

Summary

Project Title: Establishment and maintenance of disease-suppressive soils with green manures in the Pacific Northwest

The Pacific Northwest (PNW) is a worldwide leader in potato production. Washington produces the greatest yields/acre worldwide, Idaho supports the largest potato acreage in the United States, and Montana and Oregon contribute potato seed to neighboring states. The sustainability of potato cropping systems is jeopardized by diseases like Verticillium wilt, caused by the pathogen *Verticillium dahliae*, which can reduce yields up to 50%. Additionally, the widespread use of soil fumigants to control *V. dahliae* compromises environmental quality and limits the potential for sustainable production. Green manures can be used for disease-suppression and to enhance soil quality; however, establishment and maintenance of disease-suppressive soils is not always reproducible. Previously, we presented evidence that most green manure crops are infected with *V. dahliae* but do not display symptoms. The objective of this proposal is to identify the role of asymptomatic infections of green manure crops in disease-suppressive soils and practices growers can implement to maintain suppression. Specifically, we propose to determine if (i) green manure crops select for strains of *V. dahliae* that are not pathogenic to potato and (ii) green manure crops reduce the aggressiveness of strains of *V. dahliae* that are pathogenic to potato. Information from these experiments will be presented at field days, workshops, scientific meetings, and through social media outlets to reach broader audiences of growers and stakeholders. The results will also be published in extension bulletins to enable immediate grower adoption and peer-reviewed journals to disseminate the information to scientific and agricultural communities. Grower adoption will be assessed with surveys. Ultimately, this information will enable sustainable potato production by empowering growers to use green manures in place of fumigants and therefore reduce environmental impacts, enhance economic returns, and social well-being.