WA Soil Health Initiative • Long-Term Agroecological Research and Extension Site

Photo: Kwabena Sarpong

Northwestern Washington Annual Cropping Systems LTARE Established in 2021

Why Long-Term Research?

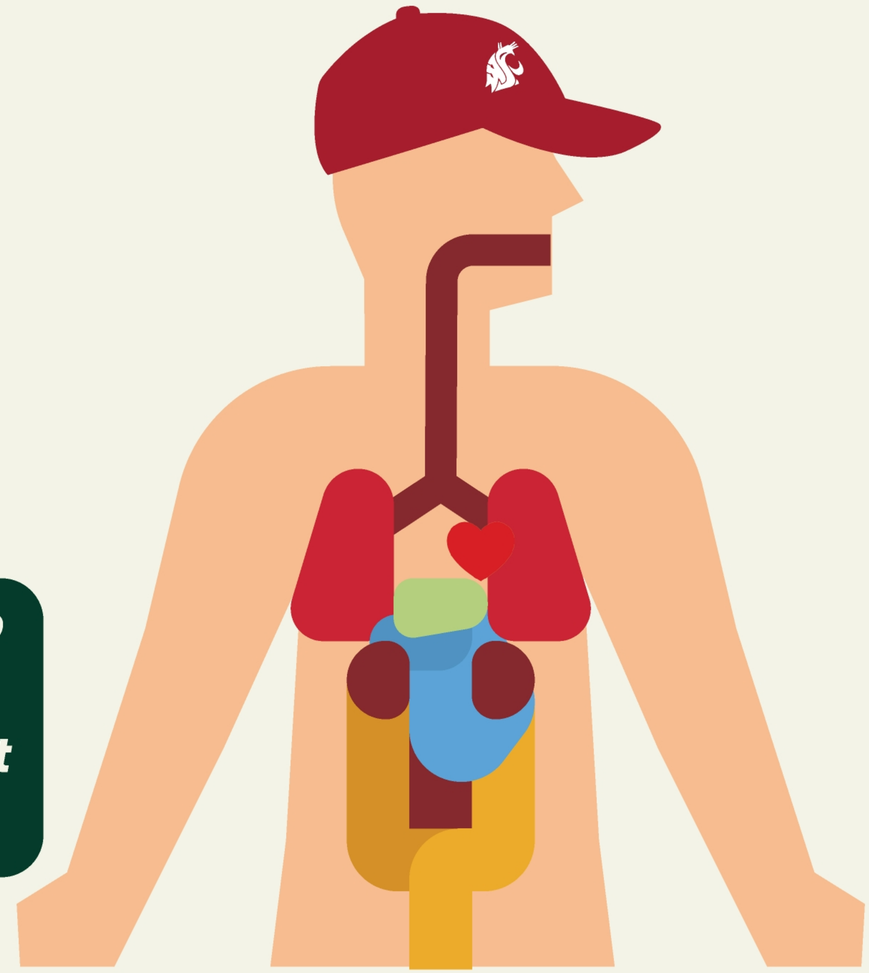
Long-term agricultural research on soil health is essential for creating resilient food systems, tracking changes in soil carbon and measuring economic benefits. To truly understand the impact of management on soil health and productivity, we need research that goes beyond typical grant cycles.

The Washington Soil Health Initiative has established Long-Term Agroecological Research and Extension (LTARE) sites across the state, tailored to the diverse regions and cropping systems of Washington. This effort aims to develop region-specific best management practices that promote environmental and economic productivity.

What is Soil Health?

Soil health describes how well soils support plants, animals, and humans. The term ***health*** recognizes that soils are alive and that soil organisms carry out key functions.

Just like our organs carry out essential functions to keep our body working and healthy, healthy soils carry out important functions that promote a healthy environment and a resilient food system.



Healthy soils can

- Reduce effects of climate change
- Provide wildlife habitat
- Filter air and water
- Support biodiversity
- Ensure thriving rural economies
- Increase crop productivity

Planning for the Long-Term

Planning and starting a long-term study takes a large investment and can be a daunting task.

Thankfully, the supportive farming community in northwestern Washington, including a **stakeholder advisory committee** that is composed of farmers from several key industries, has guided the researchers to prepare a site that is relevant & pushes the envelope.

The crops — potatoes, barley, silage corn, and winter wheat — were chosen to represent the 10,000 acres of high-value fresh market potatoes planted in the Skagit Valley and common rotational crops.

This long-term experiment was designed with two main principles in mind:

Adapting to changes in local needs and farming practices

&

Representing a continuum of soil management

Just 20 years ago, processing peas were a common rotational crop in the Skagit Valley, yet today the acreage has disappeared completely. Key crops in the region could shift again.

No experiment can represent every farmer's practices, but farmers can find where their practices fit into the continuum represented at this long-term site.

Some Soil Health Challenges in Northwestern Washington

Soil Compaction

Tillage and equipment traffic can lead to compaction and impact water movement and crop growth.

Pest Pressure

Soilborne pest pressure, especially plant pathogens, can impact yield and quality.

Soil pH

Crop rotations include a diverse range of crops that have varying soil pH and nutrient needs.

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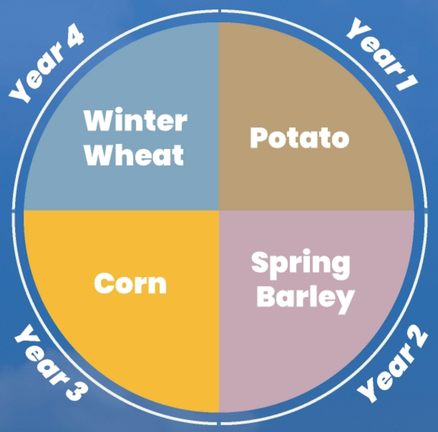
Investigating **Reduced Disturbance** and **Increased Organic Matter** Additions

The section of the field directly in front of you has each of the four systems represented



General Crop Rotation

System 1

- Full tillage
- Bale and remove crop residue

System 2

- Full tillage
- Leave crop residue
- Annual cover crop

System 3

- Reduced tillage
- Leave crop residue
- Annual cover crop
- Compost addition

System 4

- Reduced tillage
- Leave cover crop residue
- 3-year perennial cover crop
- Compost addition

Cover Crop

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What is Being Measured at this Site?

Soil Health Indicators

Biological

What organisms live in the soil and what soil functions are they serving?

Chemical

How quickly do nutrients cycle though soil and how available are they to the plants?

Physical

What is the structure of soil and how does it impact water movement and storage?

Weed Populations

Economic Performance

Carbon Stocks

Measure stored carbon to understand soil's capacity to remove and store atmospheric carbon.

Crop Performance

Yield

Disease Incidence and Severity

Crop Quality

Learn more about the Washington Soil Health Initiative

The Washington Soil Health Initiative (WaSHI) is a partnership between the Washington State Conservation Commission, the Washington State Department of Agriculture, and Washington State University. Together, the partners conduct research, provide outreach and education, and develop incentive programs to improve soil health across Washington.

WASHINGTON SOIL HEALTH INITIATIVE

Learn more about this LTARE and others on the WaSHI website:
www.wasoilhealth.org

Scan the QR code to visit the website