

Cultivating Conservation

Building Soil - A Hidden and Hungry Ecosystem Beneath our Feet

When you walk through your orchard or vineyard, there is an entire world below every step. The healthy soil beneath your feet is full of bacteria, fungi, worms, insects, and plenty of other strange and fascinating things.

According to Professor Kate Scow of UC Davis “A gram of soil - about a quarter of a teaspoon - can easily contain a billion bacterial cells and several miles of fungal filaments”.

In spite of being common and found everywhere we still have lots to learn about soil ecosystems and scientists are finding new species in the soil all the time. Because soil contains an entire ecosystem, pests found in the soil often also have natural predators or diseases to keep them in check.

On earth, almost all energy comes from the sun. Since sunlight doesn't penetrate into the soil, the life in the soil relies on plants- getting energy from plant roots, or dead plant material found on the surface of the soil and worked into the soil by an army of insects and worms. Plants exude sugars and other chemicals from their roots which can help form healthy food webs in the soil. In nature most soil is covered by a dense blanket of plants, leaves and deadwood fall onto the ground and decompose into the soil, feeding the life within the soil.

Agricultural settings can look very different. Soil may be left bare between crops, vegetation removed, and plant material taken away rather than allowed to decompose. Over time, that can mean less organic matter returning to the soil and less food for the ecosystem living within it. So what does feeding and protecting that underground ecosystem look like in an Okanagan vineyard?

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Building soil from the ground up at Tantalus Vineyards

Tantalus Vineyard in Kelowna was Okanagan Similkameen Stewardship's first Wildlife Habitat Steward in the Central Okanagan. Sustainability is visible throughout the property, from its LEED-certified winery, to a 10-acre forest nestled within the vineyard.

The team has also been working hard to bring more biodiversity back into the vineyard while rebuilding the soil beneath it.

Cover crops - Tantalus Vineyard has been experimenting with cover crops for years, testing out different plants to see what works best for them with their terroir. Intentionally planting cover crops is relatively new to vineyards in BC. New information about which cover crops work well in vineyards is coming out all the time, but you may still need to play around to find what works best for your soil and your needs. For example Tantalus used to use mustard in their cover crop mix to act as a natural fumigant, but found the plants became too tall and unruly in the vineyard. Forage radishes are great if you have compacted soil and are looking for better drainage, but they also make great food for pocket gophers and other rodents.

On-site compost - Compost is one of the best foods for your soil. Not only is it rich in organic matter and nutrients it also comes preloaded with the bacteria and fungi that helped to break the waste material down into compost. While it can be hard to produce enough compost on site to meet all your needs, it can be a great boost to areas particularly poor in organic matter or for plants that need more nutrients.

On-site biochar - Biochar is a form of charcoal that when added to soil can help soils retain both water and water soluble nutrients. After the winter kill of 2024 like many vineyards, Tantalus was left with many grape trunks and experimented with making their own biochar. Biochar is especially effective in sandy soils that don't hold water or nutrients very well on their own, and is even more effective when applied together with compost which gives the biochar nutrients to hold on to.

No till - After losing loose soil after tilling Tantalus decided to stop tilling on their farm. While this makes seeding new cover crops a bit more difficult, reducing the soil disturbance helps to keep carbon in the soil and helps to continue to build up organic matter in the soil.

Viticulturalist Scott Woody says that soil organic matter in the vineyard is increasing- a sign that their efforts are moving things in the right direction. There are benefits above ground, too. Flowering cover crops bring colour and diversity between the vines, attracting pollinators and other beneficial insects- and plenty of attention from curious wine tasters.

The vineyard is a good reminder that healthy agricultural land isn't only about what we can see growing above the surface. Some of the most important work may be happening quietly beneath our feet.



Photo: Tantalus



Photo: Tantalus