consumer Services, Division of Forestry, 1911 SW 34th Street, Gainesville, FL 32608

Symptoms of the Disease



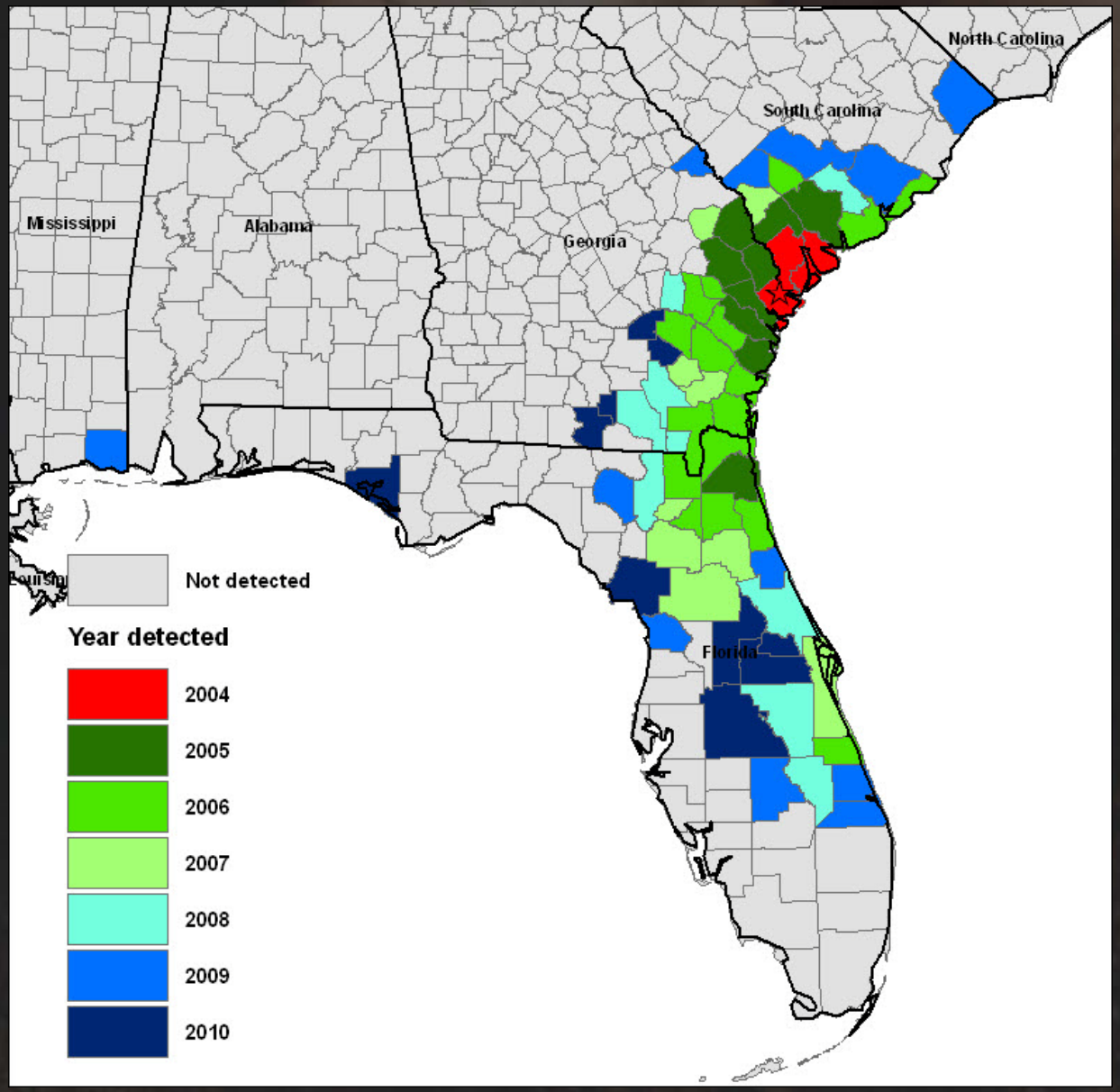
- Leaves turn reddish and remain on the tree for a while.
- Dark streaking underneath the bark (vascular tissue)

Image credit:
Left: Ronald F. Billings, Texas Forest Service, www.bugwood.org, #5383213
Right: A. Mayfield, Florida Department of Agriculture and Consumer Services, www.bugwood.org, #2199084

Signs of the vector

Image credit:
Top left: Albert (Bud) Mayfield, Florida Department of Agriculture and Consumer Services, www.bugwood.org, #2199086
Bottom left: James Johnson, Georgia Forestry Commission, www.bugwood.org, #2109039
Right: Albert Mayfield, Florida Department of Agriculture and Consumer Services, www.bugwood.org, #2199082

Distribution in the US



Four states have confirmed the disease as of December 2010: South Carolina, Georgia, Florida, and Mississippi.

Map provided by Jeff Eickwort, Forest Biologist, Florida Department of Agriculture and Consumer Services, Division of Forestry.

Management

- Correct identification of the pathogen (and its vector) are of paramount importance in any management of a disease

- There are several barriers to the treatment of this disease
  - The beetle is a powerful flier
  - By the time symptoms appear, the beetle has likely infected many trees in the area
  - Pesticide use against the beetle is not recommended due to the numerous off-target species that would be affected
  - Biological controls are not known at this time
  - Human movement of infested plant material is aiding the long-distance spread of the vector.
  - Fungicide root infusions are expensive, only work for high-value single trees, and must be reapplied on a regular basis. Some phytotoxicity has been noted to some fungicide products.

- The suggestions made for treating or halting the spread of this disease are based on similar treatments for wilt diseases of other trees.

You can help

- Submit samples to your NPDN laboratory if you see a wilted canopy, entry holes, and dark streaking under the bark.
  - **Submit fresh 1-2 inch pieces of sapwood with the streaking, taken from about chest-high on the affected tree. Place the pieces in a zip-top bag and keep the bag cool (cooler or refrigerator) until it can be delivered to the laboratory via overnight or 2-day mail service.**
- Remind people not to transport mulch, firewood, etc.
- Direct questions to the Forest Health Protection site: http://www.fs.fed.us/r8/foresthealth/laurelwilt/index.shtml

For more information, check out the brand-new full-length Laurel Wilt module (with videos!) at www.protectingusnow.org

UNIVERSITY OF FLORIDA

SPDN
Southern Plant Diagnostic Network

Plant Biosecurity

Stephanie Stocks
Protect U.S. Coordinator
University of Florida

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Scripted Presentation

- Learning objectives
  - What does plant biosecurity mean?
  - Food supplies fluctuate due to many factors (weather, pests, disease, etc.)
  - How would you be affected if there was a food shortage?
  - What food demands do we expect in the future and do we have enough resources to do it all?

Scripted Presentation

- Learning objectives
  - What happens if somebody introduced a disease or pest on purpose?
    - Agroterrorism in the 20th century
      - World War II examples of rinderpest, anthrax, and glanders infections
      - Arab Revolutionary Council
      - Gosh Etzion
  - What is a select agent?

Scripted Presentation

- Learning objectives
  - What are USDA-APHIS-PPQ Select Agent and Toxin List
    - *Peronosclerospora philippinensis (Peronosclerospora sacchari)*
    - *Sclerophthora rayssiae var zeae*
    - *Phoma glycinicola* (formerly *Pyrenochaeta glycines*)
    - *Ralstonia solanacearum* race 3, biovar 2
    - *Rathayibacter toxicus*
    - *Synchytrium endobioticum*
    - *Xylella fastidiosa* (citrus variegated chlorosis strain)
    - *Xanthomonas oryzae*
      - What are they, what do they do, where are they, etc.

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Updates

- Rough draft created by Amanda Hodges and Stephanie Stocks
- Submitted to Jim Stack (Kansas State University) who has agreed to co-author the presentation
- Once the final draft is ready, submitted to 3-4 technical reviewers and 1 non-technical reviewer

E-Learning Module

- Once all the reviews are back and changes are made, the e-learning module will be created
- Work with the authors to create interactives such as quizzes, choose the correct picture, rollover to find the information, distribution maps, etc.
- These will also be submitted to 3-4 technical and 1 non-technical reviewer

Lesson plan

- Target grades 9-12
- Includes: Scripted presentation for the teacher to use, handout(s) for the students, activity for the students (experiential), and e-learning module with associated quiz
- Locally tested?

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Lesson plan

- Targeting NSES Life Science Standard: The Interdependence of Organisms
  - Living organisms have the capacity to produce populations of infinite size, but environments and resources are finite. This fundamental tension has profound effects on the interactions between organisms.
  - Human beings live within the world's ecosystems. Increasingly, humans modify ecosystems as a result of population growth, technology, and consumption. Human destruction of habitats through direct harvesting, pollution, atmospheric changes, and other factors is threatening current global stability, and if not addressed, ecosystems will be irreversibly affected.
- Can also include Natural Selection (life science standard), Science as Inquiry, Science and Technology, and Science in personal and Social Perspectives

Future E-Learning Modules and Project Direction

Susan T. Ratcliffe

Director, North Central IPM Center

University of Illinois Urbana-Champaign

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

E-LEARNING MODULES

Coming in 2011

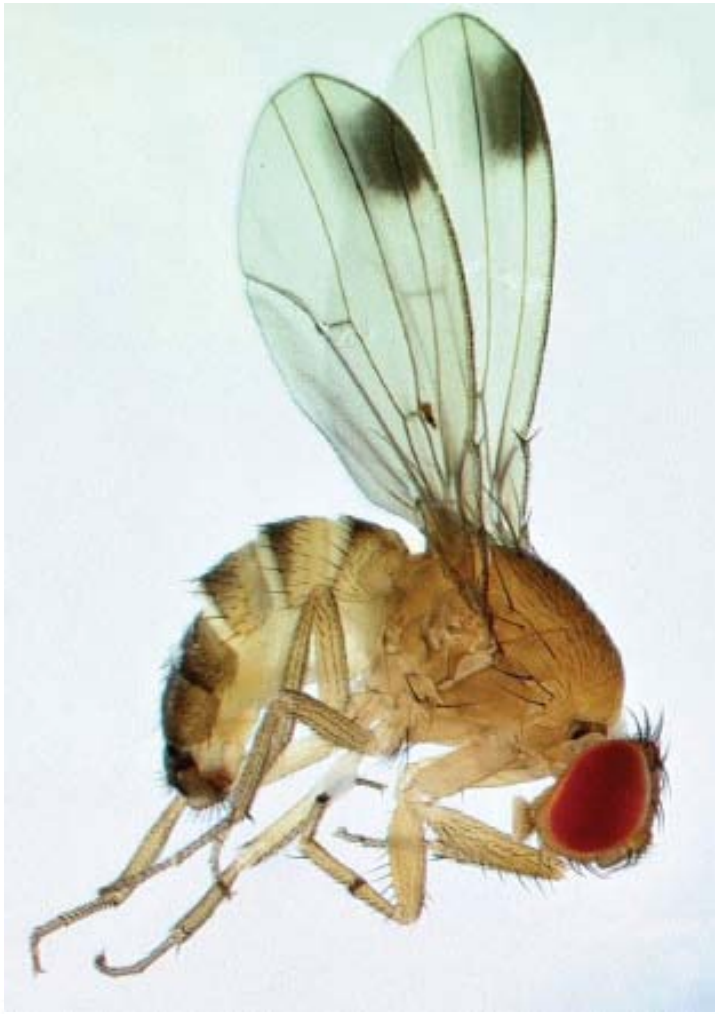
protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Giant African Snail

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Yuri Yashin, achatina.ru, Bugwood.org

Spotted Wing Drosophila



protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Gorak Arakelian

Exotic Pests of Concern for Ornamental Plants

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Charles T. Bryson, USDA Agricultural Research Service, Bugwood.org

Thousand Cankers Disease

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Whitney Cranshaw, Colorado State University, Bugwood.org

Potato Psyllids and their Pathogen Vectoring Concerns

Developed by Susan Halbert, FL Dept. of Agriculture and Consumer Sciences

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Whitney Cranshaw, Colorado State University, Bugwood.org

Common and Exotic Pests of Concern for Stonefruits

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Carroll E. Younce, USDA Agricultural Research Service, Bugwood.org

DEVELOPMENT OF FUTURE MODULES FOR INVASIVE PLANT PESTS AND ANIMAL BIOSECURITY

As funding permits, additional modules will be added to the site. If you are interested in developing an e-learning module, contact Amanda Hodges at achodges@ufl.edu.

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Protect U.S. personnel will be contacting individuals to assist with content development and module reviews.

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests

Central Science Laboratory, Harpenden Archive, British Crown, Bugwood.org

To view author guidelines, visit www.protectingusnow.org

protect u.s.
community invasive species network
First Detectors Protecting U.S. from Pests