

Plant Pathology Seminar Series

“Three’s a Crowd: Soybean, Rhizobia, and Pathogenic Fungi”

By: **Kristen Hamel**



Soybean is a valuable crop, both economically and ecologically. Though it’s grown in many countries, the top producers of soybeans worldwide include the US and Brazil. In 2018 alone, the US produced 4.54 billion bushels of soybeans, with a total value of \$41 billion². Most of the plants grown in the US come from the Midwest “Corn Belt.” This area focuses on corn production, but often alternates with soybean in crop rotation. Soybeans provide an ecological benefit since they have an association to nitrogen-fixing bacteria, rhizobia. The aftermath of this mutualistic relationship returns nitrogen to the soil, improving soil health.

Unfortunately, symbiotic rhizobia are not the only organisms that interact with soybean roots. *Fusarium virguliforme* is the causal agent of sudden death syndrome, a serious disease that leads to losses in yield from 15-80%⁸. It is one of the top five most destructive diseases in soybean after soybean cyst nematodes¹. This fungal pathogen infects soybean roots, causing symptoms like root rot and taproot splitting³. It also produces a phytotoxin, FvTox1, that travels up the xylem, causing leaves to undergo chlorosis, crinkling, and defoliation⁷. Even if sudden death syndrome doesn’t lead to death, yield is still heavily impacted. Research has also shown that sudden death syndrome may also be linked to soybean cyst nematode infections⁸.

Due to its systemic symptoms of both roots and leaves and its persistent survival structures, options are limited for the management of *F. virguliforme*. Traditional methods including resistance genes, fungicide, and crop rotation can reduce, but not completely defend against it^{3,4,9}. In this seminar, I will introduce the latest research on potential management strategies for sudden death syndrome, including metalloid nanoparticles and arbuscular mycorrhizal fungi bio-controls^{5,6}. In combination with current strategies, these new developments could aid farmers in the battle against this pathogenic fungi.

4:10 pm | October 12th, 2020 | Plant Pathology 515, Fall 2020

Zoom Link and ID: <https://wsu.zoom.us/j/91621814000?pwd=MDVOY1prSQYbDRaMXNvTVNxTS82UT09>

Meeting ID: 916 2181 4000

Passcode: 5353

Call in number: 1 253 215 8782



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References

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