

Washington Tree Fruit Soil Health

Long Term Agroecological Research and Extension Site

Washington
state produces
50%
of apples
in the US

WSU Wenatchee Tree Fruit Research and Extension Center - Sunrise Orchard

Core objective: Develop and evaluate management systems which optimize fruit yield and quality through sustainable soil health management practices.

Washington's tree fruit production region



Site objectives

Establish best
management
practices

Reduce variability

Reduce fruit
disorders

Test practices that
buffer water stress

Manage soilborne
disease

What is being measured at this site?

Soil Health (Example metrics)



Parasitic and beneficial
nematodes
Soil structure
Soilborne pathogens

Carbon pools
Rhizosphere microbiome
Soil nutrients



Crop Performance

Yield
Fruit quality



Economic Performance



WaSHI is a partnership between WSU, WSDA, and WSCC that funds research, extension, and demonstration of soil health management practices. This site is one of 6 long-term agroecological research and extension (LTARE) sites established by WaSHI across Washington. Visit wasoilhealth.org or scan the QR code to learn more about this site.



Washington
State Department of
Agriculture



WASHINGTON STATE
UNIVERSITY

Identifying long-term sustainable approaches to manage soilborne disease and nematodes

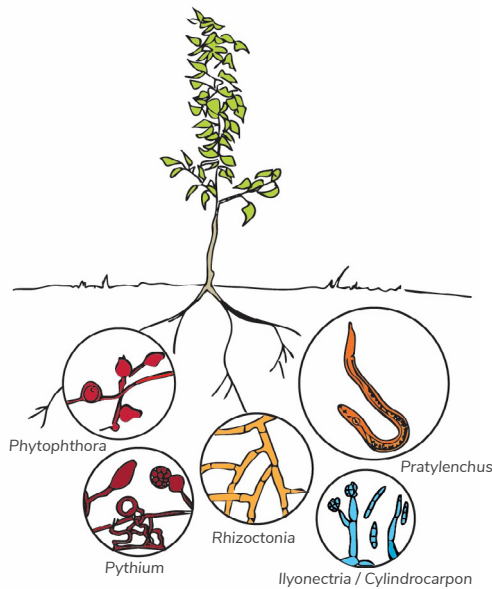
Replant site



Biorenovation treatments



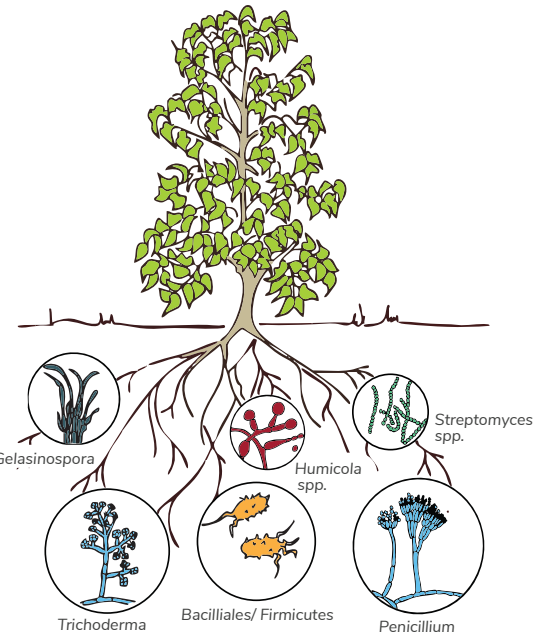
Site after biorenovation



Brassica Seedmeal Treatment

or

Anaerobic Soil Disinfestation Treatment



Host challenged by the pathogen complex that incites replant disease

Enhanced tree fruit production and long-term disease suppression through management of the rhizosphere

Brassica Seedmeal Treatment



Applied to warm, moist soil the summer before planting (average soil temperature 62 F)



Brassicaceae seedmeal applied at 0.14 pounds (current study) or 0.4 pounds (previous study) per square foot



Rototilled to incorporate



Covered with impermeable film for 3 weeks to trap volatile gases



Film removed to aerate before planting

Anaerobic Soil Disinfestation Treatment



Applied the summer before planting (soil temperature 62 to 68 F)



Finely chopped hay applied as a carbon source at 8 US ton per acre



Incorporated chopped hay to 8 inch depth with rototiller



Drip irrigation pulsed to maintain >30% volumetric water content



Covered with impermeable film for 3 weeks to trap volatile gases



Film removed to aerate before planting

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