Learning Series:
Introduction to Regenerative Organic Agriculture

Introduction

This session provided an exploration of the foundational principles behind regenerative and organic agriculture, with some new insights woven in. Learning is iterative, and people often need to hear concepts several times before the concepts themselves truly land, so revisiting familiar ideas is part of the process.

The Foundational Principles That Shape Regenerative Organic Agriculture

"*Do not stop thinking of life as an adventure. You have no security unless you can live bravely, excitingly, imaginatively; unless you can choose challenge instead of competence.*" - Eleanor Roosevelt

This quote is about embracing challenges and seeing life as an adventure. This connects to farmers' own journeys; leaving comfort zones, shifting from conventional to organic, and now exploring regenerative thinking.

Organic Agriculture Principles
The four core principles that underpin organic agriculture worldwide are as follows:

1. Health: Soil, plants, animals, ecosystems, and people are interconnected. A healthy environment supports healthy food systems and healthy communities. Emerging research links microbial communities across soil, plants, livestock, and humans.
2. Ecology: The health of soil and ecosystem is a reciprocal system. Organic systems prioritize living ecological processes and work in harmony with natural cycles.
3. Care: A precautionary, responsible approach that protects ecological well-being for current and future generations.
4. Fairness: Building relationships grounded in equity; between people, within communities, and with the environment. Certification frameworks around the world stem from these principles, standardized by IFOAM.

These principles make up the integrated concept of soil-human-planet health. The microbes that exist across people, plants, and livestock are very similar, so it makes sense that their inter-relatedness is why human health is impacted by soil and plant health.

Regenerative Agriculture Principles

The six regenerative agriculture principles are:

1. Context: Practices must fit the specific environmental, social, and business realities of each farm.
2. Minimize Disturbance: Especially around tillage. Zero-till is not always the ultimate solution; instead, tillage should be used intentionally and followed quickly by reseeding or re-establishing ground cover to minimize disruption to soil biology. Lower intensity, frequency, and depth are key.
3. Keep the Soil Covered: Through living plants or residues. Cover protects soil organisms, supports water cycling, reduces evaporation, and prevents erosion from rainfall impact.
4. Keep a Living Root in the Soil as Long as Possible: Keeping plants growing for as much of the year as possible supports carbon capture, feeds the soil food web, and stabilizes the physical structure of the soil. Living roots are not just “green cover”, they are the energy source driving nutrient cycling and soil ecosystem function.
5. Diversity: Diversity matters above and below ground: multiple plant species and functional groups support microbial communities, livestock nutrition, and overall resilience. Species diversity (e.g., oats, wheat, radish) is different from functional diversity (e.g., nitrogen fixers, flowering species, deep-rooted plants), and we should consider diversity in both crop rotations and landscape planning. Loss of tree cover disrupts water movement across entire landscapes, which means that diversity at the farm and ecosystem scale influences water cycling.
6. Livestock Integration: Grazing animals act as landscape managers, returning carbon and nutrient-rich manure to the soil and boosting microbial activity. Their presence upcycles nutrients and strengthens the carbon loop.

Principles vs. Practices

Principles explain the “why,” practices are the “how.” Principles are universal and stable; practices depend on context. This distinction is at the heart of the ongoing debate about what counts as “regenerative.” Organic systems are often perceived as practice-based, even though they are rooted in principles. When planning, producers should regularly reconnect practices to the principles they are meant to uphold. Principles are the “why”, and they direct how practice is done.

Three Laws of Ecological Stewardship

The laws of ecological stewardship provide observations of how ecology functions and how we use a management plan to achieve objectives. The three long-standing ecological rules that help guide management decisions are:

1. Rule of Cascading Effects
    a. Changing one part of a system triggers multiple other changes, sometimes amplifying benefits.
    b. Here is an example: moving away from tillage improves physical structure; adding cover crops amplifies that effect; adding livestock amplifies it even more.
    c. Multi-species cover crops often recover from drought far better than single-species stands.
2. Rule of Disruption
    a. Can be positive or negative. Systems need periodic variation to stay resilient. Doing the same thing the same way every year can degrade function.
    b. One example includes a grazing operation where starting the rotation in the same paddock each year led to chronic stress in that one field. Changing the pattern improved soil and plant performance.
3. Rule of Diversity
    a. Diversity shows up again because it underpins so many ecosystem functions. Research from von Vliet, Provenza, and Kronberg show how diverse pastures shape the nutritional quality of meat and milk.
    b. Animals grazing phytochemically-rich, multi-species pastures produce foods with higher levels of compounds linked to lower inflammation and chronic disease. Simplified diets, whether in pastures or processed feed, erode this nutrient richness.
    c. This connects back to the One Health idea: diverse landscapes → healthier plants → healthier animals → healthier people → healthier ecosystems.

Comparing Organic and Regenerative Approaches

Organic certification is clear, regulated, and practice-based, built on shared principles of health, ecology, care, and fairness. Certification follows the product from farm to processor. Regenerative is largely outcome-based and varies widely across programs. Some allow synthetic inputs; others do not. There is still inconsistency and “noise” around the term, though pairing organic + regenerative (e.g., ROC) creates a clearer, more aligned framework. Over time, a more consistent definition may emerge.

Monitoring for Outcomes (ROO Program)

The four ecological functions are deeply interconnected and serve as the foundation for life:

1. Water cycling
2. Mineral and nutrient cycling
3. Energy flow
4. Community dynamics (biodiversity and interactions)

While specific tests (like water infiltration) provide direct measurements, they also offer indirect insights into structure, compaction, and biological activity. These functions influence one another constantly. The health of a soil system can be understood by how well these functions perform. In well-functioning soils, these cycles interact smoothly; when one is limited, productivity and resilience suffer.

Water Cycle
The water cycle is the most visible and relatable process: precipitation, infiltration, storage, and evaporation. Healthy soils take in and hold water more effectively, supporting root systems and the web of life beneath the surface. Water loss through evaporation is part of the natural cycle, but management choices can strongly influence how much moisture is retained.

Energy Flow
Energy flow is similar to blood flow in mammals; it is essential, constant, and life-sustaining. For farmers, its most visible expression is photosynthesis: plants using atmospheric carbon to build biomass, exchange carbon compounds with soil organisms, and gradually build soil organic carbon. Most carbon movement is invisible because CO_2 is a gas, but the green in fields is a reliable signal of a functioning carbon cycle.

Community Dynamics (Biodiversity and Interactions)
Above-ground and below-ground diversity in plants, animals, microbes, and even humans forms an interconnected network. Greater diversity stabilizes ecosystems, improves nutrient cycling, and generally boosts system resilience.

Mineral and Nutrient Cycling
Nutrient cycling often gets the most attention because it is easy to measure through chemistry (N, P, K and beyond). Chemistry is only half the story: microbes also play a critical role. Nitrogen fixation, phosphorus solubilization via mycorrhizal fungi, and other biological processes work alongside (and sometimes more efficiently than) synthetic inputs.

Assessment Through Outcomes

The core method for incorporating measurable results into monitoring and decision-making involves identifying three locations on the farm:

1. Best-performing managed area
2. Most challenging managed area
3. (For those pursuing regenerative organic certification) A representative/average area

These comparisons help farmers combine their intuition and lived experience with measurable indicators. By eliminating obvious variables, like slope or field history they can better pinpoint what is limiting performance: whether it is physical (compaction), biological (weak microbial activity), or nutritional.

Adding an Unmanaged Comparison
To understand the system's true potential, compare the managed sites to an unmanaged area such as a fence line, ditch, or field edge. These areas often show stronger water infiltration and stable plant communities because they have not been tilled or driven on. Even though these zones share the same climate and soil type, their performance differs, giving farmers a helpful benchmark of what nature can achieve without human disturbance.

Building a Baseline

These assessments create a baseline within each farm's context. Over time, farmers can revisit the same locations to see whether management decisions, such as reducing tillage or adding cover crops, are improving soil function. Water infiltration is one indicator that tends to respond quickly.

Using Monitoring to Guide Decisions

Outcome-based monitoring is a decision-making tool. By pairing observations with measurable changes in soil function, farmers can evaluate whether their practices are moving their system toward regenerative outcomes. This approach not only defines regenerative agriculture in a practical way, but also embeds continuous improvement directly into the farm's management cycle.

Reiterative (Or Iterative) Management Planning Model

Assess – Plan – Evaluate – Monitor – (Repeat)

This model is a cycle farmers can use to continually assess soil function, make informed decisions, monitor results, and adapt over time. Here are some key points:

- Start with assessment. In the first years of using this model, the focus is on getting closer to the soil (literally). That means hands-on observation of soil structure, life, and function to understand which of the four core ecological functions might be limiting performance: water infiltration, nutrient cycling, biodiversity, or carbon flow.
- Plan based on what you find. Once you identify what is most limited, you choose a management approach aimed at improving that function. This could involve adjusting cover crops, altering tillage, tweaking rotations, or exploring new practices shared by peers.
- Monitor your results. Monitoring is not something that happens only at harvest. It can include:
  - Visual assessments
  - Tissue tests
  - Yield or livestock performance data
  - Simple experimental plots, even in a garden
  - These small-scale trials help test ideas without committing a whole field.
- Re-evaluate and adjust. Because conditions change and soils respond over time, this model is not linear. You revisit what you have learned, refine your management decisions, and continue observing. Curiosity is the driving force; keep experimenting, keep learning.

The Human Side of the Model

A farm reflects the people who care for it: their values, intentions, and love for the land. Every individual's farm visibly expresses that care, and farmers should think about their own favorite spot on the farm, where they feel most connected and inspired.