

Regenerative Agriculture: Practices or Paradigm Shift?

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Soil Degradation & Desertification

Agriculture has released 50 to 100 GT of carbon from soil into the atmosphere.

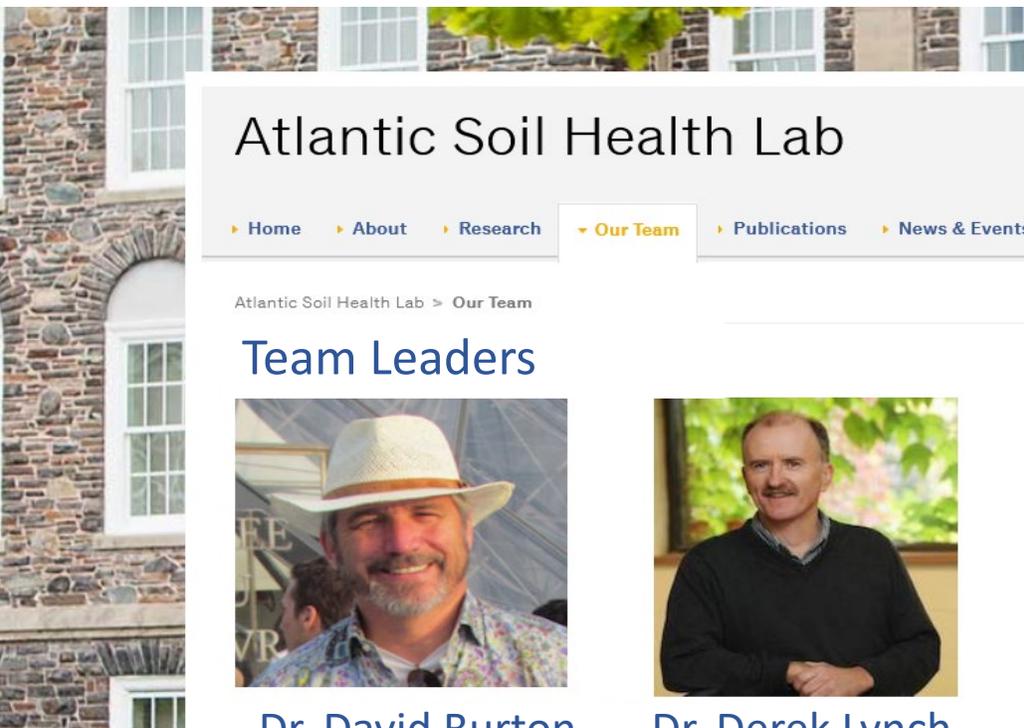
- Tillage accelerating organic matter loss
- Reduced plant roots and residues returning to soil
- Increased soil erosion

[Lal, 2009](#)



Soil health

Is the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals and humans.



Atlantic Soil Health Lab

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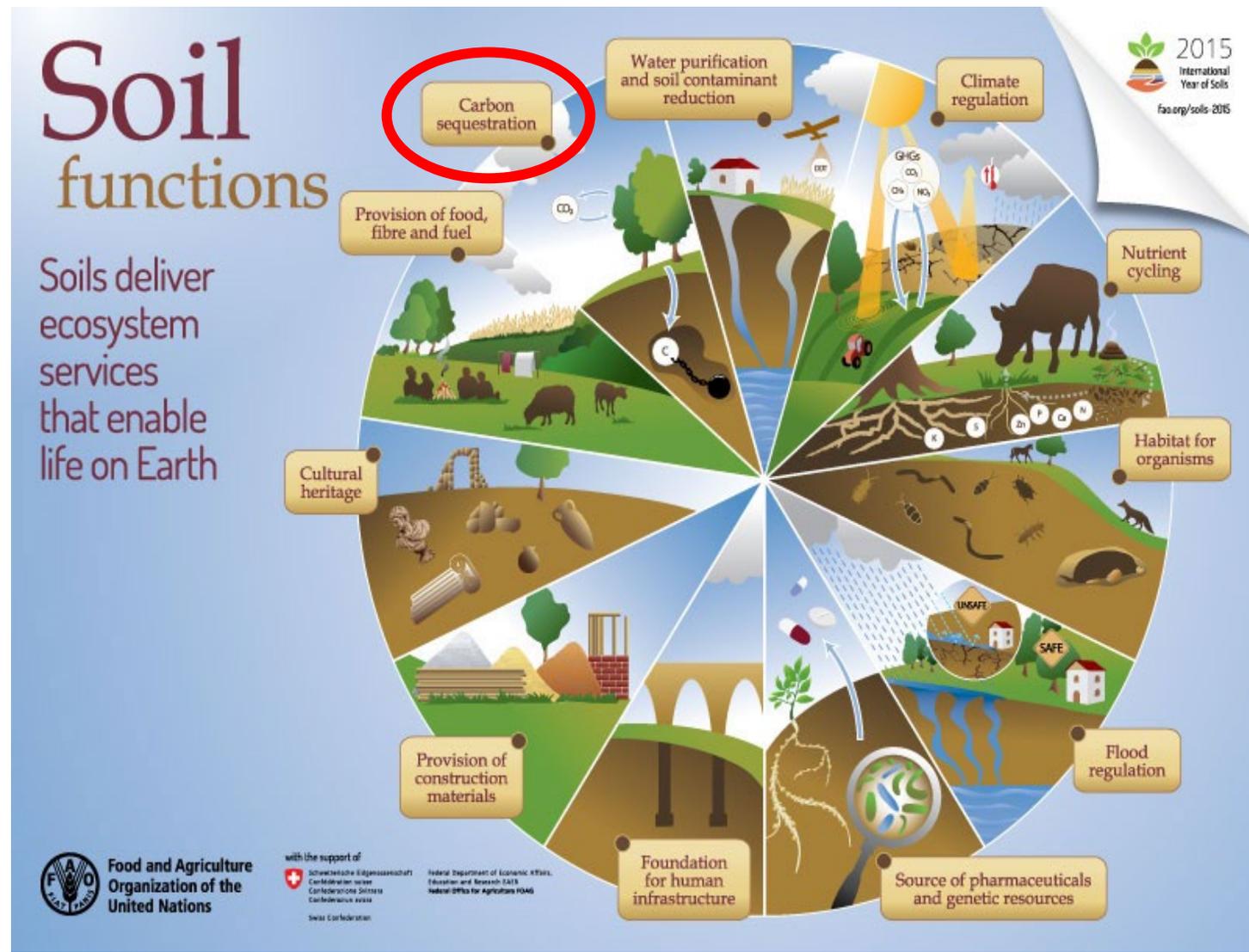
Team Leaders



Dr. David Burton



Dr. Derek Lynch



Soil Degradation & Desertification

First we must sustain soil health (and productivity) by stopping further soil degradation.

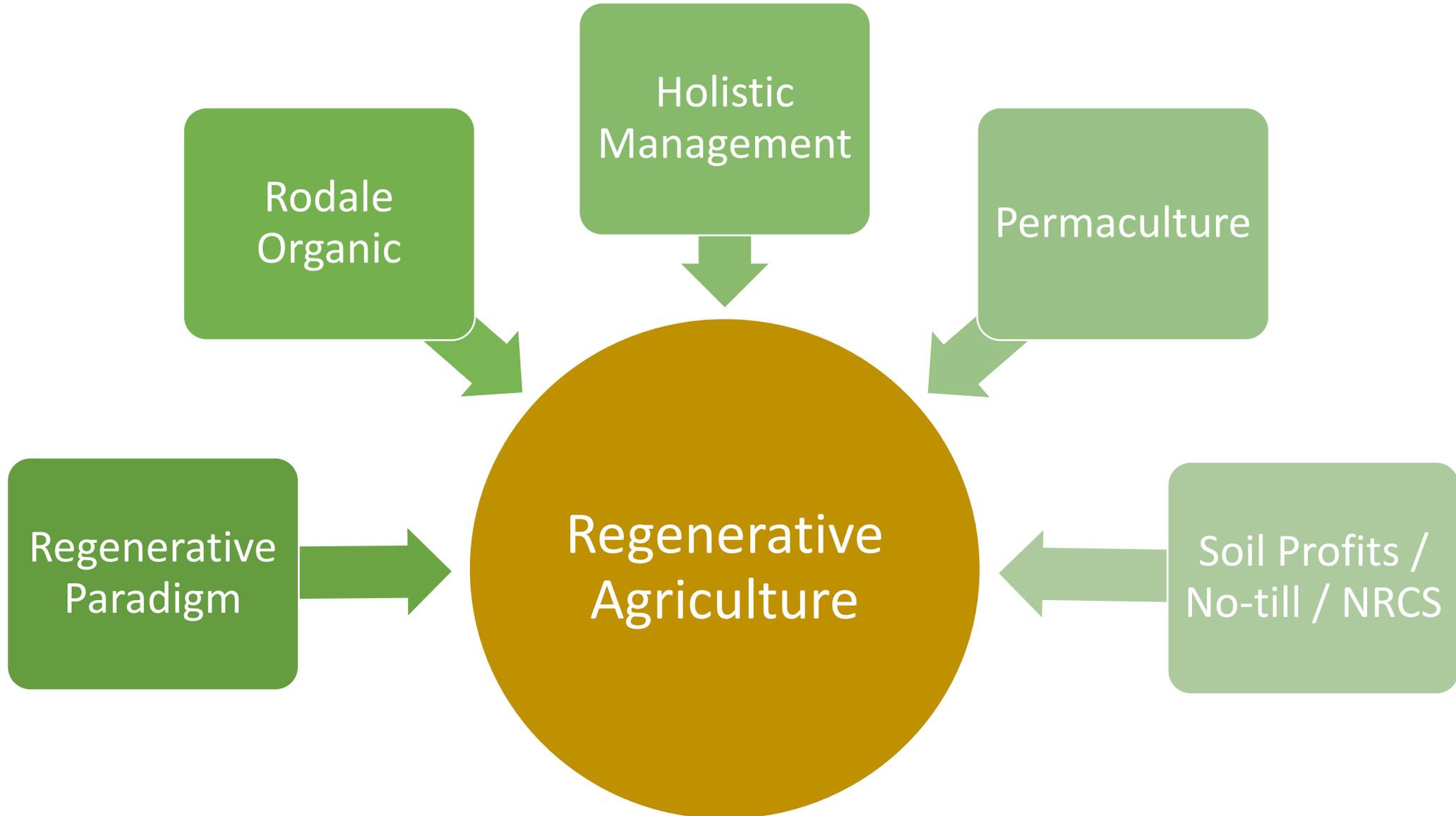
But what about land already degraded?

How can we return degraded land to its full potential?

How do we return carbon to the soil?



5 Lineages of Regenerative Agriculture



Regenerative Agriculture

Lack of consensus on definition

[\(Giller et al. 2021\)](#)

Regeneration - renewal or restoration of a biological system after injury

(paraphrased from Meriam Webster Dictionary)

Example: A set of planned agricultural practices that ensure the holding is not depleted, and over time the soil, water, air and biodiversity are improved or maintained to the greatest extent possible.

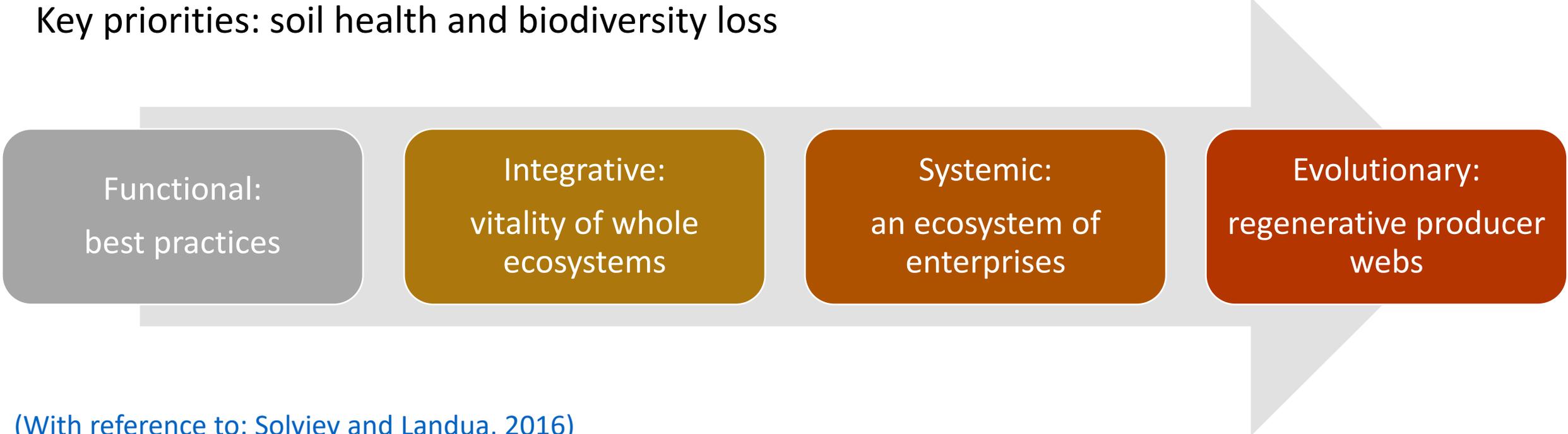
“Define” comes from the Latin verb, *definire*:
de- "completely" + *finire* "to bound, limit,"

Regenerative Agriculture Paradigm

Regenerative Agriculture is intended to be a process of continuous improvement of the land, and our relationship with the land.

This is achieved by evolution from just adopting best practices to a paradigm shift in how we view agriculture and the relationship between humanity and nature

Key priorities: soil health and biodiversity loss



Functional:
best practices

Integrative:
vitality of whole
ecosystems

Systemic:
an ecosystem of
enterprises

Evolutionary:
regenerative producer
webs

Table 1. Agronomic principles and practices considered to be part of Regenerative Agriculture and their potential impacts on restoration of soil health and reversal of biodiversity loss. Giller et al. 2021. <https://doi.org/10.1177/0030727021998063>

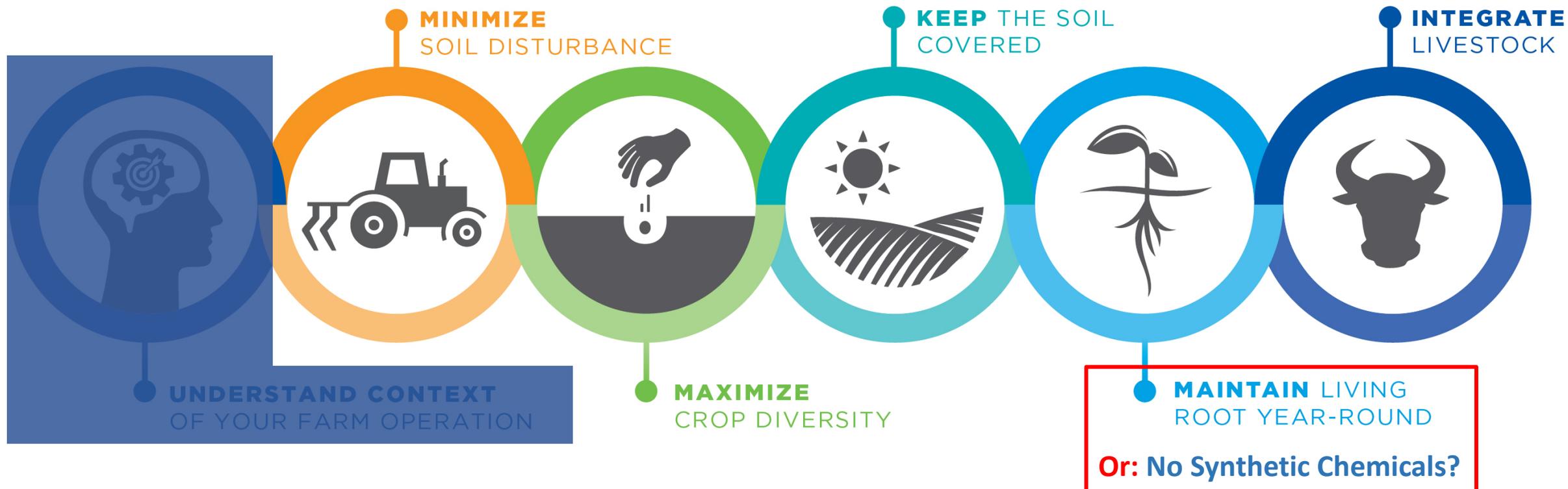
Principles	Practices	Restoration of soil health	Reversal of biodiversity loss
Minimize tillage	Zero-till, reduced tillage, conservation agriculture, controlled traffic	***	—
Maintain soil cover	Mulch, cover crops, permaculture	***	*
Build soil C	Biochar, compost, green manures, animal manures	***	—
Sequester carbon	Agroforestry, silvopasture, tree crops	***	**
Relying more on biological nutrient cycles	Animal manures, compost, compost tea, green manures and cover crops, maintain living roots in soil, inoculation of soils and composts, reduce reliance on mineral fertilizers, organic agriculture, permaculture	***	—
Foster plant diversity	Diverse crop rotations, multi-species cover crops, agroforestry	**	***
Integrate livestock	Rotational grazing, holistic [Savory] grazing, pasture cropping, silvopasture	**	?
Avoid pesticides	Diverse crop rotations, multi-species cover crops, agroforestry	*	***
Encouraging water percolation	Biochar, compost, green manures, animal manures, holistic [Savory] grazing	***	—

Based on McGuire (2018), Burgess et al. (2019) and Merfield (2019).



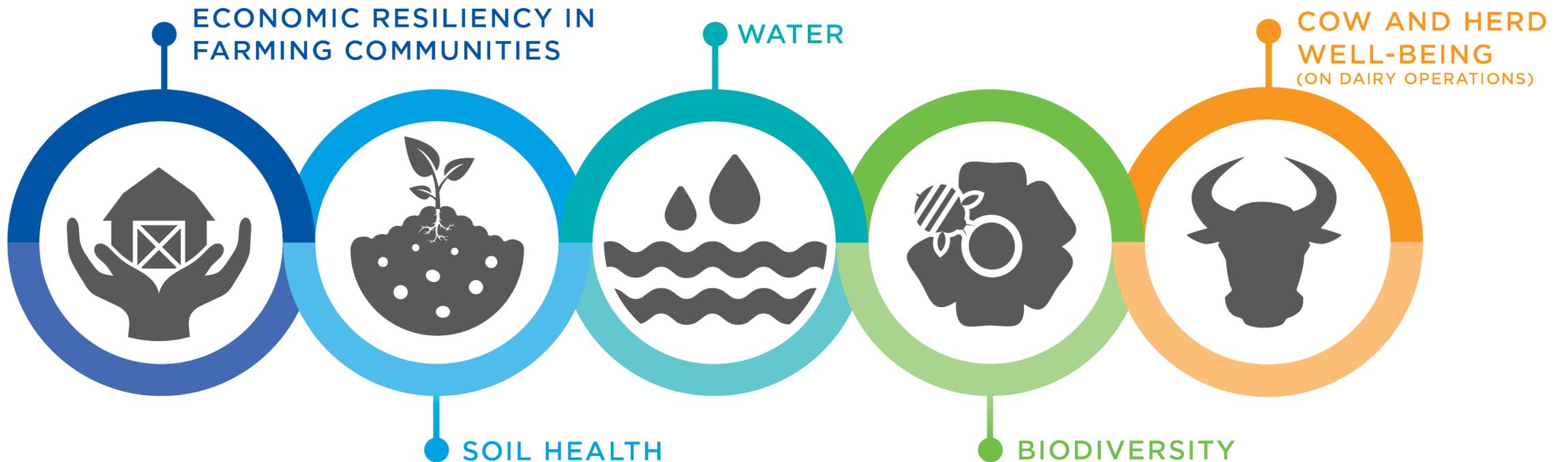
“We will advance regenerative agriculture on 1 million acres of farmland by 2030.”

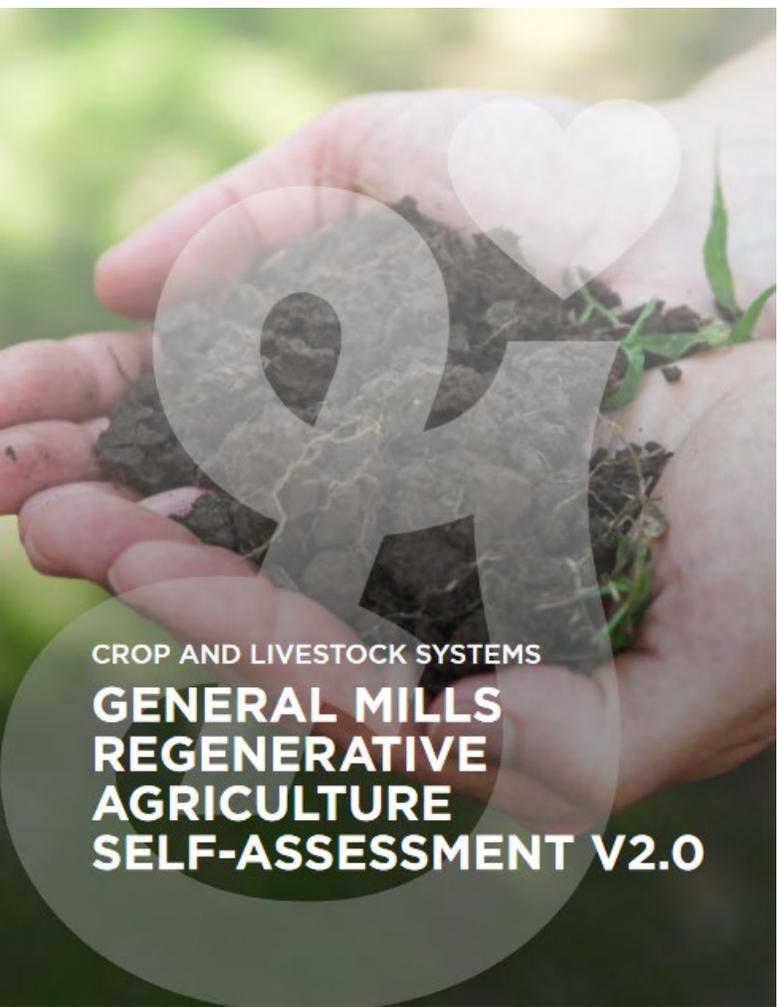
6 Core Principles of **REGENERATIVE AGRICULTURE**





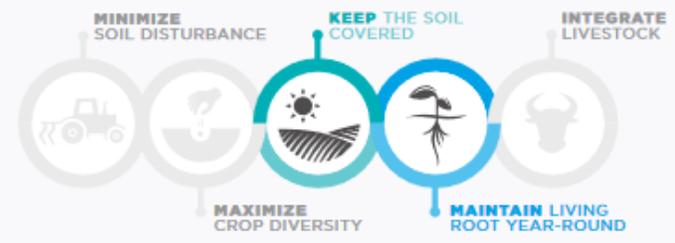
WE ARE MEASURING IMPACT ACROSS 5 KEY GOALS:





CROP ACRES

REGENERATIVE AGRICULTURE PRINCIPLES IN PLAY



LIVING ROOT IN THE GROUND

PLEASE SPECIFY THE PROPORTION OF YOUR TOTAL CROP ACRES THAT FALL UNDER EACH TIER. THE TOTAL MUST ADD UP TO 100%.

Please complete ONE of the below indicators based on your region's climate.

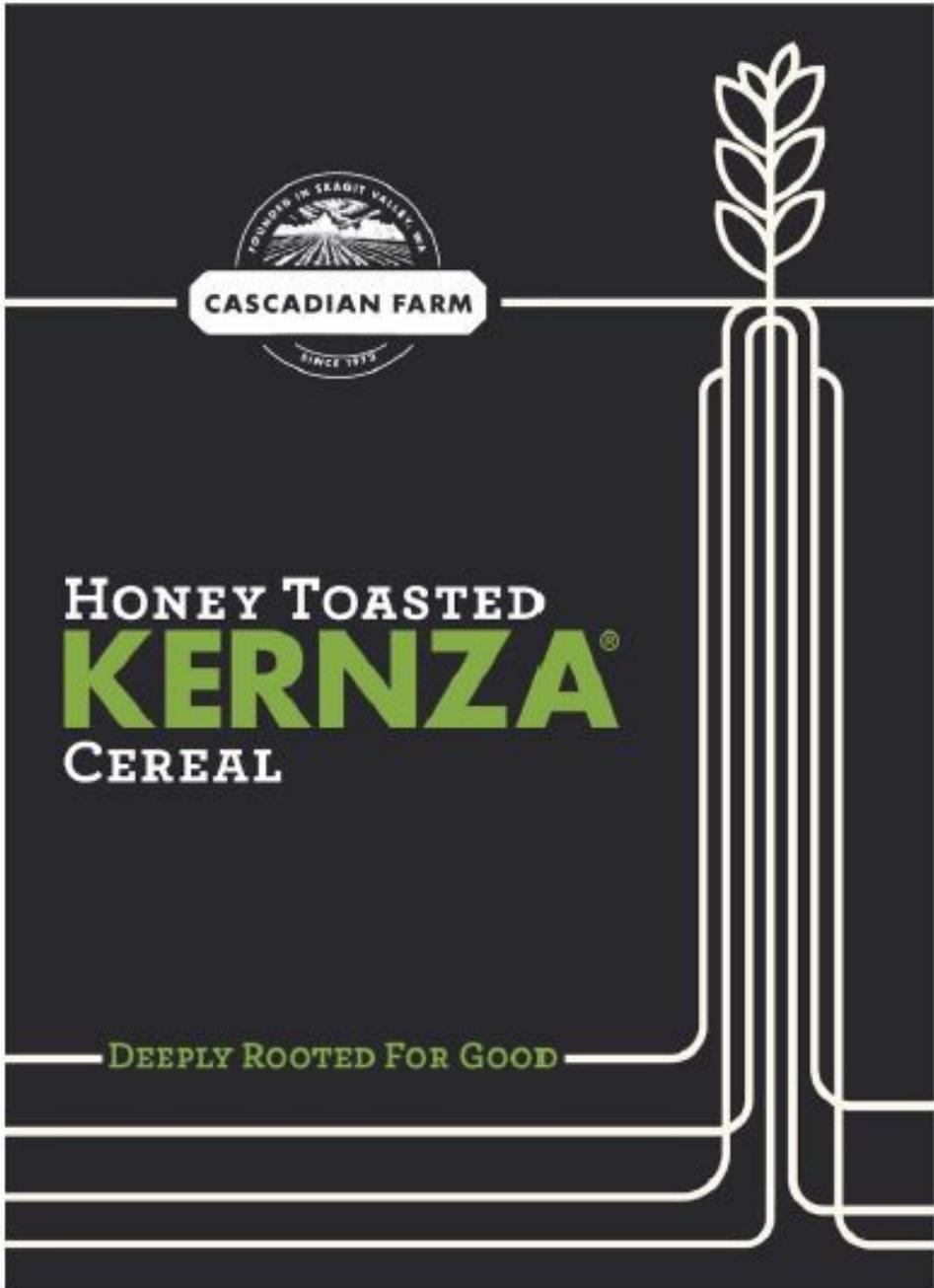
% OF TOTAL CROP ACRES IN EACH TIER

For humid, dry subhumid climates, or acres under irrigation

0	Does not meet baseline.	
<hr style="border-top: 1px dashed #ccc;"/>		
1	BASELINE: Fields have a living root in the ground for at least 130 days per calendar year. Weeds do not count. Dormancy may count toward days with a living root in the ground. Assume living root starts at planting and ends at harvest.	
<hr style="border-top: 1px dashed #ccc;"/>		
2	Meets baseline and fields have a living root in the ground for at least 200 days per calendar year.	
<hr style="border-top: 1px dashed #ccc;"/>		
3	Meets baseline and fields have a living root in the ground for at least 300 days per calendar year.	

%

file:///C:/Users/an719989/AppData/Local/Temp/GMI%20RA%20Self-Assessment-Combo%20(30).pdf



We advanced the commercialization of Kernza, a perennial grain with deep roots that shows promise in increasing soil health, carbon sequestration, water infiltration and biodiversity, through a \$1 million grant to the University of Minnesota's Forever Green Initiative and The Land Institute.

<https://www.generalmills.com/en/Responsibility/Sustainability/Regenerative-agriculture>



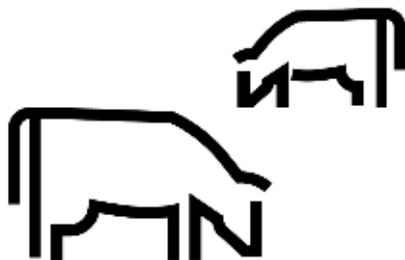
Regenerative
Organic
Certified™

Three Pillars Of Regenerative Organic Certified



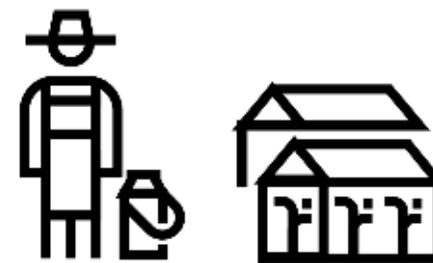
Soil Health

- Builds Soil Organic Matter
- Conservation Tillage
- Cover Crops
- Crop Rotations
- No GMOs or Gene Editing
- No Soilless Systems
- No Synthetic Inputs
- Promotes Biodiversity
- Rotational Grazing



Animal Welfare

- Five Freedoms
 - Freedom from discomfort
 - Freedom from fear & distress
 - Freedom from hunger
 - Freedom from pain, injury or disease
 - Freedom to express normal behavior
- Grass-Fed / Pasture-Raised
- Limited Transport
- No CAFOs
- Suitable Shelter



Social Fairness

- Capacity Building
- Democratic Organizations
- Fair Payments for Farmers
- Freedom of Association
- Good Working Conditions
- Living Wages
- Long Term Commitments
- No Forced Labor
- Transparency and Accountability



Regenerative
Organic
Certified™

2. Regenerative Practices	Practice Description	Bronze	Silver	Gold
2.1 Vegetative Cover	<p>Operations shall aim to cover land with living vegetative cover year-round. Otherwise, maintenance of either dead/rolled/lightly incorporated crop residues or mulch is required when field preparation or planting is not underway. See requirements per level at right.</p> <p>For perennial systems, either native vegetation or seeded mixes are maintained as ground cover between perennials.</p> <p>Exemptions may be granted when operations are unable to meet the above guidelines due to unforeseen factors, such as extreme weather. Documentation is required.</p> <p><i>CT: No vegetative cover maintained.</i></p>	Maintains year-round vegetative cover on 25-50% of all cultivated land	Maintains year-round vegetative cover on 50-75% of all cultivated land	Maintains year-round vegetative cover on 75-100% of all cultivated land, and utilizes at least one nitrogen-fixing cover crop (i.e. legumes) in each full crop rotation of each arable field.
2.2 Crop Rotations	Operations shall demonstrate use of crop rotations or perennial systems. Annual crop rotations should include a green manure. See requirements per level at right.	Minimum of three crops rotated through the same area	Minimum of four crops rotated through the same area	Minimum of seven crops in each rotation, including at least one nitrogen-fixing cover crop



REGENERATION INTERNATIONAL

Building Regeneration
Alliances

We believe the global transition to a regenerative food and agriculture system has the power to:

- Reverse global warming
- End world hunger
- Revitalize local economies
- Enhance human health and well-being
- Restore farmers' independence by ending corporate control over the global food system
- Regenerate ecological health, including soil fertility and biodiversity;
- Promote social justice and fair trade

<https://regenerationinternational.org/what-we-do/>

Conclusions

- Regenerative agriculture is an evolving concept
- Industry is embracing the idea in principle, but standards vary
- Entry point: Opportunity to embrace more sustainable practices and receive recognition
- Raising the bar: Stacking of regenerative practices on organic standards in an intentional and measurable way
- Currently focusses on adopting practices and integration within production systems
- Can we imagine a shift in the community of agriculture to build truly 'regenerative alliances'?

