

Bean Disease Update

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Talk outline

- Bacterial diseases
- White mold
- Rhizoctonia

Bacterial diseases

Halo Blight

Pseudomonas syringae pv. *phaseolicola*



Common Blight

Xanthomonas phaseoli pv. *phaseoli*

Xanthomonas citri pv. *fuscans*



Brown Spot

Pseudomonas syringae pv. *syringae*



Wilt

Curtobacterium flaccumfaciens pv. *flaccumfaciens*



Bacterial diseases

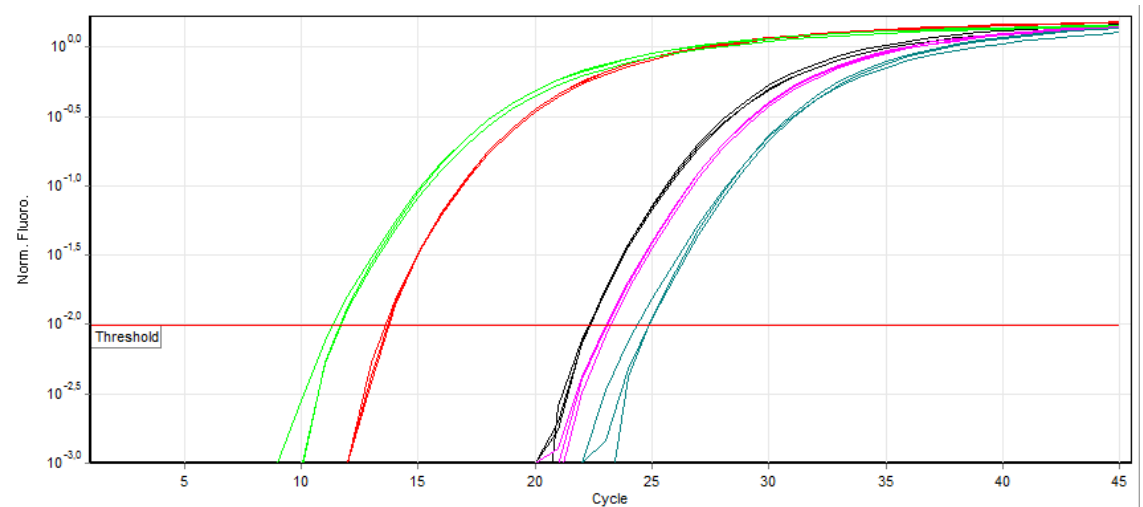
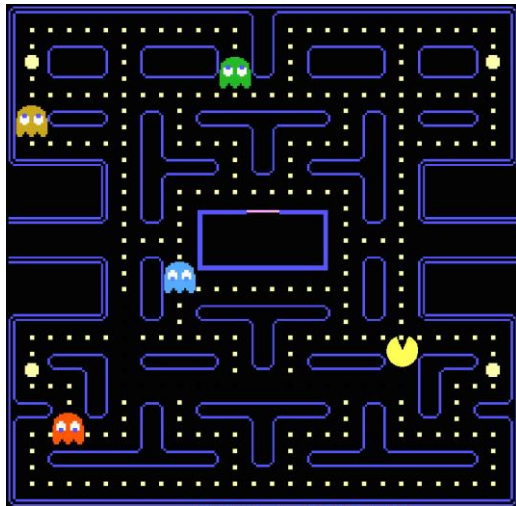
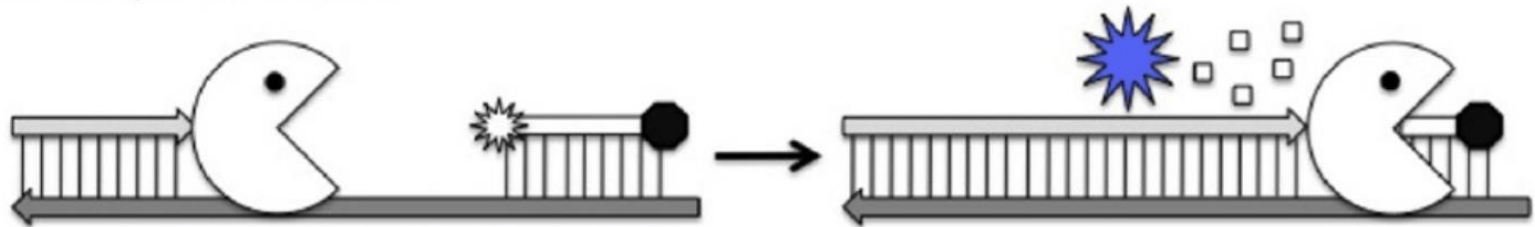
- Regulated diseases in Idaho
- Seed required to be tested
- Present test requires culturing and inoculations =>several days/weeks
- 5,000 to 10,000 seed sample sizes

Project aims

- Design real-time PCR assays for bacterial pathogens
- Develop large scale DNA extraction for seed testing
- Deploy assays to investigate epidemiology in Idaho

Real-time PCR or qPCR (TaqMan)

B. TaqMan Probe



Culture method workflows

Soak beans

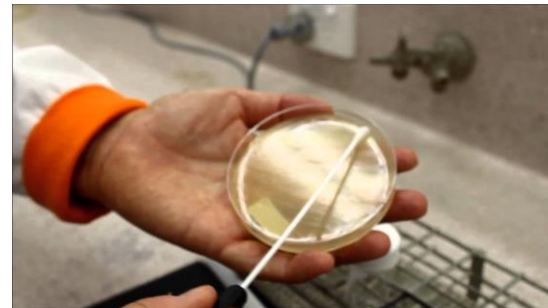
Swab on to plates

incubate plates

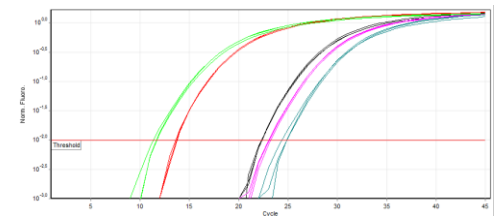
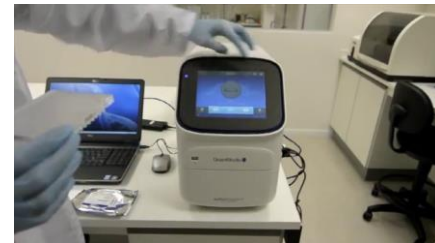
Check plates

Pour & set agar plates

Grow plants



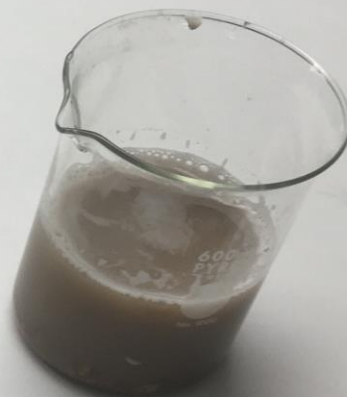
PCR Method workflow



Large samples sizes are a challenge!







Results so far

- 5000 seed sample possible
- Optimizing homogenization time for varieties:
- Black beans 3 minutes v Pinto 9 minutes

Soak Time	Bacteria DNA	Plant DNA
Instant	16.7	21.5
1 Hour	16.9	21.9
4 Hours	16.6	21.9
16 Hours	20.5	24.9
24 Hours	20.9	25.7

Results so far – seed testing

- 36 samples
- Conventional test all negative except for 3 *Pss*
- Molecular test negative for *Xanthomonas* and *Psp*
- Still designing assay for *Pss*

Epidemiology – sources of inoculum



Results

- JB and insect traps negative for *Xanthomonas* and Psp
- All 18 water samples (including 3 from WA) were negative for Psp
- 6 were positive for *Xanthomonas*!



And the locations were...



Conclusions and further work

- Test more samples
- Develop Pss assay
- Optimize for different varieties
- Field sampling strategies

White mold in 2021? Low levels at Parma



White collar in black beans
Rhizoctonia solani AG 11



White collar in potato



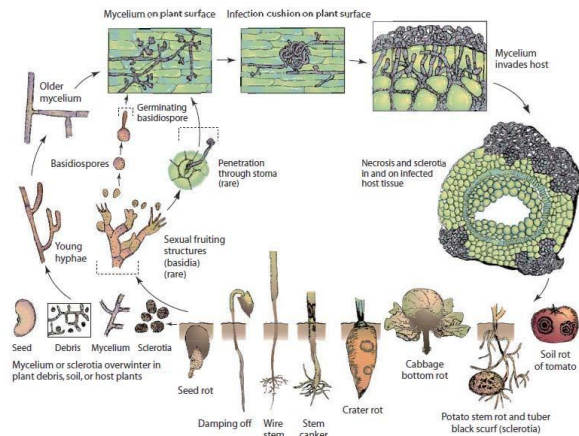
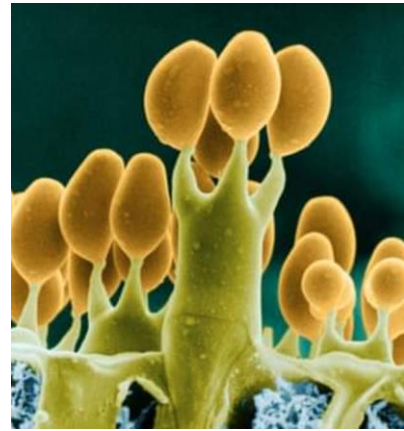
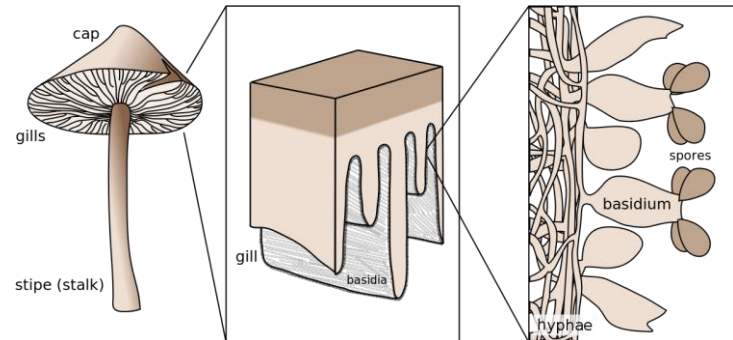


FIGURE 11-154 Disease cycle of *Rhizoctonia solani* (*Thanatephorus cucumeris*).



- Sexual phase
- Importance?
- Recombination?
- Not long distance?



Rhizoctonia survey

	Southcentral Idaho	Southwestern Idaho	Total:
AG 1-IB		1	1
AG 2-1		3	3
AG 2-2	1	7	8
AG 3		1	1
AG 4 HG I	10	3	13
AG 4 HG II	12	16	28
AG 4 HG III	2	3	5
AG 5		5	5
AG 11	1	4	5
AG A	6	9	15
AG E	1		1
AG F		8	8
AG K	7	6	13
Waitea		1	1
Total:	40	67	107

Conclusions - Rhizoctonia

- Large diversity of AGs/subgroups present
Beans 14 v potatoes 7
- Diversity makes diagnostics/management recommendations challenging
- Recombination likely to be happening – soil borne fungus and locally adapted strains?
- AG 4 HG-I and HG-II frequently isolated and aggressive to bean stems and roots

Acknowledgments

Parma

- Ben Wood
- Lara Brown
- Mack Murdock
- Hayden Woods
- Chris Ballou
- Christian Cumagun

ISDA

- Liz Vavricka



Treasure Valley Virtual IPM Meeting

Tuesday February 8th at 9 am

Register at:

<https://bit.ly/3KJYJZq>

After registering (only requires name and email) you will receive information about joining the meeting on the day. The meeting is free to attend and two ISDA credits, two ODA (core) credits and two CCA IPM Credits are available.

Meeting Agenda

- 9am Vegetable Diseases – James Woodhall
- 9.30 am Glyphosate Resistant Kochia – Joel Felix
- 10 am Alfalfa leaf cutting bee health – Justin Clements
- 10.15 am Insecticide resistance in onion thrips – Justin Clements
- 10.30 am Insect and mite management in hemp – Stuart Reitz
- 11 am Question and answer session



University of Idaho



Oregon State
University

For further information, please contact James Woodhall at jwoodhall@uidaho.edu.