Front Porch Event

Lavender Diseases and Using a Diagnostic Lab

with Tom Creswell
Purdue University

November 2, 2023

Lavender Diseases and Using a Diagnostic Lab

Tom Creswell

Clinical Engagement Professor and Lab Director

Purdue University

Plant and Pest Diagnostic Laboratory

Causal Agents of Plant Problems

A range of possible causes

Insects

Environment

Mechanical Injury

Chemicals

Animals

Plant Pathogens

Nematodes

Genetic Abnormalities

It’s your chance to respond….

What is your greatest area of interest when researching lavender plant health?

Dominant Diseases/Plant Pathogens

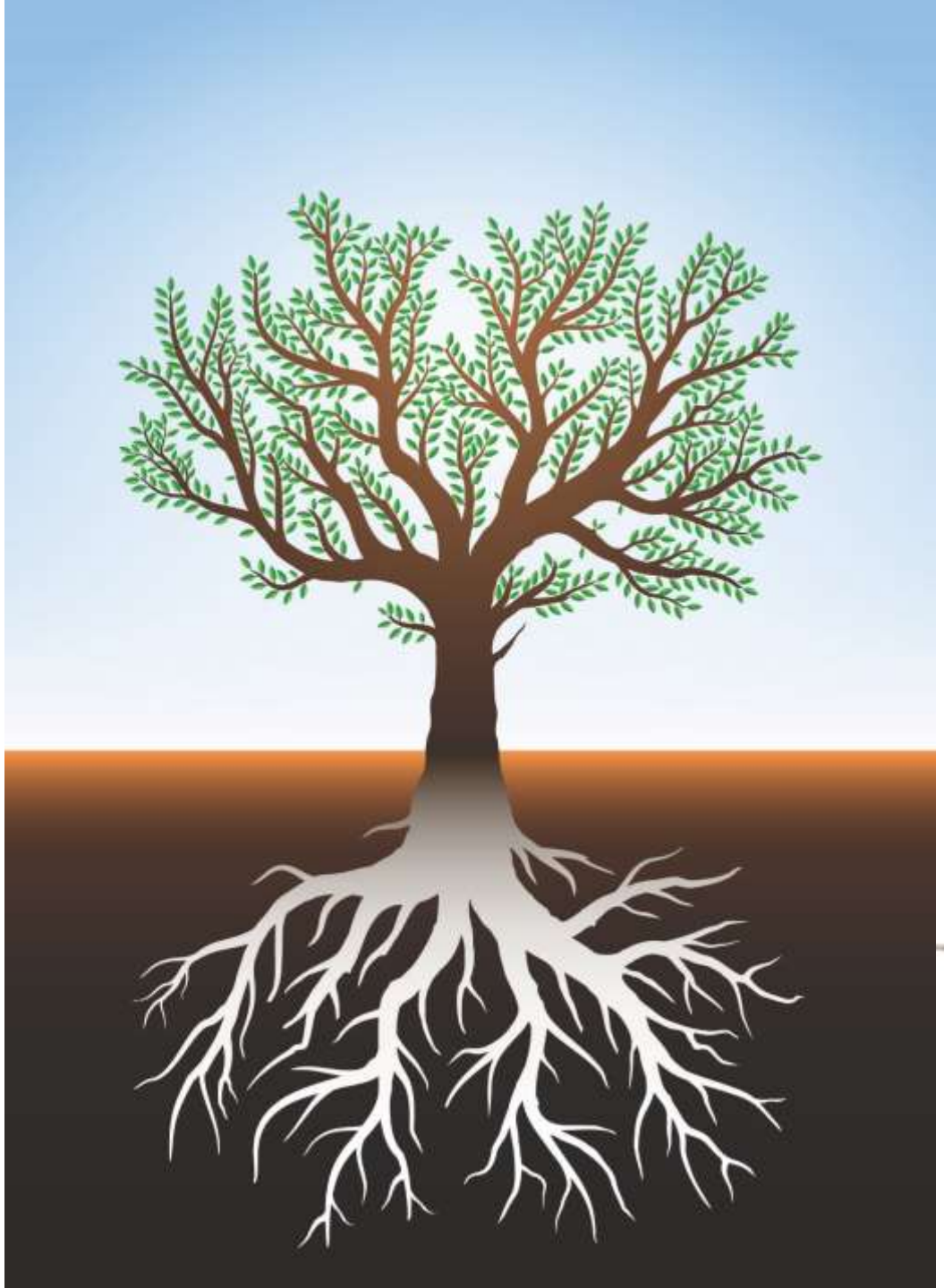
Disease Symptoms

Prevention/Treatment

Soil Health/Ideal Growing Conditions

Insect management

Something else



How Do Plants Talk?

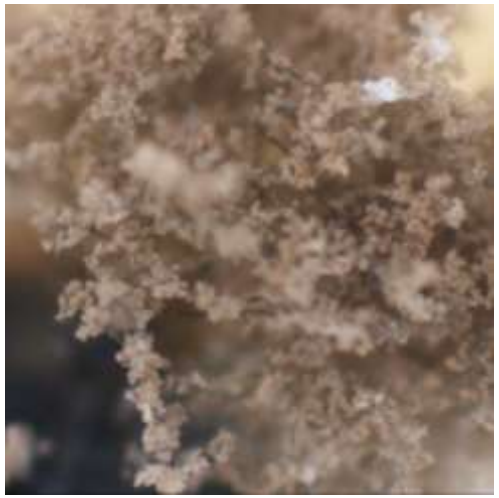
Symptoms vs. Signs

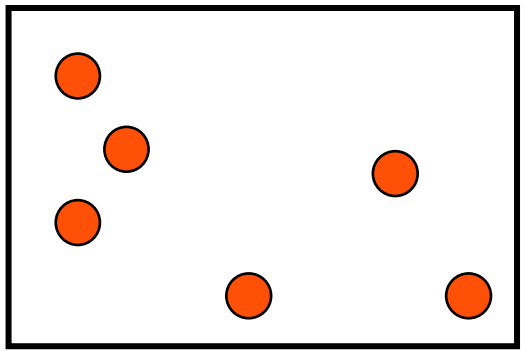
Symptom = Plant reaction to a disease

- Dieback
- Root rot
- Leaf spot
- Blight

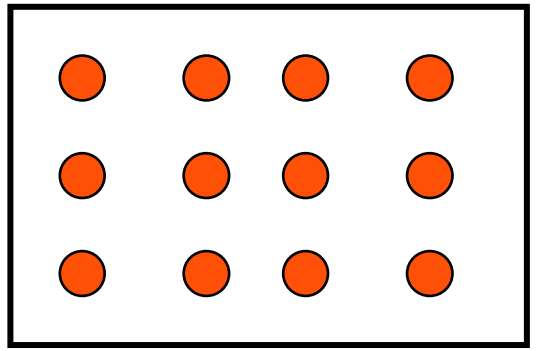
Sign: Physical evidence of the pathogen

- Fungal threads
- Fungal spores/structures
- Bacteria



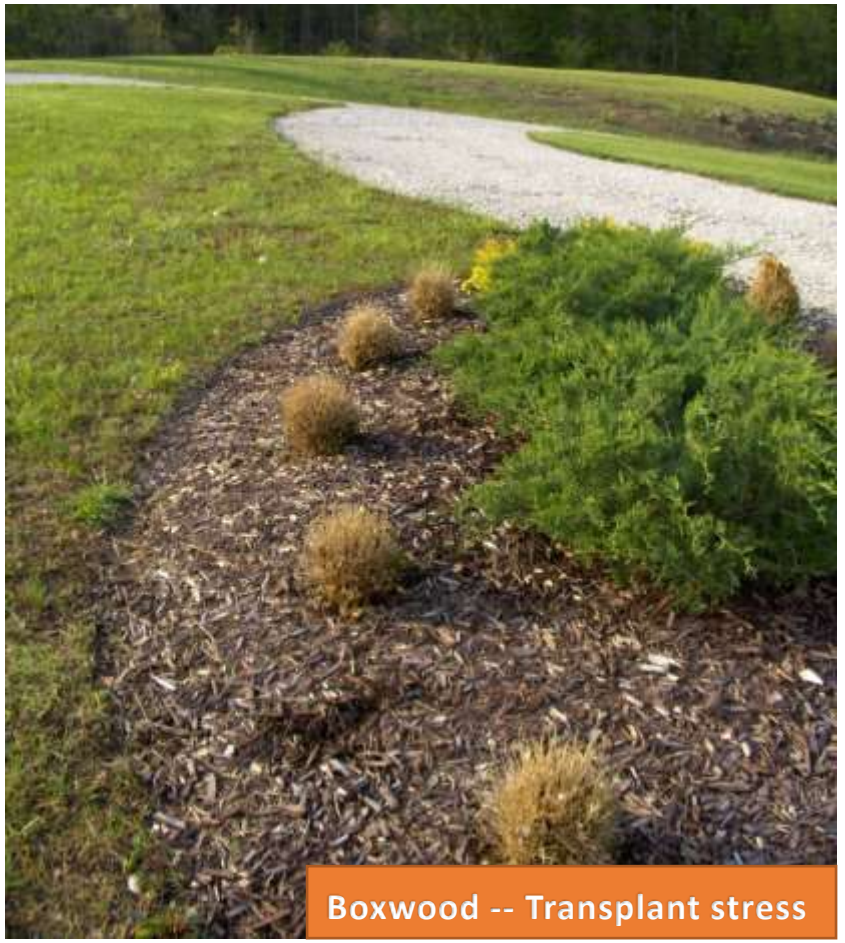


- Random
- Biotic
- Infectious



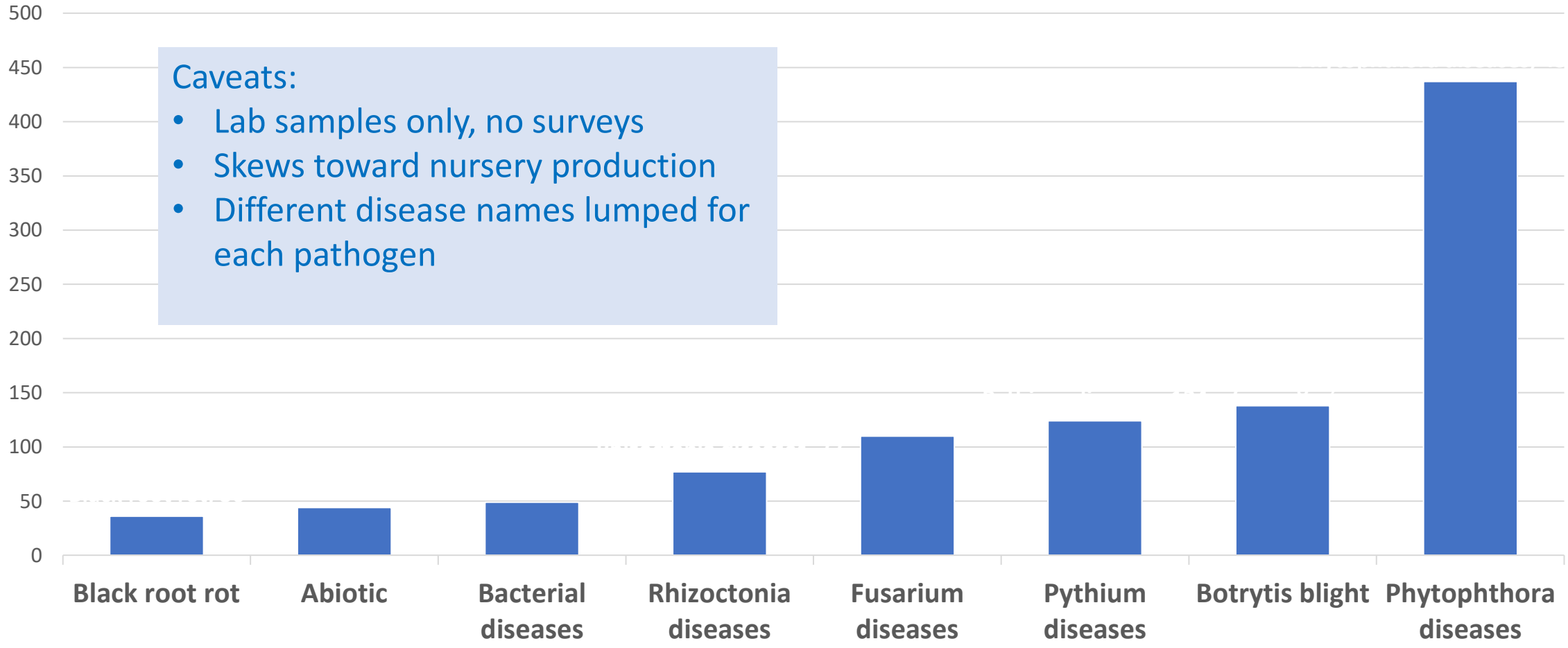
- Uniform
- Abiotic
- Noninfectious

Root rot disease



Boxwood -- Transplant stress

Most Frequently Reported Lavender Diseases
National Plant Diagnostic Network Data



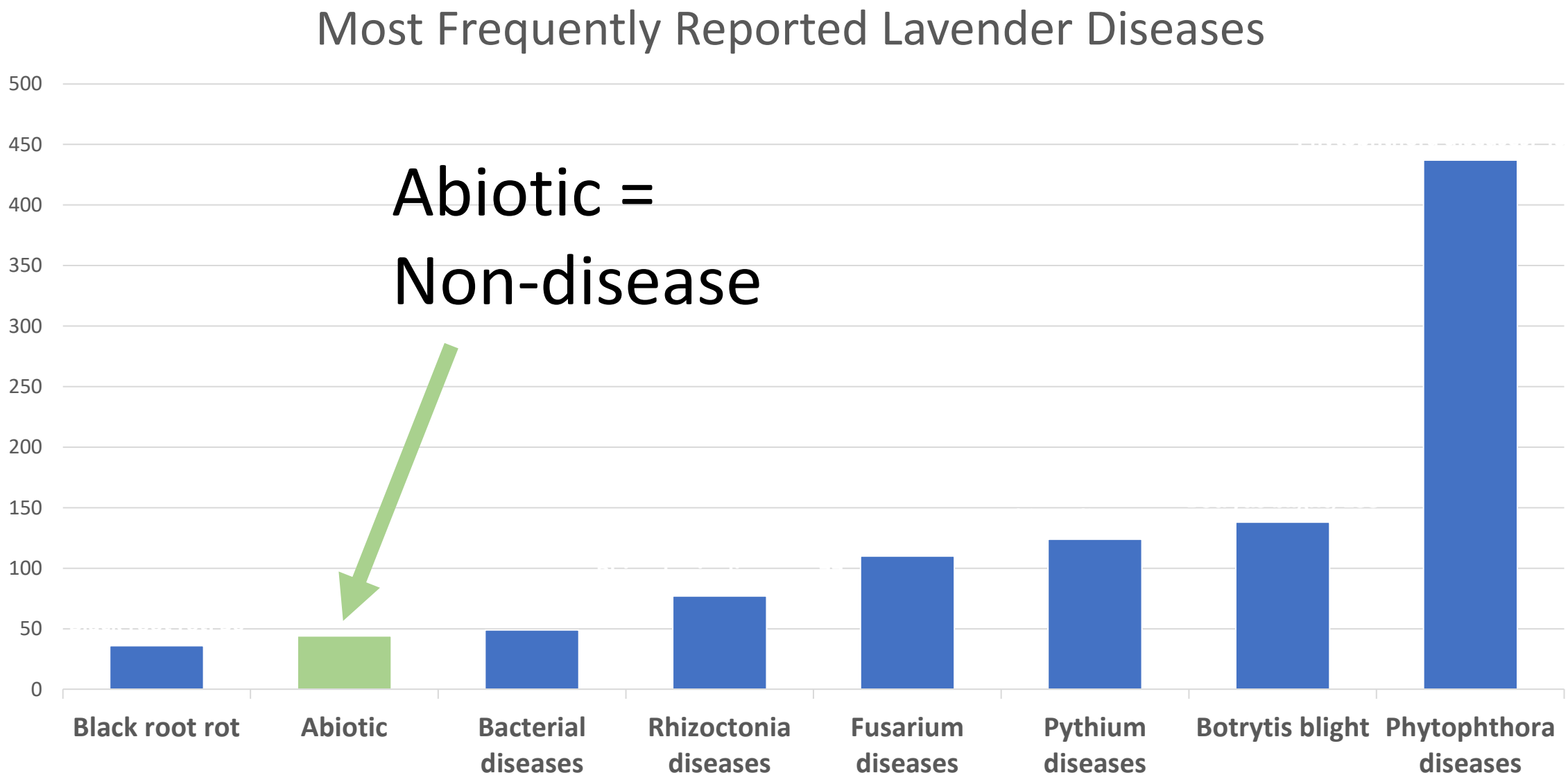
It’s your chance to respond….

Do you routinely test your soil or plants for “ideal” health/ conditions?

Yes – **I test both my soil and plants**.

Yes - **I test my soil**, *but have not routinely had plants tested.*

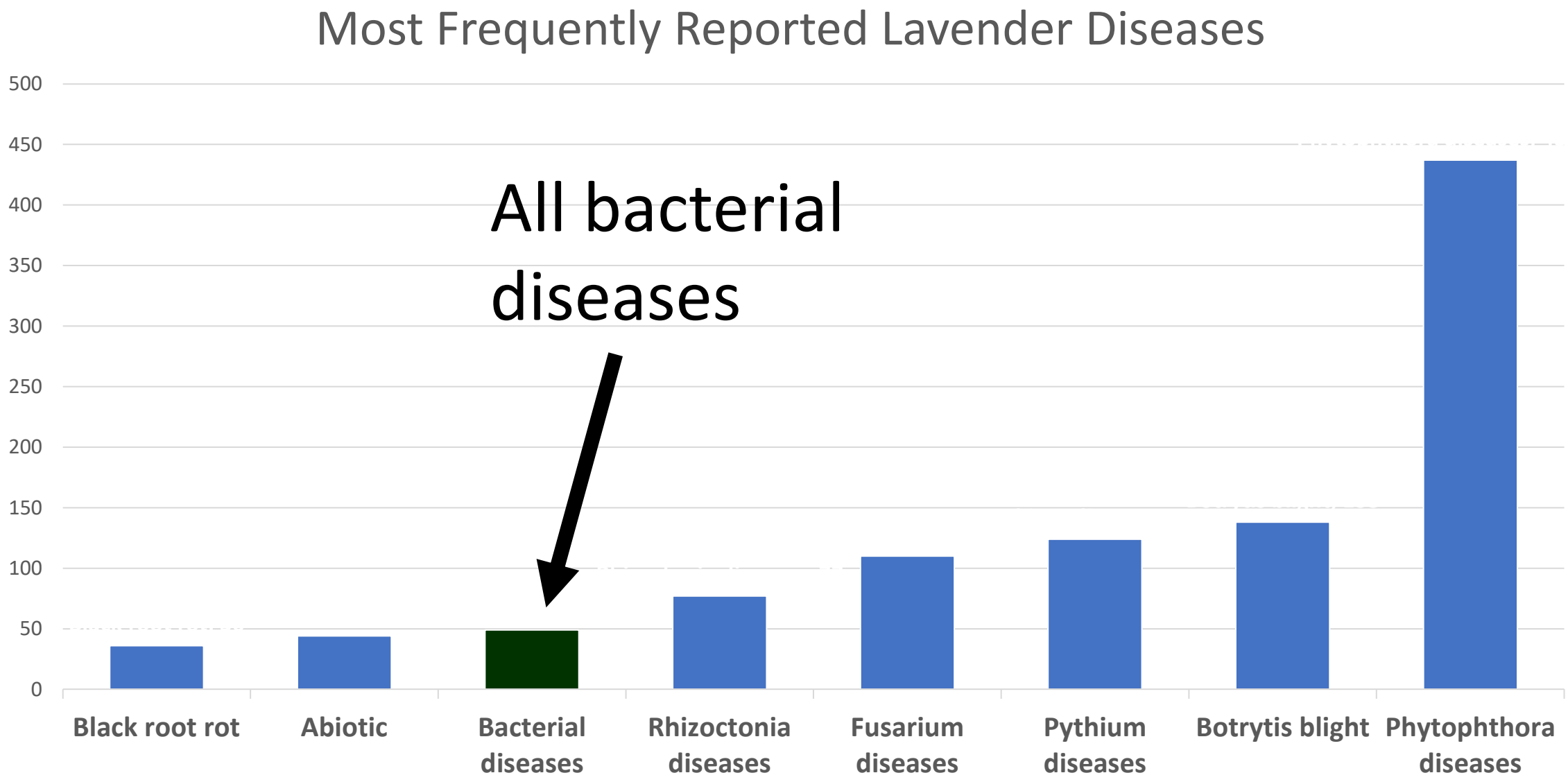
No – I do not currently routinely test *my soil or plants for ideal health/conditions.*


Most Frequently Reported Lavender Diseases
500
450
400
350
300
250
200
150
100
50
0
Abiotic =
Non-disease
Black root rot
Abiotic
Bacterial diseases
Rhizoctonia diseases
Fusarium diseases
Pythium diseases
Botrytis blight
Phytophthora diseases

Abiotic problems – **Winter Damage**

https://www.ontario.ca/page/dealing-winter-damage-lavender

Abiotic problems – **Poor drainage**


Most Frequently Reported Lavender Diseases
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450
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0
All bacterial diseases
Black root rot
Abiotic
Bacterial diseases
Rhizoctonia diseases
Fusarium diseases
Pythium diseases
Botrytis blight
Phytophthora diseases

Photo: Francesca Rotondo, OSU

Bacterial leaf spot – *Xanthomonas hortorum*

Bacterial leaf spot – *Xanthomonas hortorum*

Lavandula x intermedia ‘Grosso’

Lavandula dentata

Photos: Francesca Rotondo, OSU

Bacterial blight – *Xanthomonas sp.*

- Same pathogen as leaf spot
- Just more advanced

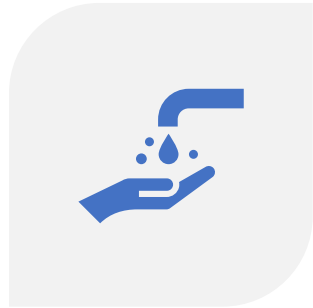
Spanish lavender

Managing Bacterial Diseases

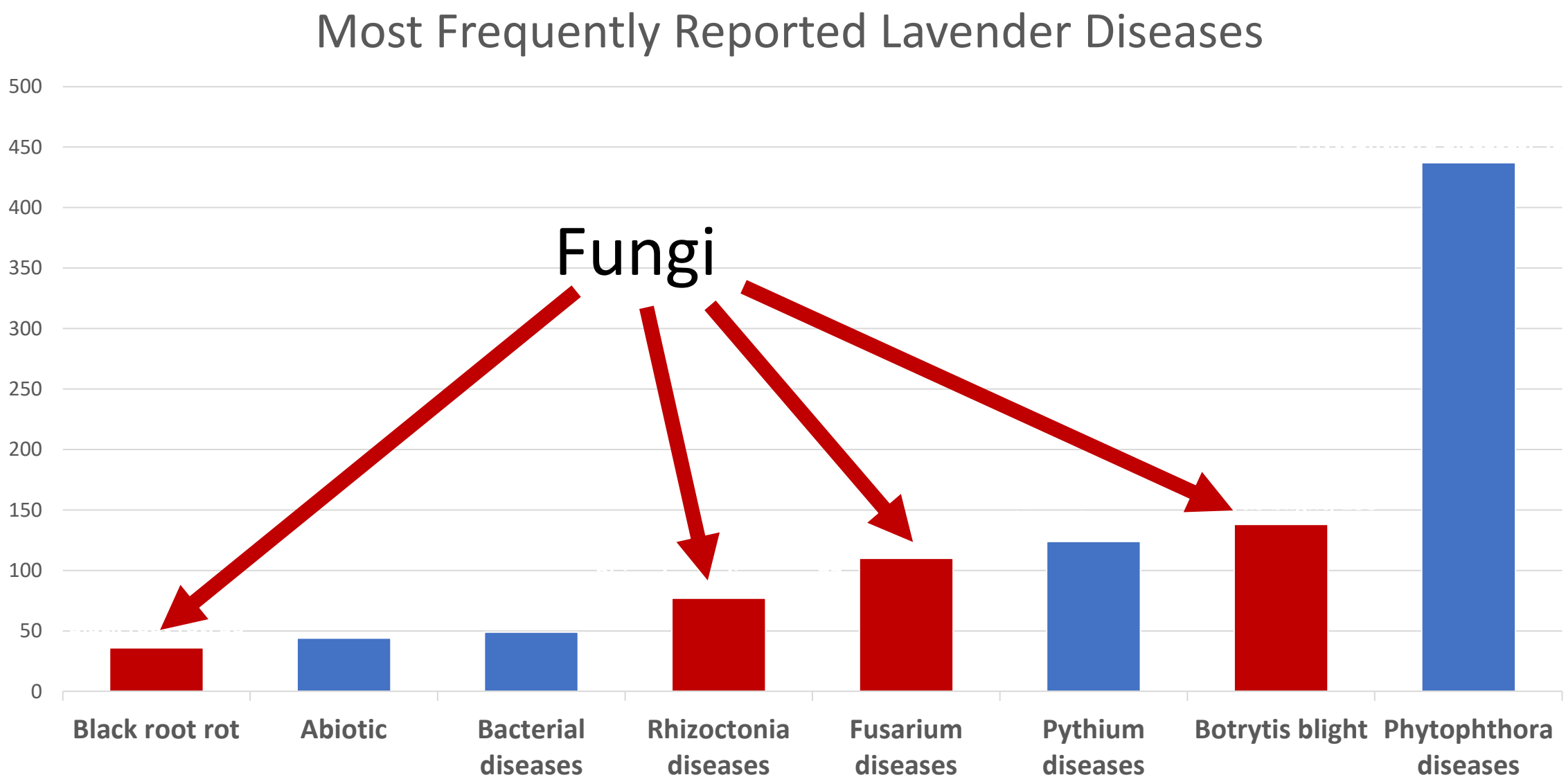
REMOVE INFECTED PLANTS

PROPAGATE ONLY FROM HEALTHY PLANTS

REDUCE LEAF WETNESS



GOOD SANITATION: CLEAN POTS, TOOLS, HANDS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Fusarium diseases
Pythium diseases
Botrytis blight
Phytophthora diseases

Shab – *Phoma sp.*

- Twig dieback
- Described in 1916
- Weak pathogen
- Probably ignored unless other problems are present
- Last seen in our lab in 2011

Septoria leaf spot
Septoria lavandulae

Septoria leaf spot – Fungal

- Brown color
- Drier appearance
- More circular

Bacterial leaf spot

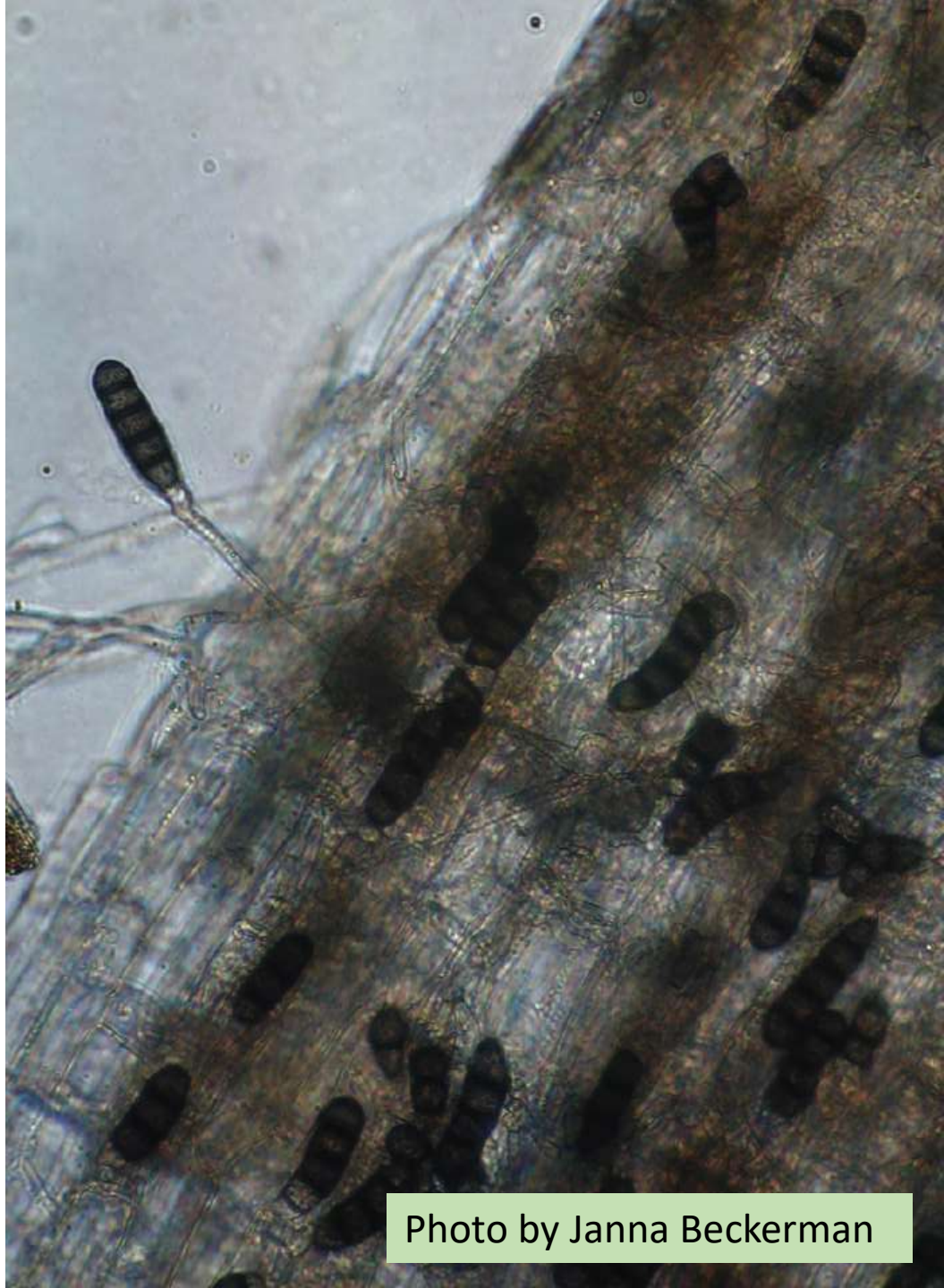
- Black color (under fuzz)
- Wet appearance
- Irregular shape, moving down leaf

Black root rot

- Fungal
- Soil borne
- Reduces root function
- Very damaging to young plants but does not kill large plants
- Management = sanitation
- Black root tips on many plants
- Wide host range

Black root rot: Berkleyomyces (Thielaviopsis)

- **Common name 'black root rot' due to darkly pigmented fungal sores that cover root cells giving a 'blackened' appearance**
- **Common: found in > 120 plant species**
- **Hosts include pansy, vinca, petunia, holly, many others.**



Black Root rot – *Berkeleyomyces basicola*
better known as *Thielaviopsis basicola*

Rhizoctonia diseases

- Soil borne
- Wide host range
- Survives on organic matter in soil
- No spores produced
- Some produce sclerotia (fungus balls for survival)

Rhizoctonia dieback

Symptom

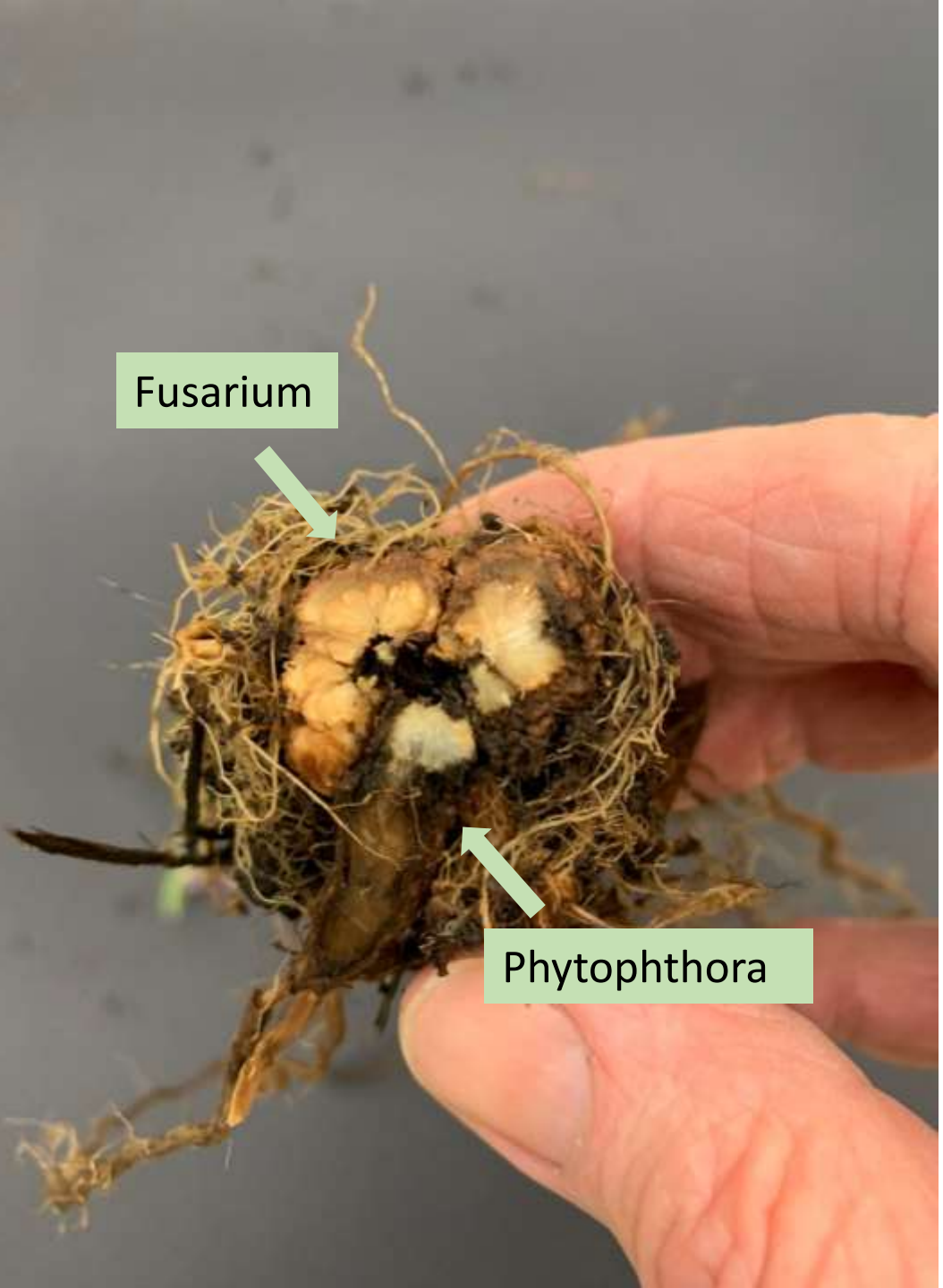
Photo by Janna Beckerman

Photo by Janna Beckerman

Sign

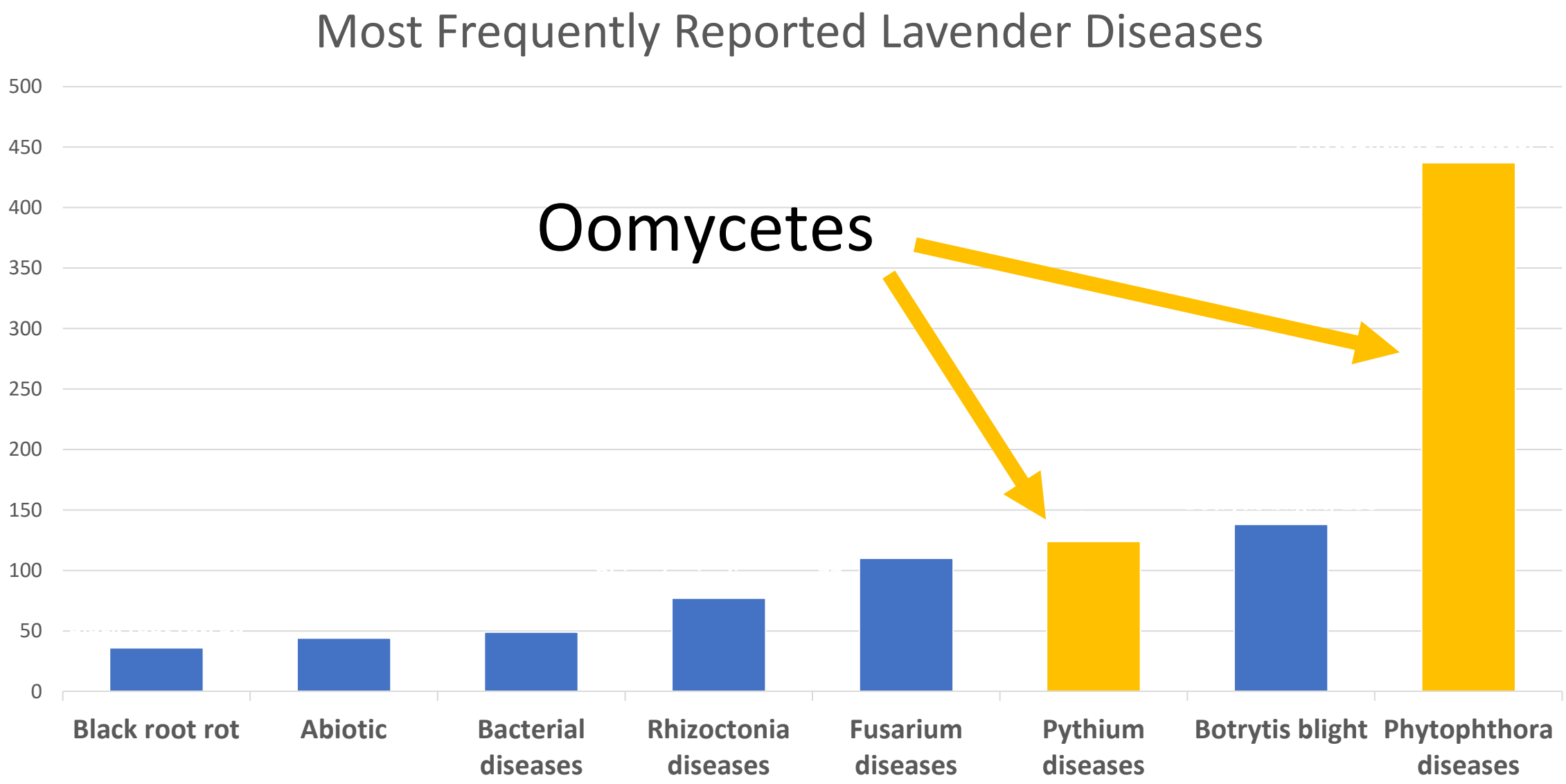
- Rapid growth under ideal conditions (63-79 degrees F, even, but not excessive moisture)
- Web blight in high humidity and crowded canopy
- Mangement:
  - Sanitation
  - Good air movement (in greenhouse)
  - Fungicides

Fusarium dieback



Fusarium wilt/dieback

Botrytis blight – Botrytis spp.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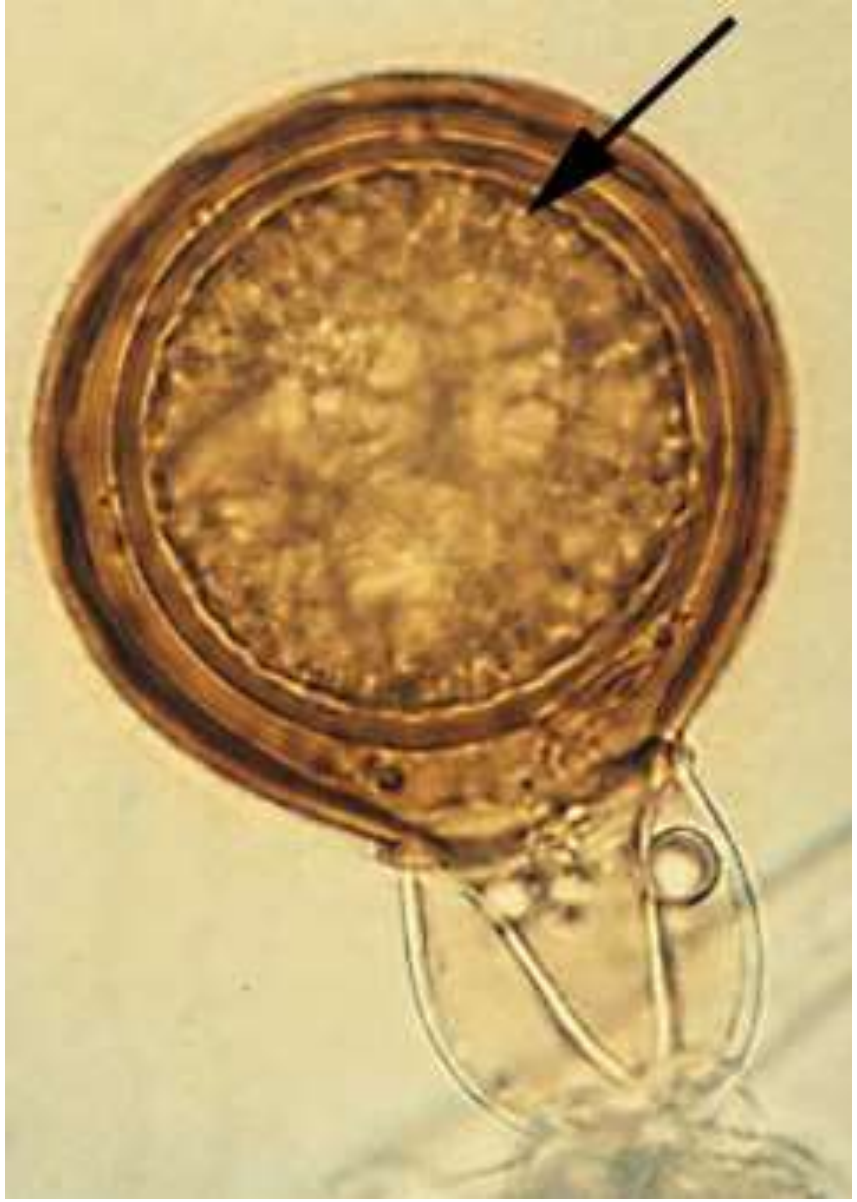


Photos by Janna Beckerman

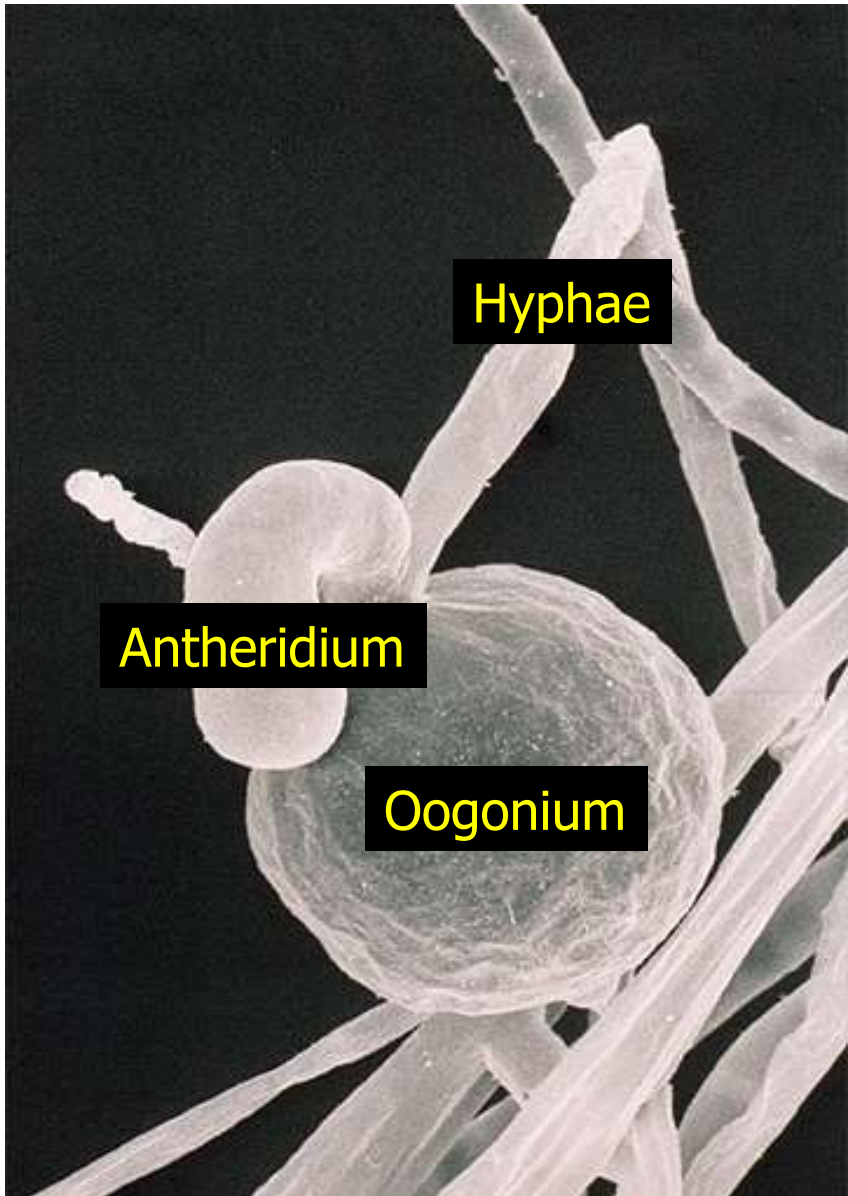


Photo by Gary Chastagner

Pythium root rot

Pythium species are everywhere!

- May be parasitic and/or saprophytic
- As parasites they mainly infect germinating seeds and root tips and strip off fine rootlets and root hairs of plants, although some also infect leaves.


Phytophthora root/crown rot
Photo by Janna Beckerman

Phytophthora root/crown rot

Agdia Immunostrip Test

Phytophthora root rot

It’s never just one thing….

1. Phytophthora root/crown rot
2. Botrytis blight/dieback
3. Fusarium crown rot

Pythium management:
It really is about water management

Photo by Janna Beckerman

Pythium and Phytophthora management points:

- Avoid overfertilization
- Avoid overwatering
- Eliminate symptomatic plants.
- Manage water carefully
- Control fungus gnats and shore flies in containers

Soilborne pathogen management

- Avoid spreading contaminated soil
- Sanitize tools, pots, greenhouse benches
- Use clean water (treated if recirculating system)
- Cleaning Pots/Trays: Scrub clean then soak
  - 10% solution of bleach (1 part bleach to 9 parts water) WITH detergent
  - Detergent is necessary to get the bleach through thick walls to kill fungal spores.
  - Trays must soak for thirty minutes.
- Commercial products, such as Physan 20 (1 T per gal), Zero-Tol (2.5 oz/gal sprayed onto trays) or Greenshield (1 tbsp/gal for 10 minutes as a dip) are effective in eliminating many fungal spores.

Choosing large plant samples

Collecting small plant samples

Sampling Guidelines

- Send the whole plant when possible
- Package to keep soil around roots: AL foil or plastic bag
- Don’t add water
- Ship early in the week (most labs are closed on weekends)
- Fill out the sample form with complete information

Questions Diagnosticians Ask

When did symptoms first appear?

What is the main concern?

What fertilizers or pesticides were used?

Any other plants affected? Patterns of damage?

Which varieties?

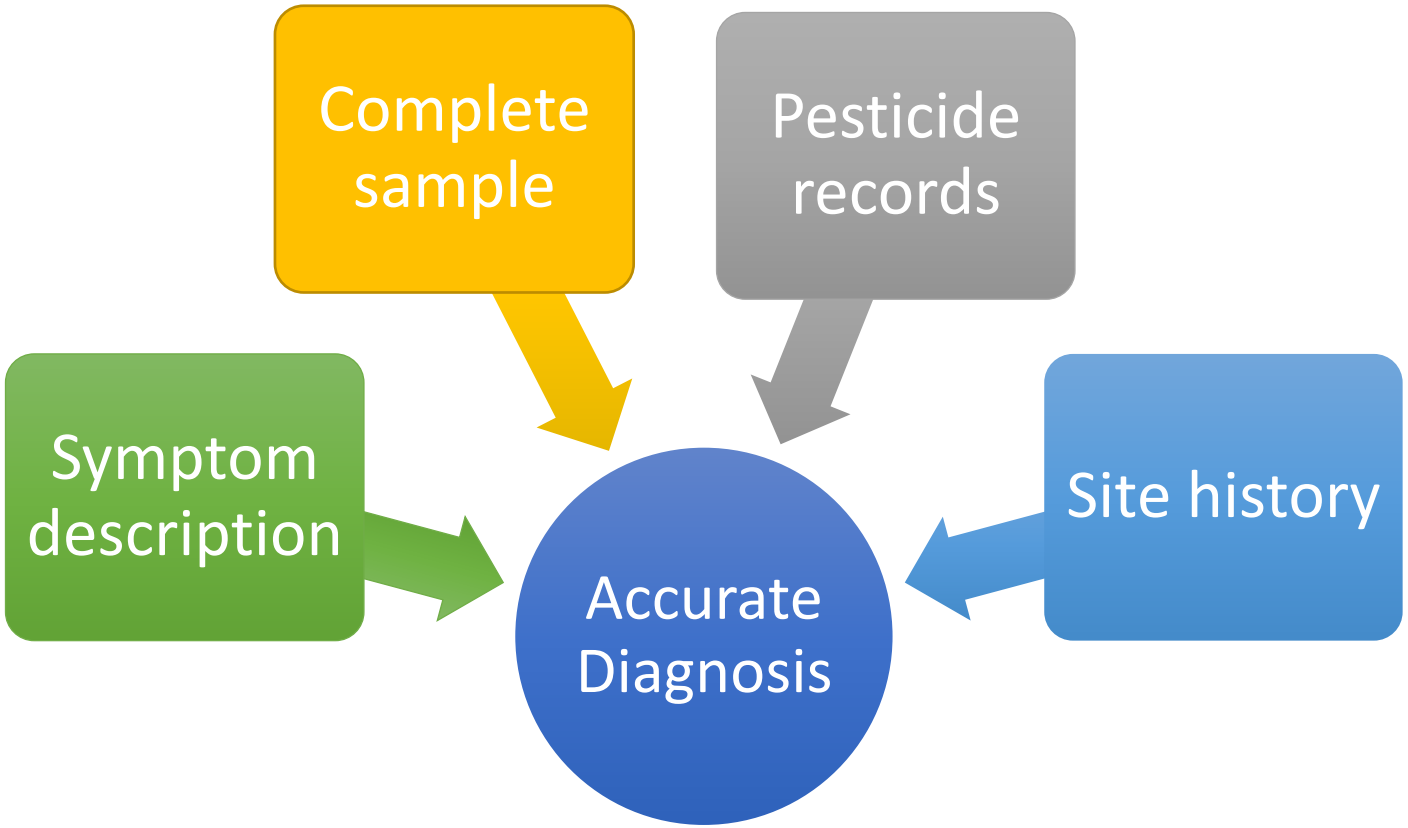
Environmental conditions?

Age of plant?

More information is better!

Diagnostic ROI: Return on your investment

Value of a diagnosis = quality of sample + information provided



Final Diagnosis Caveats

- Each sample is unique in time, specific plant sampled or location on plant
- New information may change the report
- Abiotic problems are presumptive – No tests to allow confirmation
- Diagnosis may not identify species of pathogen
    - Species ID takes time and money and may not help with management.

It’s your chance to respond….

I know where the closest National Plant Diagnostic Network facilities are located?

Yes

No

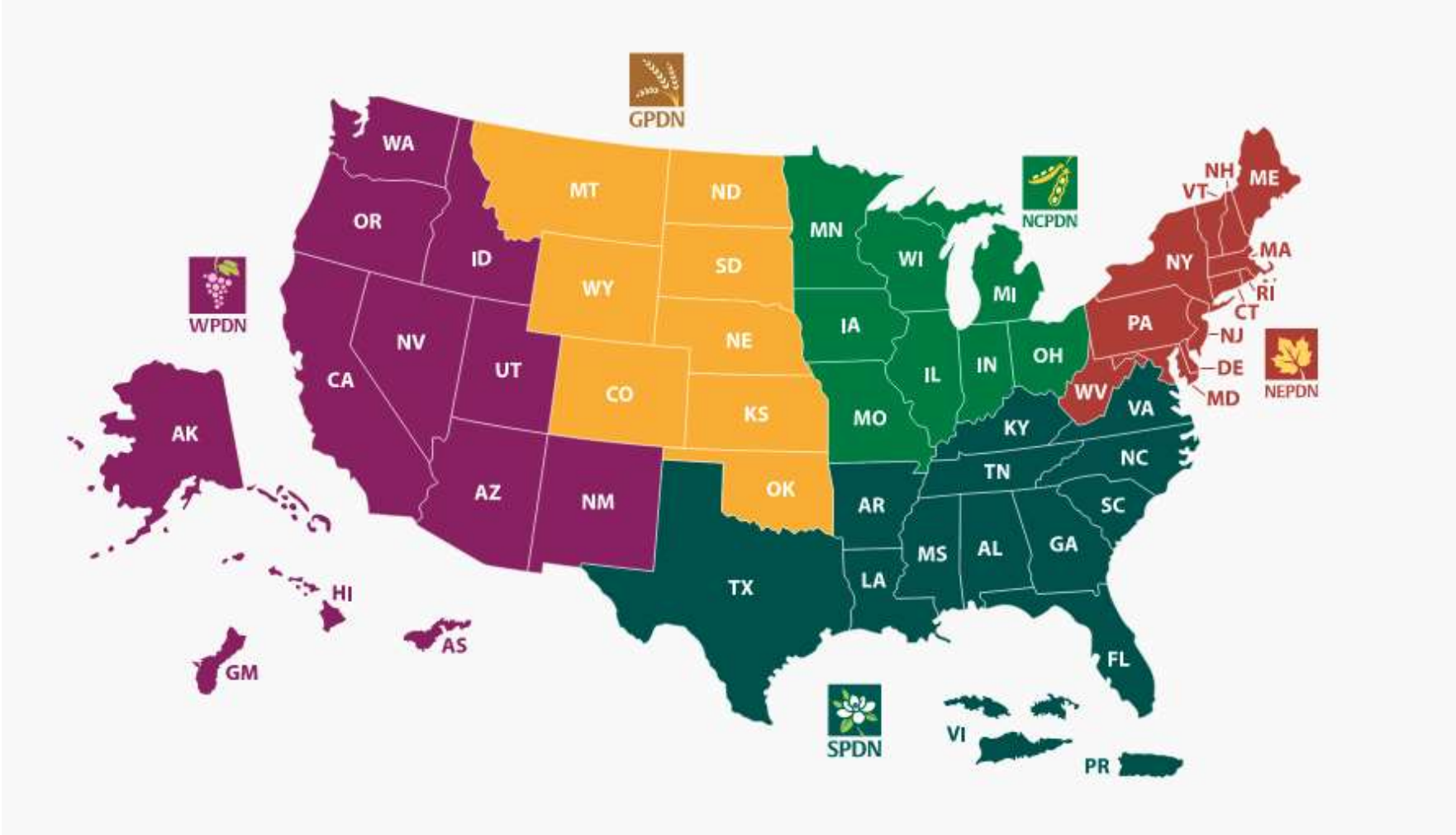
I think so…maybe.

What is the National Plant Diagnostic Network??

Find your lab at npdn.org
The National Plant Diagnostic Network

Five Regions

USDA Supported
- Funding
- Support
- Training

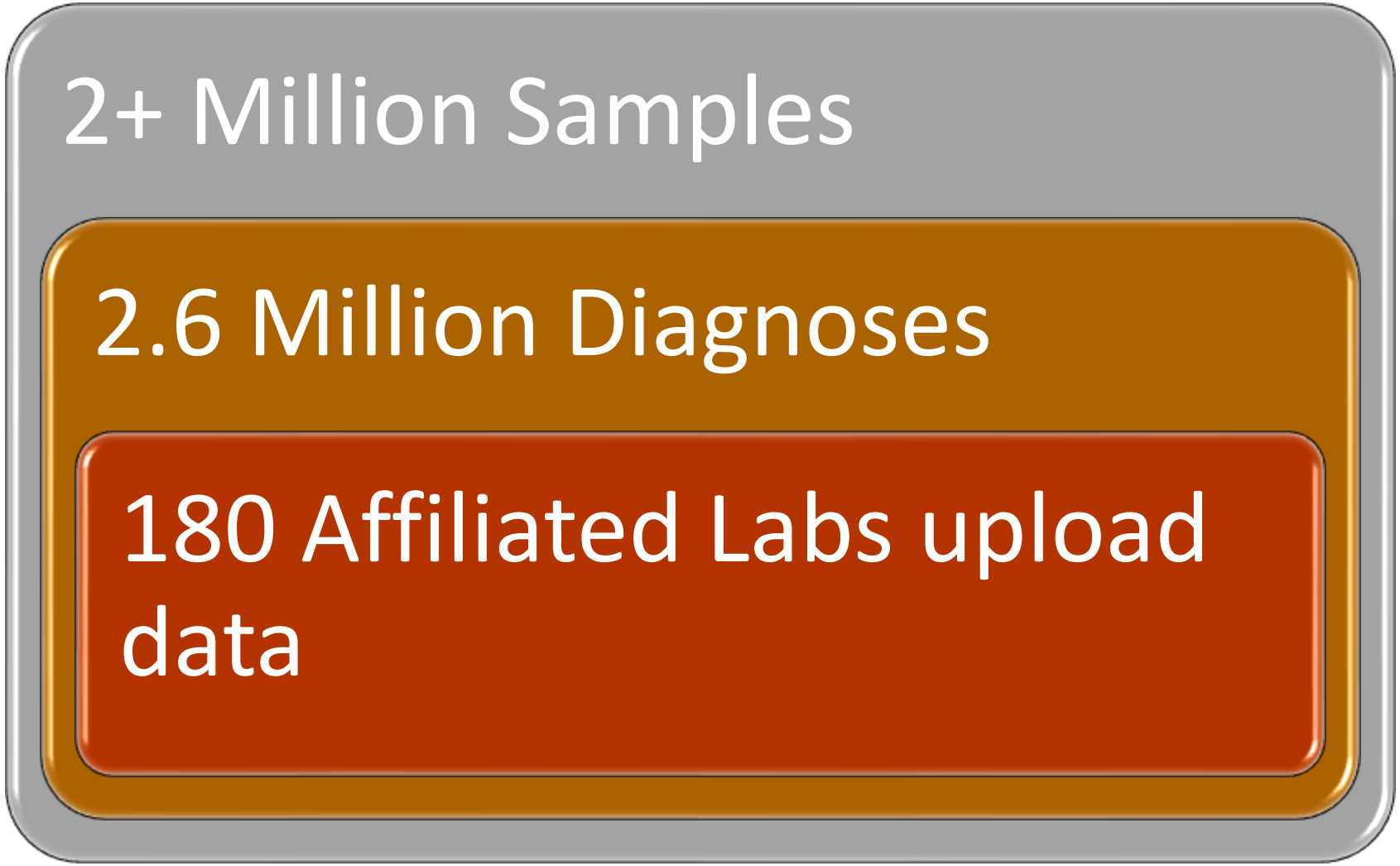


NPDN National Data Repository

Located at CERIS*
at Purdue University

*Center for Environmental and Regulatory Information Systems

Since start of NPDN in 2002:



PURDUE UNIVERSITY | Extension

PURDUE PLANT DOCTOR

PLANT PROBLEM DIAGNOSIS ▾ ABOUT US LANDSCAPE REPORT

Welcome to the Purdue Plant Doctor.

Enter the name of the plant, plant problem, pest, or disease,

or click your way to identify and manage your pest or disease.


Broadleaf Trees, Shrubs, and Vines


Evergreen Trees and Shrubs


Flowers


Beneficials

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LANDSCAPE REPORT

PURDUE EXTENSION

PLANT AND PEST DIAGNOSTIC LABORATORY

Tom Creswell
creswell@purdue.edu
765-494-7071

Thank you for attending!

uslavender.org/front-porch

USLGA's Education and Research Committee hosts Front Porch webinars to share with and educate lavender lovers everywhere.

Contact us with questions or topic suggestions!
education@uslavender.org

"If you have an hour to an hour-and-a-half to sit on the front porch with a cup of coffee or glass of tea, a rocking chair or swing, a few cookies or a piece of fresh-out-of-the-oven apple pie … and a computer or smartphone … let's get together and chat!"

Next Event:

Front Porch Event: Farmers' Markets

Thursday, December 7, 2023
5 pm PT/8 pm ET

Join our panel of successful lavender farmers with the best advice and best practices for a successful Farmer's Market Experience.