Foundations of Regenerative and Organic Agriculture Production Systems

Regenerative Organic Oats Virtual Learning Session

December 11, 2025

Organic Consultant Inc – Ruth Knight BScAgr, MSc, CCA-ON

Quote

"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

Outline

01	Organic Principles
02	Regenerative Principles
03	Principles versus practices
04	Ecological Stewardship
05	Ecosystem Functions
06	Compare and Contrast
07	Re-Iterative Management Planning

Organic Principles

Health	Ecology	Care	Fairness
• Sustain and enhance the health of soil, plants, animals, humans and planet as one and indivisible.	• Living ecological systems, work with them and emulate them.	• Precautionary and responsible manner to protect the health and well-being of current and future generations and the environment.	• Build relationships that ensure fairness with regard for the common environment and life opportunities.

Source: IFOAM

Soil – Human – Planet Health

- Microbes are similar across soil, plants, humans, and livestock
- 40 soil microbiome functions that either directly or indirectly contribute to soil, plant, animal and human health

Soil microbiomes and one health Banerjee, S and van der Heijden, M.G.A Nature Reviews Microbiology 21, 6-20 (2023)

"Soil Human Planet Health." – Ruth Knight BSc.(Ag.) MSc.

Regenerative Agriculture Principles

CONTEXT	Your ecological, business, family, and community context
MINIMIZE DISTURBANCE	Reduce intensity and frequency of tillage. Decide to till with a purpose and re-seed as soon as possible. Reduce or eliminate chemistry.
KEEP SOIL COVERED	Plants live or dead protect soil ecosystem from water loss and disperse raindrops.
LIVING ROOTS	Living roots maintain food source for soil ecosystem and maximize carbon capture potential.
DIVERSITY	Add diverse species and functional plant group in crop rotation, within the crop and surrounding landscape. Above and below ground.
INTEGRATE LIVESTOCK	Livestock are the pruners and managers of the landscape and add another level to the carbon loop. Livestock upcycle nutrients and microbiome.

Principles vs. Practices

Principle	Practice	
Minimize soil disturbance	• Reduced tillage • Direct seeding/drilling	• Zero tillage • Perennial crops (less tilling) • Reduced chemistry inputs
Maximize diversity	• Crop/plant diversity • Relay cropping • Intercropping	• Crop rotation • Companion planting • Biological amendments
Keep soil covered	• Cover cropping	• Mulch • Maintain stubble
Keep living roots	• Cover cropping • Permanent cover	• Perennials forage • Crimping annuals
Integrate livestock	• Rotational Grazing • Silvopasture	• Additions Compost, Manure • Graze annual covers • Enhance habitat

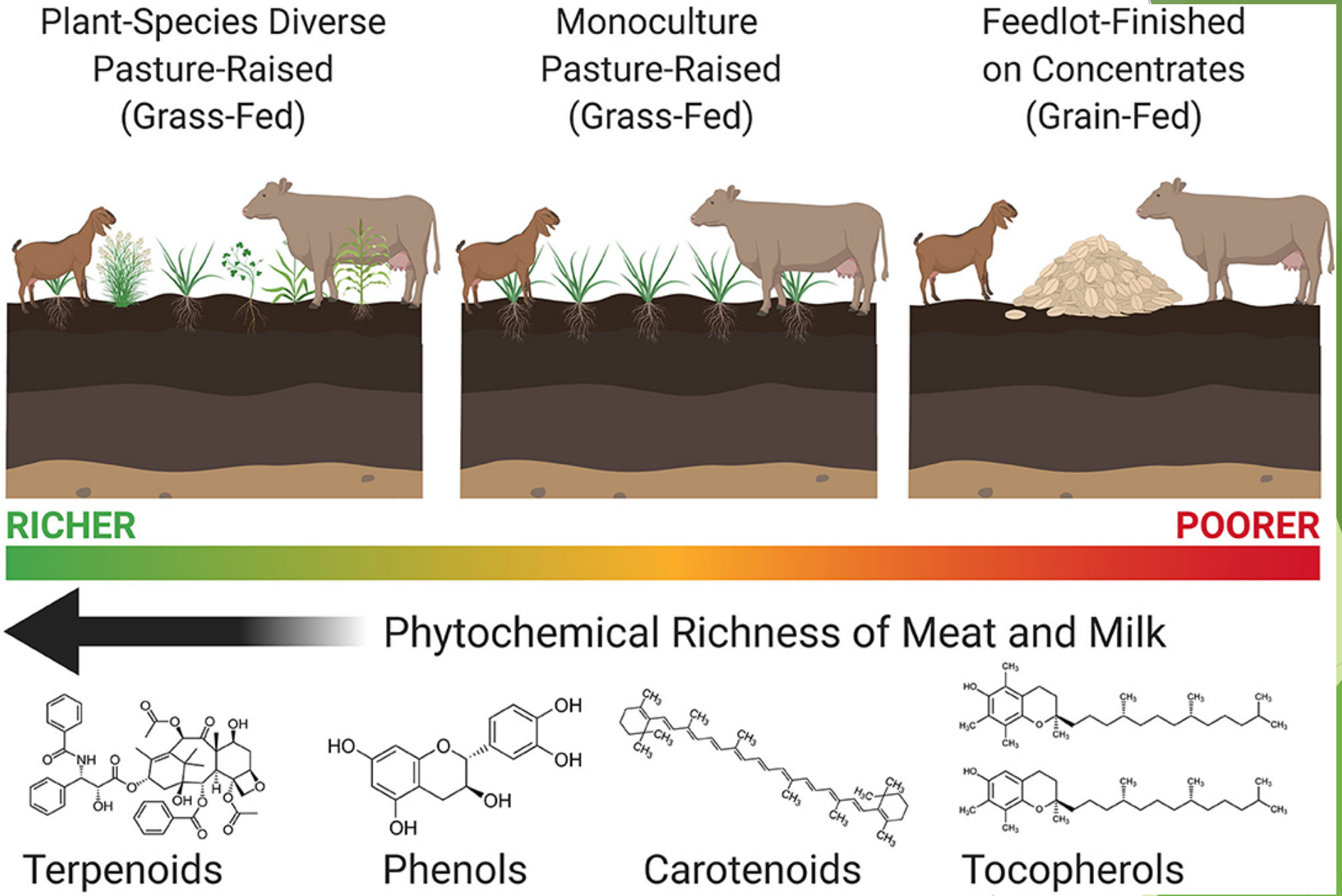
Laws of Ecological Stewardship

Rule of Cascading Effects

Rule of Diversity

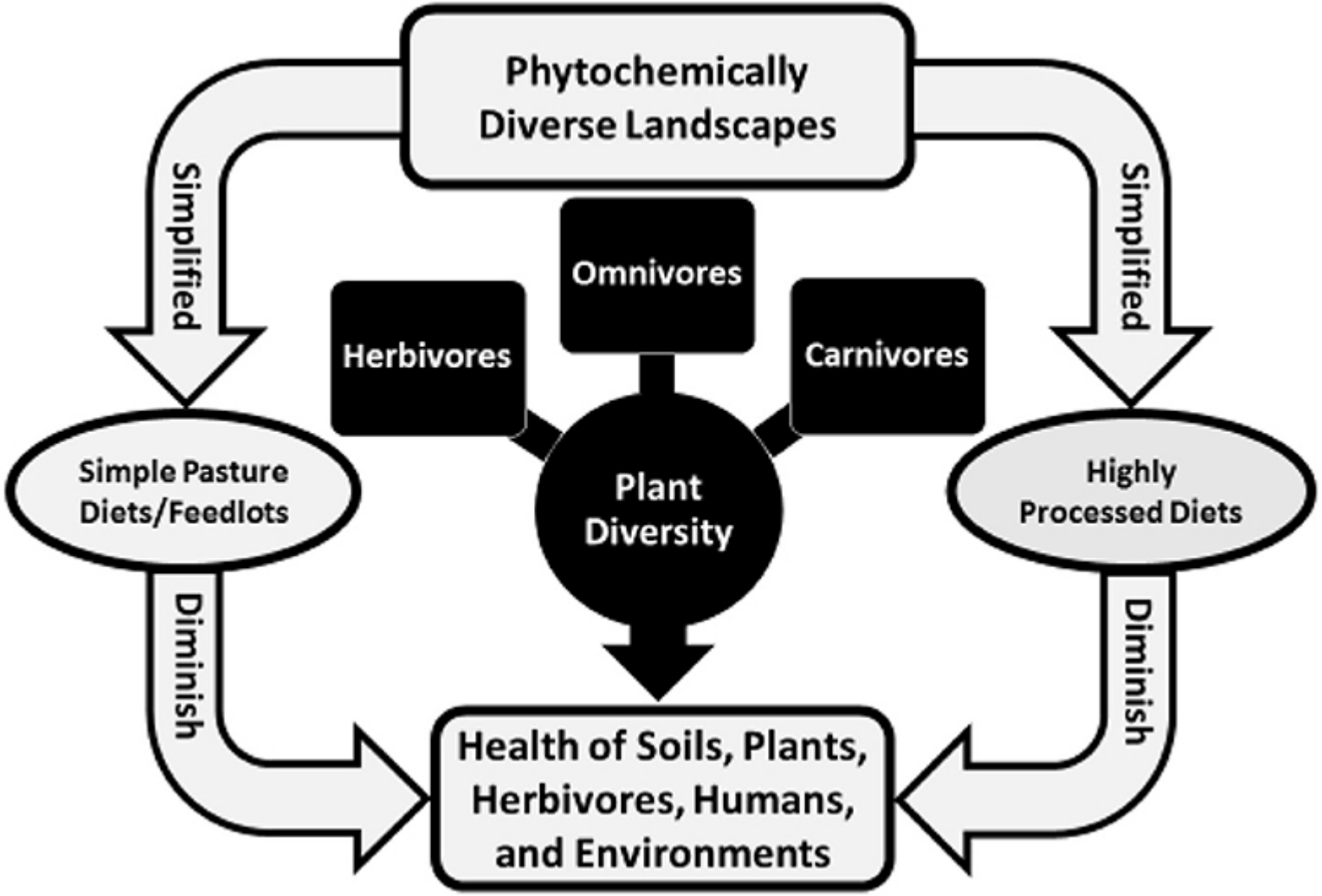
Rule of Disruption

Source: Understanding Ag



Front. Sustain. Food Syst. , 31 January 2021 Sec. Agroecology and Ecosystem Services Volume 4 - 2020 | https://doi.org/10.3389/fsufs.2020.555426 Stephan van Vliet, Frederick Provenza and Scott Kronberg

Is Grassfed Meat and Dairy Better for Human and Environmental Health?
Fred Provenza, Scott Kronburg, Pablo Gregorini



Front. Nutr., 18 March 2019 Sec. Nutrition and Sustainable Diets
Volume 6 - 2019 | https://doi.org/10.3389/fnut.2019.00026

Diversity and Nutrition

- Grazing animals' access to phyto-chemically active plants in diverse landscapes results in enhanced meat, dairy, and eggs
- Species richness links plant, human, livestock and planetary health

Frederick Provenza - Utah State University, Stephen van Vliet- Duke University Physiology, Scott Kronberg - Northern Great Plains ND USDA, Pablo Gregorini – Dept Ag NZL

Compare & Contrast

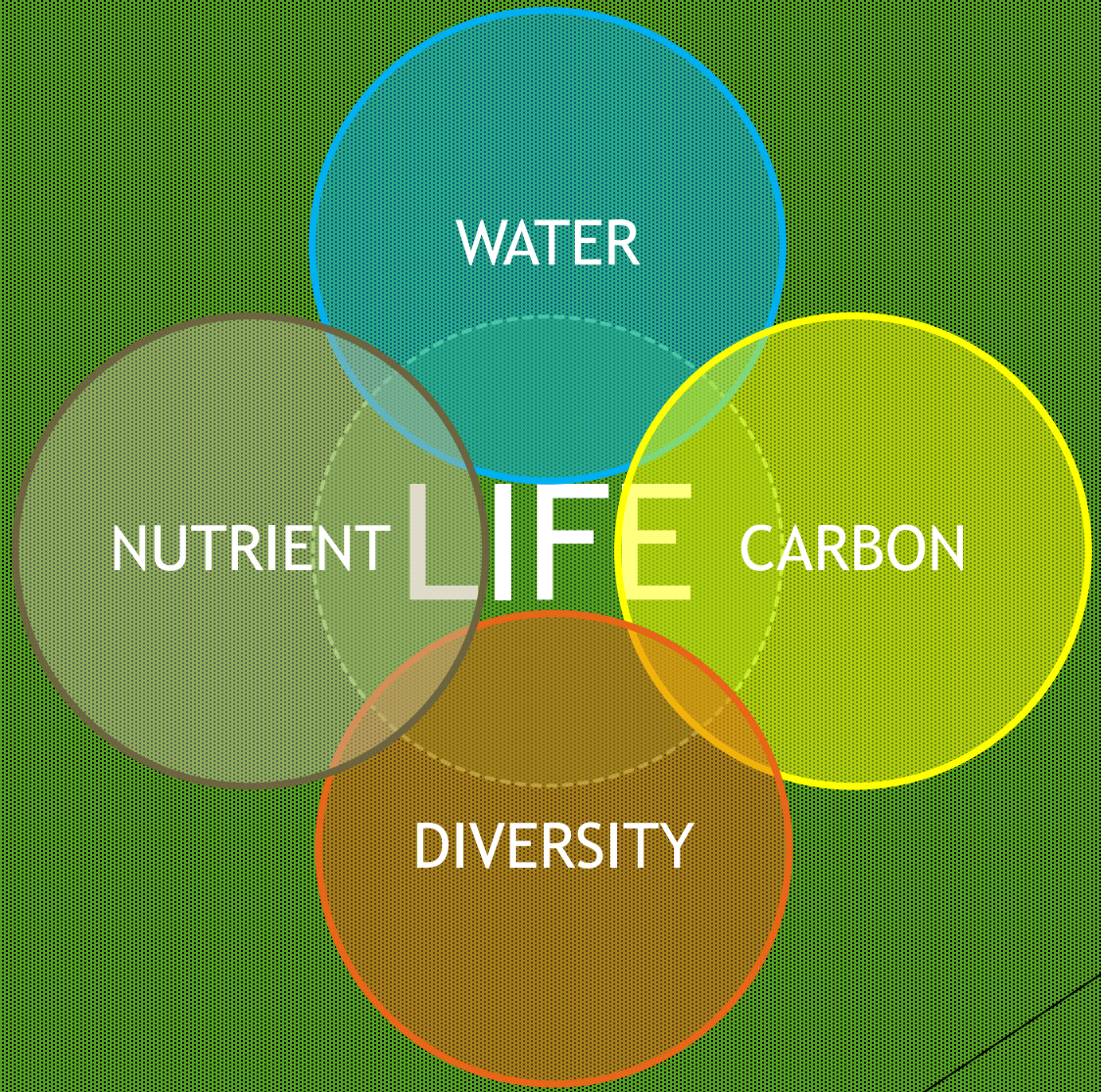
Principles versus Practice

- Principles (WHY) universal truths/rules that guide decision making
- Practice (HOW) is the application or methods

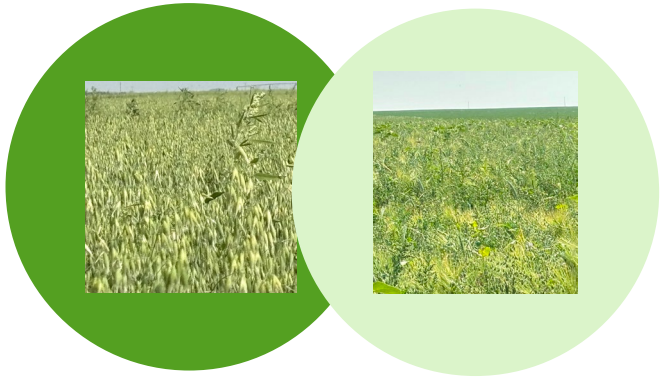
Organic – practice based, defined in regulations, international equivalency certifications common philosophy

Regenerative – outcome based, no concrete definition, certification schemes- varying philosophies and independent

ECOSYSTEM FUNCTIONS



Monitoring Ecosystem Function - Outcomes



MANAGED –

BEST PERFORMING AND MOST CHALLENGING, ROC- REPRESENTATIVE

UNMANAGED AREA – UNCULTIVATED

COMPARE RESULTS TO EXPLORE THE POTENTIAL

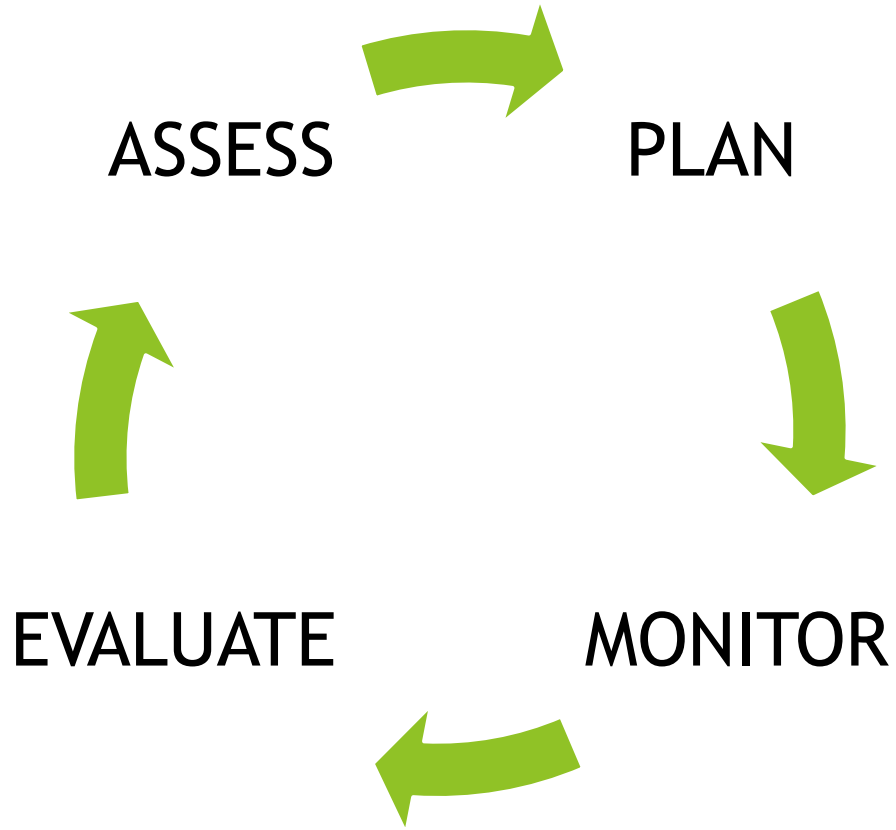
SOIL PHYSICAL, CHEMISTRY, BIOLOGY

WATER INFILTRATION

PLANT TISSUE, BRIX

FIELD OBSERVATIONS

Re-iterative Management Planning Model



Your Farm is a Reflection of You – Gabe Brown

What stood out for you during the monitoring visit?

Open Sharing Session

- What has been your experience with monitoring? What ecological function is most challenging?
- What management changes have you tried? Or are curious about?
- What are your plans for 2026? Do you have questions that your fellow participants can answer or share their experience to help you with your plans?