

Workshop Title: Soil Regeneration for Healthy Farms and Resiliency

Speaker & their title: Ruth Knight, Organic Consult Inc.

Executive Summary:

Photosynthesis drives soil regeneration. With proper management, soil will regenerate, recycle nutrients, provide abundant nutritious food, sequester carbon, and purify water. Healthy soils are more resilient to climate stress by absorbing more water and retaining water longer. This session explores the principles and practices for soil regeneration and managing our land.

Detailed Notes

We are life farmers not cattle farmers, or grain farmers, vegetable farmers, etc. We farm the life in the soils.

Fertile topsoil is a product of photosynthesis and microbial activity. The root of the word synthesis is making life from light.

Prior to WW1 and WW2 there was a good understanding of the things that happen in the soil - the soil web of life. Since the wars the emphasis has shifted to chemicals and much soil knowledge has been lost or ignored.

The plant roots interact with the mycorrhizal fungi present in the soil. Eighty-five percent of plant nutrients are mediated by this interaction. This is the liquid carbon pathway (Lip) and it starts with photosynthesis. Humus in the soil is 60% carbon. Humus is resistant to breakdown by microbes. It helps to increase water retention and nutrient density.

Farmers need to increase and support the photosynthesis process. This is primarily accomplished by keeping growth on our land as long as possible. Soil microbes work 9 months of the year in South West Ontario. However the traditional growing season is only four months of the year.

Increasing the rate of photosynthesis increases the amount of humus in soils. More humus provides more nitrogen and phosphorous and increases the availability of carbon in the soil.

Principals of soil regeneration

- Minimize soil disturbance - tillage
- Keeping the soil covered 24/7
- Maintain living roots in the soil as long as possible
- Foster a diversity of crops - Interplanting, mixed cover crops, and use of livestock.
- Integrate livestock in soil management.
- Manage farm scapes for other ecological services - pollinators, water, wildlife

Some examples of ways to promote soil regeneration include:

- Planting soybeans in rye with no till methods
- Integrate grazing and perennial plants
- Integrate grazing and biannual plants

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Soil is not just a mechanism for growing plants. Healthy soils have many other benefits:

- With more microbial diversity there is more nutrient diversity in the food we consume. Soil bacteria genes transfer to the gut and aid digestion in humans.
- Soil health is related to disease immunity in humans. Loss of biodiversity has been associated with an increased incidence of asthma and allergies.
- Mood cycle in humans; one soil bacterium has been found to lower the incidence of depression.

In the future, soil and crop management that maintains or improves the function of microbes in the soil needs to become a priority in agriculture. Management of soil organic matter is the key to air and water quality.

What do I wish that all farmers knew? That generations to come will thank us for the way we have managed our farm scapes.

Q. If one wants to start a career in soil regeneration where can you start.

A. Many places to start - be a farmer, coach, consultant, etc..

Q. How can we assess the progress we make in improving the biology in our soils?

A. There are different soil test processes as well as tissue analysis. Ruth suggests using a variety. Brick tests on sugar levels in the plants can be used on a regular basis. Use our taste buds as well.

Q. If you are attempting to grow humus over a period of years is it better to leave the area fallow or to grow cover crops?

A. Ruth suggests cover crops and use of livestock will be very effective in the long run.

Ruth also suggested taking a shovel into the field to examine the roots on the plants. Be an observer! One can also tell a lot about the Health of plants by observing the quality and structure of soil.

Q. Soils here are very acidic and do not buffer acidity very well.

A. Ruth was unable to offer much comment on this issue. Ph management in the Atlantic region is a battle. Soils want to be at 4 here. Encouraging diversity in crops and good land management will help