Fiscal Sponsor: Organic Trade Association

EXPLORING THE FUTURE OF REGENERATIVE AND ORGANIC CROP PRODUCTION

Presented By Mallory Krieger & Nate Powell-Palm

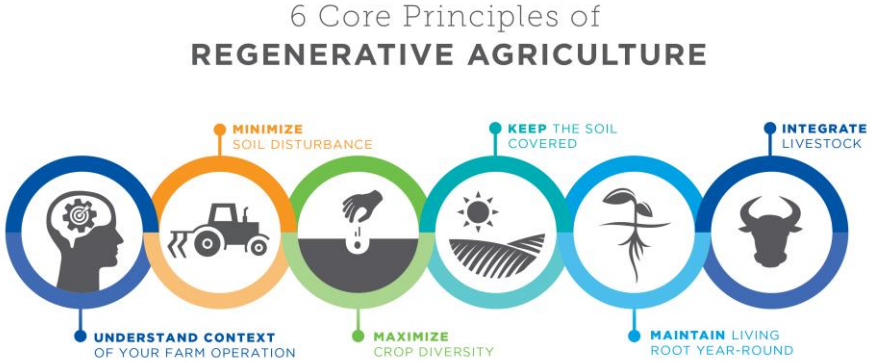


Table 1. Principles, Practices, and Restrictions of Regenerative Agriculture Versions, compared with Conservation Agriculture.

	Versions of Regenerative Agriculture				
Principles/Practices	Gabe Brown	Drawdown.org	Regenerative Organic	Chico State University	Conservation Agriculture
Limit tillage	✓	✓	✓	✓	✓
Protect the soil					
Plants or crop residues on soil surface	✓				✓
Controlled traffic					✓
Maintain living roots in the soil	✓			✓	
Increase biodiversity					
Diverse crop rotations	✓	✓	✓	✓	✓
Multi-species cover crops	✓	✓		✓	
Cover crops			✓		✓
Inoculation of soils				✓	
Integrate livestock	✓		✓	✓	
Restrictions					
Input limitations		On-farm fertility (no external nutrients)		Soil fertility through biological systems	
		No pesticides or synthetic fertilizers	No Synthetic Inputs		
			No GMOs or Gene Editing		
Other			No Soilless Systems		

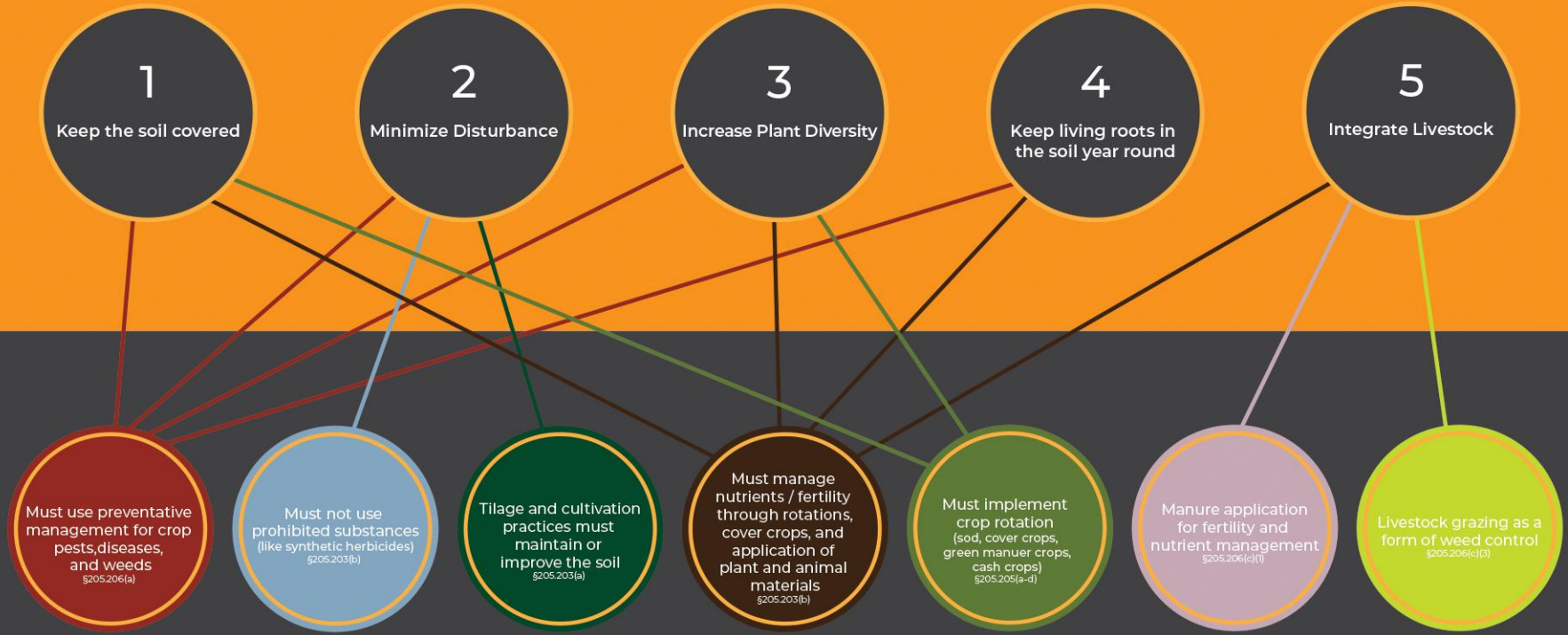
WHAT IS REGENERATIVE AGRICULTURE?

No standard definition

- Government: NRCS Soil Health Principles
  - https://www.nrcs.usda.gov/wps/portal/nrcs/detail/nd/soils/health/?cid=nrcseprd1300631
- University: Washington State University
  - https://csanr.wsu.edu/regen-ag-solid-principles-extraordinary-claims/
- Industry: General Mills
  - https://www.generalmills.com/en/Responsibility/Sustainability/Regenerative-agriculture

USDA ORGANIC

Principles of Regenerative Agriculture



National Organic Program Regulations

The definition of organic production requires practices that foster cycling of resources, promote ecological balance,and conserve biodiversity.

§205.2

Criticisms of Organics

Yield Drag

Historic comparison: organic yields on average 20% lower than conventional. Average is highly variable depending on crop, region, and soil type. (de Ponti, et. al. 2012)

Closing the Gap: Practices such as multi-cropping and crop rotation susbstantially reduce the gap to 8-9% (Berkeley Food Institute meta-analysis, 2014)

Yield gap decreases over time under organic management: "Closure of the yield gap between organic and conventional farming can be a matter of time, and that organic farming may result in greater spatial stability of soil biotic and abiotic properties and soil processes. This is likely due to the time required to fundamentally alter soil properties." (Schrama, et al, 2018)

"More than 15 years of production data demonstrated that the organic systems at WICST produced forage yields equivalent to conventional production, and grain yields that were 90 percent of the WICST conventional grain systems. In two-thirds of the years studied, organic grain yields reached 99 percent of the yields in the conventionally managed plots." (Wisconsin Integrated Cropping Systems Trial, 2015)

Criticisms of Organics
Tillage

When done appropriately and with accompanying practices that mitigate the downsides, tillage can build soil organic matter, storing carbon in the soil.

Long-Term Agroecological Research (LTAR) experiment at Iowa State University is one of the longest replicated comparisons of organic and conventional ag in the country - started in 1998. Compares 3-4 year organic rotations of corn, soy, oats, and alfalfa to 2 year corn/soy conventional rotation.

“The organic plots had up to 40% more biologically-active soil organic matter, which is important for fertility and nutrient availability. Organic soils also had lower acidity and higher amounts of carbon, nitrogen, potassium, phosphorus, and calcium.” (Long Term Study Shows Soil-Building Benefits of Organic Practices, www.certifiedcropadviser.org)

Why chose organic as the path to regenerative outcomes?

- Confidence for buyers and customers.
  - Organic offers third-party verification of practices
  - Regulations are clearly defined and backed by law

- Increase overall farm profitability
  - Purdue University found if organic famers get a 100% premium and keep yield drag to <33% of conventional, they are more profitable than conventional farms (Langemeier, 2020)
  - Organic agriculture is 22-35% more profitable than conventional (Crowder & Reganold, 2015)

OATS Podcast

Honest and fair answers to six common criticisms of organic agriculture

- Episode 1 - Moldboards and Dust Clouds: Organic Has a Tillage Problem
- Episode 2 - Unsightly Fields: Organic is a Weedy Mess
- Episode 3 - Farming Like It's 1921: Organic is Anti-Science
- Episode 4 - Double the Acres Half the Yield: Organic Can't Feed the World
- Episode 5 - Soft Markets: Organic Doesn't Scale
- Episode 6 - No Tools, No Premiums: Organic Transition is a Trap

OATS online training for agronomists and crop advisors

- Basics of organic production - weed control, nutrient management, crop rotation, pest management
- Systems thinking & long-term strategies for success in organic production
- Managing risk during transition
- Certification and record-keeping
- National Organic Program (NOP) rules and regulations
- Marketing and Profitability
- On-farm & hands-on experiential learning on organic operations

Launching in early 2022

Fiscal Sponsor: Organic Trade Association

OATS is supported with funding from the Organic Trade Association's industry-invested GRO Organic research, promotion, and education program. Top GRO Technical Assistance Donors are General Mills, Clif Bar, Stonyfield, King Arthur Baking Co., and Organic Valley.

Thank you.

Mallory Krieger, mallory@organicagronomy.org
Nate Powell-Palm, nate@organicagronomy.org

Stay informed – Subscribe at organicagronomy.org/subscribe