How to Raise Healthy Soil For The Ultimate Harvest Every Season

If you want to see what’s happening in soil that’s healthy and full of life, grab your shovel and head to Al Miron’s farm near Crooks, South Dakota. When he plants his no-till corn he stops to make sure the seed is planted to the correct depth. At the same time he counts the number of worms he can find.

Miron said, “It’s not uncommon for me to find six to 10 worms between two kernels of corn. And when you spade my soil in June, you’ll find enough worms to go fishing. You don’t normally think about going out to a farmer’s field to look for worms. You find worms in a grove or a wet area. But with residue, you’ll find worms in my fields even in the middle of summer.”

According to the Natural Resources Conservation Service (NRCS), earthworm populations consume two tons of dry matter per acre per year, partly digesting and mixing it to form healthy soil. The burrowing and feeding activity of earthworms provides improved water infiltration and soil aeration.

Natural Resources Conservation Service
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Total earthworm populations in long-term no-till fields like Miron’s are typically at least twice those of conventionally tilled fields, because tillage destroys the habitat earthworms need to survive.

Do Not Disturb

Miron and a neighbor farm 1,400 acres of cropland with a no-till farming system. The two own equipment together because it’s an efficient and cost-effective way to plant and harvest their crops. No-till is one of the soil health management practices they use to improve the water holding capacity of their ground. No-till allows organic matter to increase and compaction to decrease. Soil microorganisms, fungi, and other tiny life forms, along with earthworms help build organic matter, providing moisture and nutrients to growing crops.

In 1972, Miron bought his first parcel of land. He owns a relatively small operation. He wanted a place close to his employer near the business services in Sioux Falls. That’s because he was working off the farm in animal nutrition and research, plus doing consulting work. He retired in 2009, but continues his consulting work to teach others here and abroad how to farm.

Back then there was no emphasis on soil health. Farmsteads were not classified in terms of erosion potential such as Highly Erodible (HEL) or Non-Highly Erodible (NHEL) like they are today. Now a landowner’s farming systems must comply with the highly erodible provisions in the Farm Bill to minimize soil erosion.

Some of the ground Miron bought is prone to erosion. He was aware of this when he purchased it. “This farm has been plowed only once since I’ve owned it. It’s been chisel plowed. And then I went from minimum till to no-till,” he said.

No-till, crop rotations, and experimenting with cover crops, are a few things that Al Miron, Crooks, SD, does to make for a soil-friendly environment for trillions of earthworms, microorganisms, fungi, and other tiny life forms, to build up the soil health on his farm. He also invests considerable time to monitor his fields for weed pressure, pest control, and overall crop performance.

Some people think that crop residue in the field doesn’t look as nice as conventionally tilled fields. “But you’ve got to look beyond that and see the good that residue does,” he said.

For example, on Miron’s main farm in Minnehaha County, SD, the soil organic matter measured as high as 4.7% in 2014. That compares to only 2.4% in 1994. This progress is evidence of high-performing, productive soils. Organic matter is an essential component of soils, providing a carbon and energy source for soil microbes. It also stabilizes and holds soil particles together, reducing the hazard of erosion and aids the growth of Miron’s crops by improving the soil’s ability to store and transmit air and water.

Bank Water for Dry Periods

Soil moisture may cause some concern when you’re new to no-till as a means to nurture soil health. Under the residue, Miron’s soils stay wet so he may not be able to plant as early as his neighbors who conventionally till. To plant on the right day he’s got to manage his soil with proper drainage.
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As a result, he’s involved in water infiltration studies with the help of Deron Ruesch, District Conservationist at the Minnehaha and Lincoln County NRCS, and Anthony Bly, Sioux Falls-based soils field specialist with South Dakota State University Extension.

Following six replications, in one test it took under two minutes for an inch of rain to soak into one of his no-till fields. In conventionally-tilled corn over the fence, it took 11 minutes for an inch of rain to soak into the ground.

In another experiment, the average time for two inches of rain to infiltrate his no-till was nine minutes. This compared to 41 minutes in a conventionally tilled spot. He said, “When you turn over those samples of dirt you could see a lot of worm holes and root holes. That’s why the water soaked up so well.

This past June, Miron recorded an astounding 10-inches of rain for the month. Some of it fell in the form of a heavy downpour. Surprisingly, the only water that he saw run off his no-till fields was water from culverts or flooding from land across the road. Due to no-till, there was no runoff from rain that had fallen on his property.

No-till farmer, Al Miron, Crooks, SD, pulls a fertilizer cart behind the planter to apply fertilizer underground in a band three inches away from the row. This minimizes nutrient loss and keeps the fertilizer from washing to the Gulf of Mexico if he gets a heavy rain. Good water infiltration is also a big part of that because he rarely has water runoff. Now the rain soaks into the soil and is a ready reserve to water Miron’s thirsty crops on hot summer days.

Experiment with Cover Crops

Miron recently began working with Dr. Pete Sexton, manager of the SDSU Southeast Research Farm, Beresford, SD, to experiment with seeding cereal rye, a cover crop, in strips following corn harvest. It’s too soon for final results. However, his soil structure improved. And his soil is also more crumbly; what healthy soil feels like.

Cover crops restore soil health because they increase organic matter in the soil. The key is to keep a live root in the soil as many months during the year as possible. Cover crops can improve water infiltration into the soil.

Check out the size of this worm hole on Miron Farm in Minnehaha County, SD. Total earthworm populations in long-term no-tilled fields like Al Miron’s in Crooks, SD, are typically at least twice those of tilled fields. As earthworms burrow and feed underground, their activity provides improved water infiltration and soil aeration in his fields.
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For example, deep-rooted crops like forage radishes create natural water passages and eliminate the need for tillage to break up compacted soils. Legume cover crops serve as natural fertilizers while grasses scavenge nutrients that are often lost after harvest or during winter.

Along with Miron’s crop residue above ground, cover crops protect his soil against heavy, erosive rain and strong winds. Cover crops also trap excess nitrogen, keeping it from leaching into groundwater or running off into surface water, releasing it later to feed growing crops.

If you’d like to address soil health concerns on your farm, Miron advises you to get started by talking to other farmers to find out what’s working for them. He said, “I’m always happy to help farmers and share my thoughts with them. My problems or concerns may not be the same as someone else’s, but we can learn from each other. Most farmers are willing to help other farmers.”

View Interview on YouTube at: https://www.youtube.com/watch?v=us1Yw9BCD-0&t=69s

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Al Miron’s Soil Health Achievements

- Years no-tilling: 25
- No-till acres: 1,400
- Soil Organic Matter 1994: 2.4%
- Soil Organic Matter 2014: 4.7%
- Cover Crops: Experimental basis now

SAVINGS from No-till

- Farm Machinery: 48%
- Repairs: 12%
- Fuel, Oil, Grease: 25%
- Time & Labor: 20%