South Dakota Soil Health Coalition

# Soil Visions

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## Learn How Soil Health Can Decrease Need for Costly Inputs & Provides Increased Profit Opportunities During 2020 Conference

Internationally acclaimed Australian soil health expert, **Dr. Christine Jones** shares how by increasing soil health, farmers can decrease the need for costly inputs during the fourth annual S.D. Soil Health Coalition Conference (SDSHC) held **January 15-16, 2020** in Watertown, S.D. at the Ramkota Hotel and Watertown Event Center (1901 9th Ave. SW).

"I'm greatly inspired by the multi-species cover crop revolution in the United States. Leading-edge farmers…are showing it's possible to maintain or even improve crop yields while winding back on fertilizer," says Jones in an interview with *Eco Farming Daily*. "They're building soil, improving the infiltration of water, increasing water holding capacity and getting fantastic yields. They have fewer insects and less disease. The carbon and water cycles are fairly humming on their farms."

A member of Arizona State University's Carbon Nation Team, Jones will provide SDSHC Conference attendees with information and case studies on how soil health building practices reduce the need for fertilizer, herbicides, insecticides and fungicides. **Cont. pg. 3**

## Off Season Tips to Maximize Equipment Performance

*By Lura Roti for SDSHC*

Seeding and harvest equipment play a large role in farmers' ability to implement two important soil health principles:

1. Soil cover or leaving enough residue
2. Limiting soil disturbance.

With these principles in mind, University of Nebraska Extension Engineer, Paul Jasa encourages soil health advocates to evaluate equipment performance in the off season, so they have time to make necessary modifications before 2020 planting or harvest.

"Just because it worked fine this season, doesn't mean things are in prime working condition for next season. Anytime farmers can get into the field to evaluate or learn about strengths or weaknesses of equipment – these are key learning moments. But don't wait until the planting window opens, or it's time to harvest to discover the modifications you need to make," says Jasa who has nearly 40 years' experience helping producers make farm machinery work for them. **Cont. on pg. 5**

**Register today**

To learn more about the SDSHC Annual Conference and to register, visit www.sdsoilhealthcoalition.org/annual-meeting/ or contact Cindy Zenk, S.D. Health Coalition Coordinator at sdsoilhealth@gmail.com or 605-280-4190.

# Soil Health News

## Important Announcement for Membership

The SD Soil Health Coalition Bylaws have been reviewed by the Board of Directors and updates to some of the language have been proposed. According to the current Bylaws: *"Amendments to these By-Laws may be proposed at any meeting of the Coalition. Section 2. Amendments to these By-Laws may be voted on at any meeting of the Coalition. Membership must be given 30 days written notice prior to the meeting. Amendments must be adopted by two-thirds affirmative vote of the regular members present at said meeting, or amendments may be referred to the entire membership for majority vote by letter ballot."*

Please consider this your official written notice, an announcement will also be made at the Soil Health Conference & Annual Meeting, Jan. 15-16 and a vote on the Bylaw changes will be made at the regularly scheduled Feb. Board Meeting. If you have any questions or are planning to attend the February meeting and vote please contact us at (605) 280-4190 or sdsoilhealth@gmail.com.

## Do Farming Practices Impact Stress Levels?

SDSHC recently received a USDA NRCS Conservation Collaboration Grant to study whether or not farming practices impact stress levels. Staff from South Dakota State University are working with SDSHC to develop a survey to find out. Surveys will be e-mailed to South Dakota farmers soon. Watch your in-box and encourage your friends and neighbors who farm to participate.

**Mother of God Monastery Milpa Garden Yields Fresh Produce & Soil Health** *by Lura Roti*

Thanks to their garden plots, meal prep at Mother of God Monastery includes an abundance of homegrown fresh and preserved vegetables and fruits. So, when their garden's production began to decrease a few years ago, the sisters were concerned and called on experts for advice. Turns out their garden's soil was in poor health. Baylee Lukonen, Soil Health Technician with SDSHC suggested they implement no-till practices and as a way to jump start the soil health building process, suggested instead of planting a traditional garden, where each vegetable has its own designated area or row, the sisters plant a Milpa garden. Also called chaos gardens because they do away with rows, Milpa gardens can feature as many as 40 different plant species and don't require tillage. Due to the excess moisture this growing season, the sisters had to wait until the end of June to plant their gardens. Adrienne Kaufmann, one of the 35 Benedictine Sisters who call the Watertown monastery home, says the Milpa garden yielded some produce in spite of the strange growing season but exceeded her expectations in weed management. Along with produce, Kaufmann says the millet also attracted more birds than they typically see. And when they put a spade into the soil beneath the Milpa garden, they discovered earthworms . A good sign, Lukonen says, that the soil's health is improving. **To read complete article, click here.**

**Merit or Myth 2019: Check Out New 6-Part Video Series & More** A new 6-part video series shows how Arlington farmer, Jesse Hall maximizes yields & profits with soil health practices. Through the series Jesse covers all things, from livestock integration, to economics, from small grains to cash crops and everything in between. Click here to watch the series trailer. This series is one of many projects featured on Merit or Myth website. Merit or Myth's mission is, through social media, to engage with South Dakota-based farmers, researchers and conservationists to gain a better understanding of healthy, functioning soils. Visit meritormyth.com to learn more.

**National FFA Week is February 22-29, 2020** Throughout the year, SDSHC supports the next generation of soil health advocates in many ways including our Soil Health Bucket program. High school Agriculture education instructors receive training and are given a Soil Health Bucket to help teach students about soil health. Each bucket is filled with 18 accredited lesson plans and tools valued at more than $500, including a shovel, soil probe, pH strips, EC meter, nitrate/nitrite test strips and much more.

**2020 SDSHC Conference Cont. from pg 1**
Her presentation will discuss the role of root exudates on soil structure and function. She will explain how quorum sensing in soil microbial communities can be activated through proper establishment and management of high diversity crop and pasture mixes. Learn more about Jones and her work at www.amazingcarbon.com.

Jones is one of four leading experts invited to present during the two-day conference. The other presenters include Tom Cannon, an Oklahoma rancher who operates a cow/calf and stocker operation as well as a row crop farm; Derek Axten, a no-till diversified grain farmer from southern Saskatchewan, Canada who implements several soil health practices including intercropping; and Andrea Bjornestad, SDSU Extension Mental Health Specialist.

"We are excited about the caliber of presenters and the applicable information they will share with farmers, ranchers and all those eager to learn more about building soil health," says Cindy Zenk, S.D. Health Coalition Coordinator.

Attending the 2020 SDSHC Conference to learn from experts and network with others engaged in soil health building practices is time well spent, explains rancher and presenter, **Tom Goodson Cannon**. Cannon credits a field day at Dakota Lakes Research Farm with changing the way he thought about land management. "It convinced me to try the principles of soil health and regenerative agriculture. They are solid and work everywhere."

For more than 20 years, the fourth-generation cattle producer has implemented no-till, cover crops and other regenerative agriculture practices to build the soil health of what had been conventionally cultivated crop acres.

Cannon's overall goal is to build up the soil health of crop acres to mimic the health of native grasslands his family's cattle have grazed for 125 years. "Water infiltration rates are so much better and there is no erosion. By watching the native grasslands, I decided to implement cover crops," Cannon explains that by adding cover crops to no-till acres, his water infiltration increased dramatically. "Cover crops increased the diversity of green living roots. Infiltration rates went up five to six times, compared to acres with no-till alone and my soil has become more productive."

Although Cannon has 600-acres of irrigated farm ground, because of his soil health-building efforts, he rarely runs his pivots. "If I put an inch or two on in a season, that's a lot anymore."

Along with using less water, Cannon's other inputs have decreased as well. "It didn't happen right away, but about 11 years in, I am maintaining yields 30 to 40 percent above the county average. And I am using less nitrogen. I'm getting a bushel of corn for every .3 pounds of nitrogen."

Like Cannon, by increasing species diversity, Saskatchewan farmer, **Derek Axten** has been able to boost soil health and yields. In 2007, Axten began focusing on building his farm's soil health. "When I look at my kids and think about the next generation, I want to do everything I can to make the soil better to secure a future in farming for them," says the fourth-generation farmer.

In addition to no-till and cover crops, Axten also implements intercropping. Growing two complimentary crops together, like yellow mustard and forage peas or chickpeas and flax. "We end up with more net product with lower inputs. Intercropping for us got us hooked on reducing inputs. We quit using synthetic fertility on those fields and did not see a yield difference."

Axten separates and cleans the grain he harvests on his farm. In addition to discussing intercropping during his SDSHC Conference presentation, Axten will also share how through soil health building efforts he is able to not only save on inputs but also access more marketing opportunities. Axten is a member of Grounded Growth, a service that connects farmers with food processors who value regenerative agriculture practices. **Cont. pg. 4**

**Cont. from pg. 3 2020 SDSHC Conference:**
"There are so many benefits to focusing on soil health. Simple things like our stress level. Because we are not spending as much on inputs, and our yields are good, even with the markets what they are, our profitability is up, so my stress level isn't," Axten explains.

Managing stress levels is a focus of **Dr. Andrea Bjornestad**'s talk. The SDSU Extension Mental Health Specialist says South Dakota's farmers and ranchers are at risk for mental health issues due to chronic stress resulting from the many factors out of their control in recent years.

"Whether it is the weather, market prices, tariffs or health care costs – farmers have no control over these external factors which have a direct impact on their lives and livelihoods," Bjornestad says.

She explains that chronic stress takes a physical and mental toll on a body. "It can lead to difficulties sleeping, chronic pain or worse," Bjornestad explains. "What is happening to producers is very serious. Agriculture sustains one of the highest mortality rates from stress-related illnesses. Suicide among farmers and ranchers is an international concern."

Because the factors creating chronic stress are out of our control, Bjornestad says it is important farmers and their families make time for self-care. "Don't isolate yourselves. Work to get more social interaction and peer support from other producers who understand," she said. Other self-care strategies may include:

- Exercise regularly
- Eat healthy
- Utilize effective time management
- Engage in hobbies or interests
- Obtain enough sleep
- Avoid alcohol or drugs
- Laugh
- Try to keep a positive attitude
- Politely stand up for yourself
- Spend time with the people you love
- Seek out social support

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**Check out 2019 Profiles in Soil Health Videos**
featuring South Dakotans from across the state and their soil health stories. Click here.

soil is for life
New PED Talks Video Series Digs into Soil Health

**PED Talks** Check out this series of 10-to-15-minute, science-centered "PED Talks" on soil health has been posted on YouTube. Soil peds are aggregated particles of sand, silt, clay and organic matter. Like their namesake, PED Talks combine soil-related topics including explanations of soil health, how we can improve it, and the progress that's being made to ensure we have the healthy soils necessary to feed, clothe and fuel the world in the future.

**Cont. from pg. 1 Maximize Equipment Performance**

**Combine evaluation**
**Uniformity of residue spread:** A combine that spreads residue uniformly across the field during harvest leads to greater success at planting. "In a wet or dry growing season, uniform distribution of residue leads to greatest success at harvest."

If the combine is not spreading uniformly, it needs a chaff spreader, which is designed to catch the fine residue, like soybean pods and wheat chaff, and distribute them uniformly.

**Leave it anchored:** No need to spend on a residue chopper. "Leave it anchored and standing so it doesn't blow away and provides better snow-catch."

Run the combine cornhead about a foot or two high at harvest to get most of the residue down to the ground yet leave enough residue standing to keep it in place and to catch snowfall. Knife-to-knife snapping rolls or tapered snapping rolls do a good job of processing the residue to make no-tilling into corn residue easier.

Read more recommendations for managing corn residue at harvest here.

**Seeder evaluation**
If there is an area of a field dry enough, Jasa encourages farmers to take seeding equipment out yet this fall or in early spring and evaluate it to see how well the planter performs.

While considering the principles of soil health, farmers will need to evaluate their seeder's ability to complete the following four tasks:
•Cut or handle residue to get seed into the ground
•Get seed to desired seeding depth
•Establish seed-to-soil contact
•Close the seed-vee

*Below Jasa explains in detail what to look for and suggests modifications if performance isn't what it should be.*

**Cut through residue:** Disc openers need to be sharp and working together to effectively complete the task of cutting residue to make seed-to-soil contact.

**Desired seed depth:** Disc openers need to be large enough to maintain a good residue cutting angle – cutting residue 2- to 3-inches deep and penetrate the soil to desired seeding depth.

"As discs wear down, they not only lose their sharp edge, but they lose the ability to cut residue deep enough. This is where testing is important."

Weight also helps to ensure opener can cut through residue. "In the early days of no-till, a common failure was there wasn't enough weight on seeding equipment."

If a field test reveals more weight may be needed, Jasa offers several suggestions for older seeders without automatic downpressure systems.

If a fertilizer tank is on the seeder, simply add water. Consider adding sandbags or other weights.

"The seeder I plant with on our research farm is 25 years old, so I use sandbags to add weight. However, if you're seeding into fields with more variability, it may be worth upgrading to a seeder with an automatic downpressure system."

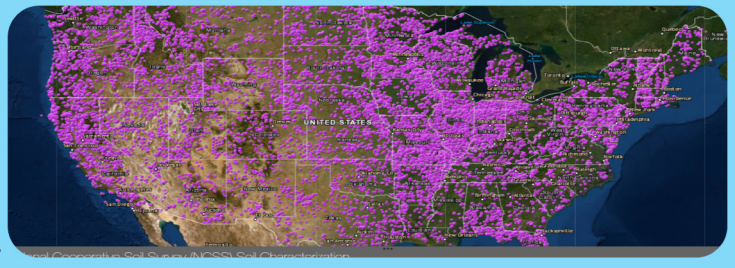
**Establish seed-to-soil contact:** A seed firmer simply firms the seed into the soil to ensure uniform seeding depth and proper seed-to-soil contact.

"Uniform seeding depth ensures all plants come up at the same time. Without it, the plants that come up behind the rest, never seem to catch up."

**Close the seed-vee:** Seeders need to loosely cover planted seed with soil to protect seeds from mice or other field rodents.
If seeding into sticky, clay soil where compaction is a concern, consider a spoked closing wheel to crumble the soil.

**Don't use residue movers:** Residue movers don't help us achieve our goal of minimal soil disturbance. "Don't focus on making soil warmer and dryer for planting season. That residue blanket will be your crops' best friend in the summer heat of July and August. To quote Dwayne Beck, research manager at Dakota Lakes Research Farm in Pierre, "I don't get paid for what my crop looks like in May or June. I get paid for what my crop looks like at harvest.'"

Check out the National Cooperative Soil Survey (NCSS) Soil Characterization Database. This application allows you to generate, print, and download reports containing soil characterization data from the National Soil Survey Center (NSSC) Kellogg Soil Survey Laboratory (KSSL) and cooperating laboratories. Click here to learn more.



## Upcoming Events

**Dec. 3-5**
SD Cattlemen's Association 71st Annual Convention
Pierre, SD

**Dec. 3**
Managing Soil: Maximizing Profit
Colton, SD

**Dec. 9-11**
SD Association of Conservation Districts Convention
Pierre, SD

**Dec. 10-11**
Ag Horizons Conference
Pierre, SD

**Dec. 10-11**
SD Farmers Union 104th Anniversary Convention
Aberdeen, SD

**Dec. 16-20**
Grassland Coalition Holistic Resource Management Roadshow & Annual Meeting
Watertown, Chamberlain, Belle Fourche, Hot Springs, Faith

**Jan. 7-10**
2020 National No-Tillage Conference
St. Louis, MO

**Jan. 10-11**
SD Farmers Union Young Producers Program

**Jan. 15-16**
**Soil Health Conference & Annual Meeting**
**Watertown, SD**

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**15 to 30 BPA Yield Increase Where Bales Grazed** *By Austin Carlson, SDSHC Soil Health Technician*

Following corn harvest 2018, Ryan Larson, a producer near Garretson, S.D., turned his cows out to graze corn stalks. As the cows made use of the crop residue covering the field of rolling hills, Larson strategically placed alfalfa round bales on hilltops exhibiting erosion and weathering to increase residue and supplement to his grazing cattle's diet.

This spring Ryan planted soybeans into the residue with his no-till drill. The only seedbed preparation prior to planting was leveling leftover alfalfa residue with a harrow on the back of his field cultivator on select grazing sites, primarily where the cows did not fully utilize the marginal quality hay. The cultivator was set so the shovels did not disturb the soil.

**Throughout the summer** he monitored the sites and realized where bales had been grazed, the soybeans were much healthier and up to a foot taller than the surrounding hilltops that were not bale grazed. **Harvest 2019** showed on grazed hilltops soybeans yielded an average of 15 to 30 bushels per acre greater than areas of the hilltops where there was no residue.

**Short term benefits** are credited to nutrient cycling from cattle and bales providing continuous soil cover. **Long term benefits** will likely reflect increased soil carbon which Ryan clearly can see now that harvest is complete In addition, bale feeding areas are easier to dig into and contain much more earthworm activity over bare hilltop counterparts.


**South Dakota Grazing Exchange** If you don't raise cattle but would like to experience soil health benefits of grazing cattle, check out the South Dakota Grazing Exchange, sdgrazingexchange.com.