What Questions Do Michigan Agriculture Professionals Have About Conservation Agriculture?

Prepared By :

Christine Charles
Elizabeth Schultheis, PhD
Brook Wilke, PhD
Tayler Ulbrich, PhD
Nameer Baker, PhD
Sarah Zeiler

charl122@msu.edu
www.canr.msu.edu/outreach

MICHIGAN STATE UNIVERSITY | Extension

KBS LTER
Kellogg Biological Station
Long-term Ecological Research

kbs ltar
Kellogg Biological Station
Long-Term Agroecosystem Research

This Report Is For You If...

- You work with farmers.
- You want to help promote the adoption of conservation practices.
- You have data that can help answer important questions from farmers and agricultural professionals.
- You are a scientist or organization looking to inspire your work with real issues and questions from practitioners.

Summary of the Project

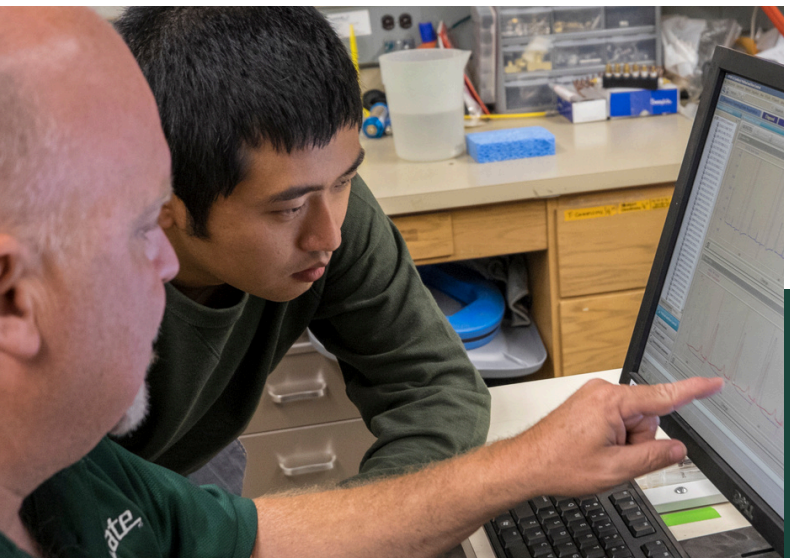
Agricultural advisors and educators need relevant, science-backed information to meet the needs of Michigan farmers. This is especially important for using conservation practices like no-till farming, cover crops, and adding new crops in a rotation.

There are many policy, economic, and structural barriers that inhibit broader adoption of conservation practices in Michigan (“Understanding Barriers and Opportunities to Expanding Conservation Practice Adoption Among Farmers in Michigan”, 2021). One of which is a need for knowledge, skills, and confidence to overcome the challenges of conversation practices.

Relying on local techinical experts, agronomists, and successful farmers is a frequently cited solution to this issue. To support these techinical experts, agronomists, and farmers, we wanted to know the science and knowledge they need to address gaps in applying conservation agriculture.

The potential for conservation practices to hurt crop yields, decrease profits, or increase pest pressure remain key issues that agricultural professionals regularly navigate. However, long-term research of row crop systems, like research conducted at Michigan State University's W.K. Kellogg Biological Station (KBS), may help address and troubleshoot these concerns.

Our goal is to use 30 years of research and a new flexible site at KBS to help advisors and educators share useful information with farmers, encouraging them to adopt environmentally benefitical and cost-effective practices.



To do this, we held a series of facilitated conversations and surveys with advisors and outreach professionals to identify questions important to the farming audiences they advise. These responses will guide a continued effort to...

1. **Analyze existing datasets for useful answers**
2. **Present past research for new audiences in educational materials**
3. **Inform new research projects**

By sharing these responses widely, we hope this assessment can support the ongoing, collaborative efforts across the state to understand the technical and scientific needs of farming with conservation practices.

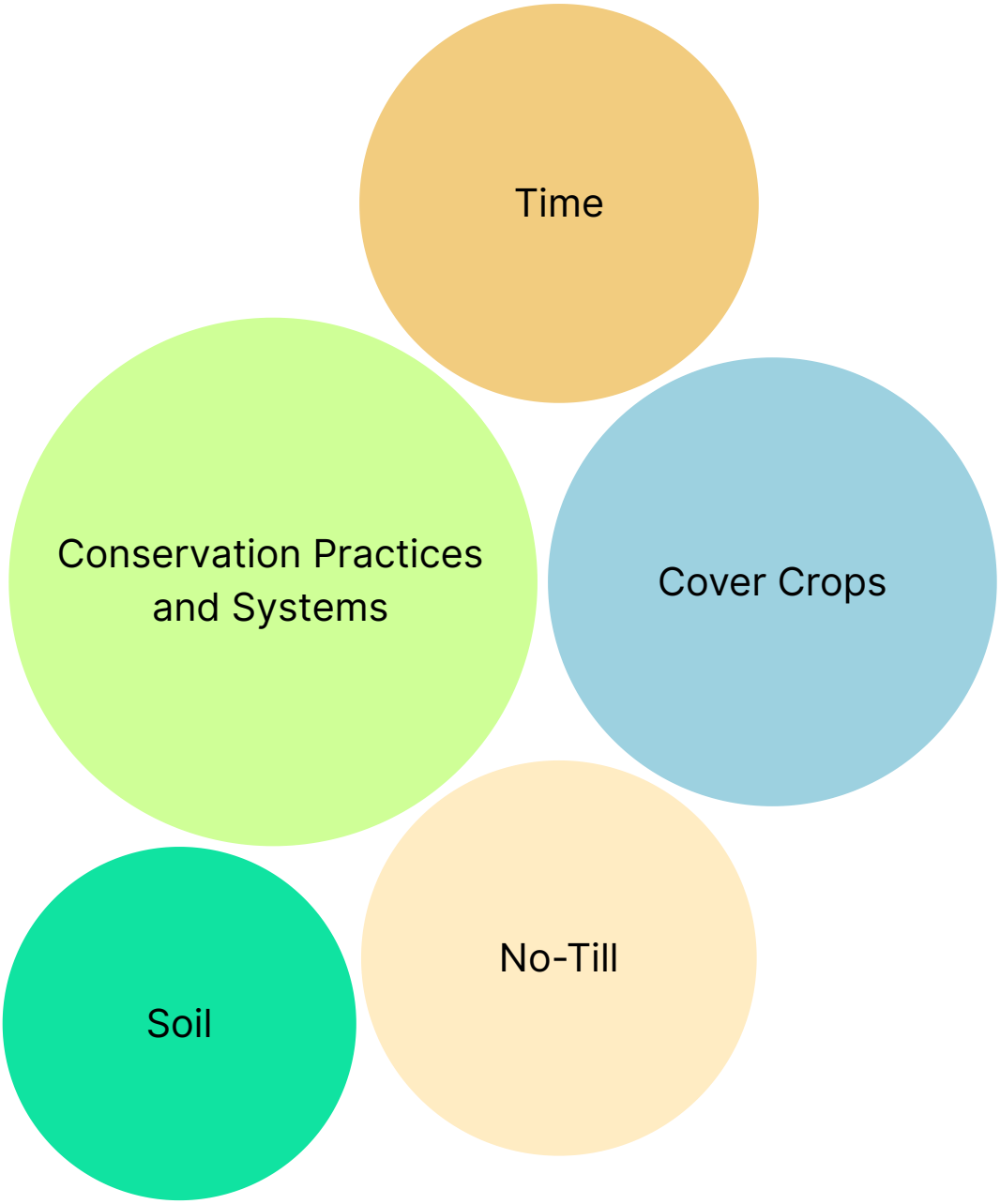
What We Did

We worked with groups that directly advise and interface with farmer audiences, including Michigan Conservation Districts, MSU Extension, crop advisors, and others. These groups know what challenges and misunderstandings stop farmers from trying conservation practices.

We completed two focus groups and three surveys with responses from 66 participants. From their responses, we identified five key areas where more research and education may be needed in Michigan.

Priority Areas Across All Questions

The following terms appeared in the highest density and frequency across all the surveys and focus groups:



Priority Areas: Subthemes

Theme	Subthemes
Conservation Practices and Systems	• Local examples and on-farm trials • Supporting farmers new to conservation • Managing risk • Troubleshooting the more complex agronomy • Changing social dynamics around conservation • The economics and profitability of conservation
Cover Crops	• Fitting covers into crop rotations • How to start or establish successful covers • Knowing of ore species options • Agronomic/economic value of cover crops
No-Till	• Needed management adjustments for no-till (chemistry, rotations, planting, equipment, etc.) • Rotational or reduced tillage results • Social resistance to no-till • Long-term results
Time	• Increased fieldwork and learning curve • Timeline expectations
Soil	• How to use soil health indicators for management • Management based on diverse soil and climate • Preventing soil loss and degradation

What is preventing people from adopting conservation practices?

Adopting conservation practices in agriculture is crucial for sustainable farming and environmental health. However, there are many reasons people may not adopt conservation. Conservation professionals and agricultural advisors have shed light on these obstacles and “debates” they often hear or navigate with clients. Their responses are categorized into agronomic, economic, ecological, and social themes.

Agronomic

- Concerns with potential risks associated with conservation practices, such as yield loss, disease, and pests are often brought up.
- Working with a short planting window after harvesting annual crops is often mentioned as a reason to not plant cover crops.
- The complexity of additional management for unknown profitability and the lack of resources for specialty crops like sugar beets further deter adoption.
- Tillage is valued for its benefits in soil warming, residue breakdown, and weed suppression, leading advisors to question if rotational tillage is as sufficient as no-till for environmental benefits.

Economic

- Economic uncertainty is a significant barrier. Professionals and advisors often hear skepticism about the profitability of conservation practices, both initially and long-term.
- Pursuing diverse rotations and livestock integration can have several agroecosystem benefits but maintaining profitability, and finding relevant markets to sell to, when adding new enterprises (new crops or grazing) remains a challenge.
- Government cost-share programs can have time and paperwork burdens that dissuade enrollment or re-enrollment.
- High costs for new equipment or equipment upgrades needed for resource conservation adds to the reluctance in adopting new practices.

Ecological

- Advisors emphasize the need for locally relevant resources. Field and region-specific context are often needed to make a convincing argument for conservation and prevent negative experiences.
- Many perennial crop farmers believe that integrated pest management (IPM) is sufficient and are unaware of alternative management options for resource conservation or soil health in specialty crops.
- Addressing weather extremes year by year (droughts conditions or too much water) is a priority, making it difficult to consider long-term resiliency solutions.
- Knowing if, or when, conservation practices improve environmental metrics and a farm's business is a regular point of skepticism.

Social Factors

- Changing established habits is challenging. Community norms and family traditions play a significant role in farm management decisions.
- Easements (CRP) are viewed negatively in certain communities and can be seen as giving away needed cropland.
- Conservation management is seen as a large investment of time to learn and implement. Clients who are hesitant to implement new practices can see conservation practices as competing with other management needs or separate from the business' bottom line thus not worth the investment.

Missing Information for Non-Adopters

Conservation professionals and agricultural advisors were also asked “what information do you wish you had but are missing when discussing conservation practices with non-adopters?” and they responded with the following:

- Timeline expectations for yield dips and financial paybacks when starting something new
- How cover crops and no-till systems respond to extreme weather events
- Best crop rotations for new practices
- What risks from climate change can be prepared for on farm
- How to support long-term management mindsets

Education Needs

There are some topics that have well established research in Michigan and have findings from the Kellogg Biological Station. Using existing knowledge, the following topics could be revisited and shared in new ways to extend impact:

- Herbicide management in tilled vs. no-tilled systems
- Successful examples of conservation practices regionally
- Profitable cover crop integration
- Management and species options for late cover crop plantings

Questions Lacking Answers for Row Crop Systems

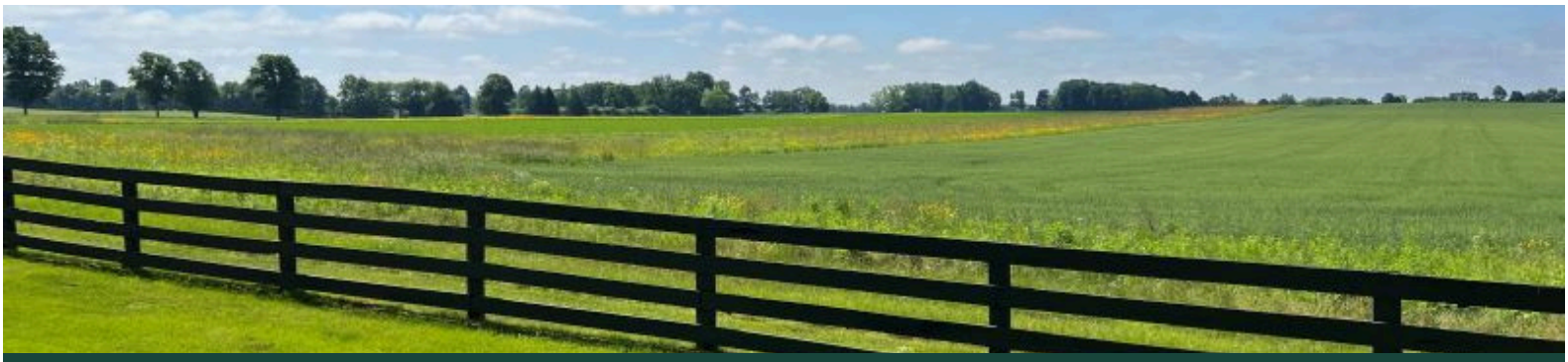
There are many questions that require long-term trends to have accurate answers. When asked what conservation professionals and agricultural advisors would like to know from over 30 years of data from long-term research at KBS and other long-term data, they responded with the following:

- Expectations for nitrogen fixation and nutrient cycling from using cover crops
- Expected financial investments for using conservation practices
- Timeline to build organic matter
- Influence of conservation practices on water use efficiency
- Can flexible conservation accomplish similar environmental goals to continuous conservation practices?
- What risks can be mitigated with using conservation over time?

Desired Research or Programs

Professionals and advisors were asked where area of education or research they would pursue if given unlimited resources. Thinking in such a way allowed for creative sharing of what they thought may be most compelling for their client and neighbors:

- Yield and ecological findings from no-input systems
- Grading cover crop value and potential for impact on nutrient cycling, water cycling, and carbon sequestration
- Quantifying and compensating farmers based on the ecosystem services provided by using conservation practices
- Measuring trends of dissolved reactive phosphorus in different management systems
- Comparison of free-living N-fixing organisms cycling potential based on management
- How does soil health change or improvement differently across a field or in different soil types?
- Intercropping logistics and profitability



In Summary...

The focus groups described in this document strengthen a pathway to answer important questions regarding climate change, biodiversity loss, and other areas in which agriculture has potential for high impact.

KBS' long-term datasets and flexible, ongoing research sites can play an important role in answering some of these questions. However, our expectation is that KBS data and research cannot address all of these questions alone.

We see it as a team effort to help move farmers to adopt more conservation practices across the state, taking many forms of data and insight into these topics.

What Next?

In the long term, the identified questions and needs from agricultural professionals will form the foundational research priorities. These responses will guide a revisit of over 30 years of long-term agroecological research, inform fresh looks at existing datasets, and inspire new outreach and research efforts.

Get in Touch

For all inquiries, please contact:

Christine Charles
charl122@msu.edu
www.canr.msu.edu/outreach

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