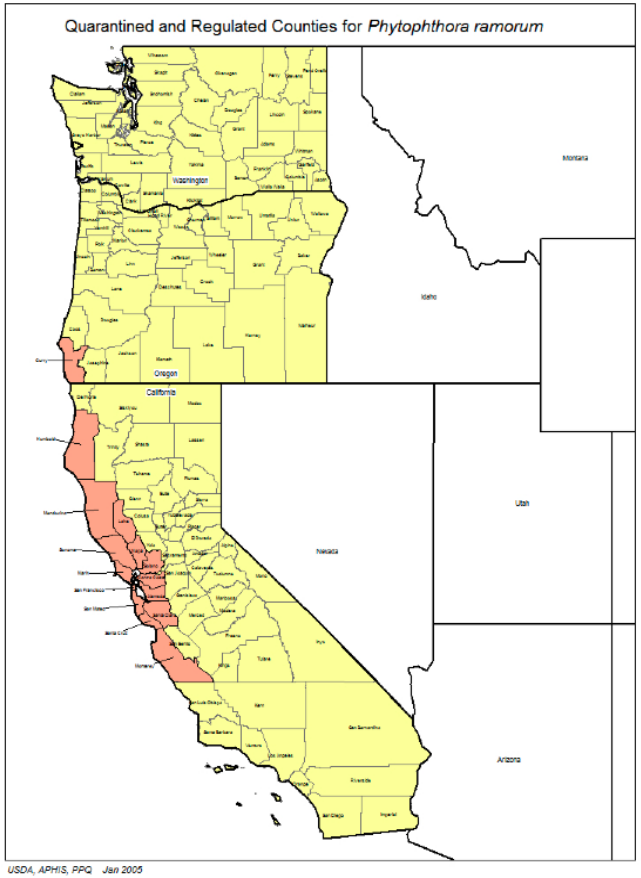
SOD - A West Coast Perspective

Continental Dialogue

Oct. 27, 2009

San Francisco, CA



SOD - A West Coast Perspective

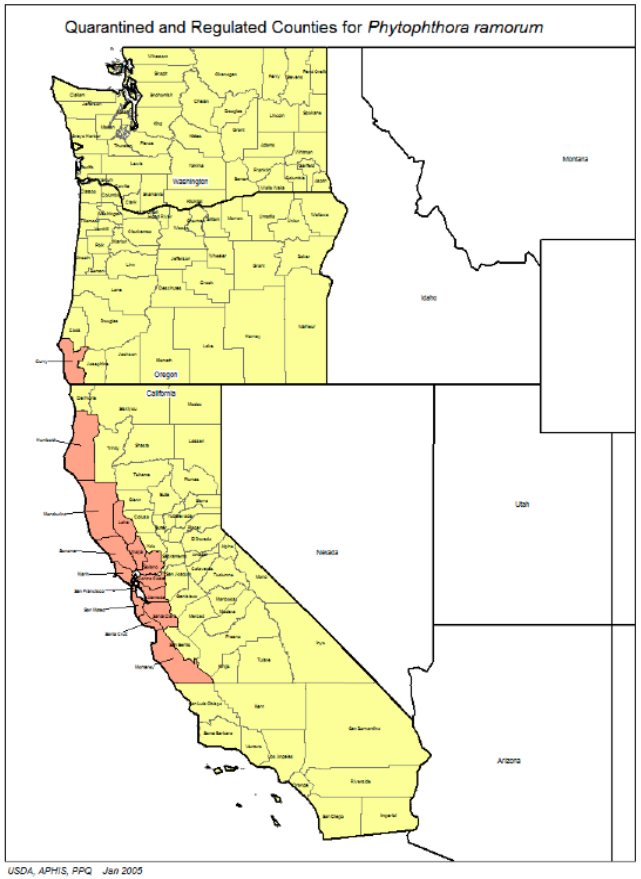
I. Current Program

II. Lessons Learned

III. Forests to Protect

IV. Vision for an Effective, Sustainable Program

V. Transition



I. Current SOD Program

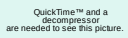
- It works, but it leaks
- Eastern/Southern forests still healthy
- Sierra Nevada, Cascade Range, Willamette Valley, Western WA & B.C. forests still healthy
- Exposed landscapes nationally still healthy

- Slow diagnostics
- Repeat nurseries
- Unsuccessful tracebacks
- Expensive, labor intensive, endless
- Sampling/testing diminishing returns
- Forest treatments need reliable funding

II. Lessons Learned

- NURSERY
  - Never sample & test our way out
  - Infected nursery cleanup is difficult
  - Critical control points identified
  - Many nurseries won't adopt BMPs on their own
- FOREST
  - Aerial survey works
  - Stream-baiting works
  - Local eradication possible
  - Not all hosts are good hosts, *e.g. tanoak & California bay laurel are spore pumps*

III. Forests to Protect



Model Refinements Needed

- Maritime fog belt
- Hosts are not equally important in disease transmission

IV. Vision for a better SOD Program

- Effective at protecting at-risk forests
- Sustainable
- Feasible
- Works for other pests/diseases

Forests

WESTERN

- Host-free line in the Forest in Humbolt Co., CA
- Host-free doughnut around Curry Co., OR infestation
- Eradicate new infestations outside host-free “firelines”

EASTERN

-- Monitor at-risk forests and be ready to eradicate any new infestations

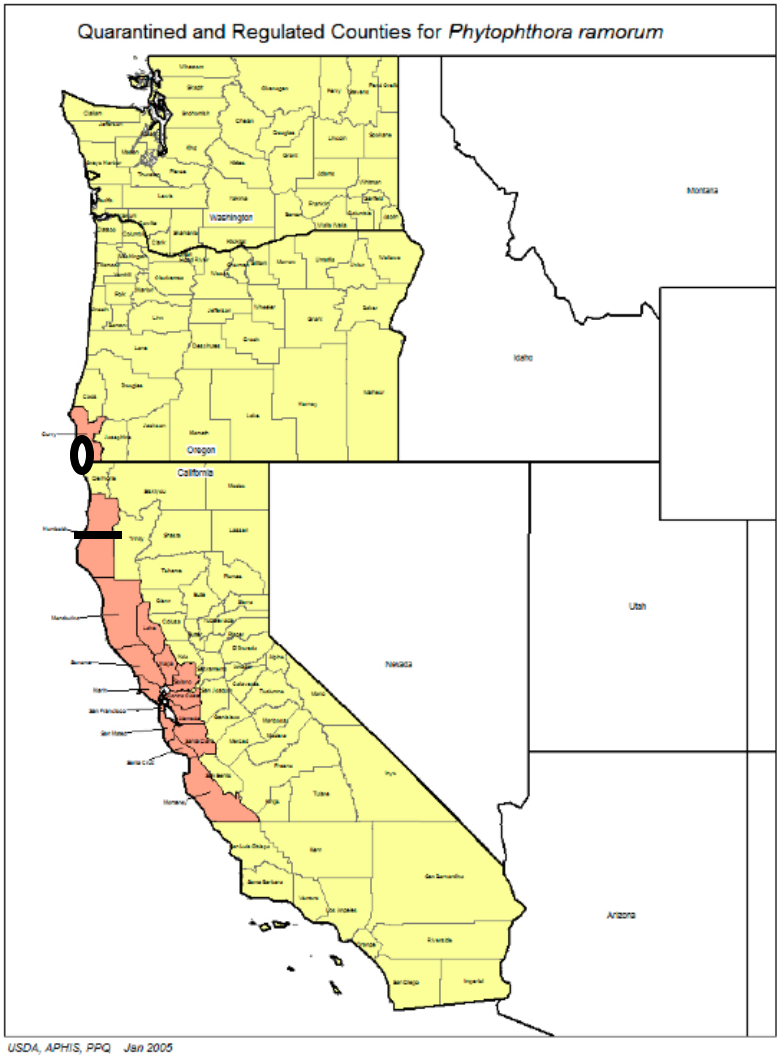


Image by APHIS

Forest SOD Outlier Eradication

- Survey, delimit
- Hack & squirt hosts
- >300-ft perimeter
- Cut, pile, & burn
- Monitor

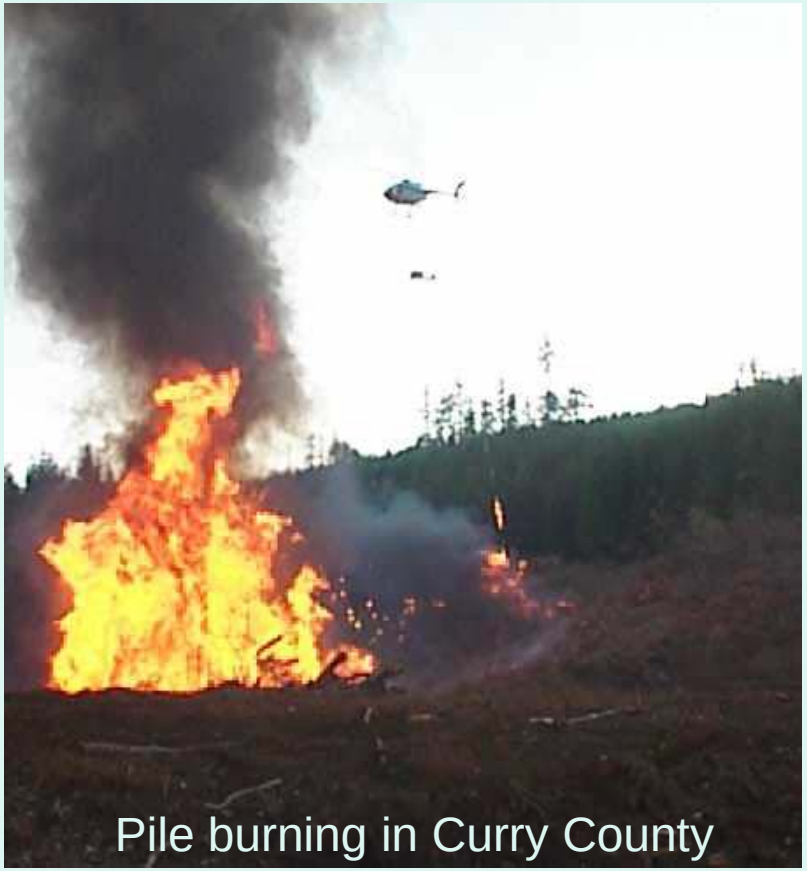


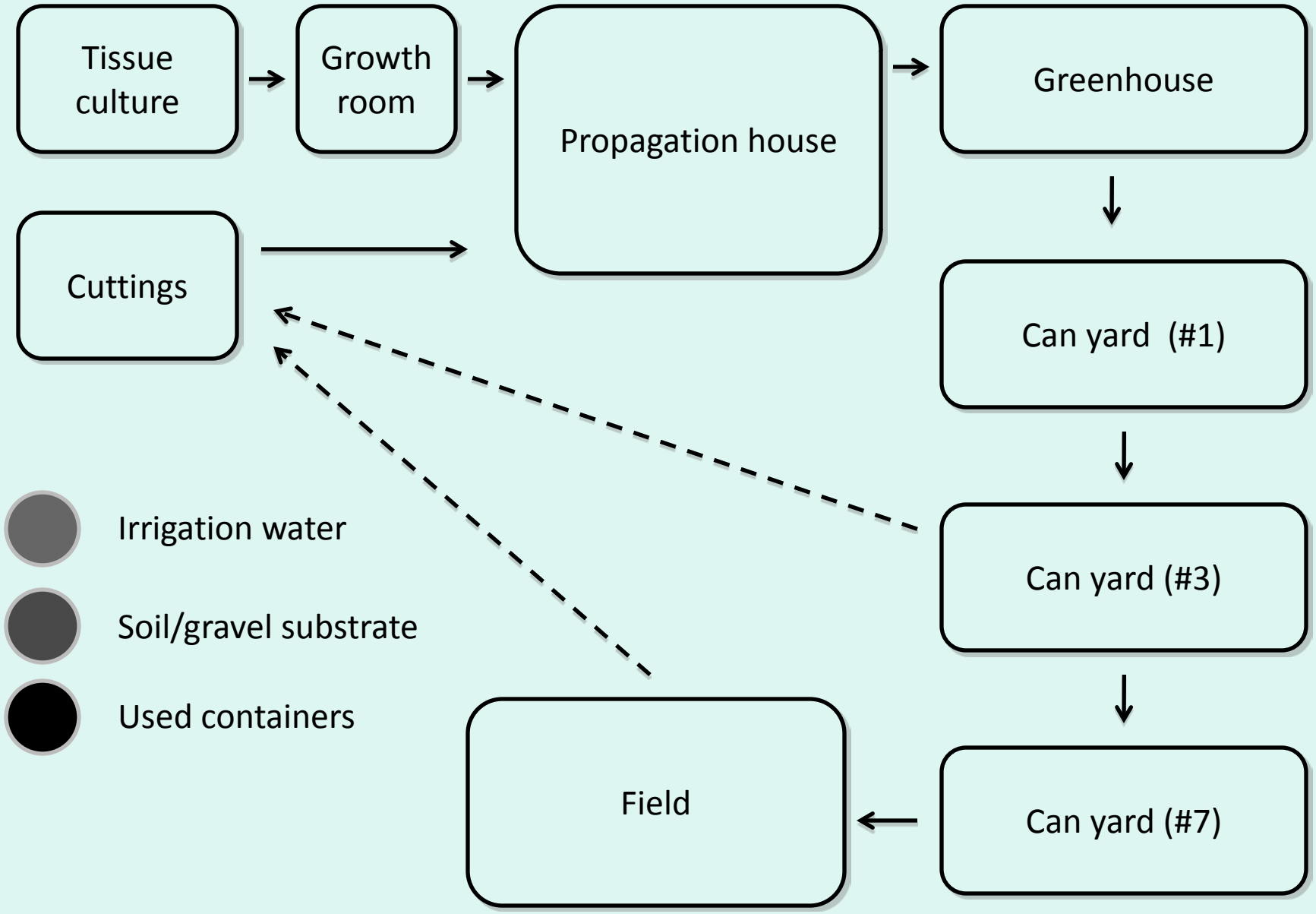
Photo by F. Arnold

Nurseries

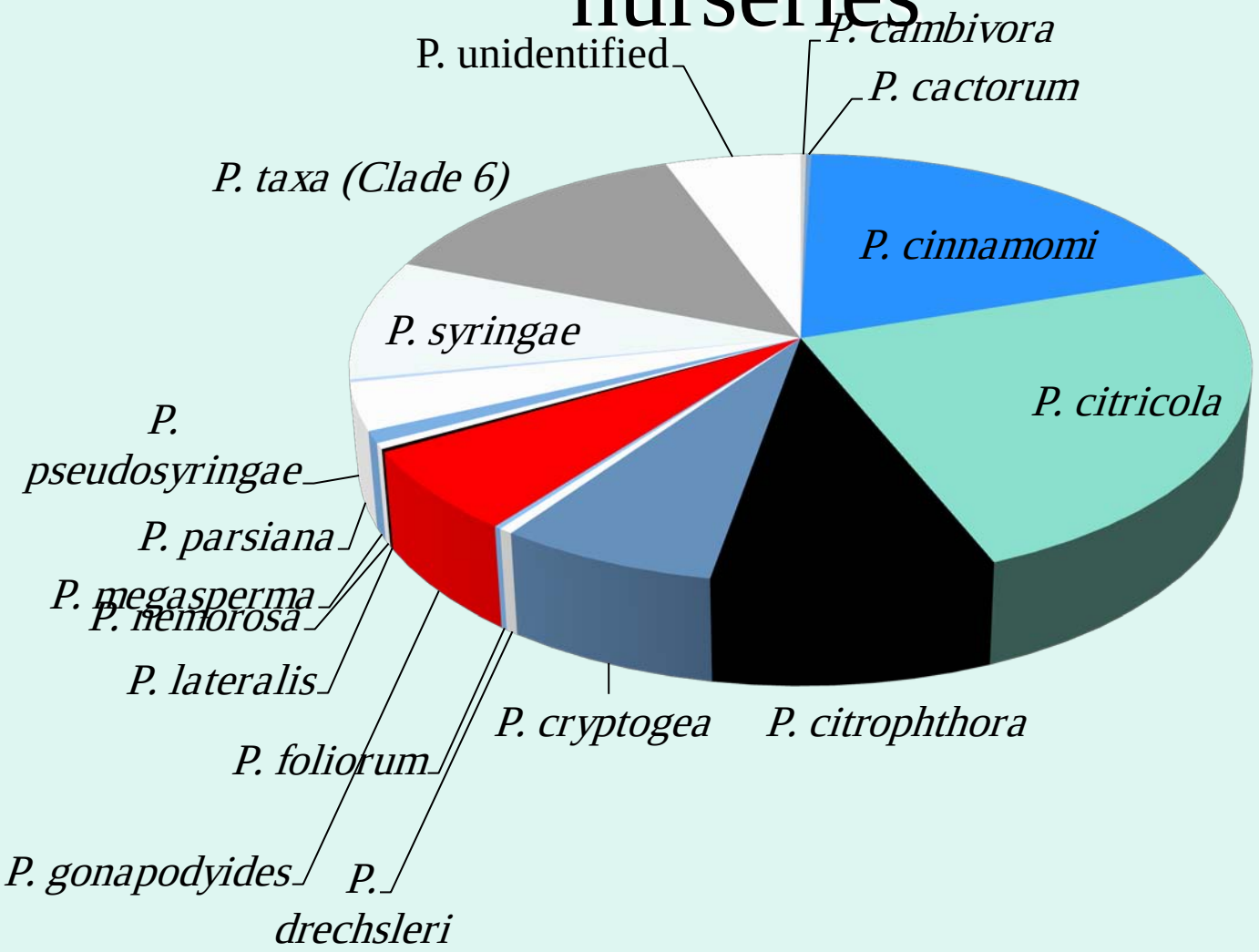
Nursery Research (Drs. J. Parke & N. Grunwald)

	A	B	C	D
Annual sales	$7.5M	$0.9M	?	$1.8 M
Acreage	300	70	2200	110
Full-time Employees	140	12	?	12
Irrigation water	recirculated	well water	recirculated	Well water
Production	Greenhouse Can yard Field	Greenhouse Can yard Field	Greenhouse Can yard Field	Greenhouse Can yard Field

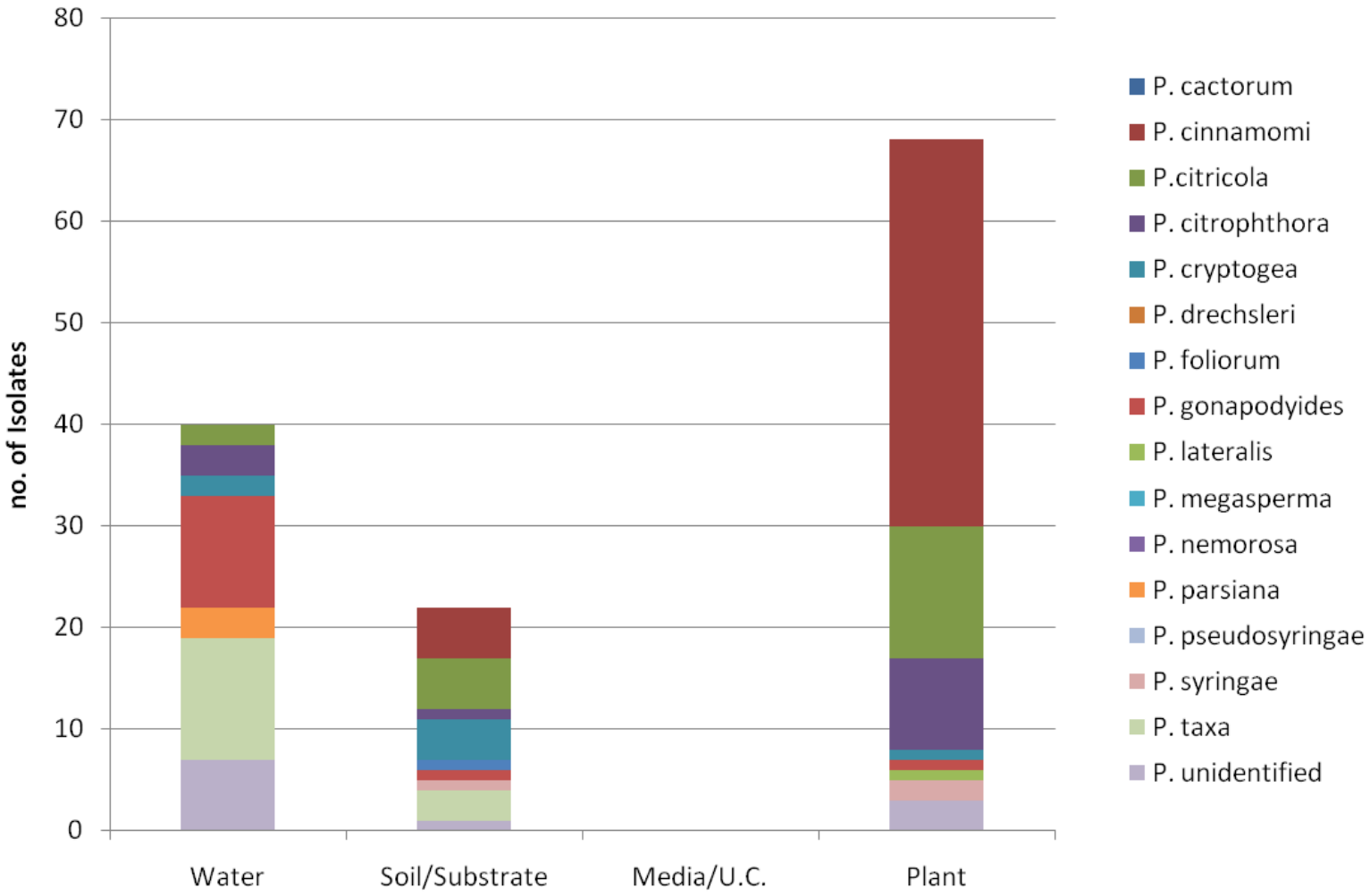
Nursery A Production Cycle

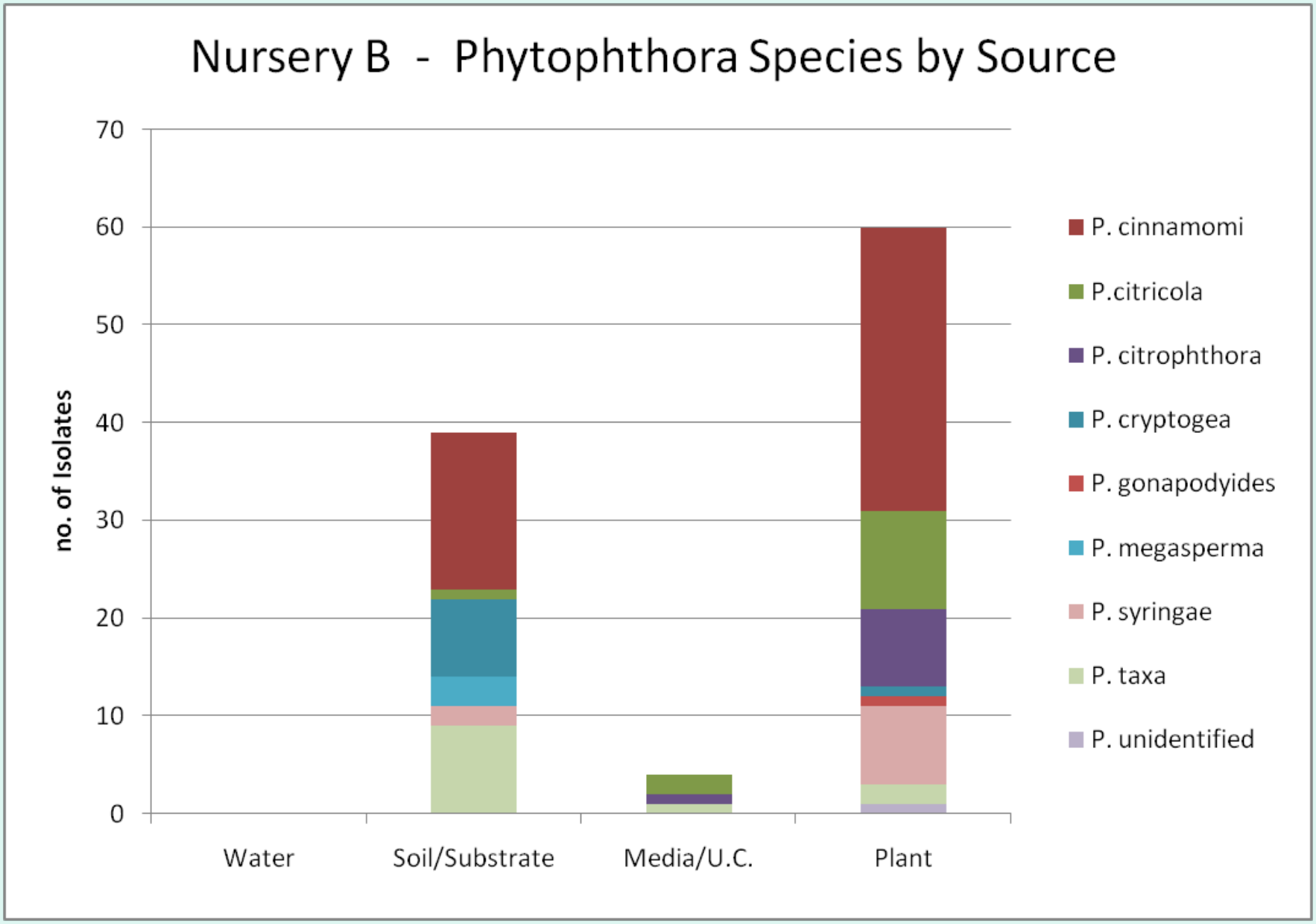


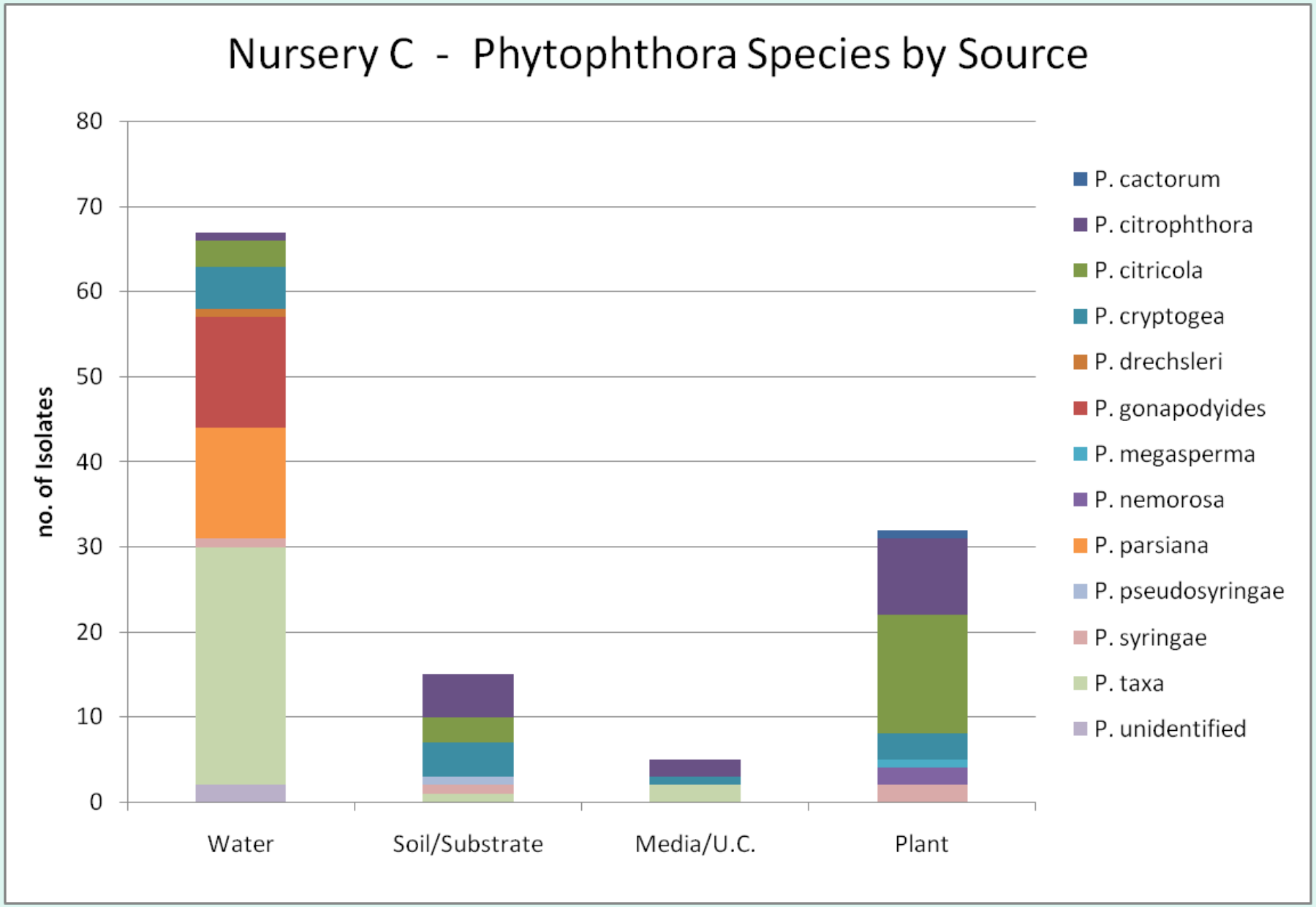
Phytophthora species – all 4 nurseries



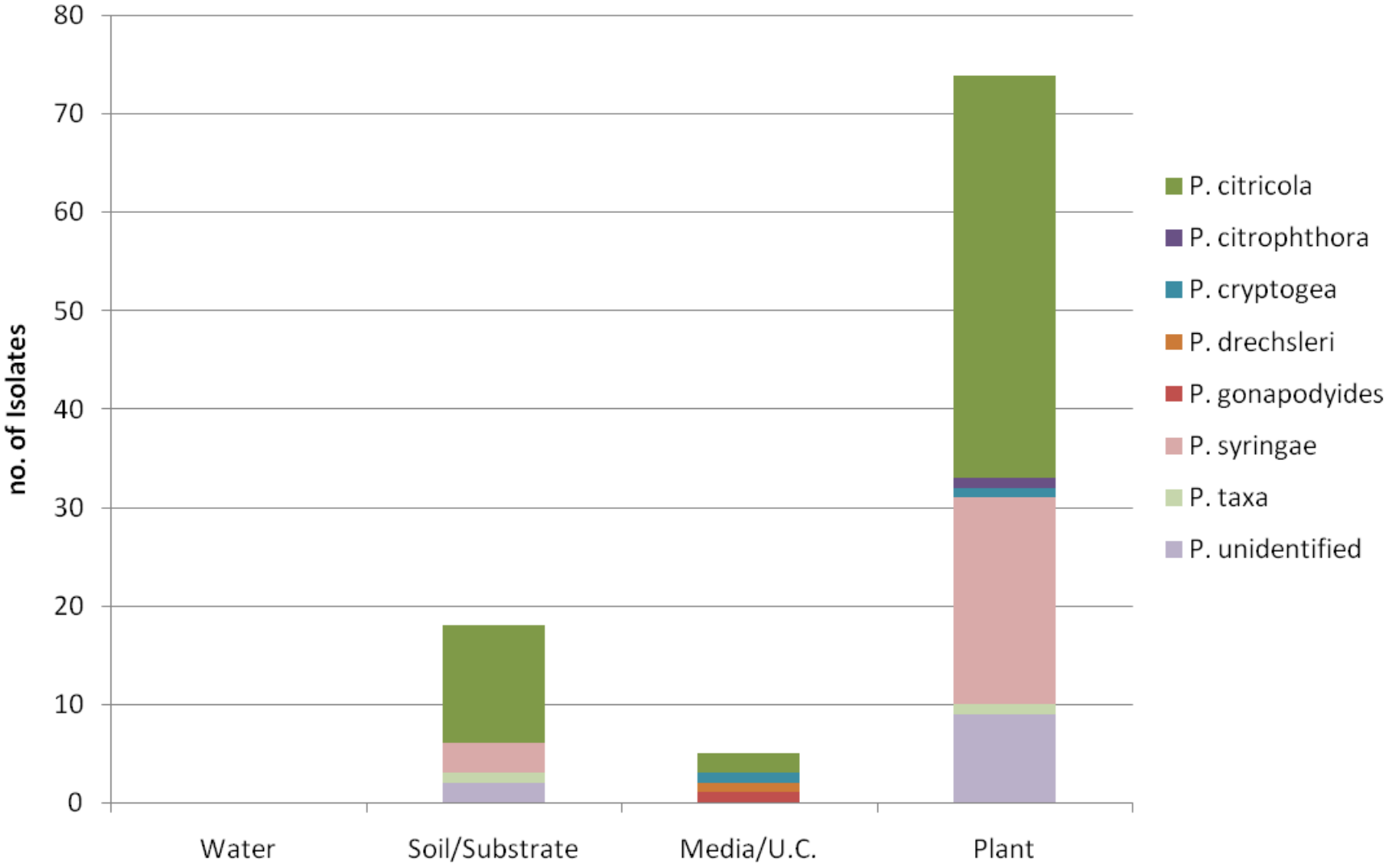
Nursery A - Phytophthora Species by Source




Nursery B - Phytophthora Species by Source
no. of Isolates
70
60
50
40
30
20
10
0
Water
Soil/Substrate
Media/U.C.
Plant
P. cinnamomi
P.citricola
P. citrophthora
P. cryptogea
P. gonapodyides
P. megasperma
P. syringae
P. taxa
P. unidentified


Nursery C - Phytophthora Species by Source
no. of Isolates
80
70
60
50
40
30
20
10
0
Water
Soil/Substrate
Media/U.C.
Plant
P. cactorum
P. citrophthora
P. citricola
P. cryptogea
P. drechsleri
P. gonapodyides
P. megasperma
P. nemorosa
P. parsiana
P. pseudosyringae
P. syringae
P. taxa
P. unidentified

Nursery D - Phytophthora Species by Source



Critical Control Points	A	B	C	D
Placement of containers on contaminated substrate	+	+	+	+
Contamination of substrate by leafy debris	+	+	-	+
Accumulation of standing water/poor drainage	+	+	+	+
Use of contaminated irrigation water	+	-	+	-
Use of contaminated pots	+	+	+	+
Contamination of potting media	-	-	+	+

Need for improved sanitation

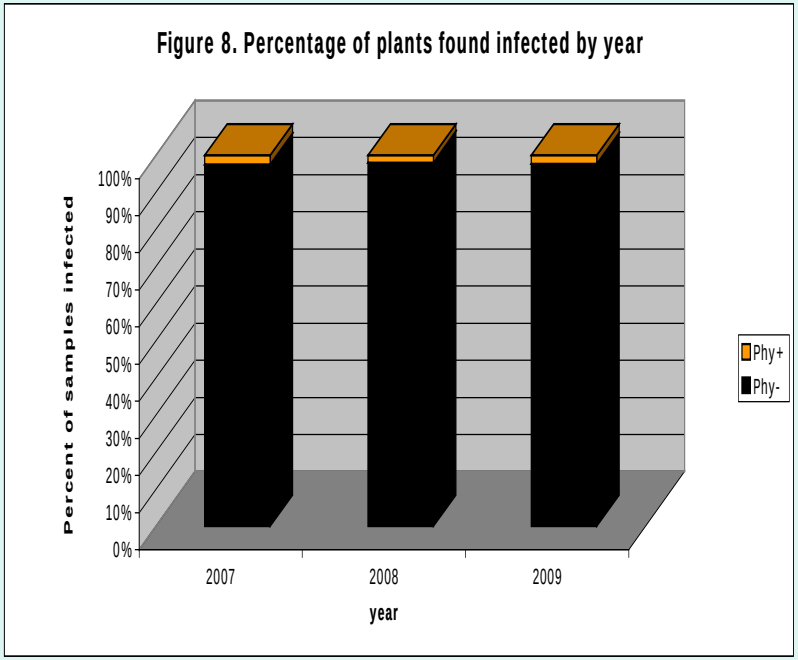
Leafy debris contaminates gravel substrate

Problem

Solution

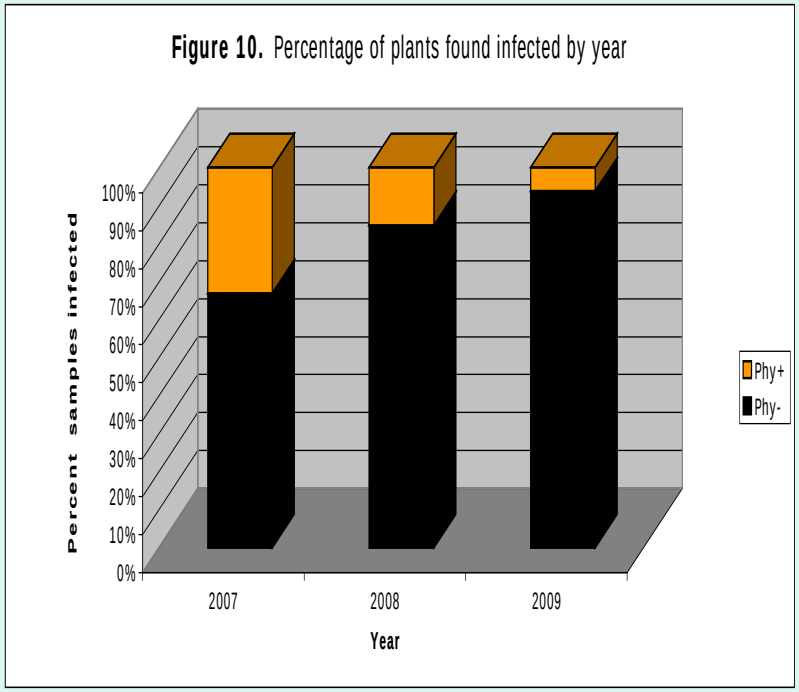
Best Management Practices (BMPs) Work

- "Within two nurseries that have had BMPs implemented for 5 or more years, *Phytophthora* problems are virtually non-existent." (Osterbauer, N., GAIP report, unpublished 2009)



BMPs Work

- "At the sixth nursery, the *Phytophthora* disease level initially started quite high and has steadily and significantly decreased since the nursery began implementing BMPs." (Osterbauer, N., GAIP report, unpublished 2009)



V. Transitioning (Nursery)

- ✓Rapid diagnostic test
- ✓Incentives for adopting BMPs
- ✓National model nursery regulations linking licenses/shipping permits to BMPs?
- ✓Focus on nurseries that buy and sell inter-state

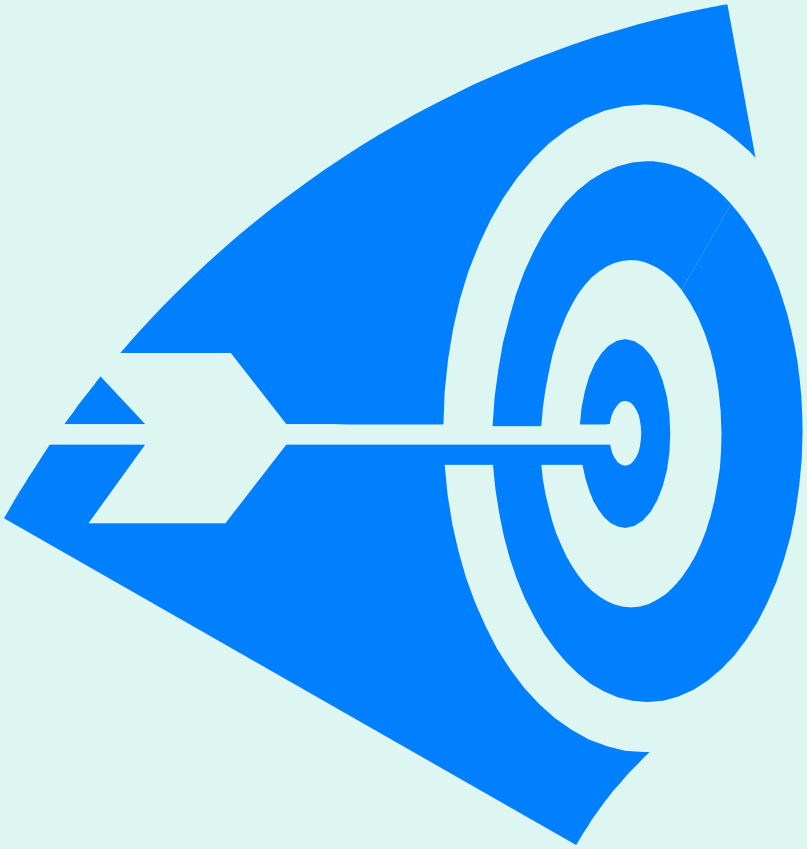
V. Transitioning (Forest)

- ✓ Rapid diagnostic test
- ✓ Construct host-free “firelines” around known infested areas
- ✓ Continue to refine risk models
- ✓ Monitor at-risk forests, fold into regular forest health surveys
- ✓ Develop eradication capability for potential forest infestations outside known infested area

Transitioning (Timeline/Budget)

- Year 1: 80% current program *(treading water)*, 20% future program *(swimming)*
- Year 2: 67%, 33%
- Year 3: 33%, 67%
- Year 4: 20%, 80%
- Year 5: 100% future program
- Year 6: fold SOD program into regular forest/nursery health programs *(climb out of pool)*

Conclusions



- We’ve learned a great deal about SOD
- Doing more of what we’re already doing is not going to improve things
- It’s time to apply the lessons we’ve learned
- National Program needs to be re-invented