REGENERATIVE AGRICULTURE

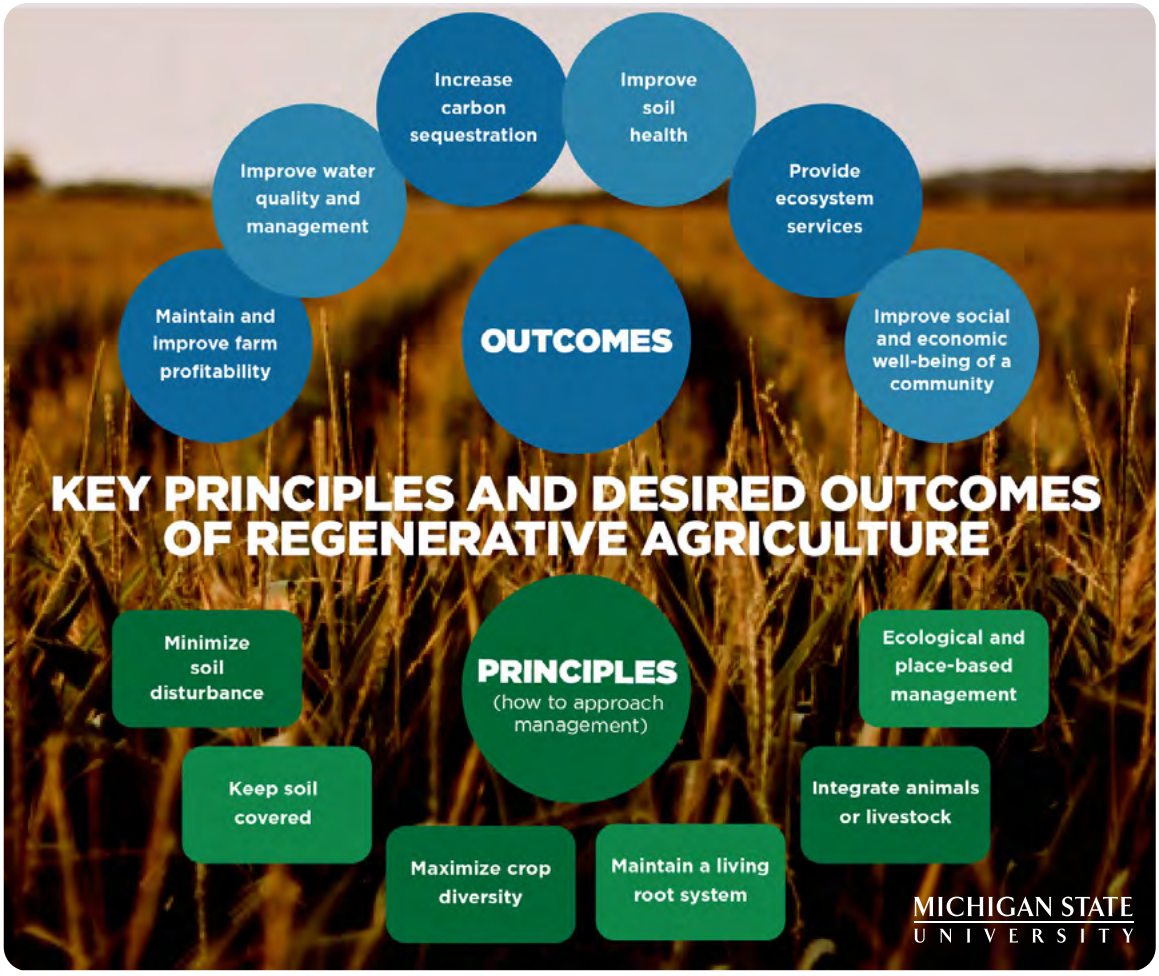
An Introduction to Regenerative Field Crop and Grazing Systems

WHY REGENERATIVE AGRICULTURE?

The need for more resilient food and farming systems has never been greater, causing more people to consider regenerative agricultural practices to improve productivity, profitability, and environmental outcomes.

IS THIS NEW?

No. Regenerative agriculture draws from the past practices of integrated cropping and livestock systems once widespread in the Midwest, as well as from the valuable insights of Indigenous cultures that have long prioritized regenerative and soil health principles. Michigan State University (MSU) honors and supports Indigenous knowledge by championing diversity and affirming Indigenous sovereignty in agriculture.



Graphical representation of how regenerative principles and outcomes are linked.

WHAT IS REGENERATIVE AGRICULTURE?

Regenerative agriculture is an approach to farming that promotes environmental outcomes related to nutrient, water, soil, and biodiversity conservation. It aims to enhance farmers' well-being and community prosperity through improved social and economic outcomes. The context-driven principles apply to all farm systems – small to large, grain to grazing, urban to rural: the list goes on.

The interconnected practices of regenerative agriculture serve multiple principles and contribute to various outcomes. Their optimal combination depends on individual farming systems and contexts. Maximizing the benefits of regenerative agriculture involves tailoring practices and management systems to meet specific farm needs rather than simply tallying up individual practices. This underscores the significance of understanding the complexity of farm systems and the unique needs of each farmer.

Example practices may include continuous no-till; use of cover crops or perennial forages; use of multi-year rotations, polyculture pastures, or prairie strips; implementation of precision nutrient management; animal integration; integrated pest management with increased use of biological control; and optimized grazing recovery periods for pastures.

MSU's approach to regenerative agriculture doesn't divide farms into regenerative or not regenerative categories. Instead, our goal is to research and share the spectrum of options where every farm and farmer can find their own path toward long-term improvement.

HOW DOES MSU SUPPORT REGENERATIVE AGRICULTURE IN FIELD CROP AND GRAZING SYSTEMS?

MSU research, extension, and outreach programs have a long history in sustainable and regenerative agriculture. This body of knowledge has grown and developed alongside the history of agriculture in Michigan and in collaboration with a diverse number of partners. Events, resources, and research opportunities are ongoing and evolving. Use the following information to connect directly to each resource and learn more about the groups contributing to this effort:

MSU ANR Communications Flickr

A field of crimson clover cover crops

MSU Extension

canr.msu.edu/outreach/

Through programs, resources, on-farm research, and direct conversations, MSU Extension aims to equip and support Michigan agriculture by applying science-backed practices and skills to further a more regenerative cropping and grazing future. MSU Extension does this through local programming, statewide partnerships, and regional collaborative networks.

MSU Lake City Research Center

Researchers take soil carbon samples from pasture

The Center for Regenerative Agriculture (CRA)

canr.msu.edu/regenerative-agriculture

The CRA provides regenerative agricultural education and insights through research, data analysis, and metrics for adoption. MSU-CRA's research centers on quantifiable data positioned to inform land management policy, bolster ecosystem resilience, and enhance food and fiber production.

MSU KBS LTAR Research Site

Drone imagery of KBS LTAR plots

Kellogg Biological Station (KBS)

kbs.msu.edu

KBS is home to two long-term research programs in regenerative agriculture – the NSF-funded Long-term Ecological Research program (LTER), which undertakes fundamental research in the ecology of row crop ecosystems and landscapes, and the USDA-funded Long-term Agroecosystem Research program (LTAR), which uses stakeholder input to guide research that enables the adoption of regenerative agricultural practices in row crop systems.

MSU ANR Communications Flickr

Field day hosted at an AgBioResearch site

MSU AgBioResearch

canr.msu.edu/research/

MSU AgBioResearch is a network of MSU researchers and research centers that seek to discover economically feasible, scientifically based solutions to Michigan-relevant challenges such as climate change, water issues, invasive species, and food safety and security. Work conducted by AgBioResearch is guided by industry and stakeholder input to meet specific needs and address emerging threats.

Credits & Acknowledgments

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