



A JOURNEY TO NO-TILL COVER CROPS

By Kurt Lawton for SD-USDA Soil Health Initiative

If you monitor soil moisture, your journey into less tillage and successful cover crops on soybean and corn acres increases dramatically,” says Austin Carlson, who farms with his dad, Bruce, near Garretson in southeast South Dakota.

The Carlson’s sloping soils, gully and wind erosion led them on a journey to achieve more resilient soils. What pushed them forward was a caring and knowledgeable mentor across the fence and a gully-washer rainstorm.

That mentor across the fence was SDSU Extension Soils Field Specialist Anthony Bly. “We’re fortunate to farm next to Anthony, who spent several years encouraging us to try no-till and cover crops. It was an eye-opener seeing the difference between his no-till field soils and our conservation-tilled soils,” Carlson says.

A GULLY-WASHER KICKOFF

Watching a heavy spring rain soak into Bly’s no-till field yet create gullies across the fence jump-started Carlson’s family farm journey into no-till, beginning with soybeans.

“Seeing our soil wash away made us realize our current practices were not sustainable. So my dad, who started no-tilling beans a few years earlier, shifted one corn field to no-till in 2016,” Carlson says. “By 2018, we were 100% no-till and never looked back.”

Carlson credits his dad’s use of the NRCS EQIP program as a driver that helped the transition. A three-year commitment to several fields using no-till and cover crops provided a great learning platform to get beyond the hiccups of planter adjustments and cover crop experiments.



South Dakota cattle owners seeking grazing. (Source: SD Grazing Exchange)

Bruce’s efforts helped pave the way for Austin’s recent no-till upgrade of an older planter. “When I had seeding depth challenges this spring, my dad and other mentors were quick to help with weight and down-pressure solutions,” Carlson adds.

SOIL HEALTH SCHOOL BOOSTS JOURNEY

In 2018, the second springboard in their soil health journey happened when Bly recommended that they attend the hands-on SD Soil Health Coalition’s (SDSHC) annual soil health school.

“The event was at Kurt Stiefvater’s farm near Salem, where we gained an amazing amount of practical knowledge from farmers about their journeys of what works and what doesn’t,” Carlson says. “We didn’t know anyone, yet everyone welcomed us and willingly shared the details of their practices in classroom and field

demonstrations. The school had such a profound impact on my soil management perspectives that I quit my off-farm job to find work promoting soil health.”

Fortunately, SDSHC had an open position, Carlson applied, and he’s been working as a soil health technician for the past five years, along with farming. “Without this group, we wouldn’t have interacted with so many great mentors that continue to have a big impact on our farm,” he adds.

ADDING A THIRD CROP

By attending this confidence booster program, Bruce and Austin began experimenting with greater crop diversity by growing small grains, followed by a cover crop in 2018, in rotation with their corn and soybeans.

The Carlsons learned to think holistically to examine all fields on their small farm with a purpose in mind. Nearby fields, easily accessible by cattle, are rotated with a small grain crop followed by drilling a diverse and economical cover crop mix that is grazed. A corn-soy rotation is used on the remaining fields unreachable by cattle, followed by cereal rye or winter wheat cover crop in sensitive areas that are generally wet or subject to erosion.

To save money on cover crop seed, Carlsons keep their small grain crops of cereal rye, oats, or wheat to use later as a cover crop. They also sell seed to some neighboring farmers, a seed supplier and use it for custom drilling.

On cropland they want to graze, Carlson’s wife and partner Baylee, an NRCS soil conservationist, helps develop cover crop species blends. “We’ll add a diverse mix of millets, sudangrass, turnips, radishes, cowpeas, sunflowers, rapeseed and flax. We aim to keep the mix inexpensive, shooting for 60-70% cool and warm season grasses, with the remaining species divided among cool and warm season broadleaf species,” he says.

GRAZING COVER CROPS

Seeding cover crops after a small grain harvest allows the growth of these diverse mixes to be fall grazed. The Carlsons have electric wire border fences and run strands of poly wire to section

off grazing areas. They like the flexibility to vary grazing area size based on their harvest schedule and the weather.

“This balancing cow and calf diets with days of cover crop grazing keeps farming fun, and it’s taught us the most about soil health,” he says. “Baylee and I get excited when we’re out there moving wire, seeing manure get distributed nicely, learning what species the cattle like to graze or not, watching root growth and soil structure improve, and seeing cattle in great condition with big calves when we wean them.”

One experiment they tried last year was adding five or six pounds of clover when drilling their oat crop—to hopefully eliminate the cover crop drill pass and fuel expense. “The clover established with the oats and remained dormant until we harvested the wheat. Unfortunately, it was a dry summer, and the clover stand wasn’t enough to graze,” Carlson says. “But it overwintered thanks to a nice layer of snow and produced what looked like a field of alfalfa this spring.”

Carlson is encouraged by this practice and believes it should work out well, given adequate moisture. They no-tilled corn into that clover stand and gained an excellent legume fertility credit.

WATCHING MOISTURE, PLANTING GREEN

Like that clover stand, the Carlsons no-till seed their corn or soybeans green into the growing cover crop that follows small grains if adequate soil moisture exists.

One critical cover crop management detail they’ve learned is paying strict attention to soil moisture. “Our favorite practice when it’s wet, like in 2018 and 2019, is to let the cover crops grow for a while to absorb excess moisture. More growth adds roots that loosen compaction and build soil structure and just no-till corn or soybeans right into it,” he says. “And we have the flexibility if it’s dry to terminate the cover crop early so it does not impact the cash crop.”

Over the past few years, this lack of moisture has challenged fall cover crop stand establishment in South Dakota. But, on the other hand, blowing soil has helped cropland farmers realize the damage that tillage can cause—even loss of life on roads and highways when flying soil impedes driver visibility.



Carlson acknowledges that no-till and cover crops have been a learning journey, like so many challenges in farming. But by looking more critically at soil health and understanding these new practices, he says it's been a lot more fun than just doing the same tillage thing every year.

“At the very least, our soil health has greatly improved in five years. By implementing the Five Principles of Soil Health, we maintain soil cover year-round with living roots to cut water and wind erosion. Our no-till soil is crumbly to provide a good seedbed with limited disturbance. We’ve added small grains and cover crops to add plant diversity. And we’ve integrated livestock to increase soil biological activity, improve nutrient cycling while providing quality food for our cattle,” he adds.

PRODUCERS REDUCING TILLAGE

SDSU forage agronomist Sara Bauder is hearing more questions from row crop producers interested in adding cover crops. “Their goals run the gamut from stopping erosion and grazing animals to retaining more soil moisture and building soil health,” she says.

In Carlson’s travels for the SDSHC, he noticed a lot less tillage last fall, given two years of dry weather and the impact of blowing soil. “And this spring, I’ve seen many more no-till soybean fields, which is a step in the right direction.”

“Cover crop adoption is on the rise thanks to increasing awareness that soil health is essential and not just a trend,” Bauder says. In addition, groups like the Soil Health Coalition; the Grasslands Coalition; the corn, soybean, no-till and forage associations; SDSU Extension, and NRCS are all working to help producers use cover crops to best fit their operations. And many incentive programs are available to help reduce seed, application costs and reduced tillage practices.

NRCS Agronomist Eric Barsness from Brookings says the easiest practice to achieve successful cover crops is after silage or small grain harvest because species grow more before frost. “For corn-soybean rotation, I think aerial seeded cereal rye applied in late August or early September works well if adequate moisture exists,” he adds.

For soybean and corn producers without livestock yet want to explore the value of cover crop grazing, you might find a local connection. The SDSHC offers a free state-wide Grazing Exchange to connect people who seek grazing for their animals with producers who have fields available for grazing.

COVER CROP MENTORS

Carlson recommends using the Mentor Network of experienced South Dakota soil health farmers, compiled by the SDSHC. In addition, you can now download a free mobile app called *Growing Connections*. “It’s a fun opportunity for local farmers to talk to farmers. I look at it like a localized AgTalk where you can pose soil health questions or issues and get numerous responses that offer solutions or ideas to try,” he says.



Midwest Cover Crop Decision Tool

A second recommendation from Carlson mirrors their journey. “Since I believe in unbiased information from other farmers or researchers, attending the Soil Health school provides great access to so many quality mentors practicing many cool soil-improving practices across the state—and no one is selling anything,” he adds.

In August, the Carlsons are paying their knowledge forward by partnering with their local mentor Anthony Bly to host the 2023 SD Soil Health School on their farms.

One valuable takeaway that mentors helped the Carlsons prove to themselves during the transition to no-till and cover crops is that better soil biology can dramatically improve farm resilience and sustainability. ■

RESOURCES:

Five Principles of Soil Health: sdsoilhealthcoalition.org/technical-resources/the-five-principles-of-soil-health

Grazing Exchange: sdgrazingexchange.com

Mentor Network: sdsoilhealthcoalition.org/mentor-network

NRCS Cover Crop Selection tools for South Dakota: nrcs.usda.gov/conservation-basics/conservation-by-state/south-dakota/cover-crops-in-south-dakota

SD Soy Soil Health resources: sdsoybean.org/topics/soil-health

Midwest Cover Crop Decision Tool: midwestcovercrops.org/selector-tool

Growing Connections Mobile App: sdsoilhealthcoalition.org/growing-connections-app

2023 SD Soil Health School: sdsoilhealthcoalition.org/event-calendar/soil-health-school

SOURCES:

Austin Carlson, Garretson SD farmer and Soil Health Technician, SD Soil Health Coalition

Eric Barsness, NRCS Agronomist, Brookings

Sara Bauder, SDSU Extension Forage Agronomist