Pasture Project
AN INITIATIVE OF THE WALLACE CENTER

Wallace Center
AT WINROCK INTERNATIONAL

GRAZING DIVERSE COVER CROPS: NEW FINDINGS, RESOURCES, AND LESSONS LEARNED

PROJECT SUMMARY

Between 2014 and 2018, the Wallace Center at Winrock International worked in partnership with Practical Farmers of Iowa, Sustainable Farming Association, and Land Stewardship Project to assess and promote the economic and soil health benefits of grazing diverse cover crops with cattle under adaptive, high stock density management. Funded by a Natural Resources Conservation Service (NRCS) Conservation Innovation Grant, the project worked with eight farms in Minnesota and Iowa to gather data, offer field days, and create farmer-focused resources on grazing cover crops.

IMPACT

Building the case. This project collected and analyzed economic and soil health datasets over three years that compare control plots (use of cover crops and winter grazing in cash crop rotations) and treatment (cash crop rotations without cover crops or winter grazing) on 8 cooperating farms in Minnesota and Iowa. Trial results indicate that the incorporation of diverse cover crops and adaptive livestock grazing can result in incremental improvements in soil fertility and biology and can result in significant cost savings from forage production and improved soil fertility.

Building awareness. This project held a series of popular field days focused on grazing cover crops in the Upper Midwest. Over 300 people attended 10 field days to learn about the experiences and best practices of the cooperating farms. This project also produced five webinars which have collectively been viewed more than 12,000 times.

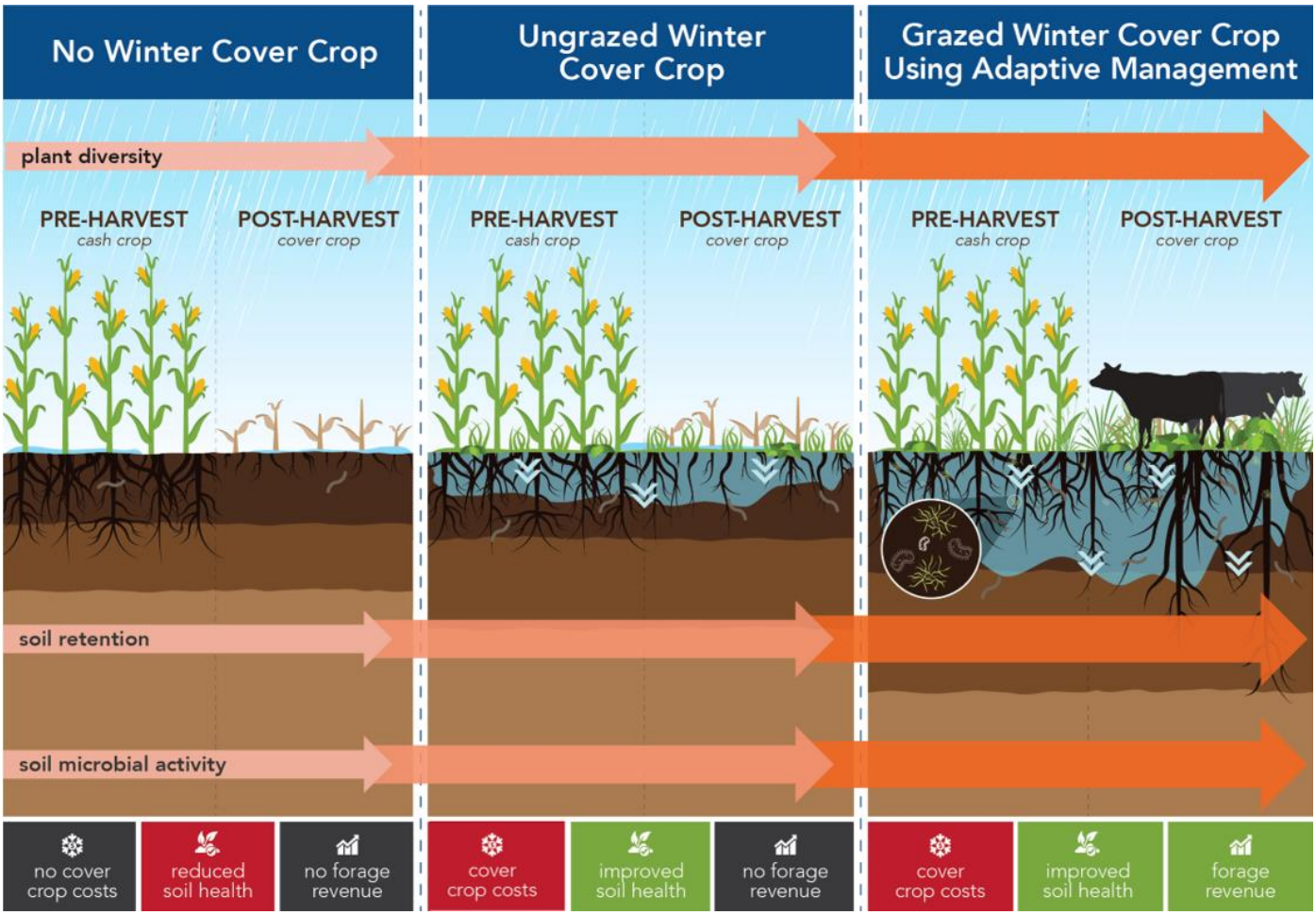
Creating resources. At the start of this project, a lack of resources on grazing cover crops was identified as a barrier to adoption. Through this project, a comprehensive how-to guide and a series of instructional videos featuring the cooperating farmers and leading experts have been developed.

WHY GRAZE COVER CROPS?

Cover crops are effective at improving water quality, reducing field nitrogen losses by 31% and phosphorus loads by 50%,[1] and provide significant on-farm benefits such as increases in soil organic matter. However, cover crops have been adopted slowly across the US, partially due to high costs.

Fortunately, coupling diverse cover crop mixes with livestock grazing can provide positive soil health and water quality impacts while producing economic benefits for the producer that offset the costs of establishing and termination. Namely, cover crops provide winter forage valuable for livestock, replacing purchased or stored winter feed. Further, employing adaptive grazing principles such as high stock density and frequent movement between paddocks can result in significant nutrient application to cropland from manure, thereby reducing input costs and increasing cost savings in the following growing season.

> *"The addition of diverse cover crops to our farm rotations has resulted in rapid soil building, increased water infiltration rates, and the added revenue from grazing winter cover crops has netted us as much or more per acre as our cash crops."*
>
> - Dawn and Grant Breitkreutz
> Stoney Creek Farm
> Redwood Falls, MN



[1] Iowa Nutrient Reduction Strategy. (2016). Iowa Department of Agriculture and Land Stewardship, Iowa Department of Natural Resources, and Iowa State University College of Agriculture and Life Sciences.

"This project, at this point, has changed my thoughts a little bit on how I want to run cows on cover. I'd like to cover more acres with cattle now…

…I would absolutely recommend integrating cover crops and grazing, if the farmer is ready for that, because it is the best and fastest way to realize an economic return on using cover crops while at the same time improving your soil conditions."

- Wade Dooley
  Glenwood Century Farm
  Albion, IA

TRIAL RESULT HIGHLIGHTS

Seven of eight farms experienced higher total living microbial biomass in the grazing cover crops plots compared to plots without cover or grazing, an early indicator of positive soil carbon changes (as measured by annual phospholipid fatty acid soil tests)

Cooperating farms had an average grazing cover crop management cost of $83/acre/year (including seed, seeding, termination, fencing, and watering expenses) but had an average forage benefit of $123/acre/year (based on estimated avoided forage purchases)

When adding in modeled long-term benefits such as reduced erosion, improved soil fertility, and increased water storage to the forage benefit, cooperating farms had an average gross benefit of $216/acre/year and a net benefit of $135/acre/year

TO LEARN MORE: READ OUR GRAZING COVER CROP TRIAL RESULTS

Reports on the Benefits of Planting and Grazing Diverse Cover Crops

Our Technical Bulletin summarizes the soil health and economic impacts of grazing cover crops seen on 8 farms in Minnesota and Iowa over a three-year trial.

You can access the Technical Bulletin here!

The project also produced a full trial report, including methods, anonymized data, supporting research and documentation, and limitations and discussion.

You can access the Full Trial Report here!

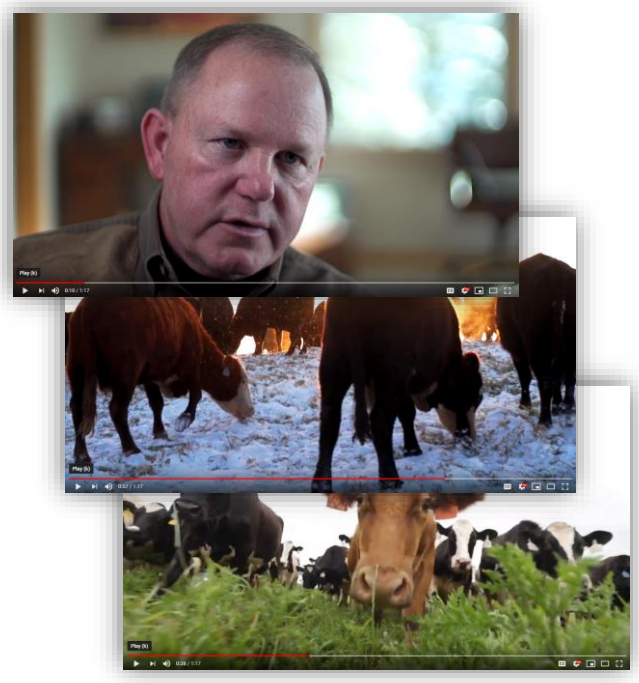
NEW RESOURCES FOR FARMERS RELEASED

Grazing Cover Crops: A How-To Guide

This farmer-facing how-to guide serves as a comprehensive resource for farmers considering grazing cover crops. This 32-page guide covers the lifecycle of grazing cover crops with cattle, ranging from seed mix design to cover crop termination. It includes important topics for farmers such as:

- Herbicide toxicity concerns
- Grazing lease considerations
- Practical soil testing guidelines
- Fencing and watering systems
- Principles of adaptive grazing
- Dozens of links to useful resources, organized by topic

You can access Grazing Cover Crops: A How-To Guide here!



Grazing Cover Crops Video Tips and Farmer Profiles

A new set of 14 videos provides expert tips and advice from cooperating farmers and adaptive grazing expert, Dr. Allen Williams, on planting and grazing diverse cover crops. Ranging from 2 to 7 minutes, these videos cover everything from the benefits to cover crops to practical tips on fencing and watering systems to animal nutrition when grazing cover crops.

An additional 3 videos profile cooperating farmers in this project, discussing why they decided to integrate livestock and the impact grazing cover crops has had on their land.

You can access the grazing cover crops video playlist here and the farmer profiles here!

CHALLENGES AND LESSONS LEARNED

Preventing cover crop failures. Cover crops sometimes fail, just like cash crops. Chance of failure can be higher in northern latitudes, but the chance can be minimized through planting as early as possible (such as interseeding into stage V4-V6 corn), considering potential herbicide toxicities, choosing appropriate seed mixes, and avoiding over-grazing (unless terminating the cover crop).

Grazing leases provide opportunities for scalability. Several cooperators in this project were farmer-grazier pairs, where the row crop producer had an agreement with the grazier to graze on their land and cover crop. This may serve to fill a gap between producers with row crops but no livestock and graziers who are sourcing winter forage. These arrangements can work well but must consider costs of infrastructure and risks for each party.

Adaptive grazing, consistent practice. Key to seeing rapid soil health improvements through grazing cover crops is using adaptive grazing principles such as achieving high stock densities and frequent moves via temporary fencing. States vary in the level of perimeter fencing required by law, which can be a challenge on land where livestock has not been present for generations, but the low cost of internal temporary fencing makes high stock density grazing more accessible than ever. Importantly, this project found that consistency in practice seems to increase positive soil health outcomes.

On-farm research poses unique challenges. Applied research on farms is needed to understand real farm conditions and constraints, but care should be taken to streamline and simplify data collection as much as possible so that farmers are not overburdened. Additionally, there is sometimes a mismatch between the timeline of grant funding and the time needed to see significant soil health changes.

Farmer leaders are key. Cooperating farmers in this project learned about the impacts of grazing cover crops on their soil health and farm economics, but they also became champions of the practice via public events and contributed practical, ground-tested advice to the project's farmer-focused resources.

NEXT STEPS

Further research. Replication of the results of this trial are needed to confirm the positive benefits of grazing cover crops. The Pasture Project has begun a new trial with 6 cooperators in Missouri and Illinois, building on the work performed here. Replication by other organizations will further bolster the soil health and economic case for grazing cover crops.

Additional and improved resources and outreach. The potential of grazing cover crops has yet to reach all the farmers that could benefit. Additional outreach to share existing resources, and development and scaling of new resources, such as innovative matchmaking sites like Minnesota's Cropland Grazing Exchange, are needed to reach more livestock and row crop producers.

Building consensus to solve tough problems. Many challenges still exist in cover crop management, and solving these challenges will require that farmers, agronomists, researchers, and conservationists work together. For example, we know that herbicide residuals often impact future cover crop stands for grazing, so solutions are needed to optimize the implementation and integration of cover crops and grazing for as many farmers as possible.

Who are the Pasture Project and the Wallace Center at Winrock International?

Pasture Project is an initiative of the Wallace Center at Winrock International, a non-profit who develops partnerships, pilots new ideas, and advances solutions to strengthen communities through resilient farming and food systems.

Pasture Project works to advance regenerative grazing and associated agricultural practices as scalable, market-driven solutions for building healthy soil, viable farms, and resilient communities in the Upper Midwest.

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Who are the partners on this CIG project?

Practical Farmers of Iowa's mission is equipping farmers to build resilient farms and communities. Practical Farmers of Iowa is an inclusive organization representing a diversity of farmers.

PRACTICAL farmers of Iowa
working together, always learning

The Land Stewardship Project (LSP) is a private, nonprofit organization founded in 1982 to foster an ethic of stewardship for farmland, to promote sustainable agriculture and to develop healthy communities.

LAND STEWARDSHIP PROJECT

The Sustainable Farming Association of Minnesota supports the development and enhancement of sustainable farming systems through farmer-to-farmer networking, innovation, demonstration, and education.

sustainable farming association
sfa
FARMER-TO-FARMER NETWORK

This project was funded through NRCS Conservation Innovation Grants (CIG). CIG is a competitive grant program that stimulates the development and adoption of innovative approaches and technologies for conservation on agricultural lands. Through CIG, NRCS partners with public and private entities to accelerate technology transfer and adopt promising technologies.