

The effects of cover crops on soil arthropod communities in the Inland Pacific Northwest

To improve farming sustainability and resiliency, growers in the Inland Pacific Northwest are transitioning from traditional production systems by diversifying crops and rotations. Diversification with cover crops benefits soil health and increases agroecosystem resiliency. However, adoption of this alternative strategy is novel in the region, and it is unknown how cover crops and diversified cropping systems impact belowground soil arthropod communities. Conserving soil arthropod biodiversity and function is critical to soil health, decomposition, nutrient cycling, and pest control and promotes plant productivity. The importance of assessing and promoting biological diversity in soils as a component of agricultural sustainability, environmental quality, and overall human health is gaining recognition. Understanding and developing targeted strategies for managing soil biodiversity on working farms will result in important advances for sustainable agriculture, especially in organic systems that rely on biologically regulated processes instead of intensive inputs.

This project will compare belowground arthropod community composition and functionality in soils under cover crops with soils from traditional management practices on three, representative working farms over two-years. In addition to two large-scale commercial operations, one of the farms is the University of Idaho Soil Stewards farm. Therefore, this project reflects two forms of agriculture in the region utilizing alternative management strategies to improve soil health. At the Soil Stewards farm, we will determine how cover crops affect belowground arthropod biodiversity relative to traditional organic production practices, measure the contribution of soil arthropods to cover crop litter decomposition, and assess soil health using soil arthropods as bioindicators.

For more information about the project email Dane Elmquist (elmq8072@vandals.uidaho.edu) or Dr. Sanford Eigenbrode (sanforde@uidaho.edu). This project is supported by [Western SARE graduate student grant #GW20-217](#).



A) Soil corer used to sample soil arthropods; B) Berlese funnel system used to extract arthropods from soils; C) Example soil arthropods collected from the Soil Stewards farm