Applied Soil and Plant Ecology Workshop

How plants, soil organisms and soil interact to regenerate agroecosystems.

By Jill Clapperton, PhD, Principal Scientist, Rhizoterra Inc.

This Workshop is for farmers, ranchers, gardeners, pastoralists, orchardists and anyone who is interested in regenerating soils and building healthy agroecosystems from the roots up. Healthy soils provide a myriad of services to the people that earn their livings from the soil. If you manage land (including yard, garden, power lines, orchard, tree farm, cropped and/or pastured fields and etc.) you have a responsibility to use crop and soil management tools (including fertilizer) efficiently and effectively. We have known for centuries that plants can be used to: disrupt pest and disease cycles, as food and medicine, and to bring joy. I will be focusing on how to use plants to rebuild and renovate our agrosystems from the soil up and one root system at time. My aim is to arm participants with practical information, tools, systems and ideas that can be implemented immediately and/or over time.

Be prepared to spend most of your time outside and in the field plots.

The workshop will begin with a 20 minute overview of who lives in the soil and what they do. Participants will be expected to have some background knowledge of the principles of soil health. Then we will take a deeper dive into managing the soil.

Soil Management is defined as: the sum total of all tillage operations, cropping practices, fertilizer, lime and other treatments conducted on or applied to a soil for the production of plants (Brady, 1974 in the Nature and Properties of Soils Ed 8). According to this definition plant root exudates, grazing, and organic matter (as compost and manure) would count as soil management.

To the Field

After the break we are going to discuss how plants differ with respect to root architecture, their preferred nutrition, how we can use nutrition to reduce environmental stress, and increase plant wellness. The interactions of roots, soil biota (everything alive in the soil), and soil together are known as Rhizosphere Processes. They create soil structure, drive nutrient cycling and recycling, and determine the characteristics of the soil habitat that can have consequences for pests and diseases. These processes can also detoxify, and filter water and air.

Companion crops, intercrops, smother crops, and cash crops. You may think you know, or your agronomist knows how to take an unbiased soil sample - let's review just to make sure- because ecosystem services might be worth some money to you. We will examine roots and root interactions, examine AMF (arbuscular mycorrhizal fungi) in the field, and collect and analyse tissue samples. How you sample, how many samples you take, and the accuracy of the results can affect your farm income especially if you are thinking about marketing soil carbon and carbon removal and/or ecosystem services. Tissue and grain analyses can tell you a lot about plant nutrition and nutrient density. Seedling vigour is totally dependent on the nutrients in the seed. Seed quality matters there will be a demonstration.

We will be using the Soil MicroBiometer and Solvita tests to look at soil respiration. We will be performing infiltration testing and water quality analysis. There might be some other new hand-held devices to play with.

This is your workshop. I look forward to lots of questions, new ideas, looking at roots, and generally having a good time sharing and learning!

Look forward to seeing you all there,

Jill

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