

ONFARM CASE STUDY

OVERVIEW

Norm Lamothe, a farmer in Peterborough County, is dedicated to optimizing his soil health to improve his 500-acre farm's productivity.

At Woodleigh Farms Ltd., Norm's soil-health journey started ten years ago when he went into the fields with his son to investigate the soil's microbial community. The Lamothe family had participated in the Soil Your Undies challenge, which involved burying a pair of cotton underwear in a field and returning about two months later to dig it up. Despite the length of time in the soil, the underwear remained in near-pristine condition. This finding suggested limited microbial biodiversity in the soil and helped to prompt Norm's search for ways to enhance the farm's soil health.

Since then, Norm has been dedicated to enhancing his soil health, which will also benefit crop yields. On-farm research is key to his efforts. "Research has always been part of what we do," says Norm. "Probably the first ten years was accidental research where we'd measure mistakes and flaws in the field, but since then, it's been a little more targeted."

The family have long studied different nutrient applications, says Norm. Recently, they have focused on more detailed data analysis to allow for smarter and more precise decision-making on the farm. For example, they started doing some variable rate nitrogen applications, which means applying different fertilizer rates in different parts of a field.

"If we can't measure it, we can't improve it," says Norm. "Something I advocate for all farmers is to go past observations and take the time to calculate what decisions cost at a farm level."

That data has allowed the family to measure and calibrate their decisions to ensure they can be economically sustainable, Norm adds.

In addition to self-guided research, Norm has actively sought support from various farm groups. Norm became a cooperator in the On-Farm Applied Research and Monitoring (ONFARM) program in 2020. In 2021, he participated in the Ecological Farmers Association of Ontario's Farmer-Led Research Program. And, in 2022, Woodleigh Farms Ltd. was accepted as a member of the Ontario Soil Network.

Woodleigh Farms Ltd.



AT A GLANCE

Farmer name: Norm Lamothe

Location: Cavan-Monaghan, Peterborough County

BMP: The use of cover crops in a rotation and an organic amendment

Soil health goals: Increase organic matter and microbial health and optimize nutrient inputs

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 effects 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

Through his ONFARM trial, Norm seeks to increase organic matter and microbial health, and to optimize fertility inputs. His BMPs are the use of cover crops in a rotation and applying an organic amendment.

Historically, the farm had a two-crop rotation of corn and soybeans. Four years ago, Norm added wheat as the third crop in his rotation. Two years ago, he added oats as a fourth crop in the rotation.

Norm has committed to leaving a 240-foot strip in a two-crop rotation indefinitely to serve as a permanent control strip. Norm's ONFARM trial is located beside that strip.

In 2020, as part of his ONFARM trial, Norm planted corn under no-till management with an interseeded cover crop. That year, the SRG team gathered the baseline soil data for comparison in subsequent years.

In the spring of 2021, Norm applied a liquid biosolid from a municipal source. Then, he planted soybeans under no-till management. He interseeded the soybeans with buckwheat using a broadcast sprayer but, unfortunately, this cover cropping trial had limited success.

In the fall of 2021, Norm applied another organic amendment.

In 2022, Norm grew oats and interseeded it to red clover. The family interseeded oats into red clover in another field in 2021 and harvested high-quality oats in a very dry season. The red clover proved to be challenging, however, as it "did too well and became a nightmare at harvest," Norm says.

He looks forward to continuing his trials and his learning. "Hopefully, we find a way to share that information with everyone so that they can learn from it as well," he adds.



THE SUCCESSES AND CHALLENGES OF THE TRIALS

Monitoring soil health requires a longer time frame to see significant changes; however, learning from the process and asking questions has enabled Norm to make smarter decisions, he says.

Within the last couple of years, the farm has experienced many benefits from the addition of organic amendments. Norm has acquired biosolids from the local municipality, mushroom substrates, as well as leaf and yard waste from the county to be processed and applied to the fields.

In 2021, Norm's yield monitor showed some soybean yield benefits from his spring liquid biosolid application. However, the yield difference was not statistically significant across the trial.

In the long run, Norm hopes the addition of these organic amendments will help reduce the farm's commercial fertilizer needs.

"I think there are successes around all of the things we're doing, but we have to replicate it further into the future to further tease out the findings," says Norm.

While Norm has seen many successes, he also notes the challenges throughout the on-farm research process. For example, variations in the field can pose hurdles.

"The field in the ONFARM trial has a long hillslope made up of medium and coarse soils. Norm has observed pockets of side-hill seepage and dry areas, which can affect localized results," Don King says. This situation underscores the need to "be aware of the characteristics of a site and its potential to support one BMP over another. ONFARM's site-specific management approach in

collaboration with the growers helps to evaluate BMPs and their suitability for a location."

Persistence and commitment to a viable long-term program will be crucial to the success of on-farm research initiatives, Norm says.

"Communicating about these challenges and achievements and learning from other growers' experiences have helped us accelerate our learning during this research program," says Norm.

"These initiatives are awesome as I'm learning something new about soil health every day."

