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BALE GRAZING

Efficient Soil Health Improvement

By Stan Wise

“Last winter, I fed 450 head of cattle and did not start a tractor for 90 days.” South Dakota Soil Health Coalition Board member and Colome, SD, producer Van Mansheim doesn’t mince words when it comes to the benefits of bale grazing.

“I hear many producers talk about they’re gonna go do chores for four hours and five hours feeding their cattle. That’s all they do all winter,” he said. “We go out there and roll up a fence every four or five days, and it takes an hour.”

Mansheim runs ManBull Farming with his nephew, Heath Bullington, and together they raise wheat, oats, corn, soybeans, alfalfa, and cover crops, and they custom graze cattle. They use bale grazing – the practice of arranging hay bales on a grid and allowing cattle access to a few bales at a time – to improve their soil, save money, and make their lives easier while feeding cattle in the winter.

Mansheim grazes cattle on corn stalks and cover crops earlier in November and December. In January and February, he lets the cattle graze hay bales. “We set up all the bales before it freezes, usually in later November, early December before the ground freezes, and we take off all the net wrap because we don’t want the cows to have to digest that,” he said. “So that takes roughly about, I would say, eight hours to set up, say, 150 bales – two people. And then every time we move our fence, about an hour.”

Mansheim places his hay bales in rows on the same land where they were hayed. “We line them up in rows because we only give the cattle a certain amount of feed – roughly four to five days of feed at a



Heath Bullington moves fence to allow cattle access to more hay bales as part of the bale grazing practice he manages with his uncle, Van Mansheim, in their ManBull Farming operation near Colome, SD. Photo courtesy of Van Mansheim.

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2022 Soil Health School Wraps Up!

See Page 5 for photos and more information about the recent Soil Health School hosted on the Anthony Bly and Bruce Carlson farms near Garretson, SD!

time,” he said. “So, if I have 150 head of cattle, it’s going to be around 15 bales. If the group is 200 head of cattle, they’re going to have 20 bales.”

Improving soil

There’s a good reason Mansheim grazes the hay bales on the same land where it was grown — his soil. “When you remove the hay or forage, you’re removing all the nutrients. You know, the nitrogen, the phosphorus, the zinc, all the micros,” he said.

That’s why he started bale grazing three years ago. “I could tell our soil was being degraded because we had been haying this ground for 40 years, and we were bringing it into our yard to feed it, but it never got back to the landscape. So, we were actually exporting nutrients from that soil, and the result of that, I was seeing that we were losing hay production.”

Mansheim also noticed problems with his hay ground in wet years. “When it got wet, I was noticing all of a sudden we were having these low spots that were turning into cattails and just weeds,” he said. “It was killing the grasses that were there, and then I was getting saline spots, so I knew I had a broken water cycle, and so that is one reason we do it is to improve water infiltration.”

The benefits

The bale grazing plan is paying off. “It’s totally improved the water



The grass was taller and thicker in July 2022 in the spot where a hay bale was grazed by cattle the previous winter on Van Mansheim’s operation near Colome, SD. Photo courtesy of Van Mansheim.



Cattle graze a bale of hay at ManBull Farming near Colome, SD. Photo courtesy of Van Mansheim.

infiltration, and the cattails are virtually gone off that hay ground in three years. The grass has come back,” Mansheim said.

“Wherever those residue piles are after they eat them, the infiltration is just phenomenal there, and the biology — it increases the biology. Even though this year we were sort of dry, we have increased hay production on this piece of ground about 30 percent in three years, and we do not fertilize it.”

Mansheim acknowledges a major concern that some producers have about bale grazing. “One big concern people have is waste, and we do not see that at all. For one, I don’t consider anything that they leave as waste because it’s feeding the soil,” he said.

“Two is cattle are tougher than we give them credit for. We force them to clean up those piles before we give them the next row.”

Mansheim keeps a close eye on the cattle to keep them healthy. He makes sure they have a clean, steady water source. He also maintains wind breaks, and he adjusts the amount of time between fence moves based on the temperature, since cattle need more hay in colder weather. “We go out there every day, but we just drive around out with them and be out with them, and it’s a lot less expensive driving a four-wheeler or side-by-side and a pickup than a tractor,” he said. “It’s so economically and time efficient. It’s a win-win.”

This simple, effective soil health practice is making a noticeable difference in Mansheim’s operation.

“This spring, when I was cutting out there, you can see exactly where the piles were from the last three years,” he said. “It’s thicker. It’s darker green. It looks like I fertilized it.”

To learn more about sustainable land management practices, visit www.sdsoilhealthcoalition.org.

Membership Minute: Scott and Paula Hamilton

Scott and Paula Hamilton run a diverse operation near Hitchcock, SD, along with Scott's brother, Jeff. Scott has been farming for 40 years. Together they grow corn, soybeans, rye, alfalfa, grass hay, and cover crops. Their livestock operation involves beef cows (including two feedlots), dirt-raised swine, sheep, and goats.

Hamilton's soil health journey started 10 years ago. "I pursued soil health because I attended some meetings and realized that there has been loss of fertility in our soils," he said. "I looked at my dead spots in some of our fields and decided that something had to change."

So, Hamilton took action to address the problem. "I worked with a local seed company to develop a blend of grass that would grow in saline and sodic soil areas," he said. "These areas are now used for hay, grazing, and wildlife production, and they work great."

For Hamilton, this process started by changing the way he looked at his operation. "You need to change your mindset first. Then there are unlimited possibilities," he said. "The way that I changed my mindset was by questioning the status quo."

More than seven years ago, he started growing cover crops for grazing and soil health, and Hamilton continues to learn new soil health management practices. Today, they are composting cattle manure, cattails, and woodchips to use as organic fertilizer. "Our long-term goals are to reduce synthetic fertilizer and use more natural fertilizer, which will increase the organic matter, water holding capacity, and try to be more economically sustainable," he said.

With improved soil that will continue to be fertile in the future, Hamilton is making sure he can enjoy more of his favorite days on the farm, which include a "beautiful sunrise, crisp air, tagging newborn calves, or working with small animals."



Scott Hamilton worked with a local seed company to develop a blend of grass that would grow in saline and sodic areas. SDSHC photo.

SDSHC Makes Resources Available as Mobile Apps!

The South Dakota Soil Health Coalition is proud to announce that the Soil Health Assessment Card and Cover Crop Grazing Worksheet are now available as mobile apps!

With the Soil Health Assessment App, users can input information about the practices used on each of their fields to receive and record a soil health score based on the information provided! This allows producers to get a baseline assessment of their soil health and identify ways to improve it! To download this app, search for "Soil Health Assessment App" in the Google Play Store or Apple App Store!

With the online and mobile Cover Crop Grazing Calculator, users can calculate the available forage in a cover crop and how long to graze their livestock on a set area of the field! This calculator can be downloaded as an app for a mobile device, or it can be used with a web browser. This calculator is ONLY available at tinyurl.com/CoverCropGrazingCalculator.

Questions about the apps can be directed to the South Dakota Soil Health Coalition at sdsoilhealth@gmail.com or 605-280-4190.

Grazing Cover Crop Calculator Form

Email

example@example.com

Field Number (if applicable)

Step 1: Estimate Total Production

Dominant Season for Cover Crop *

- ☐ Warm-season
☐ Cool-season
☐ Mix of warm- and cold-season

Average Cover Crop Height (inches) *

ex: 23

Total Production for Warm-Season Dominant Crops (lbs/acre)

Total Production for Cool-Season Dominant Crops (lbs/acre)

Total Production for Mix of Warm- and Cool-Season Dominant Crops (lbs/acre)

Upcoming Soil Health Events

Oct. 12

2022 Eastern
South Dakota
Water Conference
Brookings, SD

Oct. 13

SDSHC Board Meeting
Online and Pierre, SD

Nov. 3-4

South Dakota
Stockgrowers Assoc.
Convention
Spearfish, SD

Nov. 10

SDSHC Board Meeting
Online and Pierre, SD

Nov. 17-19

South Dakota Local
Foods Conference
Sturgis, SD

Nov. 29-30

Ag Horizons
Conference
Pierre, SD

Dec. 12-14

South Dakota
Cattlemen's Assoc.
Convention
Pierre, SD

Jan. 23

Midwest Cover Crops
Council Conference
Sioux Falls, SD

Jan. 24-25

South Dakota
Soil Health
Conference
Sioux Falls, SD

Jan. 26-28

Northern Plains
Sustainable Ag Society
Food and Farming
Conference
Fargo, ND

Access Our Events
Calendar [HERE](#).

Soil Your Undies

By Keah Munsen
NRCS Pathways Program Student

Healthy soil is the foundation of productive, sustainable agriculture. Therefore, it is important for us to maintain our land to keep the billions of microbes in the ground who love the healthy soil. Whether you are on crop, range or forestland, the quick and dirty way to test your soil health is by “planting” a pair of new, cotton underwear in the site you are curious about. I participated in this project as part of my NRCS pathways summer internship. I planted two pairs of new cotton underwear a few feet apart within the same corn field on June 2, 2022. I performed this project by having one pair of underwear as the control, while the second pair of underwear I poured extra amounts of water onto the ground where it was buried. This procedure was to test if there would be a difference in the soil microbial activity between an area that received more moisture, compared to the area that was only relying on the occasional rain that fell in the area. On June 2nd, I poured extra water onto the second pair of underwear. I then proceeded to water that same pair of underwear during times of the months where the area did not receive any precipitation. The second watering date was June 28th, third watering date was July 10th, and the last watering date was July 17th. Natural precipitation occurred during the weeks not watered.

The more the undies are deteriorated, the healthier the soil. After about 50 days, I dug the underwear up on July 21, 2022, to compare the results of microbial activity in the soil. If you look at the pictures provided as reference, you can clearly tell from the deterioration of the cotton underwear, this soil contains numerous amounts of soil microbes who are happy with where they are at. Plus, the microbes are staying busy within the soil. The control pair of underwear had a little over 50% deterioration, while the watered pair of underwear had easily over 75% deterioration. Clearly it is fair to say that the microbes seemed to like the location where we provided extra water, compared to the control site. This would lead us to assume that the soil microbes were working more, or there were more soil microbes, in the site where more moisture was provided and present.

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Control Underwear



Watered Underwear

Can You Afford to Ignore Soil Health?

Benefits of Healthy Soil:

Value of Soil Organic Matter (SOM)

LOCAL (June 2022)

Nutrient	Fertilizer Replaced	Value of having 1% SOM (per Acre)
Nitrogen	UREA	1,000lbs × \$0.86/lb N = \$860
Phosphorus	MAP	100lbs × \$2.20/lb P = \$220
Potassium	POTASH	100lbs × \$0.61/lb K = \$61
Sulfur	AMS	100lbs × \$1.15/lb S = \$115
Carbon	--	10,000lbs × \$0.002/lb C = \$20
Total		\$1,276/acre

NATIONAL (May 2022)

Nutrient	Fertilizer Replaced	Value of having 1% SOM (per Acre)
Nitrogen	UREA	1,000lbs × \$1.08/lb N = \$1,080
Phosphorus	MAP	100lbs × \$2.38/lb P = \$238
Potassium	POTASH	100lbs × \$0.60/lb K = \$60
Sulfur	AMS	100lbs × \$1.15/lb S = \$115
Carbon	--	10,000lbs × \$0.002/lb C = \$20
Total		\$1,513/acre

Compare to
\$680 in 2010!

Notes:

- Assuming 2,000,000 pounds soil in top 6 inches
- Assuming a C:N:P:K:S nutrient ratio of 100:10:1:1:1
- Calculations for 1% SOM, with 50% of the SOM from Carbon
 - Thus, 20,000lbs SOM & 10,000lbs C

2022 Soil Health School: Getting 1% Better



A class of 33 participants gathered Aug. 31-Sept. 2 in Garretson, SD, for the 2022 Soil Health School. They learned about soil structure and soil health management practices from an array of soil experts and producers.

Mornings were devoted to presentations at the Garretson Sportsmen's Club. There were detailed sessions on goal setting, soil basics, soil health systems and concepts, agronomics, soil tests, water management, cover crops, no-till, operational assessment, soil microbiology, temporary fencing, carbon management, poly cropping, and the economics of soil health.

Afternoon sessions were conducted in the field at the nearby farms of Anthony Bly and Bruce Carlson. These sessions covered weed management, cover crop mixes, livestock integration, beneficial insects, soil fertility, cover crop grazing, manure management, water infiltration tests, biomass sampling, soil sampling, bulk density, soil pit examinations, sheep grazing, planting and harvesting equipment, and a rainfall simulator.

Presenters included Soil Health Coalition Board members and staff, SDSU Extension specialists, NRCS soil scientists and specialists, crop consultants, independent and university researchers, and producers.

Evenings featured insightful panel discussions from experienced researchers and producers.

One of the key takeaways from the school was that getting even 1 percent better at soil health management could have very positive benefits for agricultural operations.

This year's Soil Health School was the culmination of the work and cooperation the Bly and Carlson families who hosted the school, SD Soil Health Coalition board members and staff, Natural Resources Conservation Service, SDSU Extension, the SD Grassland Coalition, and many speakers and volunteers. A huge thank you goes out to everyone who supported the school!



Effects of Residual Herbicides on Cover Crops

As part of the 2022 Soil Health School, SDSU Extension Soils Field Specialist Anthony Bly and South Dakota Soil Health Coalition Soil Health Technician Austin Carlson conducted a field trial to determine the residual effects of various herbicides on common cover crop species. Knowing how previously-applied herbicides will affect a cover crop is a key step in planning a successful cover crop mix. Before spending the money for seed, make sure the cover crop will work with your herbicide regime. The results of the 2022 Soil Health School residual herbicide trial can be found at www.sdsoilhealthcoalition.org/2022/09/residual-herbicide-trial/.





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Soil Health Demonstration Student Video Contest Still Open!

The 2022 Soil Health Demonstration Student Video Contest is open to all K-12 students in South Dakota! The first place entry will receive \$1,000, and the second place entry will receive \$500! This is an excellent chance for students to show off their grasp of soil health concepts and earn money to further their soil health journey! The Coalition wants to see your best soil health demonstration videos! The deadline is Oct. 14, 2022. Learn more about the contest and download entry forms at www.sdsoilhealthcoalition.org/2022-video-contest/.

2023 Soil Health Conference Registration Open

The 2023 Soil Health Conference will be held Jan. 24-25 at the Best Western Plus Ramkota Hotel in Sioux Falls and will feature keynote speakers Dr. Kris Nichols, Rick Clark, Mitchell Hora, Roy Thompson, and more!

Don't miss this outstanding opportunity to learn more about soil health land management practices! In addition to the keynote speakers, this conference will feature breakout sessions, discussion panels, award presentations, demonstrations, vendor booths, student contests, and more!

Early registrations are appreciated for planning purposes. Registration for the Soil Health Conference and Annual Meeting is \$50 and includes all event materials and meals as well as a free South Dakota Soil Health Coalition membership or membership renewal if so desired.

More information and registration options are available at www.sdsoilhealthcoalition.org/soil-health-conference/.

Producer Survey

Purdue University is working with The Nature Conservancy to understand the role of farmer-to-farmer or peer networks in promoting agricultural conservation programs and practices. These networks seek to create and facilitate platforms for farmers to learn from each other and take on leadership and mentoring positions in their community. Your insights will help us understand how effective the South Dakota Soil Health Coalition is, how you participate in the network, and how beneficial participating is to you and your agricultural operations. We appreciate your input and participation. You can find the survey at tinyurl.com/FarmerToFarmerSurvey.