AGRONOMY SEMINAR SERIES

FALL 2024

"Investigating the symbiotic productivity of rhizobia in association with crop plants"

Monday, November 18th

2:30 P.M. LILY 2-425

Attend virtually via Zoom

Seminar links will be posted at purdue.ag/agryseminars

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The nitrogen-fixing symbiosis between legume crops and rhizobia is a pillar of sustainable agriculture. While inoculant strains are selected for their efficiency, naturally occurring root-nodule bacteria (rhizobia) vary substantially in their effectiveness at promoting growth of their host plant via symbiotic nitrogen fixation. Because natural rhizobia compete with inoculants for the occupancy of nodules on crop plants, these variations in rhizobia partner quality have important implications for the productivity of nitrogen-fixing symbioses in agricultural ecosystems. Yet, we a limited understanding of the genetic basis for this variation. In this seminar I will discuss1) research investigating the state of this "rhizobium competition problem" in North Dakota 2) applied efforts to overcome it and 3) basic research into the genetic basis of inefficient symbiosis in rhizobia. These topics span a wide range of disciplines applied from the field to the lab centered on a common aim of improving the productivity of the rhizobium-legume symbiosis in agricultural systems.

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Having grown up on a small farm Dr. Barney Geddes is passionate about making discoveries that can be harnessed to improve resilience and productivity in agriculture. Dr. Geddes completed a PhD in microbial genetics at the University of Manitoba in Canada before joining the lab of Dr. Philip Poole at the University of Oxford in the UK as a post doctoral researcher to explore the engineering of nitrogen-fixing cereal crops. In a second post doctoral position with Turlough Finan at McMaster University in Canada he began work to elucidate a "minimal symbiotic genome". In 2020 Dr. Geddes started his research group at North Dakota State University in the Department of Microbiological Sciences. At NDSU his research group uses a blend of bacterial genetics, microbial ecology and synthetic genomics to uncover the determinants that allow microbes to improve crop growth.