

ONFARM CASE STUDY

OVERVIEW

For Tyler McBlain and his family, research has been a regular part of their farming operation ever since his grandfather began farming full time in the early 1950s. Most – around 85% – of the McBlain Farms Ltd. fields include research trials. The McBlain family is keen on gathering information about such topics as fertility, seed variety or hybrid, crop protection, and soil health for their heavy clay soils.

The family has a corn-soybean-wheat rotation, and they also grow some oats. The McBlains have grown soybeans and wheat using a no-till system since the 1980s and have grown corn using a strip-till system since 2017. Both no-till and strip till limit soil disturbance; in the latter system, the seed rows are tilled while the area between the rows is left undisturbed.

“You can see drastic differences in the soil makeup on our farm now compared to what it was in the 1990s,” says Tyler. “The soil is much healthier and nutrient-rich after years of working to implement best management practices (BMPs) on the farm.”

The McBlain family are also long-time users of cover crops; Tyler’s grandfather began growing red clover in the late 1960s. In the past 10 years, Tyler introduced multi-species cover crops to the fields.

Soil health is a priority for McBlain Farms Ltd., and the family always seek new solutions to work towards that goal.

“We’re trying to make sure there’s a farm here for the next generation,” says Tyler. “I have three children – Ellie, John and Ben. If one or more of them choose to farm, I want to make sure they have the opportunity.”



Tyler’s Soil Warrior for strip tillage

McBlain Farms Ltd.



Left to right: Ellie, Allison, Tyler, and John McBlain.

AT A GLANCE

Farmer name: Tyler McBlain

Location: Caledonia, Brant County

BMP: Comparison of cover crops on a field that has been managed well to a neighbouring field that is degraded

Soil health goals: Increase organic matter and other soil health indicator values

WHAT IS ONFARM?

The On-Farm Applied Research and Monitoring (ONFARM) program is completing extensive soil health and water quality analysis on 32 farm sites across southern Ontario. This network of sites and newly established partnerships will help to build a stronger understanding of best management practices (BMPs) and their effect on soil health and water quality on Ontario farmland.

ONFARM DATA COLLECTION

- Investigators led by Don King, Principal and Research Agronomist at the Soil Resource Group (SRG)
- Soil health indicator tests: physical, chemical and biological measurements
- Other baseline soil data: horizons, texture, drainage class, structure characterization, and soil type
- Field landscape and soil degradation assessments, agronomic monitoring, and BMP costing

THE TRIALS

The overall goal of the McBlain trials is to compare the impact of using a BMP on a plot that has been well-managed for decades, with an adjacent field that was newly introduced to the McBlain's management system.

The family has managed Field 1 for approximately 60 years. This field has been in a good long-term rotation with cover crops, which has built the soil up to the condition it is in today. Tyler started managing Field 2 in 2015. Previously, the field had a short crop rotation, rarely had cover crops, and was heavily tilled.

The side-by-side fields were chosen to easily compare soil health and crop yield between the fields. Both fields have similar heavy, clay soil.



Fields 1 (left) and 2 (right)

“Theoretically, if they were treated the same over the long term, the yields should be very similar,” says Tyler. However, that situation is not the case. Field 1 yields more than

Field 2 – and this difference can be attributed to the soil health differences in each field.

Tyler describes the soil in Field 1 as spongy and soft, whereas the soil in Field 2 resembles pavement. Soil that breaks apart easily is often considered healthy and rich in organic matter and nutrients. While it is evident past management practices have led to drastic differences in soil health, Tyler wants to use these ONFARM trials to see how both plots of land respond to various BMPs.

For the duration of the trials, Tyler left a one-acre strip in both fields where the BMP would not be implemented. This strategy will enable Tyler to evaluate the impact of using cover crops and how long it takes to improve yields and soil health.

In 2020, Tyler grew winter wheat under no-till management, followed by a cover crop mix. In 2021, Tyler grew corn under strip-till management. In 2022, Tyler grew soybeans under no-till management.

Already, Tyler has noticed differences between the fields. Field 1 had nearly no yield difference between the cover crop versus no cover crop strips; in Field 2, Tyler saw a yield loss where the cover crops were planted and a yield advantage without cover crops. “Although there wasn’t a drastic difference, there was a measurable yield loss,” says Tyler.



In the short term, as farmers transition to include cover crops in their operations, particularly on degraded soils, they may experience slight yield decreases. Over time, farmers' yields will stabilize and may increase with the use of cover crops in their rotations.

The soil health indicators also show the differences between the two fields. Field 1 "is measurably higher in organic matter," says Margaret Ribey, the Natural Resource Scientist at SRG. Organic matter is traditionally used as an indicator of soil health.

And the fields show differences in aggregate stability, which is "a measure of the ability of a soil aggregate to resist falling apart when wetted," Margaret says. Apart from the upper landscape position, Field 1 has a higher aggregate stability than Field 2. The similarities in aggregate stability in the upper landscape position between the two fields "could be attributed to the good soil health management that's already been occurring on that farm for the last seven years," she adds.

While the ONFARM research is a three-year program, Tyler and his family will implement what they have learned through these BMP trials far into the future.

"We've learned a lot by listening and tweaking the trials to fit our own operation," says Tyler. "Connections are crucial, especially conversing with people across the province who have different ways of doing things and can provide new perspectives."



[CHECK OUT THIS VIDEO TO LEARN MORE ABOUT TYLER'S ONFARM TRIALS](#)



THE SUCCESSES AND CHALLENGES OF THE TRIALS

The ONFARM program has been a valuable opportunity for Tyler in many ways. The most beneficial aspect of the program has been talking with and learning from the researchers, he says. This collaboration has allowed Tyler to validate his results through data.

While ONFARM has allowed Tyler to gain new insights and tackle big questions about soil health and yield, the unpredictable weather events – especially in 2021 – challenged this trial process. However, the challenges from weather are a reality of on-farm research and require resilience and adaptability, he adds.

For those individuals new to on-farm research, the key to successful trials is to start simple and small, Tyler says. While it can be overwhelming to delve into new territory when it comes to farming, do not be afraid to try things, he adds.

"There are failures out there, but that's how we learn," says Tyler. "There's nothing wrong with trying something new."

