**Quarterly report for the NW Potato Research Consortium**

**Title:** Comparison of potato yields, soil health, and pathogen loads in virgin and non-virgin soils.

**Funded PIs:**

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**Objectives:**

1. Sample soils from virgin, non-virgin and native fields.
2. Characterize soil physical, chemical, and biological properties.
3. Quantify potato performance in microplots.
4. Learn from data.

**Progress:**

Objective 1 was completed in May of 2022. A total of 54 fields of virgin (n= 19), non-virgin (n=19), and native (n= 16) soils were sampled from the Columbia Basin (n=39) and Skagit Valley (n=15).

Objective 2 is in progress. Drs. Paulitz, Griffin LaHue, Gleason, and Frost are characterizing the soil physical, chemical, and biological properties. Also, soil samples from potato rhizosphere and roots were collected during mid-July to study microbial communities associated with potato production (**Fig 1**). Nematode extraction from bulk soil and DNA extraction from bulk soils, and rhizosphere has been completed. DNA extraction from tuber skin is underway. We plan to send the samples to the University of Minnesota Genomics Center for amplicon sequencing for bacterial, fungal, and nematode communities.

Objective 3 is in progress. Microplots were established in Pullman, WA during the spring of 2022. Pots were filled with virgin or non-virgin or native soils and potatoes were planted on 5/11/2022. Potatoes were harvested during mid-September and yield was recorded for each microplot. Also, tuber skin was sampled immediately after harvesting for the microbiome study. Potato tubers and stem assay for soil borne pathogens is being conducted.

Objective 4, where we analyze and learn from the data, has not yet commenced. A bioinformatics pipeline has been developed. Once, we obtain the sequenced data and other data we will proceed with analysis and reporting. We have no reason to think this objective should not be completed on time.

A person tending to a garden

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**Figure 1.** Rhizosphere sample collection from microplots in Pullman, WA.