Potting Soils &Biopesticides

HOW THE SOIL TYPE INFLUENCES THE EFFECTIVENESS OF BIOPESTICIDES

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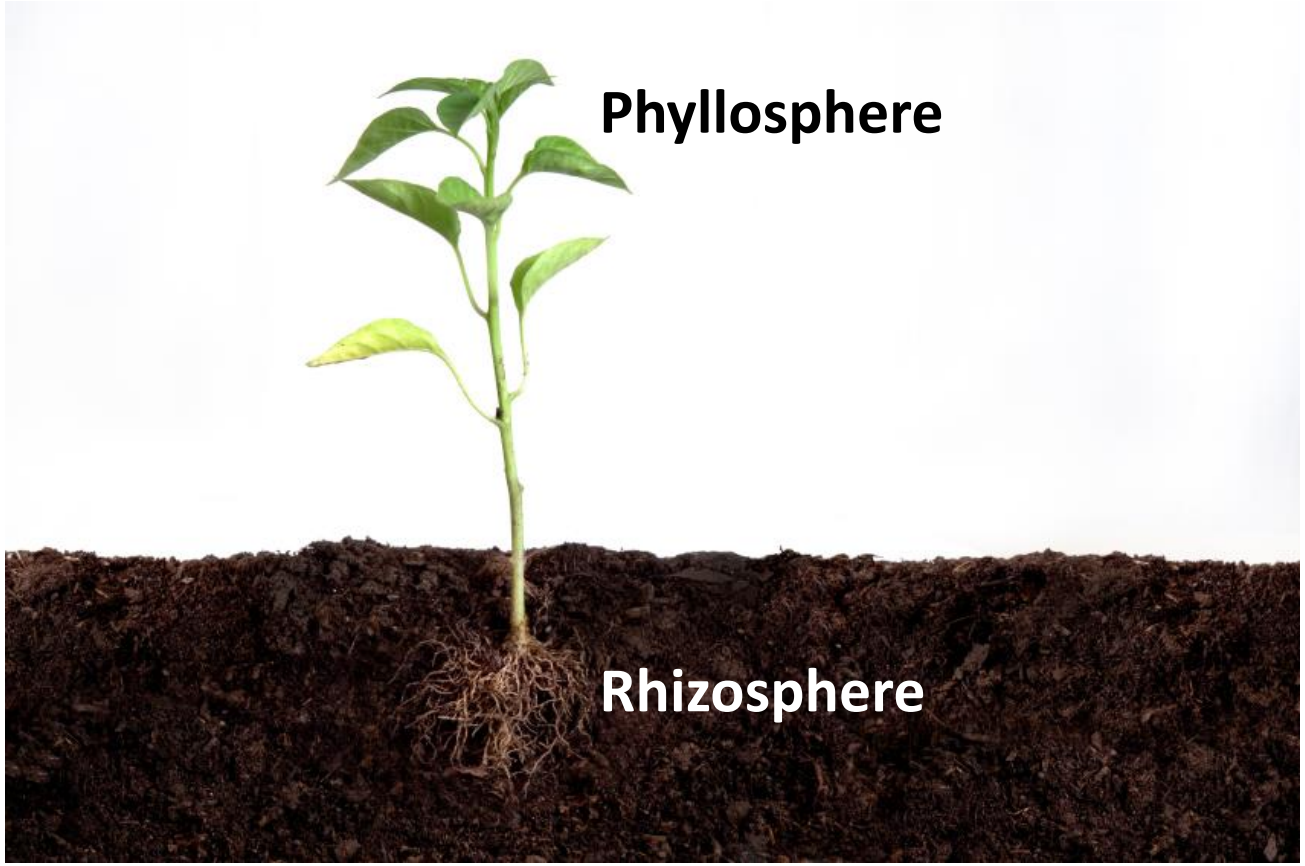
Soil's Interactions with the Plant

Most diverse "ecosystem" of all

- Bulk soil: tens of thousands of bacteria per gram
- Rhizosphere BILLIONS bacteria per gram

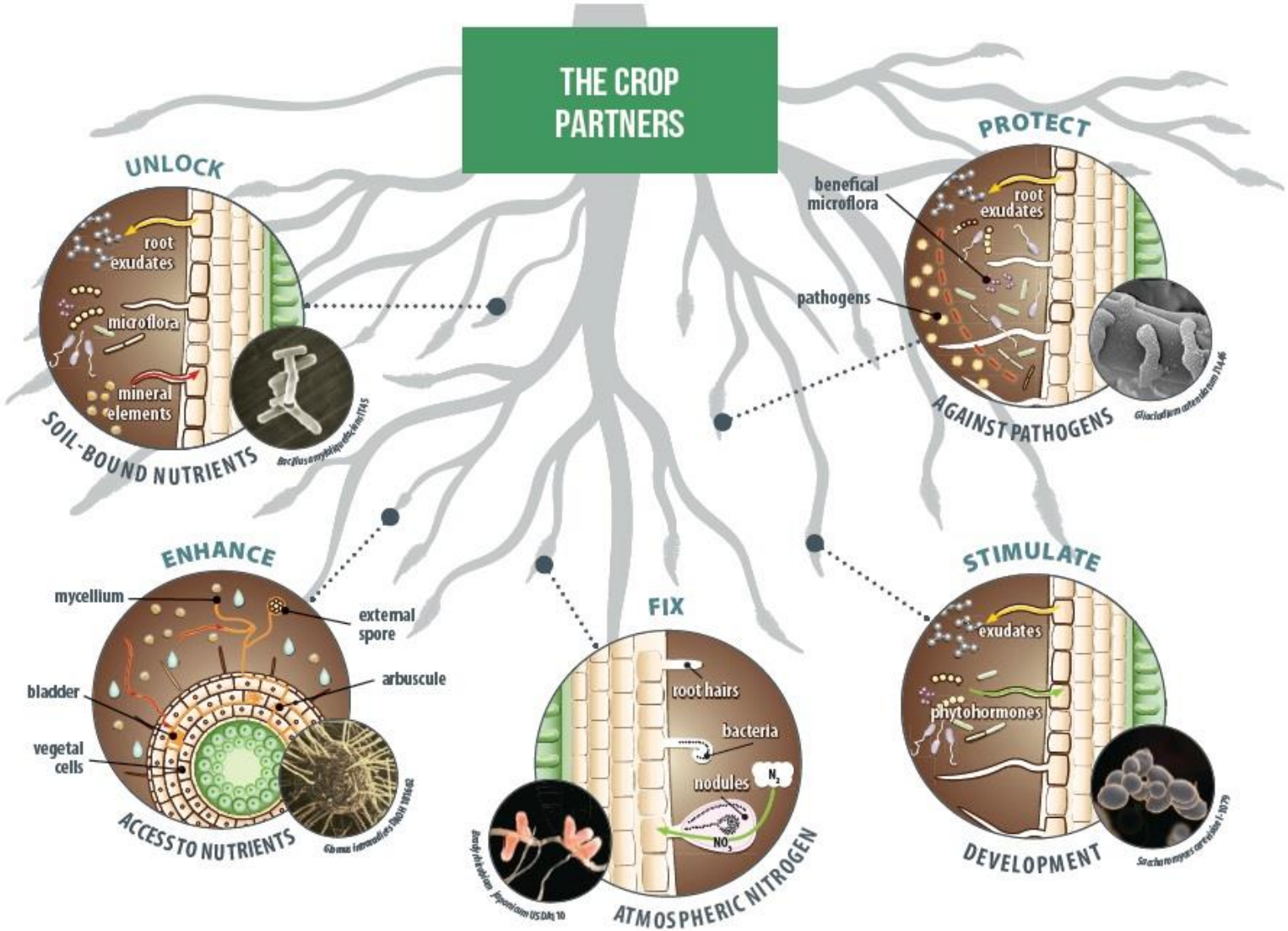


Berendsen et al. 2012

Interactions Examples

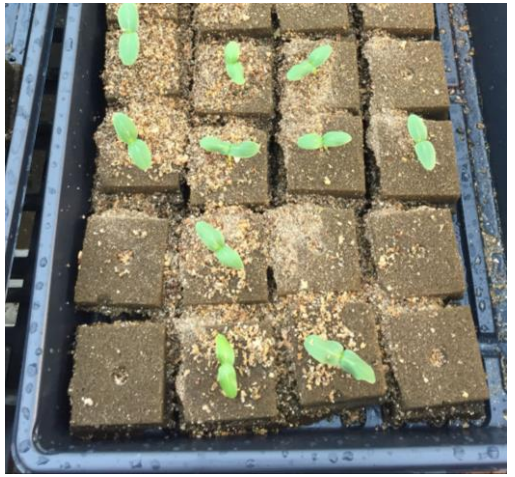
Lots of interactions between microbes and the crop!

Soils have Natural Disease Suppressiveness



Substrates & Greenhouse Production

Peat | Coco Coir | Wood products | Oasis®



- Lots of reasons (economic, environmental, etc.) to choose different substrates
- What about disease suppressiveness of those substrates?

We know different substrates/soils have different “natural” disease suppressiveness

Why?

- Differences in chemical and physical properties

What about differences in how a biopesticide works in different substrates?

- Like other soil microbes, Biopesticides are alive!

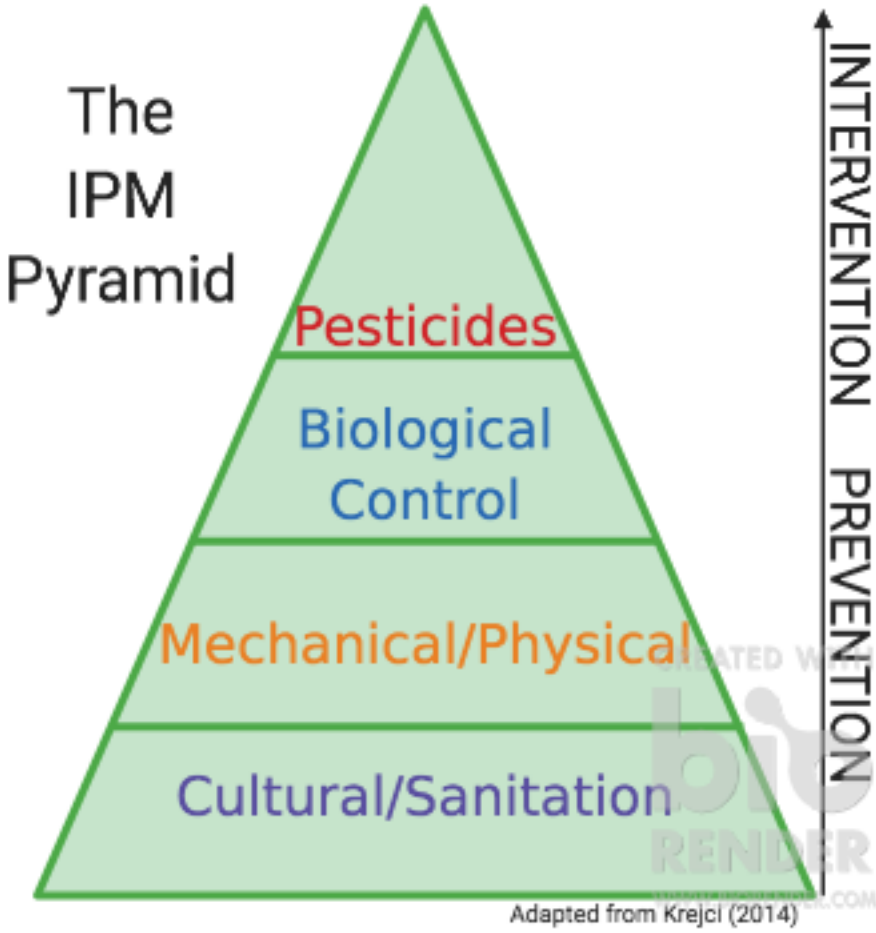
Hoitink and Boehm 1999; Pal and Gardener 2006

Biopesticides

Biological organisms—microbes like fungi and bacteria

Better for the environment, for growers, and for consumers

Best as a proactive approach to disease management



Previous work in the Poleatewich Plant Pathology Lab…

Pythium as our focus species

- Pythium root rot as a major greenhouse disease

Liza DeGenring's work :

- Application of biopesticides in propagation
- 3 biopesticides on 3 substrates: Peat, Coir, and Oasis®

Results:

Biopesticides applied at propagation did NOT cause phytotoxicity

Oasis® performed best against Pythium root rot across biopesticides

My focus: The effect of substrate type on biopesticide efficacy in greenhouse production

Questions:

1. How does the type of substrate affect biopesticide efficacy in production?
2. Why does the type of substrate affect biopesticide efficacy in production?
    1. Chemical, physical, biological?

The Specs of My Research

Crops: Cucumbers & Tomatoes

Substrates: Oasis® (inorganic); Peat, Coco coir, Pine bark mulch (organics)

Biopesticides: Cease®, Rootshield® WP, Regalia®

Ultimate Goal: To make biopesticides an effective, practical method of disease control in greenhouses

Feedback?

1. As growers, what are substrates and biopesticides that you are using?
2. Come talk to me after or email me at:
    1. im1063@wildcats.unh.edu
3. Thank you!

References

Berendsen, R. L., Pieterse, C. M. J., & Bakker, P. A. H. M. (2012). The rhizosphere microbiome and plant health. *Trends in Plant Science*, *17*(8), 478–486. https://doi.org/10.1016/j.tplants.2012.04.001

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Lallemande (2019). Rhizosphere Inoculants. Retrieved from https://www.lallemandplantcare.com/en/our-solutions/rhizosphere-inoculants/

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