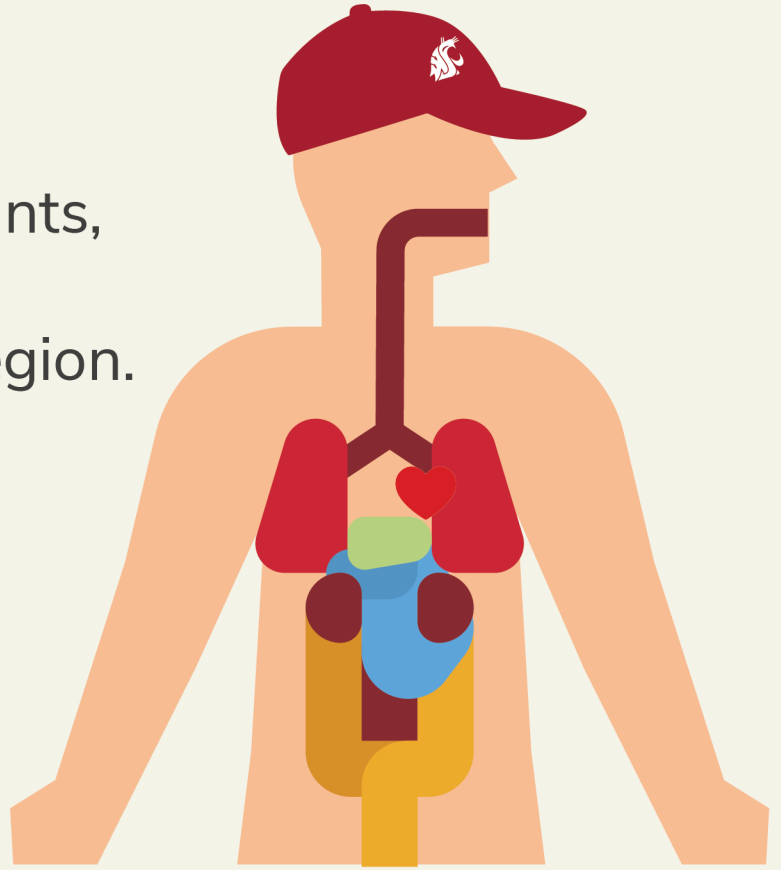
What is Soil Health?

Soil health describes how well soils support plants, animals, and humans—but it's not one size fits all—what is healthy depends on the crop and region.



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

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

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Four Soil Health Challenges in Central WA Tree Fruit Systems

Soil Compaction

Traffic through orchards can compact soil, reducing water infiltration and root growth.

Droughty Soils

Soils in Central WA can be patchy, and sandy impacting soil's inherent ability to hold water.

Soilborne Disease and Nematodes

Pests and pathogens in the soil can impact fruit yield.

Fruit Quality and Productivity

Orchardists get paid based off of quality and production.

Planning for the Long-Term

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

Thankfully, long-term planning isn't that novel of a thought for orchardists in the region. They have to think many years ahead, as the fruit trees can be productive for over 10 years!

The tree fruit industry is incredibly supportive and has been an important backbone to this project. A stakeholder advisory committee, composed of orchardists and industry experts, have guided researchers to prepare this unique site that expands beyond typical management, bringing an integrated approach to soil health management.

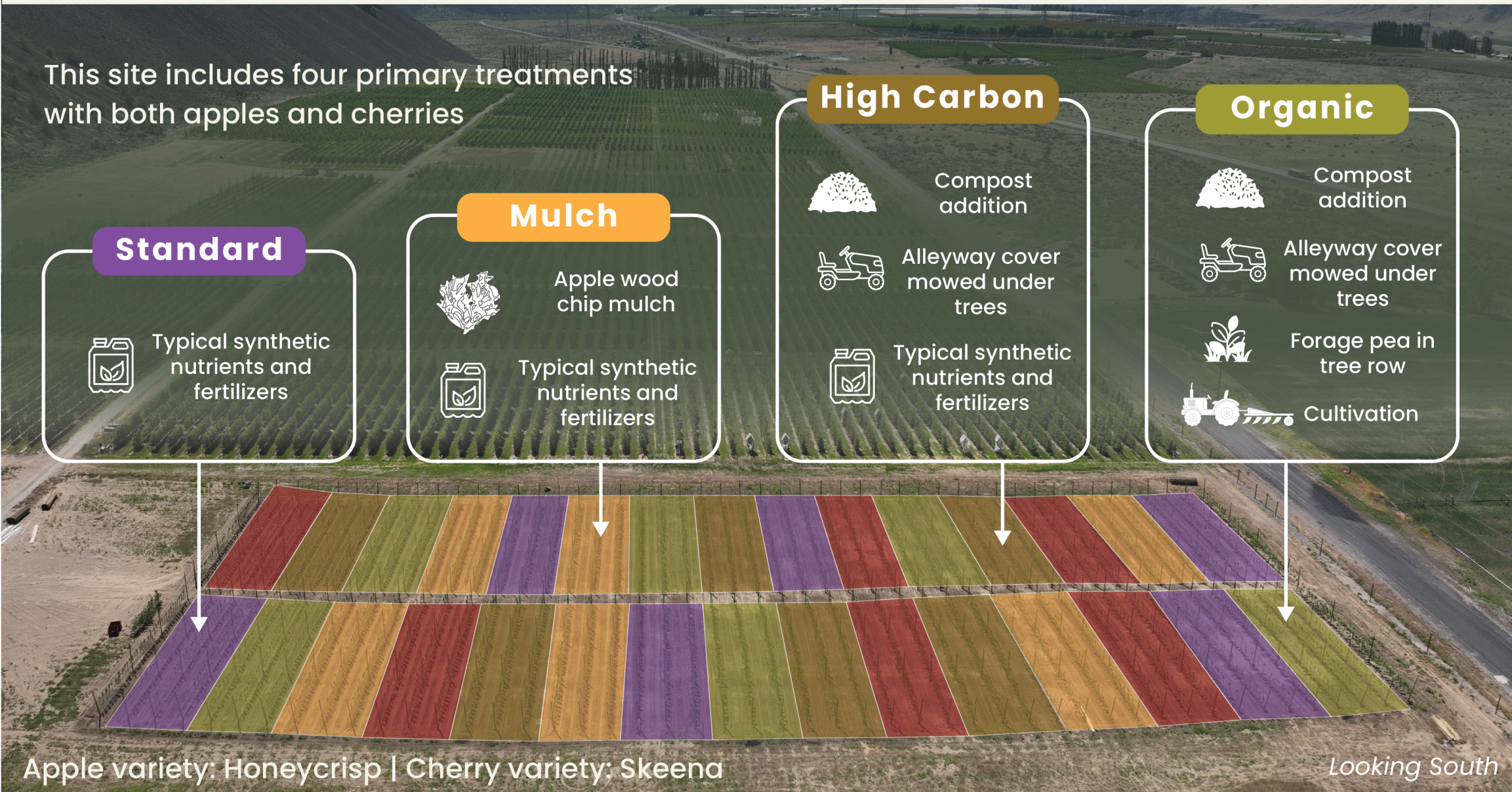
THIS LONG-TERM EXPERIMENT WAS DESIGNED TO:

PROVIDE SPACE FOR ADDITIONAL TRIALS AND COLLABORATIONS

&

CONNECT SOIL MANAGEMENT TO FRUIT QUALITY

Investigating practices **organic matter additions** to buffer environmental stress and improve fruit quality



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What is Being Measured at this Site?

Soil Health Indicators

Biological

Plant Pathogens
Beneficial and Parasitic Nematodes
Microbiome Diversity and Populations

Chemical

Plant Essential Nutrients
Metals

Physical

Available Water and Drainage
Soil Structure
Aggregates
Bulk Density
Compaction

Carbon Stocks

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CARBON

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

Economic Performance

Crop Performance

Fruit Yield

Fruit Quality and Defects

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High Carbon Treatment

***Researchers hypothesize that this treatment will have:**

- = Similar tree growth/yield
  Years 1-5
- ↑ Increased tree growth/yield
  Years 6+
- ↑ Increased organic carbon
  Years 5+
- ↑ Increased beneficial soil biology
- = Similar fruit quality
- = Similar nutrient availability

*Compared to control

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Mulch Addition Treatment

***Researchers hypothesize that this treatment will have:**

- ↑ Increased tree growth/yield
- ↑ Increased water availability
- ↑ Increased organic carbon
- ↓ Decreased root lesion nematode
- ↑ Increased beneficial soil biology
- ↑ Increased fruit quality
- = Similar nutrient availability

*Compared to control

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 State Conservation Commission

Washington State Department of Agriculture

WASHINGTON STATE UNIVERSITY

WASHINGTON SOIL HEALTH INITIATIVE

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

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