2015 Southern Plant Board Meeting  
April 26 - 29, 2015  
Omni Hotel  
Richmond, Virginia

**Sunday, April 26**

4:00 – 7:00  
Registration – James River Ballroom Foyer (2nd Floor)

6:00 – 8:00  
Southern Plant Board Reception – James River Ballroom Foyer (2nd Floor)

**Monday, April 27**

8:00 – 8:15  
Southern Plant Board Opening Session
  • Call to Order
  *Mike Evans, Georgia Department of Agriculture*
  • Roll Call
  *Kenneth Calcote, Mississippi Department of Agriculture and Commerce*
  • General Meeting Announcements
  *Larry Nichols, Virginia Department of Agriculture & Consumer Services*

8:15 – 8:45  
Welcome to Virginia
  *The Honorable Todd Haymore, Secretary of Agriculture and Forestry*

8:45 – 9:00  
Opening Comments
  *Mike Evans, Georgia Department of Agriculture*

9:00 – 10:00  
Agency Reports:
  • USDA APHIS PPQ
    *Rebecca Bech, USDA APHIS PPQ*
  • National Plant Board
    *Geir Frisoe, NPB President/Minnesota Department of Agriculture*
  • Customs and Border Protection
    *Kevin Harriger, U.S. Customs & Border Protection*
  • Horticultural Inspection Society – Southern Chapter
    *Allison Olofoson, Texas Department of Agriculture*

10:00 – 10:30  
Break

10:30 – 11:00  
Agency Reports (continued)

11:00 – 11:15  
Enhanced Efficiency Through the Use of Tablet Technology
  *Jarred Driscoll, North Carolina Department of Agriculture & Consumer Services*

11:15 – 12:00  
State Reports – AL, AR, FL, GA, LA, KY, MS

12:00 – 1:15  
Lunch (Provided)
Monday, April 27 (Continued)

1:15 – 5:00  CAPS Breakout Session

1:15 – 2:00  State Reports – NC, OK, PR, SC, TN, TX, VA

2:00 – 2:30  SANC Update
    Gray Haun, Tennessee Department of Agriculture
    Larry Nichols, Virginia Department of Agriculture & Consumer Services

2:30 – 2:50  Update – Citrus Pests
    Leon Bunce, USDA APHIS PPQ

2:50 – 3:15  Break

3:15 – 3:45  Sweet Potato Regulatory Program
    • Regulatory Program Update
      Tad Hardy, Louisiana Department of Agriculture & Forestry
    • North Carolina Eradication Project
      Alonso Suazo, NC Department of Agriculture & Consumer Services

3:45 – 4:30  Bioenergy Crops
    • Bioenergy As a Source of New Invaders: Assessing the Risk of New Crops
      Dr. Jacob Barney, Virginia Tech
    • Regulatory Programs in Mississippi
      Kenneth Calcote, Mississippi Department of Agriculture and Commerce

Dinner (Own your own)

Tuesday, April 28

8:00 – 8:20  State Preparation for the Next Plant Pest Infestation - The Florida Experience
             Leroy Whilby, Florida Department of Agriculture & Consumer Services

8:20 – 8:45  State Nursery Inspection Programs
             Joe Collins, University of Kentucky
             Gray Haun – Tennessee Department of Agriculture

8:45 – 9:10  Boxwood Blight – Insecticide Efficacy and Sterilization Tests
             Norman Dart, Virginia Department of Agriculture & Consumer Services

9:10 – 9:30  CAPS Report
             Sherry Aultman, Department of Plant Industry, Clemson University

9:30 – 10:00  Spotted Lanternfly Detection in Pennsylvania
             Dana Rhodes, Pennsylvania Department of Agriculture

10:00 – 10:30  Break
Tuesday, April 28 (Continued)

10:30 – 11:30  Pollinator Issues
   • Insecticides in the Hive
     Keith Tignor, State Apiarist, Virginia Department of Agriculture & Consumer Services
   • Honeybee Colony and Citrus Grove Tracker
     Wayne Dixon, Florida Department of Agriculture & Consumer Services
   • Update on Pollinator Plans
     Clinton Shettle, Virginia Department of Agriculture & Consumer Services

12:00 – 6:00  Field Trip – Monticello
              Tour of Thomas Jefferson's Monticello Home and Grounds

Dinner (Own your own)

Wednesday, April 29

8:00 – 12:00  SPB Business Meeting
8:00 – 12:00  CAPS Breakout Session
8:00 – 12:00  APHIS PPQ Breakout Session
10:00 – 10:30  Break
Field Operations Goals

- PPQ’s priorities
- Positioning Field Operations for the future
- Key leadership positions

Funding and solutions

- Overarching budget
- Field Operations budget
- Funding for cooperators

Agriculture Quarantine Inspection

- Risk-based sampling
- Cold treatment project
- Irradiation
- Partnerships

Program Highlights

- Emerald ash borer
- Phytophthora ramorum
- Fruit flies
- Old world bollworm

Domestic and Emergency Programs

- Program highlights
- Tribal partnerships
Tribal Partnerships

- Funding and capacity building
  - Survey and detection
  - Emergency preparedness and response
- 2015 Initiatives
  - Cooperative agreements
  - Memorandum of Understanding
  - Incident Command System

Thank you!

Questions?
Southern Plant Board
Regional Meeting
Richmond, Virginia

Facts About Virginia

- First peanuts ever grown in the US were in Virginia.
- The US Government is the largest employer with about 25% of all Virginians working for the government.
- The first Thanksgiving in North America was held in Virginia in 1619. There were no Indians invited nor women.
- When George Washington, age 23 ran for the House of Burgesses in 1758 he provided the following at a rally:
  - 47 gallons of beer
  - 70 gallons of rum
  - 34.5 gallons of wine
  - 2 gallons of cider and
  - 3.5 pints of brandy

Virginia has the highest percent population with vanity license plates at about 16%.

First-ever recorded college campus streaking occurred at Washington College in 1804 by George William Crump who later became a US Congressman for Virginia.

What happened to the Northern tip of Virginia? Why is part of the Maryland east coast line in Virginia? Why is there a jog in the southern border just east of Bristol?
Virginia NE boundary follows the Potomac river, taking the smaller north branch. West Virginia seceded from Virginia and voted to join the Union in 1863. Congress gave WV 3 counties from Virginia.

Southern tip of MD peninsula settled by Virginia plantation owners. Border was to have been line due east of Watkins point. Survey started and drifted north. Jog in the southern border is also a survey error, with a 2 mile jog and a slow 5 mile northerly drift.

EXECUTIVE COMMITTEE

President – Geir Y. Friisoe (MN)
Vice President – Wayne Dixon (FL)
Secretary/Treasurer – Ann Gibbs (ME)
Past President – Mitch Yergert (CO)
Executive Secretary - Aurelio Posadas

BOARD OF DIRECTORS

SPB
Wayne Dixon (FL) NPB Vice President
Mike Evans (GA) SPB President
Larry Nichols (VA)

Purpose of the National Plant Board

- Provide national representation for each of the regional boards
- Foster effective and harmonized plant health programs and promote efficiency, harmony and uniformity in plant pest regulatory issues
- Collaborate and communicate effectively with private and public entities
- Protect agriculture, horticulture, forestry, and the environment.

Purpose of the National Plant Board

- Provide national representation for each of the regional boards
- Foster effective and harmonized plant health programs and promote efficiency, harmony and uniformity in plant pest regulatory issues
- Collaborate and communicate effectively with private and public entities
- Protect agriculture, horticulture, forestry, and the environment.
Benefits of belonging to the National Plant Board

- Obtain timely information
- Improved funding awareness
- Opportunity to influence regional and national policy
- Networking with policy makers, scientists, industry representatives and agencies

Benefits of belonging to the National Plant Board

- Work collectively with a unified national voice to solve problems, form friendships and build bridges.

COOPERATIVE AGREEMENTS

1. BRS Pilot Inspection  
   4/28/14 – 4/27/15  
   Amount: $33,000

2. Systems Approach to Nursery Certification  
   9/30/14 – 9/29/15  
   Amount: $224,894

3. Safeguarding  
   11/13/14 – 11/12/15  
   Amount: $219,925

Total $477,819

FEDERAL REGISTER COMMENTS

Important to provide NPB Comments to the Federal Register and to USDA Request for Comments.

- USDA APHIS PPQ wants/needs to know what the NPB has to say on these comment requests.
- It is important for NPB to provide comments especially on issues that impact members.

Ken Rauscher is coordinating this effort for the NPB. Please provide a response.

FEDERAL REGISTER COMMENTS

September 30, 2014 and March 31, 2015:

- 10 Federal Register Comments have been completed and submitted.
- 4 Federal Register Comments are pending NPB member’s comments.

NPB Letters to Canadian Food Inspection Agency

- Brown Spruce Longhorn Beetle – Letter supporting continued regulation.
- Hemlock Woolly Adelgid – Letter regarding changes to requirements for movement of materials.
SPB Member Contributions and Accomplishments

Farm Bill 10007 reviews, 480 suggestions and $57.9 million distributed:

- Wayne Dixon - FL
- Christel Hardin - SC
- Sancho Dickenson - OK

Japanese Beetle Harmonization Plan – First major rewrite since 1998

- Awinash Bhatker - TX

SPB Member Contributions and Accomplishments

- NPB Web Redesign Oversight – Larry Nichols (VA) & Wayne Dixon, (FL)
- Resolutions – Sancho Dickinson – (OK)
- Awards – Joe Collins – (KY)
- Imported Fire Ant – Gray Haun – (TN)
- USDA-APHIS BRS – Scott Bray (AR) Danny Turner (NC) and Wayne Dixon (FL)
- Cooperative Agreements – Richard Miranda (FL) and Christel Hardin (SC)
- Export Certification – Carl Harper (KY)

Citrus Greening

- Bryan Black – TX
- Wayne Dixon – FL
- Denise Feiber – FL
- David Kostrom – TX

SPB Member Contributions and Accomplishments

Strategic Alliance Between the National Plant Board and Plant Protection and Quarantine

- Initiated at a June 2014 in a meeting between NPB and PPQ leadership
- Desire to more fully utilize and align respective state and federal authorities and resources to better safeguard agriculture and our natural resources.

Four key priorities identified:

- Funding
- Enforcement and Compliance
- Deregulation evaluation
- Training

An initial face to face meeting of each or the 4 committees is scheduled for mid June. Initial update on committee accomplishments is scheduled for the 2015 NPB meeting in Sedona AZ.
The SPB SANC Team
- Steering Committee – Gray Haun and Wayne Dixon
- Training – Joe Collins (KY)
- Pilot – Larry Nichols (VA) - Chair
- Regulatory Ag Guidelines – Wayne Dixon (FL) Chair
- Outreach – Tad Hardy (LA)

Tools For States
- Fact sheets, Q&A, Framework for SANC
- Training and Audits
- Outreach – posters, snapshots, presentations
- Certification
- Pilot program certification
- Compliance agreement certification

Model Laws
- Plant Pest Law
- Nursery Law
- Plant Quarantine Nursery Inspection and Cert. Guidelines

Outstanding resource for states to consult and utilize as a way to harmonize regulatory approaches for protecting agriculture and the environment. Wayne Dixon, Gray Haun, Vicki Smith, Jeff Zimmer, David Blackburn, Dan Hilburn, Mark Taylor

Model Laws
- Nursery Law
  - Definitions
  - Exemption criteria
  - Reciprocity
  - Labeling and advertising
  - Fee structures
  - Violations and penalties
<table>
<thead>
<tr>
<th>Issues Moving Forward</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable long term state funding</td>
</tr>
<tr>
<td>Stability of PPQ positions - SPHDs, program managers, etc.</td>
</tr>
<tr>
<td>Communication</td>
</tr>
<tr>
<td>Implementing the strategic alliance</td>
</tr>
<tr>
<td>Enforcement</td>
</tr>
<tr>
<td>Funding</td>
</tr>
<tr>
<td>Training</td>
</tr>
<tr>
<td>Deregulation or resource consolidation</td>
</tr>
</tbody>
</table>

Thank You
Southern Plant Board Meeting
April 27, 2015

Asian Gypsy Moth
CY11 – 21
CY12 – 44
CY13 – 42
CY14 – 76

Agriculture Programs and Trade Liaison
Automation Initiatives
• Vessel Risk List (VRL) and Integration

Agriculture Programs and Trade Liaison
Automation Initiatives (continued)
• Cargo Enforcement Reporting and Tracking System (CERTS)

Agriculture Programs and Trade Liaison
Automation Initiatives (continued)
• Consolidated Secondary Inspection System (CSIS)
Agriculture Programs and Trade Liaison

Targeting and Facilitation

- National Agriculture Cargo Targeting Unit

Agriculture Programs and Trade Liaison

Targeting and Facilitation (continued)

- Mobile Workstation Device

Agriculture Programs and Trade Liaison

2015 Initiatives

- Agriculture Pest Exclusion Coordinator
- Signage

PREVENT PLANT PESTS AND DISEASES

DECLARE

Fruits & Vegetables
Live Plants & Soil
Cut Flowers
Nuts, Seeds & Grains

Foreign insects, plant diseases, and invasive plants can be harmful to United States agriculture.

AGRICULTURE

Bad Harvest

A passenger arriving in Orlando, FL presented a negative written declaration for agriculture products. She declined to amend the declaration, but baggage inspection revealed 13 types of prohibited seeds. The passenger was fined $300. Propagative seeds may contain noxious weeds, parasitic plants, genetically modified plants, and prohibited plant genera. Insects and pathogens, such as fungi, bacteria, and viruses. These could damage U.S. agricultural resources.

AGRICULTURE

and a Partridge in a Pear Tree

A passenger arrived in Atlanta from South Korea and CBP Agriculture KB Tinkus alerted the woman's checked baggage. Via a translator, the woman declared food. CBPAS found 11 lbs. of pork jerky, 41 lbs. of pork meat, 1/2 lbs. of blood sausage, 10 lbs. of fresh grapes, 4 apples, 1 pear, 6 lbs. of lotus roots with soil, 3 lbs. of fresh ginger with roots and soil, and 2 lbs. of fresh chestnuts. All items were destroyed.

Bug in the Broccoli

At the Pham-Reyesa International Bridge in Pharr, TX, CBPAS inspected a commercial shipment of broccoli and found a live pest on the trailer floor. The USDA identified the pest as Buleria australis Richards - a first-time interception of this pest in the U.S. Buleria australis is a moth native to Northwestern Mexico and poses a threat to American agriculture. The shipment was re-exported.
Questions?
2014 HORTICULTURE INSPECTION SOCIETY - SOUTHERN CHAPTER ACTIVITIES
Allison Olofson, President - HIS-SC

2014 ACTIVITIES

● SANC Interstate Inspection
  ■ Concord, NC & York, SC
● 16th Annual Conference
  ■ San Antonio, TX
● Monthly Conference Call
  ■ Updates and future ideas

SANC INTERSTATE INSPECTION

● June 3-5, 2014
● Had 29 inspectors from 10 states, including states under the pilot (PA & WA)
● Discussed:
  ○ The history of SANC.
  ○ Role of the Inspector in SANC.
  ○ Benefits of developing SANC versus non-participating growers.
  ○ Focused Dialogue between inspector and grower on risk-avoidance, risk-preparedness, risk-detection, risk-mitigation, inventory management, and efficient use of chemicals.

SANC INTERSTATE INSPECTION

● On Wednesday, June 4, 2014
  ■ Visited Metrolina Greenhouses in Huntersville, NC (Annual and Color Location)
  ○ SANC Interstate Inspection focused on:
    ● Vegetative Inputs
    ● Water Systems
    ● Scouting & Treatment
    ● Q&A Session with Metrolina on SANC
  ■ Visited Metrolina Greenhouses in York, SC (Perennial Location)
    ● Vegetative Inputs
    ● Water Systems
    ● Scouting & Treatment

SANC INTERSTATE INSPECTION

Inspection of Water Systems
Metrolina, NC

METROLINA, NC
Tracking of Vegetative Inputs.
2014 - 16TH ANNUAL HIS-SC
CONFERENCE

- San Antonio, Texas (Sept. 21 - 24, 2014)
- Had 45 attendees from 13 different states including NY and KS.
- Presentations included:
  - A hands-on workshop of identification aid apps by Dr. Kevin Ong, Director of the Texas Plant Disease Diagnostic Lab. (Lucid Keys)
  - Plant Pathology
  - SANC
  - The Role of Education in Pest Detection and Monitoring
  - Worker Protection Standards (REIs)
  - Entomology
  - And many others.
- State Reports
SANC Interstate Inspection
- Withlacoochee Training Center (WTC)
  - Brooksville, FL
    - As of 4/20/2015 - 18 inspectors are registered.
    - SANC inspection will focus on:
      - Pest avoidance and mitigation in the areas of: Vegetative Inputs, Water Systems and Scouting & Treatment at Cherry Lake Tree Farm.

17th Annual HIS-SC Conference
- Williamsburg, VA
- September 21 - 24, 2015
  - CEU Credits will be offered for attendance
    - MD, NC, SC and VA
Enhanced Efficiency Through the Use of Tablet Technology

Jarred Driscoll
North Carolina Department of Agriculture and Consumer Services
Plant Industry Division, Plant Protection Section

Southern Plant Board
Richmond, VA 2015
April 26th – 29th

The Paperless Project’s Use

- Primarily for fillable forms
- Scanning device/NC CAPS QR code
- Take pictures
- Reference guides
- More?

The Paperless Project

- Cost Savings
  - No postage
  - No envelopes
  - No paper and printing
- Fewer Errors
  - Less transcriptional and transposing errors
  - Number are calculated correctly
  - Everything is legible
- Timely

Fillable Forms

- Apiary Inspectors
  - Monthly inspector’s report
  - Apiary inspection form
  - Fumigation requisition
- Phytophthora Nursery Survey Form
- Travel Log
- Temporary Employee Hours
Tablets Can Also Take Pictures!

NC CAPS Quick Response (QR) Code

- Goes on virtually all traps using weatherproof label
- Encourages public to go to NCDA&CS CAPS website

Questions??
Pilot Project, Phase 1

- Selection of 8 pilot growers
  - Two from each Plant Board Region
- Training for Inspectors/SPROs –
  - Fall, 2014
  - Winter, 2015
- Implementation of Pilot - November, 2014

Pilot Project - Phase 1

<table>
<thead>
<tr>
<th>Grower</th>
<th>State</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conard- Pyle</td>
<td>PA</td>
<td>November, 2014</td>
</tr>
<tr>
<td>Forrest Keeling</td>
<td>MO</td>
<td>December, 2014</td>
</tr>
<tr>
<td>Walla Walla Nursery</td>
<td>WA</td>
<td>April, 2015</td>
</tr>
<tr>
<td>Southeastern Growers</td>
<td>GA</td>
<td></td>
</tr>
<tr>
<td>Lucas Greenhouses</td>
<td>NJ</td>
<td></td>
</tr>
<tr>
<td>Greenleaf Nursery</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>Oregon Pride Nursery</td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>McKay Nursery</td>
<td>WI</td>
<td></td>
</tr>
</tbody>
</table>

SANC Pilot Timeline

- Pilot Phase- 1
  - 8 Pilot Nurseries
    - Began - Fall, 2014
    - Completion (at the earliest) –
      - Conard Pyle – Summer, 2016
      - Final Nursery – Summer, 2017
- Pilot Phase- 2
  - Include Additional Nurseries
    - Timeline - TBD

Steps to implementing SANC

- **Risk Assessment**
  - Identifies hazards and mitigation strategies (BMPs) for hazards (risks)
- **Development of SANC Manual**
  - Formalizes and documents facility’s procedures
    - Pest Management Plan (BMPs and Scouting)
- **Approval of SANC Manual**
  - Ensures facility’s plan meets SANC Standard
- **Implementation of components in SANC Manual**
  - Recordkeeping, training, BMPs, etc.
- **Audits**
  - Ensures facility’s plan is being implemented as described in SANC Manual

Risk assessment is basis for:

**Pest Management Plan must:**

- Procedures to scout for, document and manage plant pests
- Scouting on regular basis
- All incoming plants must be inspected
- Include BMPs identified during risk assessment
Pest Management Plan (con’t)

- BMPs to mitigate identified hazards (CCP Checklist):
  - Inputs (Plants)
  - Propagation Practices
  - Media & Containers
  - Site
  - Shipping
  - Water
  - Production Practices
  - Disposal

Hazard (CCP)/BMP Checklist

<table>
<thead>
<tr>
<th>Component, site, or stage of production</th>
<th>Target pests or pathogens</th>
<th>Contamination Hazard</th>
<th>BMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water management</td>
<td>Waterborne pathogens</td>
<td>Infected surface irrigation water</td>
<td>Eco-friendly irrigation using effective methods</td>
</tr>
<tr>
<td>Shipments</td>
<td>Waterborne pathogens</td>
<td>Splash disposal of pathogens, pest damage from standing water</td>
<td>Prevent standing water from not evaporating and correcting drainage problems, or by raising containers off the ground</td>
</tr>
<tr>
<td>Media &amp; Containers</td>
<td>Non-pathogenic fungus</td>
<td>Prevent growth of fungus</td>
<td>Enhanced irrigation using effective methods</td>
</tr>
<tr>
<td>Propagation</td>
<td>Non-pathogenic fungus</td>
<td>Prevent growth of fungus</td>
<td>Enhanced irrigation using effective methods</td>
</tr>
</tbody>
</table>

SANC Website: sanc.nationalplantboard.org/
Click: Tools for Industry
Click: SANC CCP Checklist and BMP Companion Document

Lessons Learned:.....

- From Growers (Conard Pyle and Forrest Keeling):
  - SANC requires extensive amount of work
  - Overall –
    - Positive reaction from growers
    - SANC was beneficial
    - Improved their operation

Lessons Learned.....

- SANC identified hazards or processes that could be improved
- Developed organizational improvements
- Assign roles and responsibilities within company
- Inspectors are integral part of process
- Growers will still rely on inspectors for information
  - (New pest issues, Regulator compliance, hazard ID, etc.)
- Growers want inspectors present during the SANC process (risk assessment, review of facility’s SANC Manual)

Next Steps: 

- Completion of Phase I (Target: 2017)
- Evaluate and identify areas of improvement
- Continued Training
- Phase-2
For more information:

http://sanc.nationalplantboard.org/

Questions?

Growing Better with SANC
A Systems Approach to Nursery Certification

Promoting a harmonized, web-based systems approach to nursery and greenhouse certification.
CITRUS HEALTH RESPONSE PROGRAM

Information Covered

- Introduction
- Status of Citrus States
- Citrus Nursery Stock
- Regulations
- Budget

Cooperative Program:

- California Department of Food and Agriculture
- Arizona Department of Agriculture
- Texas Department of Agriculture
- Louisiana Department of Agriculture
- Florida Department of Agriculture
- California Citrus Research Board
- Florida Citrus Research & Development Foundation
- Florida Citrus Mutual
- California Citrus Mutual
- Texas Citrus Mutual
- California Citrus Quality Council
- University systems in CA, AZ, TX, LA, and FL
- Citrus Nursery Industry
- USDA Agricultural Research Service
- USDA National Institute for Food and Agriculture
- USDA Animal and Plant Health Inspection Service

Bearing Acreage and Value:

- Florida 476,300 acres $1.3 Billion
- California 270,000 acres $1.99 Billion
- Texas 25,000 acres $72 Million
- Arizona 11,000 acres $56 Million
- Louisiana 1,400 acres $7 Million

Total US Acreage & Value: 782,300 $3.4 Billion
Source: USDA NASS & LSU September 2014

Arizona

- Survey:
  Trapping/Visual Sites: 5,487
  Counties: Maricopa, Pinal
  Santa Cruz, Pima
  Number of ACP Detected: 83
  HLB Samples Collected: 313 (Negative)

- Regulatory:
  Quarantines for SOS (entire state) & ACP
  Partial state
  SOS Compliance Agreements – 31
  ACP Compliance Agreements – 226

- Biocontrol:
  Tamarixia radiata
  320 releases
  64,254 wasps
  8 sites in Yuma County

California

- Survey:
  ACP- Number of Counties: 20
  Number of Traps: 33,640
  Commercial Grove: 4 Counties in S. California, 440 visits, 192 ACP
  Collected all tested negative HLB

  HLB-Number of Counties: 8
  Number of sites: 151,585
  Number of ACP Collected: 36,517
  Number of Tissue Samples: 7,005

- Hacienda Heights Survey:
  Number of Properties: 1,461
  Number Sites ACP: 156
  Number Sites HLB: 1,001
**California**

- Regulatory:
  - ACP Quarantine: Imperial, Kern, Los Angeles, Orange, Riverside, San Bernardino, San Diego, San Joaquin, San Luis Obispo, Santa Barbara, San Jose, Ventura, Tulare
  - Total Area under quarantine is 51,000 square miles
- 9,498 Compliance Agreements for nurseries, growers, harvesters, packinghouses, and others operating within the ACP quarantine.
- 14 APHIS Approved Interstate Citrus Nurseries
- HLB Quarantine: 5-mile radius in Los Angeles County (93 square miles)

**Florida**

- Multi-Pest Survey (MPS)
  - ARS Census-travel computations to establish a risk base survey: CC, ACP, HLB, CBS, Leprosis, CVC and SOS.
  - Commercial Groves acreage: 43,279
  - Residential Properties: 7,564
- Citrus Health Management Areas (CHM As)
  - 48 Established CHM As covering 92% production areas
  - Data is provide to growers on a 3 week cycle
  - Supports grower coordinated pest management decisions

**Texas**

- Multi-Pest Survey
  - Focused on HLB, ACP, CBS, CVC, Leprosis, and CC
  - Rio Grande Valley: Cameron, Hidalgo and Willacy Counties
  - Residential: 15,560
  - Groves: 25,000
  - ACP: 68,106
  - HLB: 38,973
  - HLB Positive Samples: 318
**Texas**

- Regulatory
  - Gulf Coast: Harris, Fort Bend and Montgomery Valley: Cameron, Hidalgo and Willacy
- Citrus Nursery
  - 5 nurseries in the Valley
  - 1 TX Citrus Center
  - 4 nurseries ACP/SOS outside of Valley
  - Ship under Limited permit

**Louisiana**

- Quarantine:
  - ACP: Entire state
  - SOS: Entire state
  - HLB: Orleans, Washington Parishes
  - CC: Orleans, Parts of Jefferson, Plaquemines and St. Charles
- Survey
  - Multi-Pest survey PPO CHRP 1200 Acres
  - 35 Parishes surveyed for citrus pest
  - LDAF 461 properties surveyed in Northern Plaquemines 20 positive CC
  - St Bernard 2 positive CC
  - St Charles 1 positive CC
- Regulatory
  - 10 facilities under APHIS compliance

**Other Areas**

- CHRP Support survey and Biocontrol for citrus pest in: AL, AS, GU, HI, and PR
- CHRP supports the University of HI Lab for diagnostics in the Pacific Area
California
ACP Sample counts by Cr-Value Range

<table>
<thead>
<tr>
<th>Year</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Total ACP Samples</td>
<td>0.00</td>
<td>2.50</td>
<td>1.20</td>
<td>1.60</td>
<td>1.80</td>
</tr>
</tbody>
</table>

Regulations

Citrus Nursery Rule
- Source material must originate from an APHIS approved State Certified Clean Stock Program
- Facility APHIS approved Pest exclusionary structure
- Inspection every 30 days
- CG testing every 6 months
- Treatment soil drench at least 30 days but no more than 90 days before shipment and Foliar spray no more than 10 days prior to shipment
- Subject to at least 3 inspection cycles

Pre-Certification

Leaf Wash Protocol for Kaffir lime, curry and bael leaves for consumption
- Interstate movement from areas quarantined for ACP and CG
- Based on a system approach

DA-2014-05 ACP Revised conditions for Intrastate movement of Mandarins with stems and leaves attached Jan. 2014
- ACP only area
- Compliance Agreement
- Packinghouse standards
- Transported enclosed vehicle under state seal

DA-2014-27 ACP Revised conditions for Interstate movement of Mandarins with Attached stems and leaves May 2014
- ACP only area
- Compliance Agreement (Packinghouses, Processors, handlers, haulers, transporters, shippers, receivers)
- Minimum standard packinghouse procedures (washing/brushing, disinfection, waxing, drying, culling)

Budget 2015

<table>
<thead>
<tr>
<th>STATE</th>
<th>Project</th>
<th>AGMT AMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL</td>
<td>Citrus MPS</td>
<td>$46,881</td>
</tr>
<tr>
<td>AZ</td>
<td>ACP/HLB Survey</td>
<td>$943,744</td>
</tr>
<tr>
<td>CA</td>
<td>ACP/HLB Survey</td>
<td>$10,844,701</td>
</tr>
<tr>
<td>FL</td>
<td>CHRP</td>
<td>$8,095,541</td>
</tr>
<tr>
<td>GU</td>
<td>Citrus Pest &amp; HLB</td>
<td>$2,450</td>
</tr>
<tr>
<td>HI</td>
<td>Citrus Pest &amp; HLB</td>
<td>$2,525</td>
</tr>
<tr>
<td>HI</td>
<td>HLB Diagnostic Lab</td>
<td>$5,423</td>
</tr>
<tr>
<td>HI</td>
<td>ACP/HLB Survey</td>
<td>$5,032</td>
</tr>
<tr>
<td>PR</td>
<td>ACP Biocontrol</td>
<td>$3,440</td>
</tr>
<tr>
<td>TX</td>
<td>Citrus Survey CG &amp; CC</td>
<td>$922,233</td>
</tr>
<tr>
<td>TX</td>
<td>HLB Prevention</td>
<td>$193,274</td>
</tr>
<tr>
<td>TX</td>
<td>Regulatory</td>
<td>$175,722</td>
</tr>
<tr>
<td>TX</td>
<td>Citrus Community</td>
<td>$913,840</td>
</tr>
<tr>
<td>TX</td>
<td>Area Wide ACP</td>
<td>$387,467</td>
</tr>
<tr>
<td>TX</td>
<td>Citrus Germplasm</td>
<td>$88,596</td>
</tr>
</tbody>
</table>
Leon Bunce
National Operations Manager
USDA APHIS PPQ
920 Main Campus Dr. Ste. 200
Raleigh, NC 27606
PH: (919) 855-7360
Cell: (919) 931-9868
Leon.K.Bunce@aphis.usda.gov
Sweetpotato Weevil Harmonization Plan Proposal

Southern Plant Board
April 26-29, 2015
Richmond, VA

Background
- Information presented at the 2012 SPB meeting summarized discrepancies reported in SPW trapping protocols among SPB states.
- A SPB committee was formed to get across-the-board consistency for all SPB states to trap according to the 1995-96 original trapping protocols.
- In December 2014, an abbreviated proposal for standardizing trapping protocols and certifying sweet potatoes for movement was made to the SPB committee, then to other SPB states. Support was given to further pursue these issues.

Harmonization Plan Proposal
- Additional discussion among states found a need for addressing issues beyond trapping protocols that affect shipments.
- Ex: Number of SPW, SPW-free distance, mitigative treatments, timetable trapping.
- Green tag and pink tag consideration.
- Idea: What about a Harmonization Plan?

Why a SPW Harmonization Plan?
- Voluntary
- Provide clear guidelines
- Consistently apply quarantine principles
- Signatories agree to meet requirements
- Result = fair, equitable trade among states

SPW Harmonization Plan Goals
- Re-establish and re-confirm the 1995 SPW trapping program framework for certifying green tag sweet potatoes.
- Consider establishing an expanded SPW trapping and treatment program framework for certifying pink tag sweet potatoes.
- Facilitate the fair, equitable and orderly marketing of sweet potatoes among states.

SPW Harmonization Plan
- The original 1995-96 trapping protocol options would be kept the same for green tag areas (traps/acre, placement, security, lures, etc.).
- Trap security measures would be added for pink tag areas wishing to expand movement.
- Traps/acre & duration in pink tag areas would be increased compared with green tag areas.
Harmonization Plan Categories

**Category 1**—Sweet potatoes grown in traditionally green tag areas that have been trapped using the original trapping protocols, with security measures in place, and having been found SPW-free. These sweet potatoes can be issued green tags.

Harmonization Plan Categories

**Category 2**—Sweet potato seed beds and production fields grown in traditionally pink tag areas subjected to the following additional trapping/treatment protocols:

1. Trapped throughout the entire season 24/7 using an accepted, expanded trapping protocol
2. Security measures equal to Category 1 traps
3. Lures replaced every 4 – 6 weeks
4. Documented treatment using accepted, recommended pesticides and protocols

Harmonization Plan Categories

**Category 2 Options**—Sweet potatoes fulfilling the basic Category 2 requirements can be confirmed under one of two options:

- **Option 1**
  - Two consecutive years of SPW-free trapping at site

- **Option 2**
  - Season-long SPW-free trapping at site
  - No other production within ½ mile
  - Any production within ½ mile must be trapped SPW-free

If requirements for either Option are satisfied, sweet potatoes are provided green tags and can move to Category 1 areas that allow Category 2 sweet potatoes.

Harmonization Plan Categories

**Category 3**—Sweet potatoes grown in traditionally pink tag areas that, while considered apparently SPW-free, do not satisfy the Category 2 requirements. These sweet potatoes can be issued pink tags.

Harmonization Plan Considerations

- What role should seed beds play since production fields are the true focus?
- What does 1 SPW trap capture mean?
- Should processor sweet potatoes be addressed in the proposal?
- Are the traditional green tag / pink tag designations the best / only approach?

Harmonization Plan Next Steps

- Discuss and revise draft proposal
- Reach a SPB consensus
- Present Plan to NPB for consideration
- States: “Tune in, turn on, sign up”
Sweet potato weevil eradication efforts have been documented since the beginning of last century.

Sweet potato weevil eradicated on Kume-jima

On January 11, at a press conference held at the Okinawa Prefectural Office, a senior staff member of the Naha Plant Protection Station announced that the serious plant pest known as the sweet potato weevil, or Cylas formicarius, has been eradicated on Kume-jima. The Naha Plant Protection Office of the Ministry of Agriculture, Forestry and Fisheries has been carrying out a survey of the extermination of the weevil on Kume-jima since June 2012. This is the first case in the world in which a coleopteran pest (beetle) has been eradicated by releasing into the population a large number of insects that have been sterilized through exposure to radiation. The eradication took more than 18 years to achieve. After revising relevant regulations, the Ministry of Agriculture, Forestry and Fisheries will officially announce the successful eradication of the sweet potato weevil on Kume-jima before the end of March at the earliest.

Source: Ryukyu Shimpo, February 26, 2013 issue
The North Carolina Sweet Potato Weevil Quarantine Zone.

New Hanover County: 6476 acres
Brunswick County: 1104 acres

Seaside morning glory (Ipomoea sp)

The NC SPW quarantine area: Highly heterogeneous area

The Nature of the NCSPWQ Area

- Beaches, forests, highly urbanized areas.
- Military buffer zones (federal land), state parks, historic sites, conservation areas.
- Resident and transitory population (tourists).

The SPW Eradication Project in NC

- Two Phases:
  - Phase I: Intensive surveys to determine the temporal and spatial distribution of weevils in the area. Where are they? When and in what numbers do they appear in the SPWQ area?
  - Phase II: Eradication phase.
    - Sterile Insect Releases (SIR)
    - Cultural control
    - Chemical treatments (?)
    - Outreach
    - Mating Disruption and Male Annihilation (MAT)

Phase I (2 years)

Determination of ecological and biological parameters needed for the implementation of a targeted eradication program:

- Where are the SPW populations in the NCSPWQA (spatial distribution).
- When are SPW present (temporal distribution).
- What are the primary SPW host species in the NCSPWQA.

Spatial Distribution of SPW Populations

First year

Second year

Surveys of host material will be conducted in the entire quarantine area in the first year.

Ecological and biological data will be collected on PCs for a second year (replicate).
Spatial distribution of SPW populations in the NCSPWQ area

**Year 1**
- Primary survey grid
- Trap set
- SPW population clusters

**Year 2**

**Surveys**
- Bucket traps attached with stainless steel wire to ½ in conduit pole.
- NCDA&CS-PID personnel assembling traps in the NCSPWQ area.

Part II

**Bucket traps**
- Hexagonal pattern
- Traps set 200yd apart

**More efficient system because:**
- It allows a better spread of the pheromone.
- Compared to a rectangular grid system, hexagonal systems use 13-14% less traps to survey the same area.
- Reduces the area of "dead spots"
Phase II: Eradication

- Mating Disruption:
  - Saturation of an area with a sex pheromone to "confuse" and "prevent" males from mating with females.
- Male Annihilation:
  - Male population is significantly reduced by high density trapping in the area.
  - High density trapping systems

SPW Eradication: Trapping System

<table>
<thead>
<tr>
<th>Trap Type</th>
<th>Cost</th>
<th>Efficiency</th>
<th>Durability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boll Weevil Trap</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Funnel Trap</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Bucket Trap</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Increase Trap Efficiency With Green LED Light

A Highly Efficient SPW Trap Prototype

Hardware cloth base

1 in wide ring cut from a 6 in PVC pipe used to support a bucket trap.

Fully assembled trap

A Highly Efficient SPW Trap Prototype (cont...)

A Hybrid Funnel / Bucket trap with

1. LED light
2. High dose lures
3. Food source

To maximize catch efficiency.

Sterile Insects Releases

- After mating, females sweet potato weevil will not produce the sex pheromone.

- Releasing sterile SPW males and mating with “wild” females will result in the inability of females to reproduce.

- Sterilization protocols are available

Outreach

Web pages

Multimedia

Newspaper articles

Acknowledgments

- **Funding agency:**
  - USDA Specialty Crop Grant.

- **NCDA&CS personnel:**
  - Ann Galagher
  - Whitney Swink
  - Herby Ward
  - Scott Canady
  - David Pearce
  - Bonnie Faulkner
  - Clive Jones.

- **NC Sweet Potato Commission** for their support.

- NC Ag. Commissioner Mr. Steve Troxler

- Philip Wilson (NC SPRO) and Vernon Cox (PI Director)
Bioenergy As a Source of New Invaders: Assessing the Risk of New Crops

Jacob Bamey
Assistant Professor
Invasive Plant Ecology
jnbarney@vt.edu

The Invasive ideotype

Life history
- Perennial
- High aboveground biomass production
- Flowers late / little allocation to seed production

Physiology
- Tolerates
  - Drought
  - Low fertility
  - Saline soils
- C₄ photosynthetic pathway
- High water/nutrient use efficiency

Other
- Highly competitive (reduces herbicide use)
- Few resident pests (reduces pesticide use)
- Allelopathic
- Re-allocates nutrients to roots in fall

"the thin green line"

<table>
<thead>
<tr>
<th>Agronomic crops</th>
<th>Bt feedstocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Com</td>
<td>Soybean</td>
</tr>
<tr>
<td>Perennial</td>
<td>X</td>
</tr>
<tr>
<td>C₄ photosynthesis</td>
<td>X</td>
</tr>
<tr>
<td>Rapid establishment</td>
<td>X</td>
</tr>
<tr>
<td>Long canopy duration</td>
<td>X</td>
</tr>
<tr>
<td>Grows at high densities</td>
<td>X</td>
</tr>
<tr>
<td>Tolerates water stress</td>
<td>X</td>
</tr>
<tr>
<td>Tolerates marginal soils</td>
<td>X</td>
</tr>
<tr>
<td>Tolerates saline soils</td>
<td>X</td>
</tr>
<tr>
<td>Re-allocates nutrients to roots</td>
<td>X</td>
</tr>
</tbody>
</table>

Invasive Plant Impacts

- Reduce native species diversity
- Disrupt trophic interactions
- Increase fire frequency
- Reduce pollinators
- Increase flooding
- Disrupt mutualisms
- Alter successional patterns
- Increase management costs
- Alter nutrient cycles
- Reduce recreation
- Increase soil salinity
- ad infinitum...

"for the most part, successful invasion is forever"
- Dan Simberloff

We know how this movie ends...

- fast growing
- deep rooted
- no pests
- tolerates disturbance

85 MILLION SEEDLINGS PLANTED
Exotic
Most of our worst invasive sp. were intentionally introduced
“weedy” characters
Thousands of acres as a propagule source
Transporting across diverse land use types
relatively high probability of invasion

Invasion arithmetic

Putting invasions in context
1. Most introduced species do not become invasive (~only 0.1%)
2. Invasiveness is not universal
3. Populations are invasive, not species
4. All species have some probability of being invasive

Invasiveness varies

How do you predict invasiveness of new species?

Serendipitous contingencies

What’s the most robust predictor of invasiveness?
Already being invasive...

Really hard to predict...
How do we predict invasiveness, or at a minimum assess risk?

**Weed risk assessment** (Qualitative) Tier 1

**Climate-niche** (Semi-quantitative) Tier 2

**In situ field trials** (Quantitative)

**Ecological risk assessment** (Quantitative) Tier 3

Well characterized risk

**28/40 ranked as HIGH RISK**

**Weed Risk Assessment (Tier 1)**

- 16 biofuels
- 14 common crops (e.g., corn, soybean)
- 10 invasives (e.g., johnsongrass, quackgrass)

**Species** | **variant** | **PPQ**
--- | --- | ---
Arundo donax | Wild type | High Risk
Miscanthus sacchariflorus | Wild type | High Risk
Miscanthus sinensis | Wild type | High Risk
Miscanthus x giganteus | Seeded (fertile) | Evaluate Further
Panicum virgatum | ‘M2DE’, ‘Croplight’ | High Risk
Pennisetum purpureum | | Evaluate Further
Phalaris arundinacea | | High Risk
Sorghum bicolor | | High Risk
| ‘w/o shattercane (cultivar)’ | Low Risk

**NOT** ALL LOCATIONS ARE EQUALLY SUITABLE

**Giant reed (Arundo donax)**

**How do we predict invasiveness, or at a minimum assess risk?**

**Weed risk assessment** (Qualitative) Tier 1

**Climate-niche** (Semi-quantitative) Tier 2

**In situ field trials** (Quantitative)

**Ecological risk assessment** (Quantitative) Tier 3

Well characterized risk
How do we predict invasiveness, or at a minimum assess risk?

**Tier 1**
- Weed risk assessment (Qualitative)

**Tier 2**
- Climate-niche (Semi-quantitative)

**Tier 3**
- In situ field trials (Quantitative)
- Ecological risk assessment (Quantitative)

Well-characterized risk

**In situ field studies (Tier 3)**
- Most robust assessment of invasion risk
- Evaluates habitat susceptibility
- Parameterizes ecological risk models

**Data, $$, time expensive**

**Mitigation through Best Management Practices (BMP)**

1. Right Plant, Right Place
2. Field Management
3. Responsible Harvest
4. Mindful Transportation
5. Sensible Storage
Right Plant, Right Place

1. Don’t plant noxious weeds
2. Don’t plant high risk species

State Weed Laws

- 46 states maintain noxious weed lists
- Some states also maintain seed laws (primarily for seed purity)
- Listed taxa range: $0 - 264$ ($\bar{t} = 49$)
- Some states also list federal taxa

Field Management

- Don’t site near dispersal corridors
- Reduce seed dispersal
- Control field access
- 20-X foot buffer surrounding fields
  - Plant with dense cover (fescue) or herbicide tolerant crop
- Regular field inspection
- Install barriers downslope to collect plant material

Responsible Harvest

- All planting, harvesting, and transport machinery should be cleaned prior to leaving the field
- Reduce viable propagules
  - Harvest timing
  - Harvest methods (shred vs bale)

Mindful transportation

- Trucks and trailers should be covered when possible
- Choose routes that minimize crossing sensitive habitat
- Visually inspect rights-of-ways
New plant for commercial release

Current system
Is it regulated as a noxious weed?

Yes
Regulated: No commercialization

No
OK to commercialize

Proposed system

New plant for commercial release

Current system

Is it regulated as a noxious weed?

Yes
Regulated: No release

No
Becomes invasive

Proposed system

Weed Risk Assessment

Noxious:
High WRA / 2° review

Watch:
High WRA / Mod 2° review

Caution:
Low WRA / Low 2° review

Low Risk:
Low WRA / Low 2° review

Regulated: No commercialization

OK to commercialize

Proposed system

Weed Risk Assessment

Noxious:
High WRA / 2° review

Watch:
High WRA / Mod 2° review

Caution:
Low WRA / Low 2° review

Low Risk:
Low WRA / Low 2° review

Regulated: No release

Introduces as is

Due diligence in field testing / BMPs

Becomes invasive

Subject to liability litigation

What is our exit strategy?

Bioenergy Feedstocks at Low Risk: An Invasions in the USA: a “White List” Approach
Lauren B. Quinn, Emily C. Scott, Julie Ryan Mock, Marc M. Myers, and Edward J. Rakosi
June 2013

Weed Risk Assessment

Noxious:
High WRA / 2° review

Watch:
High WRA / Mod 2° review

Caution:
Low WRA / Low 2° review

Low Risk:
Low WRA / Low 2° review

Regulated: No commercialization

OK to commercialize

What are others doing??

Application
- $50 application fee (for each non-contiguous planting)
- Cover letter / letter of intent
- Proof of site ownership
- Voucher specimen of plant
- Description of plant, estimated cost of removal and basis for calculation

Requirements
- NOT ALLOWED for state/federal noxious weeds
- ≥ 2 contiguous acres
- Traps / filters must be created
- Equipment should be cleaned
- Wildfire protection
- Quarterly site visits by division inspectors
- Permit holder required to destroy planting
- Surety bond required (150% of cost)
Bioenergy balance sheet

Bioenergy crop
- GHG reductions
- New agricultural commodities
- Energy security
- Job creation

Invasive species
- New management costs
- Ecosystem degradation
- Native species loss

Special Thanks:
Larissa Smith
Dan Tekiela
Ryan Dougherty
Matt Ho
Kevin Hensler
Eugene Dollete

jnbarney@vt.edu
http://weedeco.ppws.vt.edu/
Mississippi Non-Native Plant Species Regulatory Program

Kenneth Calcote, Director-Plant Pest Division
Mississippi Department of Agriculture & Commerce
Bureau of Plant Industry

PURPOSE & INTENT

- To manage and permit the planting and cultivation of nonnative species of plants for fuel production which may become invasive or constitute a nuisance

PROHIBITED ACTS

- Planting over 1 acre in size of nonnative plants, including genetically engineered plants for fuel production or for purposes other than agriculture
- Except under special permit issued by MDAC

PERMIT EXEMPTION

- Plants produced for human food consumption
- Plants produced for commercial feed or forage
- Pinus spp
- Plants upon extensive review by MDAC and Mississippi State University to not pose a threat of invasiveness

PERMIT

- No Permit will be issued for State or Federal noxious weeds
- No Permit will be issued unless the applicant is the property owner or has written permission to utilize the land for duration of the permit
- Separate permits are required for each plant species
- Permit expires after 1 year of issuance
- Permit holder must renew to continue cultivation

PERMIT APPLICATION

- Written application must be submitted
  - Name and address of applicant
  - Name of plant to be cultivated
  - Legal description of lands to be cultivated
  - Estimated cost of removing & destroying plant
  - With basis on how estimate was calculated
  - Corporation, Partnership or other entity must provide name & address of a contact person
  - Notify MDAC within 10 days of change of contact
PERMIT REVIEW

— Application is reviewed by M DAC in conjunction with specialist from Mississippi State University to determine if the plant is invasive or has the potential to become a nuisance

— Growing location may be visited for evaluation
  • Determine if exclusion of the plant to neighboring ecosystems is possible

PERMIT CONDITIONS

— Measures to prevent spread by seed
— Buffer area to prevent spread to adjacent areas
— Clean equipment before moving from property
— Wildfire protection measures to reduce risk and damage to surrounding areas
— Measures to prevent infestation or spread of certain plant pests
— Any other condition to prevent the spread of plants or pests
— Amended application and permit required if there is more than a 5% increase in acres planted

SURETY BOND

— Each permit holder shall maintain a corporate surety bond in the amount determined by M DAC
— Surety Bond conditioned to secure the payment of all costs of removing or destroying of plants cultivated under the permit
— Not less than 150% of the estimated cost of removing or destroying plants
— Cap of $5,000 / acre
— Surety Bond shall be renewed annually

DESTRUCTION OF PLANTS

• Permit holder must notify M DAC and remove or destroy plants within 10 days if:
  — Abandons or ceases to maintain or cultivate plants under the permit
  — Permit expired without renewing
  — Ceases to abide by the permit conditions

MDAC may issue an immediate order of destruction to permit holder & surety bond if:
  — Permit holder has not removed or destroyed the plants after being abandoned or no longer maintained
  — The continued maintenance or cultivation of the plant presents imminent danger to public health safety or welfare
  — Permit holder violated the permit conditions
  — Surety Bond has been canceled
  — Permit has expired without renewing

DESTRUCTION OF PLANTS

• Permit holder fails to remove or destroy plants within 30 days the notice of destruction:
  — M DAC will remove or destroy the plants
  — M DAC will invoice the permit holder and send a copy to the bond provider for reimbursement of the costs incurred
  — Failure of the permit holder to reimburse after 30 days, the surety bond is invoiced
  — Permit holder or surety may request informal hearing
  — May go to higher court if not resolved in hearing
Dr. Leroy Whilby  
Florida Department of Agriculture and Consumer Services  
Division of Plant Industry

**Florida Agriculture**

**Florida**

agricultural products:  
$7.10 billion

---

**High-Risk Characteristics**

Florida ranks #2 in exotic invasive pest introduction risk

At county level, arguably Miami-Dade County is ground zero for US introductions

2.5 new exotic insect or pathogen reported by FDACS/ DPI per month

---

**Points of Entry**

- Over six million tons of perishable cargo enter Florida annually
- Nearly 50 million people visit each year

---

Florida Agriculture Intrusion Stations and International Ports of Entry

- International Airports (16)
- Military Airports (20)
- Deep Channel Seaports (14)
- Florida Agriculture Intrusion Stations (20)
Number of Exotics is on the Rise

- Since 1986, 360 exotic arthropods identified by FDACS
- Does not include pathogens/fungi identified (canker, greening, Laurel wilt, gladiolus rust, etc.)
- Now averaging about 2.5 new pest detections per month

State Preparation for the Next Plant Pest Infestation – The Florida Experience

Florida Agriculture Inspection Stations and International Ports of Entry

- Over 6.5 million trucks inspected.
- 1.3 million Ag. products

Florida Department of Agriculture and Consumer Services • Adam H. Putnam, Commissioner

Number of Exotics is on the Rise

- Since 1986, 360 exotic arthropods identified by FDACS
- Does not include pathogens/fungi identified (canker, greening, Laurel wilt, gladiolus rust, etc.)
- Now averaging about 2.5 new pest detections per month

State Preparation for the Next Plant Pest Infestation – The Florida Experience

Florida Agriculture Inspection Stations and International Ports of Entry

- Over 6.5 million trucks inspected.
- 1.3 million Ag. products

Florida Department of Agriculture and Consumer Services • Adam H. Putnam, Commissioner
**FDACS-DPI**  
**Division of Plant Industry**

- Plant protection branch of FDACS  
- Over 600 employees  
- Mission:  
  To protect Florida’s native and commercially grown plants and the state’s apiary industry from harmful pests and diseases.

**Recent Examples**

- Mediterranean Fruit Fly 2009, 2010  
- Giant African Land Snail 2011  
- Laurel Wilt/ Redbay Ambrosia beetle 2005  

**Recent Example: Giant African Land Snail**

**Early Detection System:**
- Research  
- Outreach (growers, industry, public)  
- Education (students)  
- Training (inspectors)  
- Communication (information sharing across agencies)  
- Mapping high-risk areas  
- Survey initiatives (CAPS)

**Recent Example: Giant African Land Snail**

- Initial detection reported by homeowner  
- Public outreach immediately following initial detection  
- Cooperation of the public (85% of new cores reported through calls to helpline)  
- Incident Command System  
- Commissioner Putnam’s support

**GALS Progress**  
**(current through 04/10/15)**

- Number of:  
  - Cores: 28  
  - Inspections: 129,406  
  - Positive properties: 666  
  - Snails collected: 156,859  
  - Properties bait treated: 78,140

**Recent Example: Giant African Land Snail**

- Creative public outreach initiatives (Junior Detective, movie theater PSA)  
- Continued local, national, and international media interest

**Recent Example: Giant African Land Snail**

**GALS Progress**  
**(current through 04/10/15)**

- Number of:  
  - Cores: 28  
  - Inspections: 129,406  
  - Positive properties: 666  
  - Snails collected: 156,859  
  - Properties bait treated: 78,140
CAPS Program

Florida CAPS
Largest program in the country

In Summary

- Research
- Collaboration
- Outreach
- Training
- Communication

Mesh safeguarding activities to form barrier against establishment of exotic, invasive agricultural pests.
Questions
State Nursery Inspection Programs

Joe Collins
Office of the State Entomologist
Dept. of Entomology
University of Kentucky

M in education requirement

- HS
  - AR
- Some college
  - GA*
- BS
  - FL**, KY, LA, MS***, NC****, OK, PR, SC, TN, TX, VA*****

* GA only interview Assoc. or BS in past 10-15 years.
Completion of 2 years of college OR completion of vocational/tech school & 1 yr exp
OR 2 yrs exp at an equivalent to the lower level.
** FL one year of plant experience also needed
*** MS graduation from 4 year HS, directly related education and experience may be
substituted on an equal basis
**** some recent hires with Assoc. degree with considerable nursery or hort. Experience
***** will accept equivalent combo of training and experience

Training

- Mentoring
  - AR, FL, GA, KY, LA, MS, NC, PR, OK, SC, TN, TX, VA
- Classroom
  - FL 3 weeks within 1st year of hire
  - LA every other year for new and experienced inspectors
  - MS

Training con’t

- Other
  - GA webinars from GA extension
  - SC inspector handbook, Kelly System (online inspection tool)
  - TX e-training through video conferencing; face to face training on laws, regs, inspections, surveys,
critical entry point monitoring; training sessions with extension

Technology provided

- Computer 12
- Camera 5
- Phone 7
- GPS 9
- iPad/tablets 5

License applicator required?

- Yes
  - FL (public applicator), LA* (research & demo), NC (6 mo), VA (60 days)
- No
  - AR, GA**, KY, MS, OK, PR, SC, TN, TX

* Required for a promotion from Level I to Level II
** Previously required O & T
**Other duties**

- Apiary
  - GA, MS, SC, VA
- CAPS/Farm bill
  - AR, FL, GA, KY, LA, M S, NC, OK, SC, TN, TX, VA
- Citrus
- Compliance Inspections
  - GA
- Feed
  - AR, LA, M S
- Fertilizer
  - AR, LA, M S
- Permitting
  - FL: native plant harvesting, arthropod
- Pesticide
  - AR (complaints), LA, M S
- Pet food
  - LA
- Professional services
  - M S
- Post entry
  - KY, LA
- Seed
  - AR, LA, M S
- Weights & Measures
  - TX

**Pay scale for new inspectors**

- 3 between $39,000 - $42,000
- 8 between $29,000 - $35,000
- 1 at $25,000
- 1 at ~$17,000

**Who is inspected?**

- Nurseries
  - All
- Nursery dealers
  - AR, FL, GA, LA, M S, NC, OK, PR, SC, TX, VA
- Distribution centers
  - FL, PR
- Private parcel facilities
  - FL, PR
- Florists
  - GA, TN, TX
- Landscapers
  - AR, TN

**Recommendations**

- Yes
  - AR, FL, KY, NC, OK, SC (facility improvement only)
- No
  - GA, LA, M S, PR, TN, TX, VA

**What is nursery stock?**

- AR-trees & shrubs
- FL-all plants capable of propagation or dist.
- GA-any member of plant kingdom intended for prop. or growth
- KY-any plant that can overwinter incl. sod
- LA-trees, shrubs, orn plants, sod, foliage plants marsh plants
- M S-trees, shrubs, vines, roses, strawberry, brambles, budwood, scions, bulbs, corms etc
- NC-all perennial plants incl. sod
- OK-if it grows it is nursery stock. Nothing is exempt
- PR-all plants & plant products capable of prop, sale or dist.
- SC-fruit, nut, shade trees, orn plants, bush fruits, buds, grafts, scions, vines
- TN-rooted plant material. Vegetable bedding plants and tobacco transplants exempt
- TX-florist, nursery products. Vegetable, herbs, Christmas trees exempt if sold within TX
- VA-woody stems. Annuals, vegetables exempt
Studies on the soil biology and management of boxwood blight caused by Calonectria pseudonaviculata

2015 SPB Meeting Richmond, VA
Norman Dart, VDACS Plant Pathologist

Overview

Introduction:
Brief introduction to boxwood blight & boxwood
- Causal agent, symptoms, signs, distribution
- Significance of boxwood to nursery industry and landscapes
  “Early” history of boxwood blight in VA (2011)
- VDACS initial involvement
- Significance of soil biology in disease cycle of boxwood blight

Recent insights/research
- The effect of chlorothalonil (Daconil) fungicide when applied post infection
- Efficacy of ethanol and bleach as sanitizers

- Caused by Calonectria pseudonaviculata
- Causes disease to plants in Boxwood family (Buxaceae)
  - Boxwood (Buxus)
  - Pachysandra spp.
  - Sarcococca spp.

Cankers
Leaf spots
Microsclerotia: An adaptation for surviving and dispersing in soil

- Allow soil-borne plant pathogens to survive in soil for extended periods
- Known to be crucial part of disease cycle of *Calonectria* blight of azaleas in nurseries and many other diseases
- Important in the disease cycle of the Boxwood blight Pathogen?

**Box Blight: Current Global Distribution**

- **Europe:** Belgium, Croatia, France, Georgia, Germany, Ireland, Italy, the Netherlands, Slovenia, Spain, Switzerland, United Kingdom.
- **Oceania:** New Zealand

**Spread rapidly through infected nursery stock**

**Date Confirmed**

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/24/2011</td>
<td>NC</td>
</tr>
<tr>
<td>10/26/2011</td>
<td>CT</td>
</tr>
<tr>
<td>10/31/2011</td>
<td>VA</td>
</tr>
<tr>
<td>12/13/2011</td>
<td>RI</td>
</tr>
<tr>
<td>12/14/2011</td>
<td>MD</td>
</tr>
<tr>
<td>12/19/2011</td>
<td>MA</td>
</tr>
<tr>
<td>12/20/2011</td>
<td>OR</td>
</tr>
<tr>
<td>12/23/2011</td>
<td>NY</td>
</tr>
<tr>
<td>1/23/2012</td>
<td>PA</td>
</tr>
</tbody>
</table>

**ALSO:**

- OH, DE, NJ, KY, TN, BC, ON, QC

**Current:** 14 states total, 3 provinces

**VA Boxwood Blight Detections as of 2015**

- Fairfax
- Loudoun
- Manassas
- Prince William
- Westmoreland
- Grayson
- Carroll
- Hanover
- Chesterfield
- Henrico

• U.S. wholesale market value for boxwood nursery production is estimated at 103 million dollars annually
Boxwood
- Introduced to North America from Europe in the mid-1600s
- Reached peak popularity in the United States during 1800s
Savannah River point, Late Archaic to Early Woodland Period, 3500 BC to 0 AD

Kirk point (may be a Palmer) is from the Early Archaic Period, roughly 7800 to 4800 BC

Yadkin point, Late Woodland Period, 900 to 1600 AD

Biology: Cleared boxwood leaf infected with Cy. Pseudonaviculatum. Darkened regions of tissue are extensively colonized with microsclerotia.

Soil sampled before flaming
Soil sieved to remove organic fraction/debris
Organic debris ground and planted
Colony forming units compared

Soil caked on boxwood sample that tested positive for boxwood blight (Jan, 2013)

Soil splashed on lower boxwood leaves, commonly where symptoms were first observed on new plants in 2012

Elongated blackish-brown cankers & defoliation on lower branches

Pathogen 
on/in plant

Leaves fall
Stem cankers form

Pathogen in dead plant material and cankers in stems

Conidia produced by fungus (64-77F)

Average number of microsclerotia per mm² leaf area over a 4 week sample period.

- The typical area of an English boxwood leaf is about 80 mm²
- 3,520 microsclerotia per English boxwood leaf
- 3.5 Million per 1000 leaves
**Summary of soil biology**

- Boxwood blight pathogen forms an abundance of microsclerotia in leaf tissue
- Soil infested with microsclerotia and conidia can cause foliage blight and crown rot
- Conidia and microsclerotia can persist in soil

All of these components indicate this pathogen has an epidemiologically significant soil phase.

**Proposed boxwood blight primary disease cycle**

- Leaves fall
- Stem cankers form

**Proposed boxwood blight Polycyclic disease cycle**

- Need free moisture on leaves
- Secondary cycles
  - (64-77F)
- Pathogen in dead plant material and cankers in stems
- Conidia in summer
- Conidia produced by fungus (64-77F)
- Leaves fall

**Overview of experimental questions/goals**

**Question:** Does chlorothalonil (Daconil) reduce sporulation in already infected leaf tissue and when applied to microsclerotia? 

**Goal:** Identify effective affordable and readily available sanitizers for use in the field.

**Boxwood Blight Inoculum Survival Over Time**

Percent leaf discs colonized by *C. pseudonaviculata* when used as bait in soil infested with conidia and microsclerotia and maintained at 300% field capacity over a 40 week period.

**Disease severity versus inoculum concentration in soil**

Cuttings evaluated for disease severity (proportion of leaves infected)
What is chlorothalonil?
- Commonly used protective fungicide
- Found very effective at managing boxwood blight when used as a protectant in multiple studies
- Chlorothalonil is a multi-site inhibitor of various enzymes and other metabolic functions = low potential for resistance to build

Effect of chlorothalonil (Daconil) on *Calonectria pseudonaviculata* sporulation on infected leaf tissue

**Inoculate Leaves**

**Incubate and let lesions form**

**Dip leaves in various concentrations of chlorothalonil**

**Compare sporulation on leaf tissue**

**Effect of chlorothalonil (Daconil) on *Calonectria pseudonaviculata* sporulation on infected leaf tissue**

Basic question: Does chlorothalonil reduce sporulation when applied post infection?

Why study this question?
1) **Diagnostic implications**
   - We were receiving symptomatic samples treated with Daconil - yet very low sporulation
2) **Management implications**
   - Common theory is there is little to no benefit of applying chlorothalonil post infection
   - A reduction in sporulation could be helpful in reducing disease progress

**Effect of chlorothalonil (Daconil) on *Calonectria pseudonaviculata* sporulation from microsclerotia**

**Harvest MS**

**Mix MS with various concentrations of chlorothalonil**

**Plate MS mixed with chlorothalonil**

**Compare MS sporulation, germination, etc**

---

**Figure 7.** (A) Leaf sporulating with conidiophores bearing conidia and vesicles of *C. pseudonaviculata* on boxwood leaves that were not treated with Daconil 6 days after initial inoculation.  
(B) Magnified view (5X) of untreated leaf with conidiophores bearing conidia and vesicles.  
(C) Leaf with no minimal sporulation of *C. pseudonaviculata* that was treated with 2X the labeled rate of Daconil for controlling fungal leaf spots of woody ornamentals 6 days after initial inoculation of leaves and 4 days after treatment with Daconil.  
Note fungicide residue on leaf surface.  
(D) Magnified view (5X) of leaf surface with some mycelial growth but no sporulation.

**Figure 8.** Leaf area with visible sporulation (continuous expanses of conidiophores bearing conidia and vesicles of *C. pseudonaviculata*) 1, 2, 7, 12 and 15 days after treating the infected leaves with 0, 0.5X, 1X and 2X of the labeled rate of Daconil for controlling fungal leaf spots of woody ornamentals.  
Error bars show standard deviation of two replicate experiments with three replicates within an experiment.
Figure 9. (A) Microsclerotia plated on PEDA with no Daconil with visible conidiophores bearing conidia and vesicles of *C. pseudonaviculata* 12 days after plating. (B) Microsclerotia plated on PEDA with 2X the labeled rate of Daconil for controlling fungal leaf spots of woody ornamentals with no sporulation of *C. pseudonaviculata* 12 days after plating.

Figure 10. Percent microsclerotia that had visible conidiophores bearing conidia and vesicles of *C. pseudonaviculata* that were plated on PEDA with 0, .5X, 1X and 2X of the labeled rate of Daconil for controlling fungal leaf spots of woody ornamentals. Error bars show standard deviation of two replicate experiments with three replicates within an experiment.

Figure 11. Number of conidia harvested from microsclerotia that were plated on PEDA with 0, .5X, 1X and 2X of the labeled rate of Daconil for controlling fungal leaf spots of woody ornamentals. Error bars show standard deviation of two replicate experiments with three replicates within an experiment.

Figure 12. Percent microsclerotia of *C. pseudonaviculata* that germinated (visible mycelia growth) that were plated on PEDA with 0, .5X, 1X and 2X of the labeled rate of Daconil for controlling fungal leaf spots of woody ornamentals. Error bars show standard deviation of two replicate experiments with three replicates within an experiment.

Practical implications?
Leaf Debris Sanitizer Results

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Infected leaf debris Avg. CFUs/ml</th>
<th>Infected leaf debris SD</th>
<th>Conidia Avg. CFUs/ml</th>
<th>Conidia SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>19.8</td>
<td>7.9</td>
<td>40.8</td>
<td>12.8</td>
</tr>
<tr>
<td>Lysol Concentrate</td>
<td>2.8</td>
<td>1.8</td>
<td>Not tested</td>
<td>-</td>
</tr>
<tr>
<td>Lysol Disinfectant Brand III</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>5% ethanol</td>
<td>15.2</td>
<td>8.4</td>
<td>Not tested</td>
<td>-</td>
</tr>
<tr>
<td>10% ethanol</td>
<td>7.0</td>
<td>2.8</td>
<td>Not tested</td>
<td>-</td>
</tr>
<tr>
<td>25% ethanol</td>
<td>0.7</td>
<td>0.8</td>
<td>Not tested</td>
<td>-</td>
</tr>
<tr>
<td>50% ethanol</td>
<td>0.0</td>
<td>0.0</td>
<td>27.5</td>
<td>12.5</td>
</tr>
<tr>
<td>70% ethanol</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>95% ethanol</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1:10 bleach (Clorox)</td>
<td>5.2</td>
<td>3.4</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Summary

- Chlorothalonil reduces sporulation when applied post infection
- Lysol® Brand III disinfectant spray or 70% ethanol and greater are effective sanitizers for use in the field
Spotted Lanternfly
Lycorma delicatulata

Look How Pretty It Is!

Biology As We Know It

What we have seen
- Adults like Ailanthus
- Egg Masses similar to Gypsy Moth
- Not strong flyers, will hitch hike
- Heavy feeders
- Bees and wasps attracted to sap
- Have seen it on maple, willow, styrax

What research tells us
- Egg Masses don’t survive -10°C winters (Yes, they do!)
- Females lay multiple egg masses
- One generation per year
- Nymphs can cause feeding damage
- Can kill grape

Egg Masses
- 45-48 eggs per mass
- Covering becomes more brownish in color as it ages
- Laid on any flat surface, even under rocks, stone and bark
- Preference to lay on Ailanthus

Egg Masses
- Similar to Gypsy Moth
- Covering is hard but can be scraped off
- Laid on trees >4 inches in diameter
- Laid at all heights but most on southern side
- Not easily seen

Life Stages
- First Nymph Stage
- Black and White
- Very Small
- Climb up and down trees
- Can easily be blown around
- Very active when they hatch
- Hatch at 77 degrees F
**Life Stages**

Second Nymph Stage
Black, white and begin to develop red color on body
Travel up and down tree/vine for feeding

**Adults**

Female is larger than males
Prefer Ailanthus
Lazy
Congregate to feed
Secrete Honeydew

**Adults**

Laid eggs until several hard freezes in December
Congregate together to feed
Secrete large amounts of honeydew

**Adult Damage**

Lace"Blooming" on leaves and vines

---

**Host Plants**

<table>
<thead>
<tr>
<th>Host Plants</th>
<th>Common Name</th>
<th>Family</th>
<th>Utilizability</th>
<th>Degree of Damage</th>
<th>Feeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anisocyras lutea</td>
<td>Ailanthus</td>
<td>Ailanthusaceae</td>
<td>mph</td>
<td>+++</td>
<td>XXXXXX</td>
</tr>
<tr>
<td>Rhagaspis</td>
<td>Ailanthus</td>
<td>Ailanthusaceae</td>
<td>mph</td>
<td>+++</td>
<td>XXXXXX</td>
</tr>
<tr>
<td>Antlia lutea</td>
<td>Ailanthus</td>
<td>Ailanthusaceae</td>
<td>mph</td>
<td>+++</td>
<td>XXXXXX</td>
</tr>
<tr>
<td>Acrocercosis</td>
<td>Ailanthus</td>
<td>Ailanthusaceae</td>
<td>mph</td>
<td>+++</td>
<td>XXXXXX</td>
</tr>
<tr>
<td>Metapocyclus longipes</td>
<td>Ailanthus</td>
<td>Ailanthusaceae</td>
<td>mph</td>
<td>+++</td>
<td>XXXXXX</td>
</tr>
<tr>
<td>Anthocoris</td>
<td>Ailanthus</td>
<td>Ailanthusaceae</td>
<td>mph</td>
<td>+++</td>
<td>XXXXXX</td>
</tr>
<tr>
<td>Nezara viridula</td>
<td>Ailanthus</td>
<td>Ailanthusaceae</td>
<td>mph</td>
<td>+++</td>
<td>XXXXXX</td>
</tr>
<tr>
<td>Anisocyras lutea</td>
<td>Ailanthus</td>
<td>Ailanthusaceae</td>
<td>mph</td>
<td>+++</td>
<td>XXXXXX</td>
</tr>
<tr>
<td>Aracrisia</td>
<td>Ailanthus</td>
<td>Ailanthusaceae</td>
<td>mph</td>
<td>+++</td>
<td>XXXXXX</td>
</tr>
<tr>
<td>Xanthogaleruca</td>
<td>Ailanthus</td>
<td>Ailanthusaceae</td>
<td>mph</td>
<td>+++</td>
<td>XXXXXX</td>
</tr>
</tbody>
</table>

---

**Host Plants**

- Anisocyras lutea (Ailanthusaceae) nymph + 3X
- Antlia lutea (Ailanthusaceae) nymph + 3X
- Acrocercosis (Ailanthusaceae) nymph + 3X
- Metapocyclus longipes (Ailanthusaceae) nymph + 3X
- Anthocoris (Ailanthusaceae) nymph + 3X
- Nezara viridula (Ailanthusaceae) nymph + 3X
- Anisocyras lutea (Ailanthusaceae) nymph + 3X
- Aracrisia (Ailanthusaceae) nymph + 3X
- Xanthogaleruca (Ailanthusaceae) nymph + 3X

**Host Plants**

- Ailanthus
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae

---

**Host Plants**

- Ailanthus
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae

---

**Host Plants**

- Ailanthus
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae

---

**Host Plants**

- Ailanthus
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae

---

**Host Plants**

- Ailanthus
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae

---

**Host Plants**

- Ailanthus
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
- Ailanthusaceae
Host Plants

- **Host Plants**

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Family</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Rhus typhina</em></td>
<td><em>Rhus</em></td>
<td>nymphae adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Rosa multiflora</em></td>
<td><em>Rosaceae</em></td>
<td>nymphae adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Rosa rugosa</em></td>
<td><em>Rosaceae</em></td>
<td>nymphae adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Rubus idaeus</em></td>
<td><em>Rosaceae</em></td>
<td>nymphae adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Sorbus intermedia</em></td>
<td><em>Rosaceae</em></td>
<td>nymphae adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Sorbus fruita</em></td>
<td><em>Rosaceae</em></td>
<td>nymphae adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Phellodendron拐杖</em></td>
<td><em>Rutaceae</em></td>
<td>adult,nymph +++ ++ ++</td>
</tr>
<tr>
<td><em>Populus</em></td>
<td><em>Salicaceae</em></td>
<td>adult ++</td>
</tr>
<tr>
<td><em>Philadelphus</em></td>
<td><em>Philadelphus</em></td>
<td>nymphae adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Prunus</em></td>
<td><em>Sapindaceae</em></td>
<td>nymphae adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Pinnus</em></td>
<td><em>Picea</em></td>
<td>nymphae adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Acer</em></td>
<td><em>Aceraceae</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Fraxinus</em></td>
<td><em>Oleaceae</em></td>
<td>nymphae adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Amur</em></td>
<td><em>Amur</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Virginia</em></td>
<td><em>Virginia</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Chinee</em></td>
<td><em>Chinee</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Hardenbergia</em></td>
<td><em>Hardenbergia</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Malus</em></td>
<td><em>Malus</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Pyrus</em></td>
<td><em>Pyrus</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Malus</em></td>
<td><em>Malus</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Parthenocissus quinquefolia</em></td>
<td><em>Parthenocissus</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Vitis</em></td>
<td><em>Vitis</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Hardenbergia</em></td>
<td><em>Hardenbergia</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Hardenbergia</em></td>
<td><em>Hardenbergia</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Taxodium</em></td>
<td><em>Taxodium</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Quercus</em></td>
<td><em>Quercus</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Picea</em></td>
<td><em>Picea</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Picea</em></td>
<td><em>Picea</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Pinus</em></td>
<td><em>Pinus</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Pinus</em></td>
<td><em>Pinus</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Pinus</em></td>
<td><em>Pinus</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Pinus</em></td>
<td><em>Pinus</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Pinus</em></td>
<td><em>Pinus</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Pinus</em></td>
<td><em>Pinus</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Pinus</em></td>
<td><em>Pinus</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
<tr>
<td><em>Pinus</em></td>
<td><em>Pinus</em></td>
<td>adult,nymph ++ ++ ++</td>
</tr>
</tbody>
</table>

**The Find in Pennsylvania**

- Found in PA in late September
- Noticed by a PAGame Commission Employee at his home
- Confirmed by USDA
- Not on the watch list for CBP
- Visual Survey indicates confined to about 15.5 sq. mile area

**Hardgoods Supplier**

Cooperative with PDA and USDA
Hired Quality Assurance Person and own Entomologist
Removed Ailanthus back from stone area
Spent over 6 figures to insure safer product being brought onto property and leaving location
Trace forwards reported negative – follow up in summer

**Hardgoods Supplier**

Quarantine issued November 1, 2014
6 Townships and 2 Buroughs
No articles stored outside allowed out of the quarantine without inspection
 Industries impacted by quarantine logging, Christmas tree farms, stone sales, nurseries, and orchards
Quarantine Area

Community very engaged
Cooperative effort between township supervisors, county commissioners, conservation, foresters, extension educators, state and federal partners
Training sessions for egg mass identification and scraping going on during winter months

Actions Taken

- New Pest Advisory Group
- Work group for PPQ and PDA
- Technical Working Group Formed for research questions
- Forest Pest Task Force
- Plant Health Resource Center
- Quarantine Restricting Movement
  - Compliance Agreements for business
  - Phytosanitary Certificates
  - Residential Compliance Checklist
  - Logs, equipment, firewood, outdoor household items, vehicles, campers, trailers, hardgoods

NPAG Immediately formed – weekly update calls
- Technical Working Group
  - OTIS Research
  - DNA Analysis
  - Translation of Korean Studies
- Farm Bill Funding for research, outreach, eradication efforts

What’s At Stake For Pennsylvania?

- Grapes 5th in US
- Hardwoods 1st in US
- Orchard Production – Apples 5th in US
- Christmas tree production 6th in US

PPQ Partnership

- NPAG Immediately formed – weekly update calls
- Technical Working Group
  - OTIS Research
  - DNA Analysis
  - Translation of Korean Studies
- Farm Bill Funding for research, outreach, eradication efforts

Outreach

- Town hall Meetings
- Monthly Advisory Committee Calls
- Township Newsletters
- Trainings
- Mailings
- Farm Show
- Volunteer Banding Program
Outreach

Banding Together To Stop Spotted Lanternfly

Report egg masses you have scraped here >>

For directions on how to report your scraped and destroyed egg masses follow the instruction on this page “Reporting Scraped Egg Masses Instructions”

Current Death Count

The estimated number of Spotted Lanternfly killed by Egg Mass Scraping based off of reported efforts. This information comes from the “Reporting Scraped Egg Masses Instructions” page. This number will be periodically updated to reflect the efforts of PCA and the community.

Old Total: 17,740
(9/18/2015)
Change: 7,490
(Thu, 7/21/2016)

Reporting Scraped Egg Masses Instructions >>

Collect a specimen: Turn the adult specimen or egg mass in to the department’s Entomology Lab for verification. First, place the sample in alcohol or hand sanitizer in a leak proof container. A Sample Submission Form can be found in the Publications section below.

Take a picture: Submit photographs to info@pea.gov.

Research

- DNA Analysis
- Pesticide Efficacy
- Grape Studies
- Chipping Study
- Containment
**Eradication Efforts**

- Directed Tree Removal
- Banding
  - Volunteer
  - Survey Crews
- Satellite Locations
  - Tree Removal
  - Applications

**Thanks**

- USDA – APHIS-PPQ
- USFS
- Dept. Conservation and Natural Resources – PA
- Penn State University
- Penn State Extension
- PA Game Commission
- Berks County Commissioners
- Berks County Conservation
- Township Supervisors Pike, District, Hereford, Earl, Washington
- Area Businesses and Residents
- PA Plant Resource Center
- PA Forest Pest Task Force

**Questions?**

**Thank You!**

Dana Rhodes  
Pennsylvania Department of Agriculture  
[danrhodes@pa.gov](mailto:danrhodes@pa.gov)  
717-772-5205
Insecticides in the Hive

Keith Tignor
Virginia Department of Agriculture and Consumer Services

What is an Ideal Pollinator?

- Mobile
- Large number of individuals
- Attracted to pollen source
- Apparatus to carry pollen

16.7% decline

Estimated Amount of Conventional Pesticides Used in the U.S. in 2007

Total Usage = 857 million lb.

Estimated Amount of Conventional Pesticides Used in the U.S. in 2007

from A. Grube, Donaldson D., Kiely T., and Wu L. (2011)

Environmental Fate of Pesticides

Ideal Pollinator – Honey Bee

- Year round activity
- Transportable population
- Capable of Flight
- 60,000 to 80,000 individuals in hive
- Hairy
  - Nearly 100% of body covered with hair
  - Plumose hair
  - Pollen basket
- Pollen and nectar are primary food source
Detected Agrochemicals in North American Apiaries


Occurrence of Samples with Multiple Agrochemicals in North American Apiaries


Correlation of Fungicide Residues with Pesticide Contents of Pollen Samples


Pesticide Impact on Honey Bee

  - Reduced drone fecundity
  - Reduced queen cell production
- J. Wu, Anelli C., Sheppard S. (2011)
  - Increased larval mortality
  - Delayed adult emergence
  - Reduced adult longevity
- L. Dahlgren (2012)
  - Reduced queen survival
- J. Berry, Hood W., Pietravalle S., Delaplane K. (2013)
  - Decreased brood survival
  - Increase queen supercedure

Winter Hive Losses in Virginia

Overall colony losses of 32.9% during the period 2000-2014

Honey Bee Pests and Diseases

- **Nosema**
- **Varroa Mite**
  - Annual increase in population
  - Late season impact
- **Small Hive Beetle**
  - Seasonal growth
  - Impact on worker population
  - Larvae SHB
  - Adult SHB
Honey Bee Pests and Diseases

- **Nosema**
- **Varroa Mite**
  - Annual increase in population
  - Late season impact
- **Small Hive Beetle**
  - Seasonal growth
  - Impact on worker population
    - Larvae SHB
    - Adult SHB

Pesticide Contamination of Pollen Samples

Impact of Pesticides

- **Lethal**
  - Broad spectrum
  - Toxicity to adult
  - Toxicity to immature
  - Lethal determination
    - Dosage
    - Concentration
    - Time
- **Sub-lethal**
  - Weight loss
  - Shorter life span
  - Behavior changes
  - Reduced fecundity
  - Reduced immunity
  - Deformity
  - Mutation
  - Loss of habitat/food source

Status of Bumble Bee Populations in Northern and Coastal Eastern States of the U.S.

from S. Cameron, Lozier J., Strange J., Koch J., Cordes N., Solter L., Griswold T. (2011)
Factors Affecting Pollinator Populations

- **Environment**
  - Temperature extremes
  - Climate change
  - Bloom dates
  - Drought

- **Nutrition**
  - Habitat loss
  - Food resources

- **Genetics**
  - Diversity
  - Isolation
  - Integrity

- **Toxicants/pollutants**
  - Point source
  - Non-point source
Pollinator Protection in Florida Citrus Groves

Wayne N. Dixon
Florida Department of Agriculture and Consumer Services
Southern Plant Board Annual Meeting Richmond VA 2015

Florida Apiary/Citrus Industry Link – Mapping Service


The Florida Apiary/Citrus Industry Link is a public mapping service created to promote and simplify communications between the apiary and citrus industries.

Asian Citrus Psyllid

Citrus Greening
Huanglongbing

- 577,000 acres of citrus groves, 75 million citrus trees
- Florida 2nd largest in global orange juice production; leads grapefruit
- Florida produces 70 percent of the United States’ supply of citrus
- Florida’s citrus economy is approximately $9 billion a year
- 76,000 full time and part time jobs

Since 2006:
- >$3.63 billion in lost revenues
- >7,000 jobs by reduced OJ production

Citrus Health Management Areas

National Science Foundation report

http://www.crec.ifas.ufl.edu/extension/chmas/chma_overview.shtml

CHMA - Citrus Health Management Areas

CHMAs are groupings of commercial citrus groves in close proximity where growers work cooperatively to manage the spread of HLB

Participants achieve coordinating Asian Citrus Psyllid sprays to provide long-lasting effective control to minimize movement of psyllids between groves and reduce the time needed before additional sprays are required

Important that beekeepers report their bee hive locations

The exact locations are not indicated – within 1 mi²
Multi-blocks

Groves planted since 2007 with possible soil neonicotinoids

Beekeeper Information

Grove Owner Information

CHMA Boundary

Bee Forage Areas
Layers Available

Base Maps

Here’s a link to the mobile app from the Google Play store:

Just in case, here’s the Apple store link too:

Also, the app itself is made to be compatible with mobile browsers
natively, so you should be able to just Google search for “ArcGIS Florida Apiary Citrus” and then click to open.

Google search:
https://www.google.com/search?q=ArcGIS+Florida+Apiary+Citrus&ie=utf-8&oe=utf-8

Application link:
http://www.arcgis.com/home/webmap/viewer.html?webmap=5bf617766b4774a3a851ed513c26519b5

Our webpage:

AES bee protection webpage:
http://www.floridabeeprotection.org/

If I could only train my snail stompin horse to stomp varroa mites......
Protecting Pollinators: State Managed Pollinator Protection Plans

2015 Southern Plant Board Meeting
April 26 - 29, 2015
Richmond VA

Presidential Directive: EPA Requirements

- Assess the effects of pesticides on pollinator health...take action as appropriate...
- Engage states and tribes in the development of pollinator protection plans...

Presidential Directive (June 20, 2014)

Within 180 days...The Environmental Protection Agency shall assess the effect of pesticides, including neonicotinoids, on bee and other pollinator health and take action, as appropriate, to protect pollinators; development of State and Tribal pollinator protection plans; expedite review of registration applications for new products targeting pests harmful to pollinators...

EPA “Actions” = Pesticide Registration Decisions i.e.: Recent Label Amendments - Ag & Non-Ag Uses

- Outdoor, foliar applications
  - Clothianidin
  - Dinotefuran
  - Imidacloprid
  - Thiamethoxam
- Bee Protection Box (Label)
- Applies to Three Scenarios
  - Contracted Pollination Services
  - For Food Crops And Commercially Grown Ornaments Not Under Contract For Pollination Services But Are Attractive To Pollinator
  - Non Ag Applications

EPA: Assess the effects of pesticides...

- Review of currently registered pesticides registrations including all of the neonicotinoid pesticides;
- Implementing new data requirements and risk assessment approaches for pollinators as part of its regulatory decision-making process for all pesticide chemistries;
- Expedite review of registration applications for new products targeting pests harmful to pollinators;
- Actions have the potential to include:
  - Additional risk mitigation measures, i.e.: timing restrictions
  - Loss or additional use limitations for specific uses, i.e.: blooming flowers

EPA: Engage States...
State Managed Pollinator Protection Plans

- Proposed as a means of mitigating the risk of pesticides to bees and other managed pollinators
  - Establish a framework for open communication and coordination among key stakeholders, including beekeepers, growers, pesticide applicators,
  - Hypothesis - Open communication will lead to practices that both mitigate potential pesticide exposure to bees and allow for crop production
  - Goal - Protect pollinators while allowing continued use
- Establish local and appropriate agreements and best practices for managing needs of agriculture and beekeepers...state flexibility
**EPA: Engage States...**

**State Managed Pollinator Protection Plans**

- As EPA regulates pesticides, have reached out to state pesticide regulatory programs;
- Reviewed State plans already in existence i.e.: CO, ND, & FL to identify common components;
- Sought comments, through State pesticide regulatory association, meetings, training etc regarding plans:
  - Critical Elements, i.e. Notification
  - Mandatory vs. Voluntary
  - Ag and/or Non Ag Uses
  - Measures of Success
  - Stakeholder Involvement

**Current Status:**

**State Managed Pollinator Protection Plans**

- EPA's Policy Document
  - Anticipated release Spring 2015
  - Expectations
    - Focus On Communication Between Applicators and Beekeepers
    - Critical elements of plan
    - Not enforceable - encourage States to implement Pollinator Protection Plans
    - Emphasize flexibility based on local needs
- Virginia
  - Waiting for release of EPA's Policy Document
  - Review current pollinator protection related activities and determine what if any actions will be taken
- Other States
  - ~30 States have or are in the process of developing a plan

**Future Expectations**

- Additional pesticide use restrictions — label is the law
- Ongoing Research
- Focus On Communication Between Applicators and Beekeepers
- Increasing Political and Public Pressures

[http://www2.epa.gov/pollinator-protection](http://www2.epa.gov/pollinator-protection)