

Spotlight on soil health: In the field with farmers

Wellington producer has found less tillage will let the soil do its work

BY LILIAN SCHAER

Farm & Food Care Ontario

(This article is part of a series profiling different Ontario farmers, their farms and soils, and how they're addressing the issue of soil health on the land in their care.)

Carl Brubacher farms near Arthur in Wellington County, where he and his family raise hogs and grow cash crops on Carlote Farms.

The main crops are corn, soybeans and wheat, but they also grow edible beans, canola, oats and spring wheat. Their biggest soil health challenges include excess tillage, soil and nutrient erosion, decreasing topsoil levels, picking stones, and soil compaction.

What are the biggest challenges that you face with respect to soil on your farm and how do they impact yield and productivity?

Our biggest challenge was the long-term negative effects of excess tillage and heavy rainfall causing soil density layers, shallow rooting, soil and nutrient runoff to the river and wind erosion - all contributing to decreasing topsoil levels and negative impacts to worm populations and soil health. Another big negative to full tillage is the lack of aggregate stability and the ability for soil to carry equipment weight, therefore increasing compaction. Full tillage was also bringing up a lot more stones.

What are some of your practices to promote soil health?

Rotation:

We've always done crop rotation. Our principal crops are corn, soybeans and wheat, but we also grow edible beans, canola, oats



Carl Brubacher, back row second from left, farms with his family near Arthur in Wellington County, raising hogs and growing cash crops.

and spring wheat.

Cover crops:

We broadcast a red clover mix of 50% single cut and 50% double cut into wheat fields in March. It's easy to do and the best cover crop for producing nitrogen.

If it is a light stand, we will broadcast a small amount of oat seed and then run the Cursebuster tine tillage machine across it, fracturing the soil with the Eagle tines while the harrow is tickling in the oat seed. It is really neat to watch the clover and oats growing together from two vastly different planting dates.

If manure is available, it is spread after the tillage pass and is immediately absorbed by the frac-

tures and the growing crop.

The cover crop is sprayed off in the fall, but the residue cover is still there and protects the soil all winter - therefore experiencing clean water runoff and white coloured ditches versus brown soil as the colour of spring!

In an early harvest year, we also broadcast cereal rye into the corn stalks after harvest so there is live rye growing in the decaying corn stalks over the winter and spring months.

Tine tillage and no-till:

In 2015 we switched from full tillage to targeted tine tillage. The low-disturbance Eagle tine fractures the soil with hairline fracture lines while alleviating compaction,

as well as breaking density layers while leaving roots intact to decay where they grew.

Restrictions to air and water exchange are eliminated, leading to an aerobic soil condition. Capillary water movement is enhanced. The unique fracturing of the soil resists all forms of erosion by improving infiltration and percolation.

We are fracturing the soil without relocating it so it can breathe, which enhances the earthworm populations etc.

The crop residue stays on top, which is where the worms want it.

In the past, when we plowed corn stalks under, they would still be some there to be found three years later and now they are disappearing from the top down.

Amidst natural decay, the

worms work at the stalks at night, pulling them into the soil and processing them. It's an incredible sight and sound to watch and hear.

Manure:

We use mostly nursery hog manure from our farm, but we also use some from other sources, like Lystek (note: Lystek International is an Ontario-based biosolids and organics management company).

What is the most important change that you have made on your farm with respect to soil health? Or the one that has had the biggest impact?

The change in tillage is the most important change and has had the greatest impact. Our yields have been fantastic with excellent weed control and moderate fertilizer applications while at the same time encouraging an ecosystem for the regeneration of soils.

What advice would you have for other farmers with respect to soil health?

Do something. Make it work with a long-term vision.

Advancing soil health requires adequate attention to air and water management and directly-related gas exchange. Increasing beneficial microbiome density and diversity develops with efficient gas exchange resulting from water movement. Make it happen! Come up with a plan to grow fungi, build soil active carbon, increase worm populations and protect the soils in our care.

(This project was funded by the Canadian Agricultural Partnership, a five-year federal-provincial-territorial initiative. It was led by Farm & Food Care Ontario with the generous co-operation of Ontario farmers. To read the full series of farmer profiles visit: www.farmfoodcareon.org/farming-and-the-environment/soil-health/)



Brubacher on tine tillage: "Our yields have been fantastic with excellent weed control and moderate fertilizer applications while at the same time encouraging an ecosystem for the regeneration of soils."



Tine tillage fractures the soil without relocating, boosting earthworm populations, says Brubacher.



Cover crops are a key part of Brubacher's soil health mix. Shown here is spring seed red clover growing with fall seeded oats.