Focus on *Phytophthora ramorum* Pathways: Challenges of Repeat Nurseries

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Collaborators

Depts. of Agriculture in

- Alabama
- Florida
- Georgia
- Mississippi
- North Carolina
- South Carolina

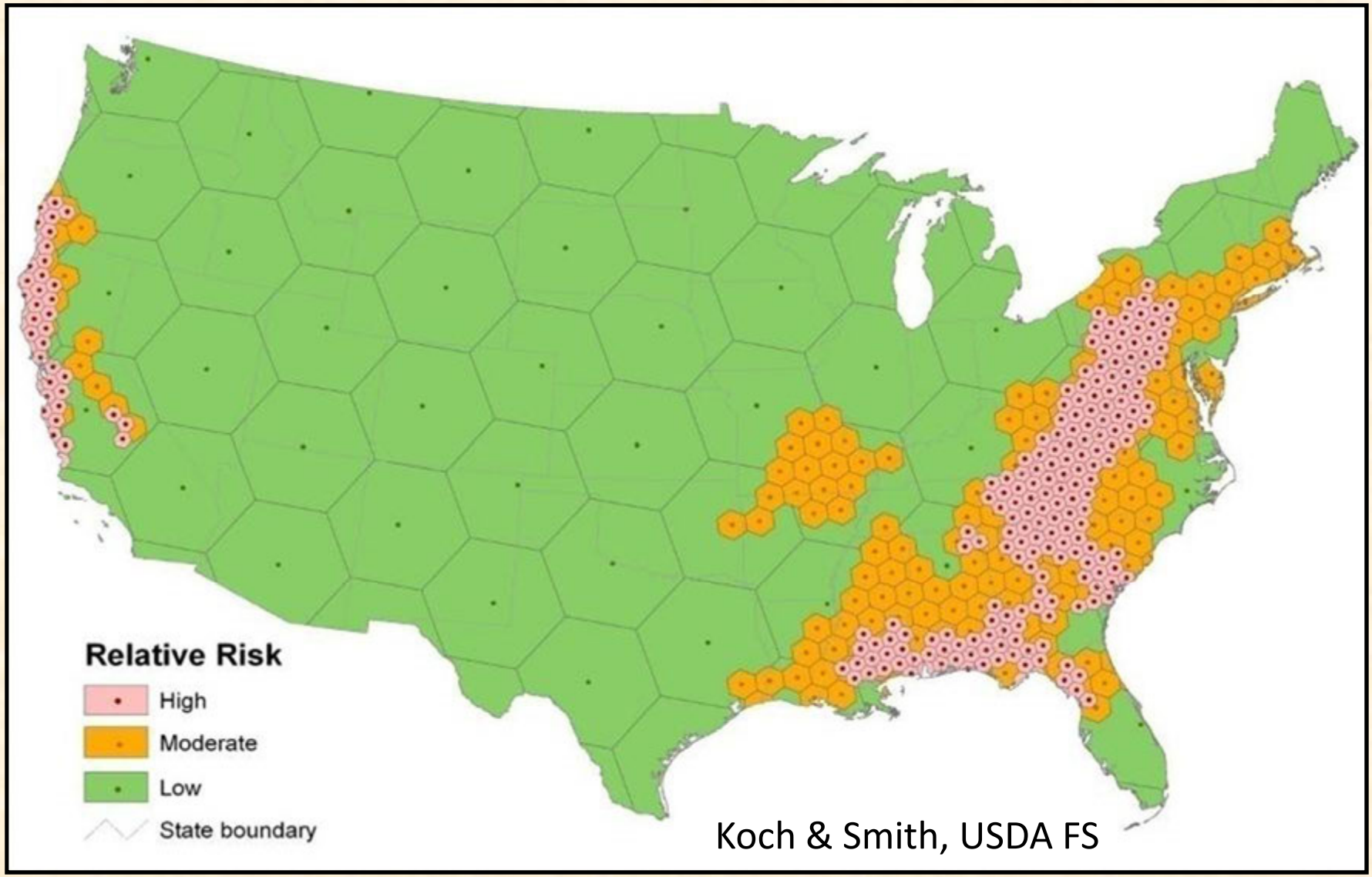
Why are we concerned about *Phytophthora ramorum* in nurseries??

- *P. ramorum* does **not** pose a new primary threat to plants in nurseries or to the nursery industry
  - at least 10 other species of *Phytophthora* are known to attack ornamental plants in nurseries and landscapes
  - some much more destructive than *P. ramorum*
- But, container-grown nursery plants may provide the avenue for introducing *P. ramorum* into the natural ecosystem

Background Information

- 2003-2004: Diseased camellias shipped all over the USA from a nursery in California
- 2004-2010: Diseased plants shipped east from multiple nurseries in CA, OR, WA
- Southeast received many of these plants
  - this region has been designated "high risk" for *P. ramorum* damage
- In 2005, USDA-APHIS asked:
  - Could *P. ramorum* escape from infected or infested plants and become established???

USDA Forest Service
P. ramorum Risk Map



Phytophthora ramorum National Regulatory Program Review 15-16 Dec 2009

Vision Statement

"The program will take a proactive approach to protect native biodiversity, wild lands, and managed landscapes from *Phytophthora ramorum* through a system of voluntary and mandatory (best management practices) approaches focused on critical control points."

Therefore, Our Mission—in the Southeast…

To keep *Phytophthora ramorum* out of forests, natural ecosystems, and managed landscapes in the southeastern USA

Our Approach…

- Determine if *P. ramorum* has escaped from infected/infested plants and become established in nurseries in the Southeast
- Collect samples from
  - container mix from potted plants
  - field soil under & around target plants
  - sources of water around nursery
- Target nurseries where *P. ramorum* has been detected by state surveys

Soil and Container Mix Samples

previous holding areas

growing area

pots

around & under pots

surrounding landscape

Water Samples

stream

pond

retention basin

natural environment

run-off from pots

puddle

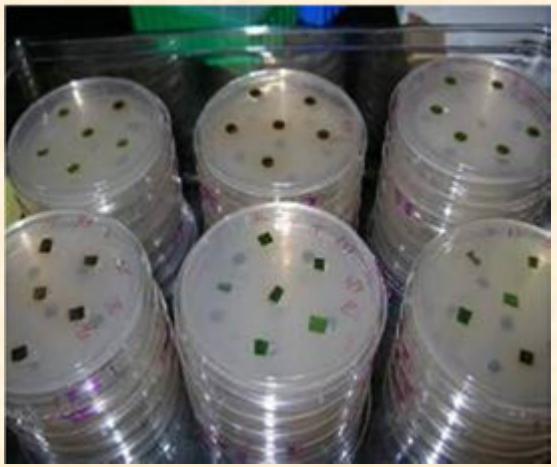
Water Sampling Challenges

(it's a Southeastern thing…)

Sample Processing: FBI

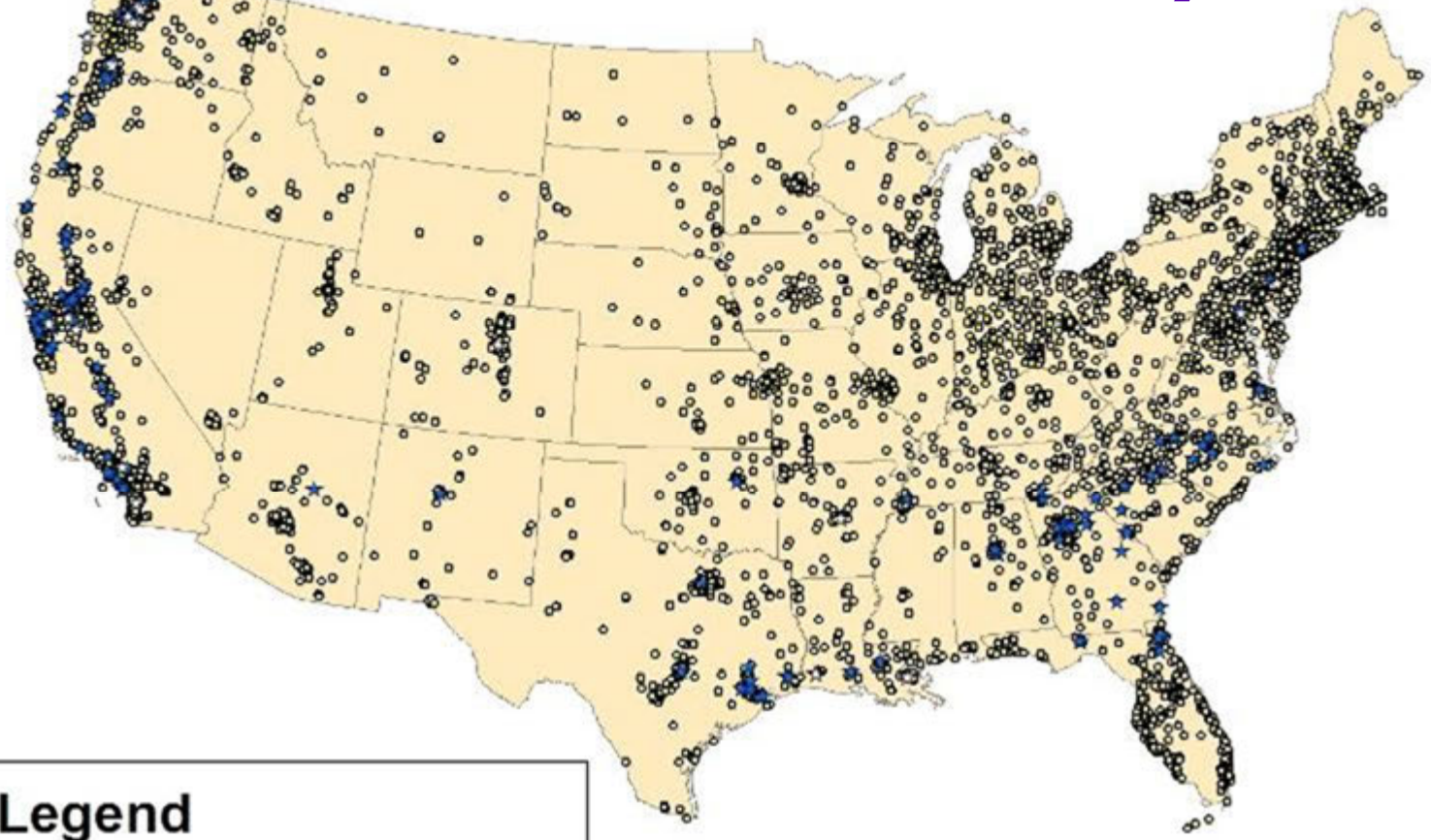
Filtration

Baiting



Isolation

2004 Trace-Forward Results: *P. ramorum* on Nursery Plants



Legend

- ★ Positive Site
- ☆ Hold released
- ◦ Trace forward/back zipcode

Found in 10 Southern States: OK, TX, LA, TN, AL, FL, GA, SC, NC, VA

P. ramorum in SE Nurseries

- Since 2006 we have collected samples at retail and production nurseries in six Southeastern states where *P. ramorum* has been found on diseased plants:
  - **AL, FL, GA, MS, NC, SC**
- *P. ramorum* has been recovered from field soil or water at one or more nurseries in each state
- In most cases, *P. ramorum* has been recovered in multiple years
  - even after recommended mitigation treatments

Inventorying Quarantined Plants

Clean-up of an infested retail site

Clean-up at an infested production site

The Problem

- *P. ramorum* has escaped from infected and infested container-grown plants
- AND, it has become established at some of these nurseries—in soil and ???
  - sometimes, where *P. ramorum* is hiding in these nurseries in not clear…
- Healthy plants placed on infested field soil have become infected
  - probably through splash inoculation
- *P. ramorum* may have moved off-site to landscapes on infected or infested plants

The Problem – *continued*…

- Infested and infected plants continue to be shipped to nurseries in the Southeast
  - however, the number of diseased plants being shipped appears to be decreasing
  - but, number of positives nurseries is increasing
- We do not have effective treatments to eradicate *P. ramorum* or other species of *Phytophthora* from soil and water
- So, *P. ramorum* has been recovered from run-off water leaving these nurseries

Run-off water leaving a nursery…

The Solution??

- Continued monitoring of nursery plants
  - those leaving nurseries on the West Coast
  - those coming to nurseries in the Southeast
- Continued monitoring of natural areas in the Eastern USA
- More research! We need:
  - more sensitive detection methods
  - to identify primary sources of inoculum
  - better treatments to eradicate or mitigate *Phytophthora* spp. in soil and water

Food for Thought…

- *P. ramorum* has been found only where we have looked intensively
- Therefore, it is likely that *P. ramorum* occurs in other states in the Southeast
  - maybe in other parts of the USA, too!
- Has *P. ramorum* moved into the natural environment in the Southeast?
  - stay tuned for Steve Oak…