CENTRAL PLANT BOARD
April 11-14, 2016, Fargo, ND

ILLINOIS · INDIANA · IOWA ·
KANSAS · MICHIGAN
MINNESOTA · MISSOURI ·
NEBRASKA · NORTH DAKOTA
OHIO · SOUTH DAKOTA ·
WISCONSIN
AGENDA

**General web info:**

http://www.fargomoorhead.org/

http://www.radisson.com/centralplantboard

http://nationalplantboard.org/npb-related-meetings/

**2016 Agenda Committee:**

- **Julie Van Meter**, NE, CPB President, 2015 Meeting Host
- **Collin Wamsley**, MO, CPB Vice President
- **Brian Kuhn**, WI, CPB Secretary/Treasurer
- **Carrie Larson**, ND, 2016 Meeting Host
- **Phil Marshal**, IN, 2017 Meeting Host
- **David Hirsch**, USDA APHIS PPQ, PPQ Representative

**Hospitality Room: Suite 1206**

*Each night from 8:00 PM to close*

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**MONDAY**

April 11, 2016

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:00 pm – 6:00 pm</td>
<td><strong>Registration</strong></td>
<td>Sky View 16th Floor</td>
</tr>
<tr>
<td>6:00 pm – 9:00 pm</td>
<td><strong>Welcome Reception</strong></td>
<td>Sky View 16th Floor</td>
</tr>
</tbody>
</table>
**TUESDAY**

April 12, 2016

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 am - 5:00 pm</td>
<td>Registration</td>
<td>Atrium</td>
</tr>
<tr>
<td>7:00 am - 8:30 am</td>
<td>Breakfast (Provided)</td>
<td>City A</td>
</tr>
</tbody>
</table>

**Breakout Sessions**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 am - 9:15 am</td>
<td><strong>Central Plant Board</strong> (Members Only Please)</td>
<td>The Loft</td>
</tr>
<tr>
<td>8:00 am - 9:15 am</td>
<td><strong>Customs and Border Protection Staff Meeting</strong></td>
<td>Metropolitan</td>
</tr>
<tr>
<td>8:00 am - 12:00 pm</td>
<td><strong>SSC and PSS Breakout Session</strong></td>
<td>Prairie Rose</td>
</tr>
<tr>
<td>9:15 am - 9:30 am</td>
<td><strong>Morning Break</strong></td>
<td></td>
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</tbody>
</table>

**Opening Session**

**Moderator: Julie Van Meter, Nebraska**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30 am - 9:35 am</td>
<td><strong>Call To Order</strong></td>
<td>City B</td>
</tr>
<tr>
<td></td>
<td>Julie Van Meter, President, Nebraska</td>
<td>City B</td>
</tr>
<tr>
<td>9:35 am - 9:40 am</td>
<td><strong>Roll Call</strong></td>
<td>City B</td>
</tr>
<tr>
<td></td>
<td>Brian Kuhn, Secretary/Treasurer, Wisconsin</td>
<td>City B</td>
</tr>
<tr>
<td>9:40 am - 9:50 am</td>
<td><strong>Introduction of Attendees</strong></td>
<td>City B</td>
</tr>
<tr>
<td></td>
<td>Julie Van Meter, President, Nebraska</td>
<td>City B</td>
</tr>
<tr>
<td>9:50 am - 10:05 am</td>
<td><strong>Welcome to North Dakota</strong></td>
<td>City B</td>
</tr>
<tr>
<td></td>
<td>Jessie Pfaff, Senior Policy &amp; Research Analyst</td>
<td>North Dakota Department of Agriculture</td>
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</tbody>
</table>

**General Reports**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:05 am - 10:15 am</td>
<td><strong>Central Plant Board Report</strong></td>
<td>City B</td>
</tr>
<tr>
<td></td>
<td>Julie Van Meter, President, CPB</td>
<td>City B</td>
</tr>
<tr>
<td>10:15 am - 10:40 am</td>
<td><strong>National Plant Board Report</strong></td>
<td>City B</td>
</tr>
<tr>
<td></td>
<td>Joe Collins, President, NPB</td>
<td>City B</td>
</tr>
<tr>
<td>10:40 am - 11:00 am</td>
<td><strong>USDA APHIS PPQ Report</strong></td>
<td>City B</td>
</tr>
<tr>
<td></td>
<td>Dr Matt Royer, USDA APHIS PPQ</td>
<td>City B</td>
</tr>
<tr>
<td>11:00 am - 11:30 am</td>
<td><strong>Federally Recognized State Managed Phytosanitary (FRSMP) Program and Deregulation Evaluation of Established Pests (DEEP) Process Basics</strong></td>
<td>City B</td>
</tr>
<tr>
<td></td>
<td>Ricardo Valdez – Official Control Coordinator, USDA APHIS PPQ</td>
<td>City B</td>
</tr>
<tr>
<td>11:30 am - 12:00 am</td>
<td><strong>Interstate Movement of Snails and the USDA Snail Matrix</strong></td>
<td>City B</td>
</tr>
<tr>
<td></td>
<td>Dr David G Robinson, USDA-APHIS National Malacology Laboratory</td>
<td>City B</td>
</tr>
</tbody>
</table>

Lunch (on your own)
12:00 pm – 1:15 pm
<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tuesday Afternoon</strong></td>
<td><strong>Moderator: Phil Marshall (IN)</strong></td>
<td></td>
</tr>
<tr>
<td>1:15 pm – 1:45 pm</td>
<td><strong>Leafy Spurge Control in North Dakota, An Integrated Management Success Story</strong> (Dr Rod Lym, Professor, Plant Science, NDSU)</td>
<td>City B</td>
</tr>
<tr>
<td>1:45 pm – 2:15 pm</td>
<td><strong>Phytosanitary Treatment Research for Thousand Cankers Disease</strong> (Dr Jenny Juzwik, USFS)</td>
<td>City B</td>
</tr>
<tr>
<td>2:15 pm – 3:00 pm</td>
<td><strong>Research Update – Thousand Cankers Disease</strong> (Dr Jenny Juzwik, USFS)</td>
<td>City B</td>
</tr>
<tr>
<td>3:00 pm – 3:15 pm</td>
<td><strong>Break</strong></td>
<td>City B</td>
</tr>
<tr>
<td>3:15 pm – 3:55 pm</td>
<td><strong>Gypsy Moth Program Update</strong> (Paul Chaloux, USDA APHIS PPQ)</td>
<td>City B</td>
</tr>
<tr>
<td>3:55 pm – 4:15 pm</td>
<td><strong>Tar Spot of Corn and Wheat Flag Smut</strong> (Phil Marshall (IN) and Jeff Vogel (KS-by phone))</td>
<td>City B</td>
</tr>
<tr>
<td>4:15 pm – 5:00 pm</td>
<td><strong>Microtuber Propagation for Seed Potatoes</strong> (William Faulkner, E Green Americas)</td>
<td>City B</td>
</tr>
<tr>
<td>5:00 pm</td>
<td><strong>Announcements</strong></td>
<td>City B</td>
</tr>
<tr>
<td>5:05 pm</td>
<td><strong>CENTRAL PLANT BOARD PHOTO</strong></td>
<td>TBD</td>
</tr>
<tr>
<td>6:00 pm – 9:00 pm</td>
<td><strong>Evening Social &amp; Awards Banquet (Meal Provided)</strong></td>
<td>City A</td>
</tr>
</tbody>
</table>

**WEDNESDAY**
**APRIL 13, 2016**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 am – 5:00 pm</td>
<td><strong>Registration</strong></td>
<td>City A</td>
</tr>
<tr>
<td>7:00 am – 8:00 am</td>
<td><strong>Breakfast (provided)</strong></td>
<td>City A</td>
</tr>
<tr>
<td><strong>Morning Sessions</strong></td>
<td><strong>Moderator: Dan Kenny (OH)</strong></td>
<td></td>
</tr>
<tr>
<td>8:00 am – 8:25 am</td>
<td><strong>State Reports: IL, IN, IA, KS, MI</strong></td>
<td>City B</td>
</tr>
<tr>
<td>8:25 am – 8:45 am</td>
<td><strong>US Canada Greenhouse Program</strong> (Alec Ormsby, USDA APHIS PPQ National Operations Manager, Accreditation, Permitting, and Pre-Departure)</td>
<td>City B</td>
</tr>
<tr>
<td>8:45 am – 9:25 am</td>
<td><strong>Systems Approach to Nursery Certification (SANC): Industry Perspective and Status of Pilot Phase One</strong> (McKay Nursery - Tom Buechel SANC Core Group - Aurelio Posadas)</td>
<td>City B</td>
</tr>
<tr>
<td>9:25 am – 10:10 am</td>
<td><strong>Mycoplasm-Like Organisms (MLOs)</strong> (Dr David Dai - NDSU Plant Sciences Department (technical overview) Tom Buechel – McKay Nursery (industry concerns))</td>
<td>City B</td>
</tr>
<tr>
<td>10:10 am – 10:25 am</td>
<td><strong>Morning Break</strong></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>Topic</td>
<td>Room</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------</td>
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</tr>
<tr>
<td>10:25 am - 10:45 am</td>
<td>State Reports: MN, MO, NE</td>
<td>City B</td>
</tr>
<tr>
<td>10:45 am - 11:10 am</td>
<td>North Dakota Pollinator Update</td>
<td>City B</td>
</tr>
<tr>
<td>Samantha Brunner - NDDA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:10 am - 11:20 am</td>
<td>Japanese Beetle Harmonization Plan Status</td>
<td>City B</td>
</tr>
<tr>
<td>Julie Van Meter, NE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:20 am - 11:50 am</td>
<td>Customs and Border Patrol Update</td>
<td>City B</td>
</tr>
<tr>
<td>Kevin Harriger – Executive Director, Office of Field Operations, Agriculture Programs and Trade Liaison, US Department of Homeland Security, Customs and Border Protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:50 am - 12:00</td>
<td>Central HIS REPORT</td>
<td>City B</td>
</tr>
<tr>
<td>Charles Elhard, HIS Treasurer – Plant Protection Specialist/Nursery Lead - NDDA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 pm - 1:00 pm</td>
<td>LUNCH (Provided)</td>
<td>City A</td>
</tr>
<tr>
<td><strong>Afternoon Session</strong></td>
<td><strong>Moderator: Brian Kuhn (WI)</strong></td>
<td></td>
</tr>
<tr>
<td>1:00 pm - 1:25 pm</td>
<td>State Reports: ND, OH, SD, WI</td>
<td>City B</td>
</tr>
<tr>
<td>1:25 pm - 2:30 pm</td>
<td>ezFedGrants Demo</td>
<td>City B</td>
</tr>
<tr>
<td>Chris Coppenbarger, Senior Financial Systems Analyst</td>
<td></td>
<td></td>
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<tr>
<td>Office of the Chief Financial Officer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>US Department of Agriculture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:30 pm</td>
<td>Announcements</td>
<td>City B</td>
</tr>
<tr>
<td>2:45 pm</td>
<td>Load For Tour</td>
<td>Outside</td>
</tr>
<tr>
<td>3:00 pm - 6:00 pm</td>
<td>Tour at the NDSU Agricultural Experiment Station Research Greenhouse, National Agricultural Genotyping Center, and Fargo Brewing Company</td>
<td></td>
</tr>
<tr>
<td>6:00 pm</td>
<td>Arrive back at hotel - Dinner on your own</td>
<td></td>
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**THURSDAY**

**APRIL 14, 2016**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 am - 8:30 am</td>
<td>Breakfast (Provided)</td>
<td>City A</td>
</tr>
<tr>
<td>8:00 am - 12:00 pm</td>
<td>Central Plant Board Business Meeting (Members Only Please)</td>
<td>The Loft</td>
</tr>
<tr>
<td>8:00 am - 12:00 pm</td>
<td>USDA APHIS PPQ Staff Meeting</td>
<td>Prairie Rose</td>
</tr>
<tr>
<td>12:00 pm</td>
<td>Adjourn</td>
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</table>
Agriculture in North Dakota

- Approximately 1% of our state and nation's population produce 85% of the country's food, feed, fiber, and fuel supply
- Food and Economic Security
- Affordable, Abundant, Safe and Nutritious
- Agriculture is the leading sector of the North Dakota economy
- Nearly one-fourth of North Dakota workers are employed in agriculture.

North Dakota

- 17th largest U.S. state by size
- North Dakota ranks 43rd based on population of 739,000 people
- North Dakota has 53 counties and a land area of 178 million hectares

Climate in North Dakota

- Climate across the state is semi-arid in the East, to arid in the West
- Northwest North Dakota averages 14 inches of precipitation
- Southeast North Dakota averages 32 inches of precipitation
- On average, 75% of the annual precipitation falls during the growing season (April-September)
- Average July temperature 69.8 degrees F
- Average January temperature 6.8 degrees F

Land Diversity & Topography of North Dakota

North Dakota – a National Leader

North Dakota produces 50 different commodities & leads the nation in the production of:

- Spring Wheat
- Durum Wheat
- Sunflowers - oil
- Canola
- Flaxseed
- Alfalfa (Edible Beans - Peas)
- Matt barley
- Honey
Other Commodities in ND

- Alfalfa
- Black beans
- Buckwheat
- Canola
- Chickpeas
- Cranberry
- Corn
- Great northern beans
- Kidney beans
- Lentils
- Millet
- Mustard
- Navy beans
- Oat
- Pea
- Potatoes
- Rye
- Soybean
- Soybean meal
- Sugar beets
- Sunflower - Confectionary
- White wheat
- Winter wheat, hard red
- Beef
- Dairy
- Sheep/wool
- Turf/irrigation
- Bison
- Elk farm-raised
- Deer farm-raised

North Dakota Livestock

Cash receipts for livestock represent the 4th largest sector of commodity agriculture in North Dakota.

- 1.69 million head of Beef Cattle and Calves
- 16,000 head of Milk Cows
- 155 million lb of milk per year
- 8,790 eggs per year in 2013
- Total of thousands of pigeons
- 138,000 head of market hogs
- 64,000 head of Sheep and Lambs
- Appro 600,000 honey bee colonies

[Link to video: https://www.youtube.com/watch?v=GOYH5uH7H6w&feature=share]

Advanced Production Practices and Innovation

- Soil Practices
  - Use of precision and practices
  - Maintenance
  - Use of till

- Nutrient Practices
  - Use of phosphorus
  - Development of advanced equipment
  - High production seed technology

Unmanned Aircraft System used to register stress, pathogen, invasive species and deficiencies

Value-added Agriculture

- Corn Wet-Milling
  - Wahpeton
- Dairy Processing
- Dry Bean Processing
  - approx. 47
- Food and commodity export companies
  - approx. 60
- Frozen Foods Plants
- Malting Plants
  - Spiritwood & West Fargo
- Meat Processing
  - approx. 100
- Pasta
  - Carrington & Minot
- Potato
  - Grand Forks & Jamestown
- Pulse Processing
  - Crosby, Devils Lake, Garrison, Minot, Plaza & Ray
- Specialized Milling
  - Minot Milling
- Harvey Milling
- North Dakota Mill & Elevator
- Sugar
  - Drayton, Fargo, Hillabro & Wahpeton

ND Products are Exported all over the World:


Grain & Oilseed Shipments

- 82% of Grain & Oilseed shipments are sent by rail, compared to 18% by truck
- A large percentage of North Dakota’s Grain & Oilseed shipments are sent to the Pacific Northwest Region
  - Hard red Spring Wheat
  - Sunflower
  - Barley
- Soybean
  - Flax
- Corn
  - Canola
- Dry Edible Peas
- Dry Beans
- Top destinations for these shipments include:
  - Vietnam, Thailand, China, Korea, Taiwan, Indonesia, etc.
- ND’s total agriculture exports totaled $4.5 billion in 2014
  - Traded sales

Source: USFS 2016 North Dakota Agricultural Special Report & USDA-Recognized Class

2
Oil and Gas in North Dakota
- Oil is one of North Dakota's leading industries
- Second largest oil-producing state in the U.S.
- Produce 1.17 billion barrels/day
- 13,077 oil wells currently pumping (July 2016)
- 10,489 reclaimed locations as of 1-7-16
- 41 active rigs as of 2-10-16
- Produce 1.65 million metric cubic feet of gas per day

North Dakota Department of Agriculture Roles
- Division: provide over 100 programs and services to the public
  - Administrative Services
  - Livestock Services
  - Marketing and Information
  - Animal Health
  - Pesticide & Fertilizer
  - Plant Industries
    - Manure Management
    - Agriculture Products Utilization Council
    - Pesticide Control Board
    - Agricultural Research
    - Rural Development

Additional Duties of the Commissioner
- Industrial Commission
  - Bank of North Dakota
  - State Mill and Elevator
  - Public Finance Authority
  - Housing Finance Agency
  - North Dakota Transmission Authority
  - Department of Mineral Resources
    - Oil and Gas
    - Geological Survey
    - Water Resources
    - Pipeline Authority
    - Renewable Energy Research Portfolio
    - Lignite Energy Council Research Portfolio

Additional Duties of the Commissioner
- Water Commission
- State Board of Tax Equalization
- Agriculture Products Utilization Council
- Pesticide Control Board
- Product Harmonization Board
- ND Trade Office
- State Board of Agricultural Research and Education
- CAPTS

Grants, Research, Marketing, Education
- The ND Department of Agriculture has many partnerships that promote and facilitate grant, research, and education programs on a federal level (USDA, EPA) and the state level (NDSU Extension).
  - A few of these programs include:
    - Upper Great Plains Transportation Institute: Improve economics and quality of transportation
    - Agri-Power: bring together producers, producers, and other stakeholders to discuss the future of pollinator health.
National Plant Board Updates
Joe Collins
NPB President
University of Kentucky

The year was 1994...

Joe's first plant board meeting

CPB Board of Directors
Julie Van Meter, NE
Colin Wamsley, MD
Brian Kuhn (alternate), Wi

Monthly calls
1 to 2 NPB/PPQ leadership meetings per year
Opportunity for states to raise issues that may affect other states

NPB Executive Team

Thanks Geir!
Pest Issues

- Dickeya dianthicola
  - Discovered late in potato season
  - 80 samples
  - 7 positive states (all regions)
  - BMPs sent to states & industry
  - Survey protocol currently unavailable
  - D. solani not detected in samples
  - Not known to occur in N.A.

- Citrus canker
  - TX
  - PPV
  - New area in NY
  - Flag smut
  - KS
  - Corn tar spot
  - IN & IL
  - Spotted Lanternfly
  - Chew toys
  - Medfly – clementines, Aruba
  - ???

New US records since Aug:

- Pickettia
  - Neofusicoccum/P. solani f.sp. phaseoli
  - Chondrostereum/P. solani f.sp. cucurbitae
  - Agromyza obtecta/P. pseudopersicicola mesembryanthemi
  - Cercospora betulae/Cercospora beticola
  - Sclerotinia rolfsii/sclerotiorum
  - Tumefaciens/C. cotophagenum

- Nematodes
  - Cyst nematodes/barley, Coccodora rosea

NPB basement

- www.nationalplantboard.org/basement
- Valuable resource for states
- Need the key? Email Carrie Larson cllarson@nd.gov for password
- What's hiding down there?
  - BOD & NPB/PPQ call minutes
  - Presentations
  - PPQ contact list
  - Organizational charts
  - Misc past meeting info

SPHD/SPRO Dialog

- Opportunity for state and federal program discussions
- Items for discussion
  - Cooperative agreements
  - MOUs
  - Personnel available/specialties
  - State regulations
  - Those who have authority in certain situations
  - Data collection
  - Organizational charts
  - Complete over time
  - Revisit over time

Members on Committees

- Resolutions:
  - Jen Frost (CPB)
  - Colleen Murney (CPB) Chair
  - Ann Gobes (PPQ)

- Awards:
  - Marc Van Meter (CPB) Chair
  - Tim Gallaher (PPQ)
  - Mike Gygax (PPQ)

- Websites:
  - Carrie Larson (CPB) contents manager
  - Brad White (PPQ) webmaster

- Japanese Beetle Harmanization

- Indo Van Meter Chair
  - Philip Lewis
  - Jason Ellis
  - froebichler@gmail.com
  - Dave Rhodes
  - Gar Schuster
  - Andrea Simon
  - Jeff Vogel
CPB Members on Non-NPB Committees
- NPPG: Phil Marshall
- CAPS Strategic Planning/National CAPS Committee: Julie Van Meter
- CARPOC: Jeff Vogel
- Cooperative Agreements: Brian Kuhn, Phil Marshall
- GM Review: Collin Wamsley
- NRPN: Robin Rosenbaum
- NDON: Carrie Larson

CPB Reps on Non-NPB Committees
- NRPN: Megan Abraham (IN)
- PEST Working Group: Ryan Krull (IA)
- Interagency GM Working Group: Christopher Deegan (WI)
- National GM Ment Board: Dave Atkins (OH), Lucy Hart (MN)
- Pollinator Issues: Andrew Joseph (IA)

Strategic Alliance between NPB & PPQ
- Initiated at a June 2014 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.

Pine Shoot Beetle
- First detected 1992
- Cleveland, OH
- NPB voted for deregulation 2015
- Quarantine not effective
- Damage is minimal
- Control through management strategies
- Proposed rule being drafted
- Based on public comments APHIS to decide whether to deregulate or not

Four key priorities identified:
- Funding
  - Alan Dowey & Brad White
  - Enforcement and Compliance
  - Paula Hentridge & Dana Rhodes
- Training
  - Alan Dowey & Geir Frissee
- Deregulation evaluation
  - Scott Pfister & Mitch Zegert
- Move to standalone

Next set of priorities will be addressed at summer BOD-PPQ meeting
Federal Register Notices

Email from Ken Rauscher asking for comments
7 requests since May 2015
- 3 NPB support
  - Hot water treatment for large mangoes, expansion of GM generally infected area, permitting for field testing of GE wheat
- 3 Not opposed by NPB
  - Orchid from China, cranberries from Chile, tomato plantlets from Mexico
- One NPB opposed
  - GE lentil
  - OR & ID issues with establishment off site

Comments needed:
- EA gall-forming wasp release to control Cape ivy due April 18
- Apples from EU due April 28
- Risk analysis to evaluate risk of:
  - Fresh pomegranate from Peru due May 6
  - Fresh figs from Peru May 6
- Amend import requirements fresh lemon & cherimoya from Chile due May 27

SANC Leadership

Ken Rauscher
NPB Program Associate

Dana Beers
SANC Co-Chair

Susan Mihalos
NPB Program Associate

American President
OR Executive Secretary

SANC Pilot Nursery/Greenhouse Operations

SANC - CPB Participation
- MI - Robin Rosenbaum
- MO - Collin Wamsley, Susan Ehlenbeck, Zack Starr
- Pilot Facility - Forrest Keeling
- OH - Dan Kenny
- WI - Brian Kuhn
- Pilot Facility - McKay Nursery

Pilot Nursery Progress

<table>
<thead>
<tr>
<th>Growers</th>
<th>EA</th>
<th>PMO</th>
<th>SANC</th>
<th>NPB</th>
<th>Implementation</th>
<th>Audit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conard-Pyle</td>
<td>✅</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td></td>
<td>✗</td>
</tr>
<tr>
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</tbody>
</table>
CFIA Director Change

Darlene Blair was appointed Chief Plant Health Officer for the CFIA in November 2015.

90th Annual Meeting of the National Plant Board

July 31-August 4, 2016, Wilmington, Delaware

Wilmington

- Largest city in Delaware
- 20 minute drive to Philadelphia International Airport, also easily accessible by Interstates 95, 295, NJ and Garden State Turnpikes, and Amtrak
- Walking distance to restaurants, theaters, coffee houses, and many interesting places

Hotel duPont

The luxurious Hotel du Pont has been welcoming guests since 1913 to one of the grandest hotels in the world, located in the heart of downtown Wilmington, DE.

Companion trip to the sandy beaches and surf of the majestic Atlantic Ocean

A quick trolley ride to the Riverfront


PLUS - restaurants, Iron Hill Brewery, IMAX theater, Children's Museum, and more!
Meeting Sessions

- Federal and Partner updates
- New and emerging pests
- Hemp
- Pollinators
- Crazy Worms
- Biotechnology
- And a few special presentations

Wednesday Evening - Buena Vista
Delaware and U.S. statesman John Middleton Clayton

Beautiful surroundings, great food and brew

Music by Betty, the Bullet, & the Boy from Boston

Don't Miss this Important Opportunity:

- Hear updates on the important plant regulatory issues facing your state
- Welcome new members, and network with state and federal colleagues
- Provide needed input on NPB business at the Annual Business Meeting
- Experience the beauty and hospitality of the 45th largest state in the USA
- Looking forward to seeing you!
PPQ Field Operations

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
- Agricultural Risk Management
- Cold Treatment Pilot Program
- Caribbean Safeguarding Initiative

Domestic and Emergency Programs
- Emerald Ash Borer
- Pale Cyst Nematode
- Grasshopper

Tribal Partnerships
- Recognized tribes
- Relationships
- ICS Training Exercises
DART and IT

- ESRI Mobile Application
- Data Quality Tool Development
- Custom Port of Entry Profiles

Thank you!

Questions?
FRSMP and DEEP Basics

Ricardo Valdez
National Coordinator for Official Control
Central Plant Board Meeting
Fargo, ND. April 12, 2016

Acronyms
- FRSMP
  Federally Recognized State Managed Phytosanitary Program
  (pronounced ‘Fre-Stemp’)
- DEEP
  Deregulation Evaluation of Established Pests

Background
- The IPPC (SPM 5) states that if a country has a pest established
  within its territory, it may not take action against it at ports of entry
  unless the pest is under official control.
- The FRSMP program is considered a type of official control.
- In the United States, we have a number of pests established (and
  NOT under official control) for which we still take action at ports of
  entry.
- The DEEP process was established for PPQ to consult and
  collaborate with the States to resolve the statuses of these pests.

When is FRSMP of interest to a State?
- When a pest is considered non-actionable at ports of entry*
  BUT
- State(s) want to keep action against that pest at ports of entry
* or is about to change status to non-actionable through DEEP process

FRSMP Petition

Petition Requirements
- State demonstrates that a pest of consequence is under a
  phytosanitary program
- State has or is able to obtain legal authority to act on the pest
- Exclusion/containment/eradication is possible

Official Control Advisory Panel (OCAP)
- Group charged with reviewing petitions
- NPB representation

Current FRSMP Programs

Florida
- Potato psyllid (Bactericera cockerelli)
- Bagrada bug (Bagrada hilaris)
FRSMP at Ports of Entry (POEs)

- Options if pest is found at a POE within the participating State:
  - Treatment (If available)
  - Re-exportation
  - Destruction
  - Redirect and Avoid
- Option if pest is found at a POE outside the participating State:
  - Avoid

DEEP Process

- PPQ presents 5-10 pests a year to the National Plant Board for input.
- NPB provides feedback to PPQ.
- PPQ takes that feedback into consideration and engages States with concerns.
- As of today, we have presented 131 pests.
- States have expressed interest in petitioning.
- 86 of these pests have changed status to non-actionable.

Contact Information and Helpful Links

- Ricardo Vakilz/National Coordinator for Official Control
  ricardo.vakilz@aphis.usda.gov
  (301) 651-2053
- FRSMP website
  http://www.aphis.usda.gov/frsmp
- FRSMP manual
Introduction

In addition to the accidental introductions that occurred in the past and continue today, a substantial number of mollusk species are intentionally introduced from abroad.

Being intentionally introduced, people who smuggle in these snails and slugs threaten their survival and successful establishment into the environment.

The interstate movement of live plant pests, including snails, requires an application for a USDA permit.

A permit or a letter of no jurisdiction may be given, but interjurisdictional authorities need to know if a permit or letter of no jurisdiction is necessary. The permit or letter of no jurisdiction is needed to ensure that the species being moved does not belong to the group named in the permit or letter of no jurisdiction.

The process for applications requiring to move live and shell plant pests or within states to order to plant "shell farms," and guidelines for successful establishment are being implemented.

Among these guidelines are:

- The facility must be located at a location where the species is already known.
- The facility must be isolated from other snails and slugs in the area.
- The facility must be isolated from other food sources that are not allowed in the area.
- The facility must be isolated from other sources of food or water.
- The facility must be isolated from other sources of water or food.
- The facility must be isolated from other sources of water or food.

Further guidelines are not being determined.
The invasive movement of snails offers food that of most insects, plant pathogens etc. In that it is usually intentional.

- The includes snails for the aquatic pet trade: gastropods such as those classified as 'exotics'. One African snail (Bolivian ramshorn) is now used for beauty treatments.

- The Giant African snail (GAS) is one of many snails and slugs that are popular items in an illegal pet trade now wide.

- Two African schistosomiasis species were recently in (2011) amplified into the larger area through gardens, parks, and other environments. These species include several snails used for beauty treatments.

- The “Snail matrix”
  - Several years ago, it was brought to my attention that several species in land snails were being studied biologically by companies, and were being shipped across state lines to schools, etc.
  - Among these us were Goniobasium capricornis (formerly Helix aspersa), commonly known as the Brown garden snail.

- Various land snail species (family, Ampullariidae):

- A was introduced into the
  - We needed to tighten up restrictions on the movement of live snails; by requirement that
  - small species should have an application submitted to the Forestry Department.
  - In the past, that would not have been necessary.
  - No plant peaks could be sold by a commerce enterprise to an entity.
  - A state where the species was not present (with some exceptions).
  - Each state would have to have access to different species, with emphasis on breeding, and species being sold for educational purposes.
  - The Snail matrix needed to be created taking into account native species (e.g., size and abundance being important factors), or plant peaks already established where there is no control control program.
  - Now all biological supply companies are required to follow the matrix, a guide as to which small species can be shipped to individual states.

- The Snail matrix continued.
LONG-TERM SUCCESS STORY
OF LEAFY SPURGE CONTROL
IN NORTH DAKOTA
HOW THE STATE WENT FROM DESPAIR TO
RECLAIMING LAND FROM THE YELLOW
INVADER

Leafy Spurge
• Noxious weed
• Produces abundant seed
  – 140 seeds stem⁻¹
• No single control method can be used
• Wide dispersal; various soil
  and habitat types
• Ample, viable seedbank

INITIAL DISCOVERY AND INVASION
• FOUND GROWING ALONG A STREET IN FARGO IN 1909

INITIAL DISCOVERY AND INVASION
• NOT ADDED TO THE STATE NOXIOUS WEED LIST BECAUSE THREAT
  NOT RECOGNIZED
• PORTER AND STEVENS WROTE "IT (LEAFY SPURGE) SEEMS TO
  SPREAD FREELY FROM THE ROOTS AND SHOULD BE WATCHED
  CLOSELY"
• ONLY CONTROL OPTIONS WERE SMOTHERING AND CULTIVATION IN
  CROPS OR MOWING AND HOEING IN PASTURE

INITIAL DISCOVERY AND INVASION
• FIRST IN-DEPTH ANALYSIS WAS CONDUCTED BY VELVA RUDD FROM
  1931-1932 AS PART OF HER MASTERS DEGREE RESEARCH

HER THESES CONTAINS A COMPLETE DESCRIPTION OF THE PLANT,
SEED PRODUCTION AND SPREAD BY ROOT.
DETAILED DRAWINGS OF THE PLANT REMAIN IN USE TODAY.
HER WORK WAS CONDUCTED IN NORTH FARGO, WHERE THE PLANT
WAS "GROWINGהחלטedly"
PRE-WAR CONTROL AND EDUCATION

Leafy Spurge was added to the ND Noxious Weed List in 1935 following a survey for five "cancerous weeds".

The weed was found in 43 of the 53 counties but no acreage was given. Other than to say "Foster County had the largest single infestation of 193 acres in a single township".

Fourteen counties had eradication programs in progress.

PRE-WAR CONTROL AND EDUCATION

Chemical Control Recommendations from NDNC:
- Sodium Chloride 1 lb/acre (320 lbs/acre)
- Sodium Arsenite, Calcium Cyanamid, Arsenic Pentoxide
- Apply to Leafy Spurge at flowering

Chemical recommendations remained unchanged for the next two decades.

The use of sheep to graze leafy spurge was begun in 1933.

WW-II CONTROL AND EDUCATION

In 1944 Bulletin the dangers of using sodium chlorate were noted. "When mixed with organic matter such as clothing or wood... becomes a serious fire hazard."

One should use caution when starting the wood stove after spraying leafy spurre!

Also recommended using cultivation with chemicals. The first integrated approach to leafy spurge control.
POST-WAR CONTROL AND EDUCATION

- Extension service began a state wide leafy spurge control demonstration program in 1953.
- First North Dakota farm research article spoke of using GA to break root bud dormancy.
- State weed law revised in 1950 - Legislatures told county commissioners to “destroy noxious weeds in the public interest” and on the way did not spend more than $3,000/yr.

SECOND RESEARCH ARTICLE LISTED THE SAME CONTROL OPTIONS 35 YEARS EARLIER EXCEPT A SECTION CALLED “HOW SERIOUS IS LEAFY SPURGE?” WAS NO LONGER INCLUDED.

Survey of landowners showed only 30% considered leafy spurge a big problem, 30% had never heard of the weed.

FIRST STATE WIDE CONTROL PROGRAM IN 1946
June was declared leafy spurge control month.
Herbicides included:
- Banvel at 6 to 8 lbs/A
- Tordon at 1 to 2 lbs/A
- 2,4-D up to 40 lbs/A in the fall.

- Larry Mitch began a small research and demonstration trial in the late 50s. Letters in his file note that leafy spurge had infested 377,255 acres, a state wide of which 332,469 were treated. The infestation was increasing by 7000 a/yr.

By the early 1970's the yellow monster had invaded over 800,000 acres and was doubling in size every 10 years.
1979 LEAFY SPURGE SYMPOSIUM

- Dan McIntyre, supervisor with the Custer National Forest worked with NDAES director H. R. Lund to initiate the symposium

- WORKSHOP ON BIOCONTROL - ED BALSEBAUGH AND PETER HARRIS
- SOCIAL AND ECONOMIC IMPACTS - LARRY MITCHEL
- CHEMICAL CONTROL - HAROLD ALLEY
- THE LEAFY SPURGE PROBLEM - DAN NOBLE, PAUL DUNN, & LLOYD ANDRES
- LEAFY SPURGE PLANT - CAL MESSERSMITH
- RECOMMENDATION FOR A PERMANENT LEAFY SPURGE TASK FORCE AND ANNUAL CONFERENCE

1979 LEAFY SPURGE SYMPOSIUM

- NDSU BEGINS INTEGRATED PROJECT
  - CAL MESSERSMITH - HERBICIDES
  - ROD KIMMERLY IS A POST-DOC
  - BOB CARLSON - ENTOMOLOGY
  - BOB HOSFORD - PLANT PATHOLOGY
  - DON KIRBY - RANGE SCIENCE
  - LARRY LEISTRITT and JAY LEITCH - ECONOMICS
  - DON GAULTZ - BIOLOGY

- USDA-ARS in Fargo reassigned D. G. Davis and D.S. Frear with S.E. Lingle hired as a post-doc to conduct leafy spurge research

OUTCOMES FROM THE SYMPOSIUM

- A cooperative project of the Agricultural Experiment Stations from five states was begun, Montana, Nebraska, South Dakota, and Wyoming, with North Dakota as the lead state.

- Major boost to the program was through redirection and enhancement of research efforts by the Agricultural Experiment Stations and by the USDA, initially by the ARS and then APHIS.

- Director H.R. Lund immediately committed $100,000 at the Bismarck symposium to fund a non-tenure research associate position and redirection occurred when a position in the Entomology Department was converted to biocontrol of leafy spurge.

Early cooperative effort was the Leafy Spurge News initially edited and published by the Montana Ag Exp Stn

Leafy Spurge Acreage in North Dakota (Years)
Leafy Spurge Acreage in North Dakota (Years)

1980's EMPHASIS WAS ON HERBICIDES
THE STATE HAD A COST SHARE PROGRAM
BIOCONTROL WAS IN RESEARCH AND DISCOVERY PHASE
BIOLOGICAL CONTROL

- Promise of biological control revitalized the control efforts in the late 1980s
- Kelly Miller, a Towner, ND rancher and Bob Thoft, a Montana state legislator went to Europe to explore possibilities
- Russ Lorenz of USDA-ARS in Mandan wrote a proposal to the federal gov.

A. FLAVA
A. LACERTOSA/CZW
A. NIGRISCUTIS

Gall midge (Spurgia esula)
Useful in wooded and moist areas

Long-horned beetle (Obera erythrocephala)
Very slow to increase in pop.

Leaky Spurge Acreage in North Dakota (Years)
Team Leafy Spurge Project

- ARS – Area Wide Pest Management Program (AWPMP) initiated in 1997
- Joint leadership from USDA-APHIS and USDA-ARS
  - Lloyd Wendel (APHIS)
  - Gerry Anderson (ARS)
- Purpose was to develop and demonstrate IPM strategies to effectively control leafy spurge.

TEAM Program

- TEAM members included BLM, Forest Service, NPS, BIA, Reclamation, USGS, State Ag Depts, Ag Colleges
- Approximately $5.5 million for the 5 year project – 13 partners
- Research and outreach programs coordinated with four states: ND, MT, SD, and WY
Spurge Fest I - 1999 Medora, ND
Spurge Fest II - 2001

When to best use herbicides
Combine all the tools.

TEAM Outreach

Leafy Spurge Acreage in North Dakota (Years)

WE HAVE BEEN MONITORING RESULTS SINCE THE 1999 APHTHONA RELEASES
OVERALL RESULTS

- Leafy spurge is no longer the most feared weed in North Dakota
- Multiple agencies working together met the goal of implementing long lasting control programs
- Impossible to have done without federal, state, and county cooperation
Well, faithful reader, this is the last installment for the Leafy Spurge News, as this is the last issue! We have learned a lot over the past 15 years of the project. Let's get started on some of the highlights of our project and someiller groups. I reached its tenth under the Thousand Leafy Spurge Program.

Questions?
Phytosanitary Treatment of Oak and Walnut Logs

From oak wilt and thousand cankers diseased trees

Jennifer Juzwik
Northern Research Station, U.S. Forest Service

United States Log Export Values

• 2013 statistics for global trade
  • Softwood logs - $1.6 billion
  • Hardwood logs - $570 million

• 2014 statistics for S. Korea trade
  • U.S. hardwood logs - $1.7 million
  • U.S. black walnut - $2.3 million

International Trade

• The Problem
  • Spread of invasive organisms through global trade

• Current Treatments
  • Most common – heat commodity to 56 C for 30 minutes (to core)
  • No comprehensive, international convention for whole logs
    • Schedules devised and set between trading countries

Domestic Movement and Trade

• The Problem – spread of invasive organisms

Methyl Bromide Quarantine and Pre-shipment (QPS) for logs

• MB on logs for export remaining one of the largest QPS uses in the United States.

• 168 metric tons annually for U.S. log exports from 2009-2012 monitored by USDA. This does not include fumigations performed by state and local operators.

• Increasing EPA (i.e. Clean Air Act) and site-specific usage restrictions provide additional incentive to develop efficacious and cost effective alternatives for log exports.

This Presentation

• Summary of recently completed research on walnut log and lumber treatment by other researchers.

• Ongoing research
  • Sulfur fluoride treatment of oak logs
  • Vacuum steam treatment of oak and walnut logs
Walnut Log and Lumber Treatment

- Elimination of walnut twig beetle and Geosmithia morbida

Phytosanitary Treatments

- Debarking
  - Did not ensure elimination of fungus from sapwood surface

- Heat Treatment
  - Min. outer sapwood temp of 56°C maintained for 40 minutes
  - Eliminated WTB and G. morbida


** Myers, B., USDA APHIS, unpublished.

Phytosanitary Treatments

- WTB re-infestation of heat or MeBr treated logs
  - WTB colonized steam heated and MeBr treated logs
  - Thus, must prevent WTB access to treated logs

On-going Research: Methyl Bromide Alternatives

Sulfuryl fluoride

Dictyocystis fopaceorum

Scott Meyers
USDA APHIS PPQ CPHST
Jennifer Juzwik
USDA Forest Service

On-going Research: Methyl Bromide Alternatives

Vacuum Steam Treatment

Zhang Chen and
Marshall White
Department of Sustainable Biomaterials
Virginia Tech University
Blacksburg, VA 24060

Iron Mark
Jennifer Juzwik
Northern Research Station
USDA Forest Service
St. Paul, MN

USDA APHIS PPQ CPHST
Olta Laboratory
Beazards Bay, MA

Oak wilt diseased logs from:
- artificially inoculated, and
- naturally-infected trees.
Three SF rates: 240, 280 and 320 mg/L
Exposure time: 72 hours

Vacuum Steam Treatment
Advantages of Vacuum Steam vs. Heat or Fumigation

- **Vs. MeBr**
  - Non-chemical
  - Requires less time

- **Vs. heat**
  - Quality of log and product minimally affected
  - Requires less time

- **General**
  - Vacuum steam currently used with other commodities

---

Phase I: USDA APHIS, VA Tech & Danzer Veneer trials

- Logs of five hardwood species, including:
  - Eastern black walnut
  - Red oak

- Determined:
  - Time to reach 56°C/30 min to log geometric center.
  - Effect on log quality
  - Energy required

---

Plastic log sweaters were applied on radial checks.

A series of data loggers and thermocouple probes were inserted into the logs.

Veneer log being tested in polymer bag. Virginia Tech.

---

Phase I: Vacuum steam treatment time for logs at 200 mm Hg and saturated steam at 30°C.

<table>
<thead>
<tr>
<th>Species</th>
<th>Log and test run (number)</th>
<th>Room temperature (°C)</th>
<th>Wood initial temp (°C)</th>
<th>Treatment Time (h)</th>
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</thead>
<tbody>
<tr>
<td>Black walnut</td>
<td>10</td>
<td>26</td>
<td>20.1</td>
<td>17.3</td>
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<tr>
<td></td>
<td>4</td>
<td>25</td>
<td>27</td>
<td>24.5</td>
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<tr>
<td></td>
<td>1</td>
<td>20</td>
<td>28</td>
<td>18.2</td>
</tr>
<tr>
<td></td>
<td>control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red oak</td>
<td>7</td>
<td>25</td>
<td>17.8</td>
<td>28.2</td>
</tr>
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<td>11</td>
<td>26</td>
<td>20.3</td>
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<tr>
<td></td>
<td>control</td>
<td></td>
<td></td>
<td>26.0</td>
</tr>
</tbody>
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Phase I: Vacuum steam effect on quality

Eastern black walnut - end checking

<table>
<thead>
<tr>
<th>Species</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red oak</td>
<td>V-S Treated</td>
</tr>
<tr>
<td>Control</td>
<td></td>
</tr>
</tbody>
</table>
Phase II: Scale-up trial in commercial V-S treating system

- Vacuum Steam Controller
- Steam Supply
- Veneer Log
- Vacuum Accumulator
- Chamber (65 feet long)

Veneer log strapped to pallets to be treated with vacuum steam.

Moving log / pallet unit into V-S chamber.

Phase III: Vacuum steam treatment time for logs under different pressures and saturated steam (90 C) to reach 60 C for 60 minutes.

<table>
<thead>
<tr>
<th>Treatment Pressure (mm Hg)</th>
<th>Tree species</th>
<th>Log number</th>
<th>Wood Initial temp (°C)</th>
<th>Treatment Time (hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>Red oak</td>
<td>R2</td>
<td>16</td>
<td>23.8</td>
</tr>
<tr>
<td></td>
<td>Walnut</td>
<td>W5</td>
<td>16</td>
<td>24.1</td>
</tr>
<tr>
<td>570</td>
<td>Red oak</td>
<td>R8</td>
<td>18</td>
<td>26.0*</td>
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<tr>
<td></td>
<td>Walnut</td>
<td>W7</td>
<td>18</td>
<td>25.5*</td>
</tr>
<tr>
<td>25</td>
<td>Red oak</td>
<td>R6</td>
<td>19</td>
<td>35.5</td>
</tr>
<tr>
<td></td>
<td>Walnut</td>
<td>W3</td>
<td>19</td>
<td>35.6</td>
</tr>
</tbody>
</table>

Phase II: Vacuum steam effect on quality

Black walnut veneer

Eastern black walnut – end checking

V-S Treated

Control

Phase III: 2016 vacuum steam treatment of logs in portable vacuum steam unit

Vacuum steam as a proposed phytosanitary treatment for walnut logs for export

Proposed draft schedule for walnut logs

<table>
<thead>
<tr>
<th>Disease</th>
<th>Temperature and Vacuum Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brownrot</td>
<td>90°C, 2000mm Hg, 1 hr</td>
</tr>
</tbody>
</table>

Inner bark

Cambium

Heartwood

Asgwood

Outer bark

Veneer

Growth rings

Walnut cross section

Temperature and Vacuum Period

90°C, 2000mm Hg

1 hr
Vacuum steam as a proposed phytosanitary treatment for oak logs for export

Proposed draft schedule for red oak logs

<table>
<thead>
<tr>
<th>Disease: Oak wilt (Ceratocystis fagacearum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature and Humidity</td>
</tr>
<tr>
<td>50°C, 210 mm Hg</td>
</tr>
</tbody>
</table>

Summary

- Effective, practical and affordable alternatives to heat and methyl bromide fumigation are needed for commercial log treatments in domestic and international trade.

- Potential alternative fumigants for log treatments are phosphine and sulfuryl fluoride (SF).
  - SF currently being evaluated for ability to kill the oak wilt fungus in infected logs.

- Vacuum steam treatment shows promise for hardwood log treatment.
  - Currently being evaluated for ability to kill the oak wilt and TCD causal agents.
Thousand cankers disease research update

Andrea Heffy, PhD candidate, UMN Department of Entomology
Dr. Jennifer Juzyk, Forest Service, Northern Research Station
Central Plains Board meeting, Fargo ND
April 12, 2016

Outlook
- Introduction
- How far can walnut twig beetle fly?
- Are there other hosts in the East that we should monitor?
- Can walnut twig beetle survive cold temperatures?
- Bark beetles, ambrosia beetles and weevils associated with TCD-symptomatic black walnut
- Known canker-causing fungi isolated from TCD-symptomatic black walnut

Research collaborators
- Aubrey Wilkie, walnut twig beetle flight assays
- Mark V. Coggeshall, out branches for host screening essays
- James R. McKenna, out branches for host screening essays
- Matt Ginzel and Tyler Stewart, insect emergence and identification
- Paul Castilla, Mog McDermott, and Melanie Moore, technical assistance in field and lab

Thousand cankers disease

Walnut twig beetle
(Pityophthorus juglandis Blackman)
Kolarik et al. 2011. Mycologia

Walnut twig beetle biology
- Two generations per year (northeastern Italy)
- Two flight periods (spring and fall)

Distribution of Thousand Cankers Disease as of April 30, 2015

- TCD-confirmed
- Quarantine Issued

Source: www.thousandcankers.com
How far can walnut twig beetle fly?

Walnut twig beetle on a flight mill

We found no significant difference between male and female flight distance, velocity, or time in flight.

We found no effect of age on flight distance, velocity, or time in flight.

Beetles flew an average of 372 m in 1 day = 0.23 miles

Monte Carlo simulation

Walnut twig beetle simulated flight distance over 5 days based on laboratory data

On average, the estimated flight distance of a beetle is approximately 1.5 mile (500 m) over 5 days.
How far can walnut twig beetle fly?

- On average, maximum flight in one day is about 1/4 mile.
- Over 5 days, beetles can fly about 1/3 mile.
- Movement over very short distances is likely a result of natural spread.
- Movement over long distances is more likely human-mediated.

Are there other hosts in the East that we should monitor?

Sources of host material

Laboratory assay

- Cut to 10 inches
- Used 3-6 mating pairs/branch section
- Looked for frass
- Waited 12 weeks
- Counted offspring

- Walnut twig beetle can reproduce in other walnut species.
- Reproduction varies across hosts.
- Not all species in Juglandaceae are hosts.
Are there other hosts in the East that we should monitor?

- Yes...
  - Butternut
  - Japanese walnut
  - Hybrids
  - Chinese walnut
  - English walnut

- ...but not all species within Juglandaceae.
  - Pecan
  - Shagbark hickory

Can walnut twig beetle survive cold temperatures?

Lower lethal temperature

Lower lethal temperature across one year, 2013-2014

50% of the population will likely die at -21°C (-6°F)

90% of the population will likely die at -36°C (-3.4°F)

Lower lethal temperature in February, 2014

Estimated mortality due to cold

> 90% mortality
80-90% mortality
60-70% mortality
40-60% mortality
< 20% mortality
Walnut twig beetle trap catches 2013-2015 (Ohio Dept. of Agriculture)

<table>
<thead>
<tr>
<th>Year</th>
<th>Time Period</th>
<th>Counted Trapped (t)</th>
<th>Traps Set (t)</th>
<th>Traps with WTB (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>August - October</td>
<td>106</td>
<td>5 *</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>June - July</td>
<td>14</td>
<td>109</td>
<td>0</td>
</tr>
<tr>
<td>2014</td>
<td>August - October</td>
<td>14</td>
<td>109</td>
<td>0</td>
</tr>
<tr>
<td>2015</td>
<td>June - July 31</td>
<td>19</td>
<td>106</td>
<td>0</td>
</tr>
</tbody>
</table>

* Thousands of WTBs collected from one trap in residential setting in 2013.

Data source: Don Kenney, Ohio Dept. of Agriculture, Reynoldsburg, OH (Annual reports for Farm Bill)

Can walnut twig beetle survive cold temperatures?

- Estimated cold mortality (2013-2014) of the walnut twig beetle population in Butler Co. is between 40-60%.

- Future research:
  - Does walnut twig beetle mortality increase after repeated or longer exposures to cold?

Insects and TCD

Bark beetles, ambrosia beetles and weevils associated with TCD-symptomatic black walnut
Butler County, OH - 2014 and 2015

Eight insect species (n = 155) were emerged from stem samples collected early Sept. 2014 from TCD trees.

<table>
<thead>
<tr>
<th>Taxonomic group</th>
<th>Species</th>
<th>No. specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambrosia beetles</td>
<td>Xyleborus allius</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Xylosandrus crassusculus</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Xylopatra savesseli</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Monarthrum rarii</td>
<td>1</td>
</tr>
<tr>
<td>Cylindrical bark</td>
<td>Synchyla fuligineae</td>
<td>1</td>
</tr>
<tr>
<td>beetles</td>
<td>Phyllothurus johnsii</td>
<td>1</td>
</tr>
<tr>
<td>Bark beetles</td>
<td>Hylastes emersi</td>
<td>1</td>
</tr>
<tr>
<td>Weevils</td>
<td>Strigotinus pallescens</td>
<td>47</td>
</tr>
</tbody>
</table>

Three species (X. crassusculus, X. savesseli, and S. fuligineae) accounted for 95% of total.

Cooperative Research: J. Juszko and H. Gland
Ambrosia and bark beetles and bark-colonizing weevils emerged from TCD-symptomatic trees in Ohio, 2015.

Seven insect species (n = 50) were emerged from samples collected early Aug, 2015 from TCD trees.

<table>
<thead>
<tr>
<th>Taxonomic group</th>
<th>Species</th>
<th>No. specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambrosia beetles</td>
<td>none</td>
<td>0</td>
</tr>
<tr>
<td>Bark beetles</td>
<td>Pityophthorus luglandis</td>
<td>2</td>
</tr>
<tr>
<td>Bark-grafting</td>
<td>Tenebroides corticola</td>
<td>5</td>
</tr>
<tr>
<td>Wasp</td>
<td>Himatia errans</td>
<td>26</td>
</tr>
<tr>
<td>Weevils</td>
<td>Stenonimus pallidus</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Acromyopsis rossinae</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>A. elegans</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Conotrachelus retenius</td>
<td>3</td>
</tr>
</tbody>
</table>

Four weevil species accounted for 86% of total.

What do we know about these insects and black walnut health?

*Pityophthorus luglandis* can be an aggressive invader of walnut resulting in thousands of galleries.
*Xylsandra crassicaulis* attacks a wide variety of woody hosts, including walnut. It is a rather aggressive invader and will attack healthy as well as stressed trees.
*Xyleborinus saxesenii* attacks a wide range of woody hosts, including walnut.
*Himalia errans* and *Stenonimus pallidus* colonize bark of dead and weakened trees. *Conotrachelus retenius* damages the nuts.

**Future Research:** Will these non-WTB insects sustain TCD epidemic when WTB populations are low?

Several non-WTB insect species do carry *Geosmithia morbis.*

<table>
<thead>
<tr>
<th>Insect taxon</th>
<th># assayed</th>
<th># with Gm</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>S. pallidus</em></td>
<td>26</td>
<td>17</td>
</tr>
<tr>
<td><em>X. crassicaulis</em></td>
<td>47</td>
<td>13</td>
</tr>
<tr>
<td><em>X. saxesenii</em></td>
<td>68</td>
<td>15</td>
</tr>
</tbody>
</table>

* Based on serial dilution plating of inoculated host extraction and fungal DNA extraction and detection from the same preparation.

Canker-causing fungi and TCD

Known canker-causing fungi isolated from TCD-symptomatic black walnut
Butler County, OH – 2014 and 2015

What is the status of fungus canker and insect-caused damage on TCD trees post-WTB 'crash'?

Hamilton, OH, August 2015
**Summary**

- Walnut twig beetle not likely to move far on its own,

- Other Juglandaceae species help reproduction and beetle; pecan and shagbark hickory do not,

- Cold mortality likely contributes to walnut twig beetle population decline in Ohio.

- Other insect species can carry *Geosmithia morbida*, and

- Other pathogenic fungi are associated with cankers and insect damage on TCD-symptomatic trees.
Questions, Discussion and Speculation
Gypsy Moth Program – An Update

Central Plant Board
Fargo, North Dakota
April 6, 2016
Paul Chelune
USDA APHIS
National Policy Manager
EAB and GM Programs
Riverdale, Maryland
301-853-2364

Today’s Topics
• Funding
• Regulated Sawmills
• Manual Update and Revision
• Vessel Inspection Program
• Pacific Northwest Response
• Other AGM Responses

Money Matters

2014-2016 Program Funding

Regulated Logs and Mills
• Moved to new regulatory schema in 2015
• Standard based approach
• No Federal processing requirements, states can choose
• Still require inspection of logs at point of origin
• Set traps at and around mills to monitor GM populations
• Take action if trap catch numbers are anomalously high at mill site

Analysis of 2015 Mill Trapping

Program Manual Revision
• NPB/PPQ Working Group
• Bi-weekly calls
• Working through manual chapter by chapter, line by line
• Consolidating chapters
• Adding an “Outreach” chapter
• Completed Survey, Outreach chapters

Working on the Regulatory chapter(s) now
Vessel Inspection Program
- Decrease in interceptions in 2015
- No changes to program partners or protocols
- Working on an AGM phenology model to better target the high risk period

Pacific North West Response
- Numerous 2015 detections of AGM and EOM in OR and WA
- Multiple spatially distinct "hot spots"
- Convened a TWG to provide response recommendations
- ~10,000 treatment acres in WA
- ~8000 in OR
- Defining surveys

PNW Response
- $3.4 million in Farm Bill funding, plus state cost share
- Total response cost = ~$4.5 million
- EAs tiered to 1995 EIS and 2012 SEIS
- Large public outreach effort
- Aerial treatments using Btk (fixed and rotary wing aircraft)

PNW Response
- Overview of all treatment areas
- Tacoma - 40% traps, 98,405 acres

PNW Response
- Map showing trapping areas and acres

PNW Response
- Map showing trapping areas and acres
Oklahoma AGM Delimit
- 2013 – 1 moth
- 2014 – 1 moth
- 2015 – 0 moths
- 2016 – Delimit

South Carolina AGM Delimit
- 2014 – 1 moth
- 2015 – 1 moth
- 2016 – Delimit

Georgia AGM Delimit
2015 detections – 1 moth

Questions?
Overview

- Company Overview
- Technology Overview
- North America
  - Operations
  - Facility
  - Certification

COMPANY OVERVIEW

E Green Global Introduction

- Headquartered in Seoul
- 4 years operating history
- Technology in development for 15 years
- Financed from Singapore, NY, Korea
- Commercial cultivation in China
  - 4MM+ FG0 seed potato planting summer 2016
  - Manufacturing facility in China (Harbin) 30 MM MCTs/yr, expanding to 30 MM MCTs/yr
- Significant footprint and partnerships established in China
- Expanding to North America, SE Asia (Sri Lanka)
E Green Americas Introduction

- Established 2015 to service North American, Europe and export market
- Clean room manufacturing facility in MN
- Business Model—
  - Processors: Sell FG2 potatoes as commercial seed (contract farm to grow FG1 and FG2)
  - Independent sales for table consumption/export produce FG0 seed potato, work with partners to cultivate to FG2
- Strategic relationships with small number industry partners, seed farms

Themes

- Same or better performance of minitubers, at lower cost
  - Robustness proven by multiple cultivations in China and Korea
- Enable reduction in generation(s) to get to commercial planting
  - Major benefits to industry
- Varietal independent
- Committed to Americas market – operations commenced

US / N. America Market Condition

1. Market going through change
2. Significant desire to remove 1-2 generations from multiplication
3. Under point #2, seed availability is a major issue for market
4. Removing 1-2 generations increases TAM for EGA
   1. End demand does not change,
   2. Removing generations removes ~10x multiplier effect to get to the end demand volume

Seed Multiplication System by technology

EGG Technology accelerates seed potato production, through its shorter production periods, lower cost, and higher productivity

Cost & Time Savings

EGG MCT Technology at a Glance

- EGG Seed Technology enhances traditional cultural cultivation technologies for higher quality and efficiency
- Producing a single piece (100 bushes) of micro tuber to be planted directly in the ground
- Setup cultivation cages of Micro tubers with several species to lower cost

Non-GMO Mass production at low cost Year round production Can be planted directly to soil
Production Technologies of Virus Free Seed Potato

Production Process

- Stem multiplication
- Tissue culture multiplication
- Planting into greenhouse
- Cold inhibited
- Field testing
- Field evaluation
- Virus testing
- Virus testing in dark room
- GA treatment

NORTH AMERICA

Results – Atlantic

<table>
<thead>
<tr>
<th>Cultivar &amp; Type</th>
<th>Stems</th>
<th>Daughter tuber</th>
<th>Tuber/Gen</th>
<th>Average-dia. (mm)</th>
<th>Longest size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlantic MCT 1</td>
<td>1.2b</td>
<td>10.5a</td>
<td>9.4a</td>
<td>3.8b</td>
<td>9.1a</td>
</tr>
<tr>
<td>Atlantic MTC 2</td>
<td>2.5a</td>
<td>9.6ab</td>
<td>3.8b</td>
<td>4.9ab</td>
<td>8.2a</td>
</tr>
<tr>
<td>Atlantic MM 1</td>
<td>3.2a</td>
<td>7.7b</td>
<td>4.5b</td>
<td>5.0a</td>
<td>8.4a</td>
</tr>
</tbody>
</table>

Production

- Initial scale 5MM units/yr
- Plan to go to 20MM units over next five years
- Cleanroom production
- Site – Plymouth, MN
- Production output divided between domestic and export markets
- Process – trade secret
  - Based on extremely tight, multi-variable management control
- Close partnership with growers, downstream

Production Facility

- Cleanroom plant culturing facility (formerly medical device production facility)
- Class 100 clean benches, separate ventilation systems / control systems
- All supportive equipment, functions
  - Plant multiplication
  - Potato dormancy
  - Sprouting

Sterility

- Whole facility is controlled
  - Limited access
  - Garment requirements
- Production rooms
  - Sterile controls
  - Separate ventilation systems; HEPA filters
  - Positive pressure, ...
- Combined RO, DI water purification systems
**Virus Testing IAW Requirements**

- Onboarding (paperwork)
- Send incoming mother plants for testing
  - Cms, PVA, PVX, PVY, PVM, PVS, PLRV, P otLV, TSWV, Patro, Rs, PMTV, TRV and TVd
  - Same for yearly testing of mother plants
- 1% testing requirement for MCTs before shipping
  - Working with authorities to develop long-term plan

---

**2016**

- Planting at 2 sites in MN
  - Seed Farm, University research site
- 4 varieties that were multiplied in our facility
- Certification process set for 2016
- Working collaboratively with MN authorities to set up long-term certification solution

---

**Summary**

- Market conditions favorable to technology introduction
- Technology proven in other regions, strong supportive data
- Operations replicate production and farming in other regions, with improvements of North American techniques
- EGA hopes to make a major, positive impact on North American market and beyond

---

**APPENDIX – EXAMPLE HARVEST ANALYSIS**
Overview

- Analysis performed Sept 2014
- Conducted by Dr. Andy Robinson, potato extension agronomist NDSU / UMN
- Done on commercial planting in Keshan, China
- Field conditions the same for microtubers and minitubers

Seed Potato Production

The goal of seed production is to "obtain a high rate of multiplication, or a high yield of seed-sized tubers, to maintain seed tuber health, and to harvest tubers with optimal physiological quality." (Seed potato technology, 1999, eds. RC. Struik and S.G. Wiersema.)

E Green Global Microtubers

- Microtubers were produced in a commercial manufacturing facility in Harbin, China
- The second field generation (originally from microtubers) was grown in southern China.
- Year-round mass production capabilities enabled
- Minitubers were grown in a greenhouse facility of Be Da Huang Potato Group Seed Potato Company in Keshan, China
- Microtubers were green-sprouted to 1 inch
- Minitubers were planted directly
- Keshan, Heilongjiang, China 46.2°N, 125.7°E, similar latitude to Grand Forks, ND (47.9°N, 97.0°W)

Field Agronomics

- Machine planted Microtubers on 24 May 2014 and vine chopped on 30 Aug (88 days)
- Dryland production
  - 27.6 inches of rain (normal rainfall is 15.7 inches)
  - Row spacing was 31.5 inches and within-row spacing of 9.8 inches
  - Planting depth 2.75 in.
  - Plant number established was 95%
  - 10 continuous plants sampled on 11 September 2014
- Minitubers were planted from 28 Apr - 4 May 2014 and vine chopped on 27 Aug (113-121 days)
- All other agronomic practices kept the same across microtubers and minitubers

Seed Background

- Minitubers were produced in a commercial manufacturing facility in Harbin, China
- The second field generation (originally from microtubers) was grown in southern China.
- Year-round mass production capabilities enabled
- Minitubers were grown in a greenhouse facility of Be Da Huang Potato Group Seed Potato Company in Keshan, China
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- Keshan, Heilongjiang, China 46.2°N, 125.7°E, similar latitude to Grand Forks, ND (47.9°N, 97.0°W)

Cultivars, Tuber Type, and Field Generation

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Starting tuber type</th>
<th>Field generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlantic</td>
<td>MCT</td>
<td>1</td>
</tr>
<tr>
<td>Atlantic</td>
<td>MCT</td>
<td>2</td>
</tr>
<tr>
<td>Atlantic</td>
<td>MINI</td>
<td>1</td>
</tr>
<tr>
<td>Favorita</td>
<td>MCT</td>
<td>1</td>
</tr>
<tr>
<td>Keen 1</td>
<td>MCT</td>
<td>1</td>
</tr>
<tr>
<td>Keen 1</td>
<td>MCT</td>
<td>2</td>
</tr>
</tbody>
</table>

MCT = microtubers from EGG
MINI = minitubers from EGG

Results – Comparing All

<table>
<thead>
<tr>
<th>Cultivar &amp; Type</th>
<th>Stem number</th>
<th>Daughter tubers</th>
<th>Tubers/Arn</th>
<th>Average dry weight</th>
<th>Largest dry weight difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlantic MCT 1</td>
<td>1.7c</td>
<td>10.5b</td>
<td>9.4b</td>
<td>3.8ab</td>
<td>9.1a</td>
</tr>
<tr>
<td>Atlantic MINI 1</td>
<td>2.2ab</td>
<td>7.7b</td>
<td>9.4b</td>
<td>3.8ab</td>
<td>9.1a</td>
</tr>
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<td>9.6b</td>
<td>9.4b</td>
<td>3.8ab</td>
<td>9.1a</td>
</tr>
<tr>
<td>Favorite MCT 1</td>
<td>1.1c</td>
<td>9.6b</td>
<td>9.4b</td>
<td>3.8ab</td>
<td>9.1a</td>
</tr>
<tr>
<td>Kuros MCT 1</td>
<td>1.1be</td>
<td>16.3a</td>
<td>14.3a</td>
<td>3.3b</td>
<td>10.5a</td>
</tr>
<tr>
<td>Kuros MCT 2</td>
<td>2.0abc</td>
<td>11.6b</td>
<td>8.7bcd</td>
<td>4.3a</td>
<td>9.7a</td>
</tr>
</tbody>
</table>

* Where columns means followed by the same letter are not significantly different according to Tukey's pairwise comparison (P = 0.05).

Summary of MCT

- Stem number was lowest for MCT 1 (1.1-1.3), while MCT 2 and MINI averaged more stems (2.2-2.5).
- Kunsin 1 is a heavy settler and had the most tubers per hill.
- Atlantic MINI tubers were the largest, due to the lower tuber size.
- MCT 1 averaged 2.2 times more tubers per stem than MCT 2 or MINI.

Results – Atlantic

<table>
<thead>
<tr>
<th>Cultivar &amp; Type</th>
<th>Stem number</th>
<th>Daughter tubers</th>
<th>Tubers/Arn</th>
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<td>4.5b</td>
<td>5.0a</td>
<td>8.4a</td>
</tr>
</tbody>
</table>

* Where columns means followed by the same letter are not significantly different according to Tukey’s pairwise comparison (P = 0.05).

Summary of Atlantic

- Stem number was lowest for MCT 1 (1.2), while MCT 2 field generation 2 and MINI averaged more stems (2.2-2.5).
- The number of daughter tubers from MCT 1 was greater than MINI, but MINI average size was more.
- Tubers number per stem was greatest for MCT 1 (9.4) compared to MCT 2 (3.8) and MINI (4.5).

Conclusions of Keshan, China Commercial Field Observation

- The high ratio of tubers to stem for MCT 1 allowed MCT 1 to have a higher tuber set than MCT 2 and MINI. This indicated the competitiveness of MCT 1 with larger seed pieces.
- Although the average seed size was slightly higher for MINI compared to MCT, the higher tuber number would compensate for this and allow fewer cut seed pieces the next growing season.

Microtubers Advantages and Challenges

**Microtuber Advantages:**
- High tuber production
  - Plant more whole tubers, which reduces labor and potential disease infections.
  - Low cost and disease free from laboratory production.
- High yield and tuber number.

**Disadvantages:**
- Small seed may have little energy left for regrowth if first shoot is killed.
  - Solutions: EOG, pre-treatment techniques (e.g., green sprouting to enable later planting to avoid frost).
Final Thoughts: EGG Microtubers

- EGG Global microtuber production has high potential for success.
- Clean laboratories ensure that seed is free from diseases. No soil used in production, which eliminates contamination potential.
- EGG is contracting with potato companies to grow MCT.
- Scientific trials are being designed to rigorously test microtubers.
- Exciting new technology that will pave the way for the future of seed potato production.

APPENDIX - SUMMER 2015 RESULTS

1. Xin Jiang

- Xinyuan xian, Xinjiang, Ill Kazakh Autonomous Prefecture

Growth & Development

Photos of the sowing
II. Keshan

- Keshan xian, Qiexpo shi, Heilongjiang
APPENDIX – MARKET OVERVIEW

Global Market, Major Growth Potential
• Potato is one of four major food crops (rice, corn, wheat, potato)
• Only small portion (10%) of potatoes are traded globally
• Last major food crop left of which productivity can be improved
  • potential solution to food security
  • Improving potato yield is hugely important among most developing countries
• High quality seed potato is the most important element to improve potato productivity

Potato is a Strategic Food Security Crop
The potato is a highly recommended crop that can help shield low-income countries from the risks posed by rising international food prices.

- Fertilizer intensive crop for the poor and hungry
- Tholes in productivity of yield even when of water 20% among major crops
- High resistance to extreme and nonextreme conditions
- Stored in outer 1000 containers
- The storage season is increasing

Productivity comparison

World Potato has Annual Market Size of $103 billion

US- Largest Processor of Potatoes
• Annual potato production 20M tons, 1M tons of seed required.
• Annual total production value of processed potato 10.5B (2013)
• Home to the world’s leading potato processors
  -e.g, Frito Lay, McCain, Conagra, J&J Sn videotape

US / N. America Market Condition
• Market going through change
  • Recent economic down turn, creates opportunity
  - Increasing exports
  - Change in public policies regarding potatoes (e.g. WIC)
  - New variety development, increasing value for these varieties
• Significant desire to remove 1-2 generations from multiplication, no other technology is enabling this. Reasons include:
  - Increased virus pressures
  - New variety commercialization
  - Market planning
• High quality seed availability is a major issue for market
• Increasing exports creates additional opportunity
• Removing 1-2 generations increases I&M for EGA
  - End demand does not change, but removing generations removes ~10% multiplier effect from reduced generation to get to the end demand volume
  - Significant greenfield opportunity for EGA
Revision of the U.S. – Canada Greenhouse-Grown Plant Certification Program (GCP)

Alec Cramby
National Operations Manager
USDA-APHIS Plant Protection and Quarantine
Central Plant Board Meeting
Fargo, ND
April 2016

Animal Plant & Health Inspection Service

Overview
- Background
- What’s new?
- Next steps
- Coordination with SANC

Animal Plant & Health Inspection Service

Background
- GCP in place since 1996
- Facilitate movement of greenhouse-grown plants between the U.S. and Canada
- Allows authorized facilities to ship using a GCP sticker in place of a phytosanitary certificate
- APHIS and CFIA revising program to strengthen oversight and improve consistency of implementation, reflect current business practices, and close phytosanitary gaps

Animal Plant & Health Inspection Service

‘New and Improved’ GCP
- Basic program is unchanged
- Increased responsibility for facility to ensure plants meet phytosanitary requirements under an audit-based systems approach
- GCP sticker is equivalent to U.S. or Canadian phytosanitary certificate, issued on behalf of APHIS or CFIA

Animal Plant & Health Inspection Service

What’s new?
- Improved coordination between U.S. and Canada on program administration
  - Technical Requirements document describes the program for facilities within U.S. and Canada
  - Single document will promote consistent implementation within and between countries
  - Compliance agreements will include same elements for all U.S. and Canadian facilities

Animal Plant & Health Inspection Service

What’s new?
- Written pest management plan
- Facilities required to provide list of all plants in production in facility (taxa, origin, special phytosanitary requirements)
- Modules may be required to document special phytosanitary measures
Changes to make life easier

- Interfacility stamp
- 28 day growth and monitoring period
- Process to allow exemptions from growth and monitoring period, and to allow outdoor growth
- Mechanism to allow bamboo stakes or other 'associated articles' to move under GCP sticker

Next steps

- Finalize Technical Requirements based on stakeholder input
- Sign new MOU
- Lead in period:
  - Finalize training material and guidance documents
  - Update audit training for ACOs
  - Outreach to GCP facilities, CBP

Implementation

- Begin reauthorization of facilities in fall 2016.
- 1-2 years to complete re-authorization of all facilities
- What happens when some facilities are under the new program and some under the old?

GCP-SANC Coordination

- Systems Approach for Nursery Certification
- Parallels with GCP; want to avoid duplicative or conflicting requirements
- Formation of GCP-SANC Working Group to work on coordinated implementation

APHIS Contacts

- Sarika Negi – Accreditation Policy Manager
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- Alec Ormsby – Accreditation Operations Manager
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  (terri.g.Dunahay@aphis.usda.gov; 301-951-2356)

Questions/Comments?

Additional information at the APHIS website:
Why Jump into This Conversation, Now?
- Many drivers of change
  - Travel, trade, foreign pest threats
  - Resource constraints
  - Changing marketplace
  - Innovations elsewhere
- Farm Bill - "Safeguarding Nursery Production"

History of SANC (Systems Approach to Nursery Certification)
- Cooperative effort involving:
  - AmericanHort / Horticultural Research Institute
  - National Plant Board (state plant regulatory officials)
  - USDA-Animal & Plant Health Inspection Service
- Program development began in 2010
- Implementation of SANC pilot began in 2014

What is “Systems Approach to Nursery Certification?”
- Risk-Based Certification Program which:
  - Requires a risk analysis of operations to determine those areas of production which pose risk for introduction or spread of plant pests (Identify Hazards)
  - Identifies Best Management Practices to mitigate risks at critical control points in the nursery
- Alternative method to certify plant material
  - Reduces reliance on annual/pre-shipment inspections

Goals of SANC
- To insure the intrastate, interstate and ultimately, international movement of pest free plant material.
- To prevent introduction of known and unknown pests into or out of a growing facility.
- To mitigate damage from those pests.
- To allow rapid delimitation of areas where pests are, determine their source, apply effective controls and allow the operation to minimize business interruption.

What does SANC really mean to us as an industry?
- SANC is an interactive approach that facilitates continuous improvement and employee engagement such that the end result will reduce the spread of pests and increase production of high quality nursery crops that will better our environment.
Why does SANC need to be successful and what will it take to do so?

- We have our backs against the wall when dealing with plant pest problems
- New insects
- New and changing plant pathogen threats
- Invasive organisms and plants
- Labor pressures, the need to get more accomplished with less

Collaboration and Coordination

- All inclusive deal—It will take everyone and everything to protect the plants and our environment
  - American Hort and HRI
  - State plant regulators
  - USDA-APHIS
  - Nurseries
  - Consumer Education

What is the SANC focus at McKay Nursery Co.?

- Our main focus is to develop and maintain a strong, conscientious employee culture that is engaged in the Systems Approach for Nursery Certification (SANC) program which promotes continuous improvement of our pest management throughout the operation.

Steps to implementing SANC

- Risk Assessment
  - Identifies hazards (risks) and mitigation strategies (BMPs) for hazards
- 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
SANC - The Final Product

- Scalable
- It fits your green industry operation
- Consistent across states
- Accepted by states
- Ease of Implementation (5 Step Process)
  - Not cumbersome (but it does require considerable effort and commitment)
  - Works within the parameters of your nursery timeline

***The finished product is a Facility Manual that fits your organization's growing operations and goals.***

MNC Risk Assessment

- Structure
  - Coordination Committee
    - Casey R.
    - 3. Increasing Parks and Forests
    - 4. Shipping
    - Sam N.
    - 3. Field
    - 4. Propagation
    - Joe K.
    - 3. Growing
    - 4. Pots, Trays and Growing media
  - Team B
    - 1. Propagation
    - 2. Site
    - Safety Committee with hands on process

Stage 1 - Risk Assessment

- Structure
  - Coordination Committee
    - Team 1: Production Plant Manual
    - Team 2: Facility Manual
    - Team 3: Propagation
    - Team 4: Design of Product
    - Team 5: Risk
    - Team 6: Site
    - Team 7: Forestry

- Team 4: Propagation and Forestry
  - Mike C.
  - Lee T.
  - Mike R.
  - Phil N.
  - Mike A.

- Team 3: Site and Safety
  - Kiki B.
  - Jared P.
  - Lee F.

The Manual

- Statement or mission
- SANC Organizational Structure
- Pest Management Plan
- Training and Accountability
- Facility Maps
- Audit Procedure
- Document Control

McKay uses BMPs to create Best Nursery practices

- What is our definition of Best Management Practices?
  - Ways to prevent and minimize potential hazards.
- What is our definition of Best Nursery Practices?
  - How we apply these preventative measures to improve our growing operation.

Training and Implementation

- How are we going to achieve it?
- Training is a continuous process
- Consistent, Uniform and Repetitive
Where are we now?

- Audit (Hollywood Review) Process
- Internal and External Audits have to be the same
- Audit follows the manual for the specific Green Industry venue

SANC - Benefits for Regulators

- Reduces the spread of plant pests
  - Eliminates inspections based on "snapshot in time"
  - Brings clarity to "how" growing operations work and measures to prevent, mitigate plant pests
- Must be as good or better than current method of certification

Issues Impacting Timelines

- Management Structure
- Current Level of Documentation
- Seasonality of the Industry
  - Nursery is in control of timeline
  - Certification program fits your operational schedule
- Operational Complexities (McKay Example: Propagation, Containers, Balled and Burlap, Bare root, etc.)

Perceptions of Pilot Facilities

- Each has felt it will help them organize management of their business
- They feel it will provide structure in training and recordkeeping
- It will facilitate the transfer of information as management changes
- Audits will insure accountability and identify any areas needing attention
Questions?

GROWING BETTER WITH
SANC
A Systems Approach to Nursery Certification

http://sanc.nationallandboard.org/
thomasbel@emkenynursery.com
Phytoplasma and Phytoplasma Diseases

Weihao (David) Dai
Department of Plant Sciences
North Dakota State University
Central Plant Board 2016 Annual Meeting
April 11-13, 2016
Fargo, ND

Phytoplasmas

- A group of phloem-limited bacteria
  - Phloem-limited
  - Cause "virus" symptoms
    - Yellowing
    - Transmitted by insects
  - Lack of cell walls
    - Similar to animal pathogenic mollicutes called Mycoplasmas
  - Named mycoplasma-like organisms (MLOs)

Phytoplasmas

- MLOs cannot be cultured in vitro (contrast to mycoplasmas)
- "Phytoplasma" was adopted in early 1990s
- Classified as Candidatus Phytoplasma (DNA sequence-based)
- ~20 Candidatus species in the genus
- Maintained in host plants (Catharanthus roseus)

Phytoplasma classification

- 16S rDNA-based (based on differences in DNA sequences of phytoplasmas)
  - 19 groups and 40 subgroups
    - 16Sr-I: Aster yellows
    - 16Sr-II: Peanut WB
    - 16Sr-III: X-disease
    - 16Sr-V: Elm yellows
    - 16Sr-VII: Ash yellows
    - 16Sr-IX: Pigeon pea WB
    - 16Sr-X: American potato purple top wilt
    - 16Sr-X: Cassia WB
Phytoplasma transmission

- Insect vectors
- Direct contact
  - Natural root contact
  - Grafting
  - Dodder (a parasite plant species)
  - Seed

Detection of phytoplasmas

- Symptom observation
- Indexing host plants
  - Insect vectors
  - Grafting
- Electron microscopy (directly observing phytoplasma particles in the phloem tissues)
- Serological detection (ELISA)
- Molecular detection (PCR)

Phytoplasma disease management

- Isolation
- Remove infected plants
- Vector management
- Cultivation
- Chemicals
  
  "None of these methods prevent losses, but can reduce losses."
**Chokecherry X-disease**
- A small tree or big shrub, native to North America
- Well adapted to severe winter and high pH soil
- Very productive
- Resource conservation
- Small fruit production
- Home processing
- Commercial

**X-disease symptoms**
- Serious in stone fruits
  - Cherries, peach, nectarine
  - Chokecherry
- Symptoms

**X-disease detection**
- Symptom based, but
  - Delay to 2nd or 3rd year
  - Confused with symptoms of stress and fall color
- Molecular method (PCR)
  - Confirm
  - Quantify
    - Screening resistance based on the pathogen proliferation rate in plants.

**X-disease management**
- Remove diseased trees
- Vector control
- Inject tetracycline (postpone symptom)
- Use resistant lines

**Identification of X-disease resistance**
- Germplasm collection
  - In 1983, USDA Plant Material Center collected 164 seed sources from ND, SD, and MN
  - 3156 seedlings were planted in Bismarck, ND
  - 2028 seedlings were planted in Pierre, SD
- Evaluation of X-disease resistance by NDSU (1993-)
  - 30 seedling lines showed high resistance
    - Clonally propagated (tissue culture)
    - Field evaluation at Lincoln-Oakes nursery (2003-)
    - 15 lines showed a consistent resistance to X-disease
Identification of X-disease resistance

- A hybrid population (RC x SC) (201 progenies) in 2005
- All seedlings were graft-inoculated
- Inoculation was verified by PCR
- Screening resistance in the greenhouse and field

Potential X-disease resistant chokecherries

Identification of X-disease resistance

- Five highly resistant progenies identified from the hybrid population.

Phytoplasma disease in Spruce in ND?
Waging the War on MLO's and Viruses

M.O. Nursery Company Interaction Seminar Series

Why is this topic so important and what impact does it have to the Green Industry?
- The potential economics of a situation
- Insecticidal treatments can take time through a crop
- There are no visible cues once infection takes place
- Residue environmental impact does not last
- They can wreak havoc in a production system
- Timing and identification difficult on plant showing (symptoms)
- All plants react differently similar to the human body-common cold
- They can mimic similar symptoms (may not know which ones you are dealing with)
- We all are susceptible at the point in time.

What can we accomplish today?
- Open discussion to states action plans lab views regarding MLO’s and Viruses
- *Emphasis is key to speed-up response time
- Forms of solutions revolving around communication in the event of distribution expedite the process

Viruses
- Typically spherical in shape (morphologically and its patterns when on a leaf)

MLO’s:
- Irregular in shape (Can also show a branching type growth in plants)

Where does SANC fit into this?
- Risk Assessment: Identify potential hazards
- Develop a plan (TPM) with solutions (derived from R/A)
- Educate and Train Staff
- Take action when necessary (Ease when problem is within nursery)
- What about outside the nursery?
There's a problem or hitch in the last one "take action"

- Problem
  - Can be delay's with collection, transfer of information, proper identification etc.

- Solution
  - Immediate notification that there is a potential plant problem/plant abnormality
  - Can streamline this process without causing a lot of pain.

Sample MNC Best Nursery Practice

- Standard MNC Cutting Process
  - Remove cutting andlol stock number/lip report number/lot to cut (At least before 9AM)
  - Bring tag and tree
  - Tree in begins work or reach out duty tree duty tree to get number (before batched)
  - Process healthy cutting
  - Drop in form number
  - Stick out tag and dictate

Incoming Plants/Cuttings

"Red" Tag Sample

Always begin with the end in mind!

- Thanks to all
JBHP Review

- Began in 2013, when then NPIS President Mike Cooper tasked the existing members of the Japanese Beetle Harmonization Plan Survey and Treatment Committees with conducting a review of the JBHP.

- Specific areas of review included:
  - State category designations & Infested counties;
  - Shipping requirements to category 1 & 2 states;
  - Criterion used to establish a state as category 4, and
  - Clarify process for adding treatments & updating state categories.

JBHP Review

- Quickly added were:
  - Changes in language and definitions to make it more consistent and current with NPIS model laws, IPPC, and FAO language;
  - Addition of executive summary of JB regulatory history, from federal quarantine to JBHP development;
  - Adding example compliance agreements.

JBHP Review

- Other changes included:
  - Standardization of language and terminology
  - Removal of treatments that no longer are labeled for use,
  - Updates to certification requirements.

- We thought we were done and then...

- Then along came adult mitigation...

JBHP Review

- A draft of the revised JBHP was released to the NPIS SOD in March & September 2013

- Released to the NPIS membership in October 2013

- Changes were made based on feedback, and a final version released for signature in March 2016

JBHP Review

- This was a very thorough review

- We went through the plan line-by-line, page by page.

- Dozens of conference calls

- Hundreds of emails
JBHP – Future Research Needs

- Compost –
  - acceptable methods of production, minimum temp that must be generated during the composting process to be lethal to all life stages of JB, & safeguarding methods during & after the composting process.
  - Non-neonicotinoid chemical options for pre-harvest soil surface treatments
  - Additional chemical options for dip treatments
  - Determine if a lesser trap density would be as effective for detection surveys

JBHP – Implementation

- The JBHP must be signed by all three parties.
- Recommended implementation date is January 1, 2017.
Office of Field Operations
Agriculture Programs and Trade Liaison

Central Plant Board
April 13, 2016

Agriculture Resource Allocation Model

- The AgRAM is a workload-based, objective management tool designed to project staffing requirements.
- The AgRAM model has been used to determine that, based on the optimal staffing requirements for CBPAS, an additional 723 new hires are needed for our workforce.
- These numbers include CBPAS, Supervisory CBPAS, and CBP Canine Handlers.

National Agriculture Cargo Targeting Unit

- Consists of five permanent Agriculture Operations Managers and a Branch Chief who continuously analyzes national quarantine activity in order to identify high-risk shipments.
- Function at harmony within local targeting units.
- Collaborating with CBP system development groups to enhance programs to provide platforms for additional targeting.
- NACTU has assumed a field support role and is available for direct field support 7 days a week to provide guidance and assist with research requests to gather field intelligence.

Targeting Response

- Local Targeting - CBP Field Operations / USDA SITC
  - Trade Compliance seizure / recall
  - Information shared with CBP to facilitate response
  - Exams of related shipments requested within AOR
- National Targeting - CTA / NACTU
  - Collaborate in mapping the pathway
  - NACTU leverages port communication network
  - User Define Rules (UDR)

Targeting at International Falls, MN
Pacific Rim Containers Inspected

Rail Targeting in Portal, ND
Railcar Inspections
Delegation of Title 19 Authority

- Pursuant to CBP Delegation Order 15-034, and a bilateral agreement with APHIS, the OFO Assistant Commissioner attended the Delegation Order to include CBPAS.
- CBPAS will soon effectively utilize Title 19 authority for five (5) specific violations related to agriculture.
- Training to be provided by OCC and APTL.

Mediterranean Fruit Fly

- Interceptions of Ceratitis capitata, the Mediterranean Fruit Fly (Medfly) cause enhanced restrictions on host commodities.
- Dominican Republic: Commodities under DA-2015-14 must meet specific requirements prior to importation into the USA.
- Spain: Consignments of Pepper shipments are restricted.
- Morocco: Tangerine/Clementine/Mandarin Fruit (Citrus reticulata) and Sweet Orange Fruit (Citrus sinensis) are prohibited.

Federal Noxious Weeds FY 2015

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Family</th>
<th>Common Name</th>
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<tbody>
<tr>
<td>Alopecurus Galeatus</td>
<td>Poaceae</td>
<td>Barnyard Grass</td>
</tr>
<tr>
<td>Pterosicyos Formosana</td>
<td>Gramineae</td>
<td>Japanese Foxtail</td>
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<tr>
<td>Stachys palustris</td>
<td>Lamiaceae</td>
<td>Marsh woundwort</td>
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<tr>
<td>Festuca arundinacea</td>
<td>Poaceae</td>
<td>Tall Fescue</td>
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<tr>
<td>Pennisetum pedicellatum</td>
<td>Poaceae</td>
<td>Ryegrass</td>
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<td>Poaceae</td>
<td>Forage Sorghum</td>
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<tr>
<td>Kikuyu</td>
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<td>Kikuyu Grass</td>
</tr>
<tr>
<td>Stipa</td>
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<td>Needlegrass</td>
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<tr>
<td>Oryza sativa</td>
<td>Poaceae</td>
<td>Rice</td>
</tr>
<tr>
<td>Cenchrus ciliaris</td>
<td>Poaceae</td>
<td>Wiry Love Grass</td>
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<tr>
<td>Maize</td>
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<tr>
<td>Sorghum</td>
<td>Poaceae</td>
<td>Sorghum</td>
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<tr>
<td>Brassica oleracea var. acephala</td>
<td>Brassicaceae</td>
<td>California Wild Mustard</td>
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<tr>
<td>Sinapis arvensis</td>
<td>Cruciferae</td>
<td>Field Jatropha</td>
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<tr>
<td>Raphanus sativus</td>
<td>Cruciferae</td>
<td>Radish</td>
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Wood Packaging Materials (WPM)

October 2015–December 2015

<table>
<thead>
<tr>
<th>Field Office</th>
<th>No ISPM 15 and Pest</th>
<th>No ISPM15</th>
<th>Pest</th>
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<tbody>
<tr>
<td>Chicago</td>
<td>39</td>
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<td>15</td>
</tr>
<tr>
<td>Detroit</td>
<td>20</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>Seattle (partial)</td>
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<td>10</td>
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</tr>
<tr>
<td>National</td>
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<td>383</td>
<td>186</td>
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</table>

Khapra Beetle (KB)

<table>
<thead>
<tr>
<th>Calendar Year KB Interceptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>-----</td>
</tr>
<tr>
<td>14</td>
</tr>
</tbody>
</table>

- CBP improves providing training and situational awareness of KB behavior and habits based on detection of unknown materials.

May I ask some questions?
Horticulture Inspection Society - Central Chapter
Central Plant Board Update
Fargo, North Dakota
April 2016

What is HIS?
- Organization members are people engaged in plant pest inspection work as inspectors or as supervisors, in field, laboratory, or office.
- Subscribing members are friends of the society, such as previously employed inspectors, inspectors from outside the Central Plant Board region, researchers.
- Members get together twice a year to learn about new and important topics regarding plant pest issues.
- Creates great networking and contact-making opportunities.

Fall Conference
- Wisconsin Dells, Wisconsin
- October 19-22, 2015
- Hosted by Wisconsin Department of Agriculture, Trade and Consumer Protection.
- 43 registered attendees.
- Topics:
  - Control strategies for living insect and diseases pests
  - Phytophthora root rot and other pests at Conferences sites
  - Updates from the HIS National Plant Board Steering Committee
  - An introduction to various plants
  - Insect, nematode, fungi and related diseases
  - Developing new strawberry varieties
  - New methods for environmental plants
  - Presentations available on YouTube.

HIS Summer Multi-state Inspection
- Carmel, Indiana
- July 27-29, 2015
- Hosted at Behn Nursery and KBI Perms.
- Ken Raischler worked the group through SARN.
- Purdue Plant and Pest Diagnostic Lab and Purdue's Horticulture and Entomology Departments.
- Special thanks to SARN National Plant Board for funding.
- And to SPPG for sending inspectors.

2016 Meetings
- Fall Conference will be in Lafayette, Indiana hosted by Indiana Department of Natural Resources at Purdue University.
- Working on plans for Summer Inspection to be held at a nursery participating in the SARN pilot program.
HIS Manual

- Finishing up some revisions and printing latest edition soon
- Includes recommended regulatory actions, and write-ups on 50 insect and mite pests, 37 disease and nematode, and 8 environmental problems
- Available for $65.00 (plus shipping)

Officers

- Past President --- Josh Plunkett, Minnesota
- President --- Liz Metts, Wisconsin
- Vice President --- Angela Rust, Indiana
- Secretary --- John Back, Michigan
- Treasurer --- Charles Elhard, North Dakota
- Newsletter Editor --- Sadie Reda, Iowa
- Manual Editors --- Todd Voss, Iowa
- Publishing --- Don Davis-Maduk, Minnesota; Julie Thompson, Missouri

On The Web:

- Posting a Facebook site for easy sharing and feedback - rolling out to membership soon
- www.nationalislandboard.org/his