

The Effects of Cover Crop Diversity on the Diversity of Soil Arthropod Communities

Cover crops provide numerous soil health benefits and can be used as part of agricultural diversification strategies. Cover crop adoption has been slower in the inland Pacific Northwest, especially in dryland cereal systems.

Although interest in cover crops has increased recently, research to support adoption has been limited. In an effort to increase IPNW-specific cover crop research, we are conducting a study to investigate how cover crop diversity affects the diversity and function of soil arthropod communities. Soil arthropods contribute significantly to soil health and plant performance by facilitating microbial processes, nutrient cycling, residue decomposition, and pest/pathogen control.

Research objective: Determine whether cover crops with greater plant species diversity aboveground promote increased arthropod biodiversity belowground. The cover crops we are investigating include flax, sunflower, spring pea, and sweet clover. Treatments include each species planted individually, a mixture of all species, and a fallow control.

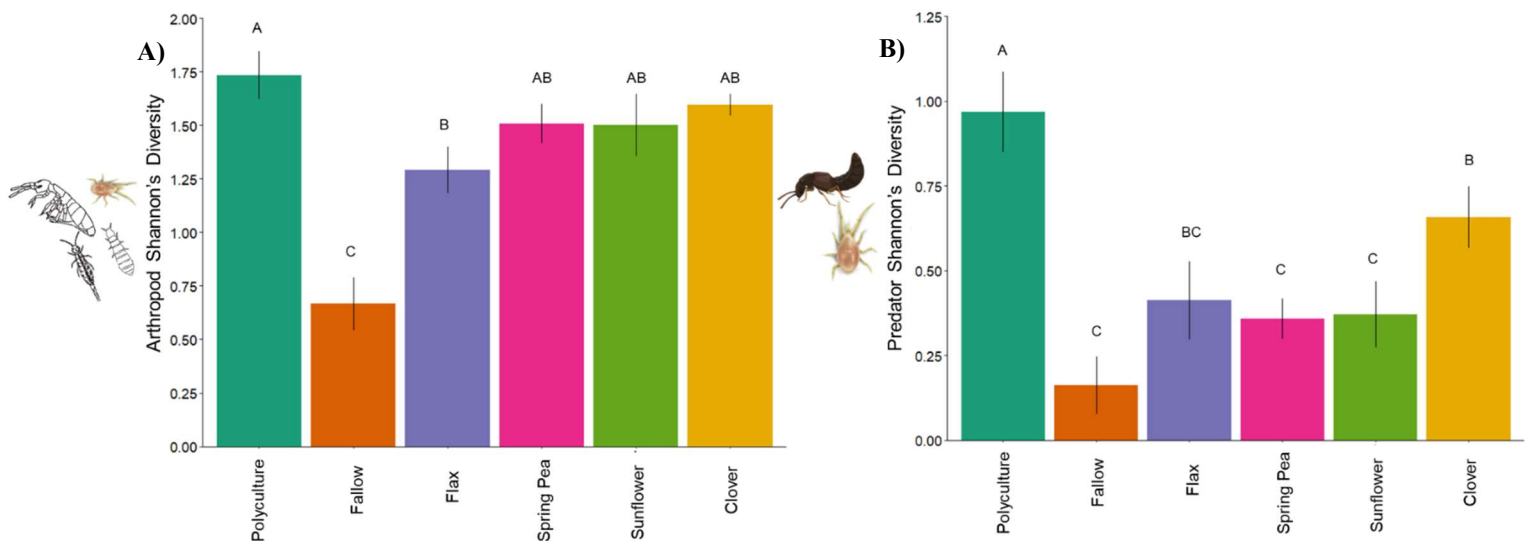


Fig 2. A) Diversity of soil arthropods in each cover crop treatment; B) Diversity of predatory soil arthropods in each cover crop treatment. Means sharing a letter are not significantly different. Shannon's Diversity is metric that accounts for both species richness (number of species) and species evenness (abundance of each species) in a community.

- Cover crop species and diversity affect soil arthropod diversity with possible implications for soil and crop health.
- The diversity of the entire soil arthropod community was higher in all cover crop treatments compared to fallow (A).
- Higher soil biodiversity is known to improve ecosystem functionality and resilience.
- Polyculture cover crops had the highest diversity of predatory soil arthropods compared to all other treatments (B).
- Augmenting predator communities improves control of soil pests and can regulate soil microbial communities by consuming soil arthropods that feed on microbes (e.g., springtails).

Questions? Contact Dane Elmquist at elmq8072@vandals.uidaho.edu

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