



September 2017 Issue:

Soil Visions

Dates to Remeber

GRASSLAND MANAGEMENT WORKSHOPS




The South Dakota Grassland Coalition and its partners are sponsoring these **FREE** grassland management workshops for **ANYONE** interested in **establishing, maintaining, or improving** grasslands for grazing, hay, habitat, or recreation.

Bring your questions and get specific advice for your grassland projects!!



Cooperators:
SD Game, Fish, and Parks
NRCS
US Fish and Wildlife Service
Pheasants Forever
SDSU Extension
The Nature Conservancy
SD Soil Health Coalition

All Workshops
9:30 am – 12:30 pm
No RSVP needed
Coffee & Cookies provided

Workshop Locations
9:30 am – 12:30 pm

Oct 10: Pierre, SDSU Extension Center 412 W. Missouri Ave.

Oct 11: Mitchell, SDSU Extension Center, 1800 E. Spruce St.

Oct 12: Watertown, SDSU Extension Center, 1910 W. Kemp Ave.

Topics:

- Soil prep
- Seeding timing
- Seeding methods
- What to plant & why
- Managing pollinator plants
- Post-planting management
- Mowing
- Fire
- Chemicals
- Establishing new grass in an old stand
- Agency program options (CRP, WRP, wildlife programs, etc.)
- Open Discussion, advice, and Q&A sessions



Soil Temperature Part 3: The Biggest Driver of Heat Units over the Growing Season

The growing season of 2016 was a warm one even though it started out cool and wet, and by the end of the year, the number of heat units or growing degree days for 2016 was 216 above the norm. The take-home from this particular chart was that ambient (or air) temperatures have by a far greater influence on soil temperatures at planting than any other management factor, further rendering the till/no-till issue as it relates to soil temperature at planting a non-issue.

In this, the final video on weeds, we spent a little time with no-tillers [Matt Bainbridge](#), [Al Miron](#) and [Ralph Holzwarth](#) and got them to tell their stories about how their no-till, diverse rotation systems were doing with weeds, and how this affected some of their costs to cope with weeds. The message we received

from them is consistent with our previous videos namely that with low-disturbance (i.e., no-till) systems, especially when combined with diverse rotations, weed control can actually improve and costs for weed control can be lower than in conventional tillage systems.

January 17th - SHC Annual Banquet
Watertown David Brand

Watch the full presentation right here from our Facebook page.
We had 799 views!

Watch the Rainfall Simulator Video that was done on campus before Dr.Montgomery's Presentation. This video had 1,040 Views!

The Fifth Agriculture Revolution

Dr. David Montgomery is a geologist who has investigated the impacts of degraded soil health on the past and is looking to see the benefits of healthier soil in the future.

“It is going to become progressively harder for us to feed the world in the future if we continue with agriculture practices that degrade the productive capacity of our land base.”

His presentation at SDSU on September 18 walked the audience through his research, travel, and discoveries that were implemented into three books about history, microbiology and soil health.

“If a non-fiction book can have a villain, the villain of the “Dirt” book was the plow.”

The plow is an iconic symbol of agriculture, and it’s a symbol that has been challenged by the soil health movement.

Dr. Montgomery started his first book with a “backwards” look. In “Dirt” he explored the role of soil erosion in different societies. He also explained how soil erosion could be a reason for demise of some ancient civilizations. He stated that one of society’s most valuable resources is soil and its ability to sustain life.

“Societies that build soil are gaining natural capital, societies that are eroding soil are losing natural capital.”

One third of agricultural lands have been taken out of production by misuse of the soil.

Montgomery said that valuing and taking care of the land isn’t a new concept. He quoted a 1796 letter to Alexander Hamilton from George Washington, “If [inhabitants] were taught how to improve the old instead of going in pursuit of new and productive soils, they would make these acres which now scarcely yield them anything turn out beneficial to themselves.”

Is soil restoration possible? Can we reverse the historical pattern?

Dr. Montgomery and his wife Anne Biklé co-wrote “The Hidden Half of Nature.” They found inspiration in their own yard. When they moved to their new house in Seattle, they wanted to plant a garden but found that the degraded soil in their yard deemed a difficult challenge. The two worked together trying new techniques to try and rebuild their soil. They began composting and covering the soil with organic material. After five years they compared their treated soil to the original soil and found that they had created two inches of top soil. Dr. Montgomery pointed out that what he had been taught is that it takes 500 years to create an inch of top soil.

The success the couple had in their front yard inspired them to dig a little deeper to figure out how this had worked.

They looked at the root systems of the plants. The roots weren't just taking nutrients from the soil, they were also putting nutrients back into the soil. Why do plants do this? Basically, they have created a symbiosis with microbiology in the soil, trading nutrients, metabolites, and exudates.

Dr. Montgomery went on to briefly explain how the microbiology in the soil can be compared to functions in our "gut." It turns out that if you look at the human digestive system and the microbes that live inside us, it's the same system as the rhizosphere turned inside out.

"We face reality today that the human population is projected to expand globally by 1/3 or 1/2 again over the next few decades."

Agriculture will have to change to be able to sustain a growing population, the question is how it will change.

When Dr. Montgomery was laying the groundwork for his book "Growing a Revolution," he started by visiting farms around the world that had rebuilt healthy soil by adopting principles of conservation agriculture. He was looking for the common elements that have made these experiments successful.

Dr. Montgomery listed three basic principles to conservation agriculture:

- Minimal or no disturbance/direct planting of seeds (no-till)
- Permanent ground cover (retain crop residues and include cover crops in rotation)
- Diverse crop rotations (to maintain soil fertility and break up pathogen carryover)

Farmers around the world who have adopted these practices have not only increased yields, but have reduced fossil fuel, fertilizer, and pesticide use. Higher farmer profits and less pollution in both organic and conventional crop systems.

Dr. Montgomery recognizes four agricultural revolutions throughout history:

1. cultivation and tillage
2. husbandry/crop rotations and grazing
3. mechanization and industrialization
4. green revolution and biotechnology

He believes that soil health could be the fifth agricultural revolution. How can we build soil fertility as a consequence of intensive agriculture? A solution could come from combining the best of modern technology with the best of ancient wisdom.

“Soil health is the future of agriculture.” Restoring soils will help with feeding the world, climate change and carbon sequestration, environmental degradation, and restoring profitability.

Montgomery said, “The short-term incentives for farmers are starting to align with the long term interest of society as a whole.”

Through their soil health journey Dr. David Montgomery and his wife, Anne Biklé, created a universal phrase that captures the spirit of conservation agriculture:

“Ditch the plow, cover up, and grow diversity.”

Mariah Kessler

9/27/2017



Soil Health School Summary

The 2nd Annual Soil Health School (SHS) is in the books and deemed successful by the committee. SHS is designed to engage producers or participants to manage soils for resilience and profitability. This year’s agenda featured classroom exercises from highly respected experts and producers from this region as well as hands on field exercises. Evaluations from participants praised the hands on field exercises including group activity of forage allocation to meet a specific goal when grazing cover crops and the tightly whitey demonstration. Field events were hosted by Dennis Hoyle on the Hoyle land with special assistance from Jonathan and Jadon Rohrbach. Classroom presenters dove into areas from soil properties, assessments,

and biology to crop rotational diversity, agronomics, cover crops and equipment needed to achieve your goals.

Coalition would like to thank the committee members, presenters, participants and everyone who made the event a success. 2018 Soil Health School will be held at the Kurt and Kathy Stiefvater farm near Salem. Being watching for updated agenda and dates of the school.



Soil Health = Record Yields?

September 6, 2017 [Blog](#)

It's been said that what comes easy doesn't last, and what lasts doesn't come easy. This adage is especially true when it comes to change.

Any change worth making isn't going to be done overnight and it isn't going to be realized without difficulty. One Iowa farm is showing the Midwest though that, when it comes to [transitioning to soil health](#) practices, the change doesn't always have to be as difficult as we've been led to believe.

SOIL HEALTH: RECORD SETTING YIELDS

"I always heard at least five years yield drag on no-till," Says Kevin Prevo, one of three primary operators of the Prevo family farm located on the outskirts of Bloomfield, Iowa. "But we never saw that. We actually had our best ever average yields in 2014, until we topped it in 2016 for both corn and soybeans."

These results (and their timeframe) certainly run counter to what most of us hear about incorporating soil health practices. We get it. Stop turning over your land, drastically [reduce input costs](#) and watch your operation blossom in a short amount of time? Twenty years ago (and to many, still today!) this would have been unheard of! The Prevo family farm is one example of how this seemingly tall tale can be more down to earth than we expected.

This is not to say that the Prevos didn't have their fair share of growing pains. [The transition](#) has required a drastic change, first in *mindset*, then in practice, and the implementation of a year-round management-intensive system. However, for those hesitant to transition to regenerative farming because of the dreaded five-year drag, the Prevos are proving that that notion isn't a universal truth.

Of course, as we've continually discussed, it's not an individual practice that accomplishes what the Prevos have done, but the adoption of a systems approach. Dr. Randy Anderson of the ARS discusses the idea of [systems synergy](#) where we stack practices on top of one another (e.g., no-till, on top of, say, diverse rotations on top of, say, cover crops). The result is that the benefit of the whole is *far* more than the sum of the individual benefits. Kevin Prevo highlights their transition to no-till above, but their success would not have been possible without the incorporation of [cover crops](#). NRCS soil scientist Jason Steele knows this first-hand.

"It's important to build up that [soil biology](#) with cover crops," Jason says. "Organic matter will increase in the poorer soils first, providing immediate improvements in [infiltration](#) rates and water holding capacity."

If one simply transitioned from [till to no-till](#) and left it at that, these benefits would not have been realized (and the increase in yield would certainly be a pipe dream).

LOOKING FORWARD

When it comes to soil health in the future, the "five-year drag" may become a belief of the past. With the stacking of practices like diverse rotations, cover crops and no-till, as well as clarity on how to go about the transition most effectively, you tap into system synergy. The result: profitable farming and healthy soils can be realized quicker and more fully than previously thought.

As far as things go for the Prevos, the horizon is only getting brighter. The family farm is on their third straight year of record soybean yields with corn yields not lagging much further behind.

"We beat our corn yield average record this year by 20 bushels per acre over our 2014 highs," says Kevin Prevo. "And we did it on traditionally poorer producing soils."

Turn your “weakest link” (i.e. your poorest, most degraded soils) into a strength, increase [infiltration](#) rates, and increase [yields](#). Throw on top of this terms like “environmentally friendly” and “sustainable” and you have a recipe for current and future success. Land that is primed to feed your family for [generations to come](#). These are a handful of the reasons why soil health is the [farming of the future](#).

Still, the idea of a [change in practices](#) looms large. We don’t dismiss this reality. This is where ancient wisdom still has a part to play in helping us move forward.

“The secret of change is to focus all of your energy not on fighting the old, but on building the new.” – Socrates

Join the Revolution,

– Barrett

Cover Crops Boost Yields and Weed Control, National Farmer Survey Says

September 15, 2017 | Posted in [Cover Crops](#)

Source: [SARE Outreach](#)

Following the use of cover crops, farmers reported increased yields of corn, soybeans and wheat, and improved control of herbicide-resistant weeds, according to a nationwide survey. In addition, the survey of 2,012 farmers showed acreage planted in cover crops has nearly doubled over the past five years.

Survey participants—88% of whom use cover crops—reported that after cover crops:

- Corn yields increased an average of 2.3 bushels per acre, or 1.3%
- Soybean yields increased 2.1 bushels per acre, or 3.8%
- Wheat yields increased 1.9 bushels per acre, or 2.8%

This marks the fifth consecutive year in which the survey reported yield increases in corn and soybeans following cover crops. It is the first year the survey team was able to calculate the impact of cover crops on wheat yields. The poll was conducted by the Conservation Technology Information Center (CTIC) with help from Purdue University and funding support from SARE and the American Seed Trade Assn. (ASTA).

Regarding weed control, 69% of respondents said cover crops always or sometimes improved control of herbicide-resistant weeds. That is a significant number, as a majority of respondents (59%) reported having herbicide-resistant weeds in at least some of their fields.

“In addition to yield increases, farmers reported other benefits to cover crops, ranging from improved soil health to better control of herbicide-resistant weeds,” notes Rob Myers, Regional Director of Extension Programs for North Central SARE at the University of Missouri. “For instance, 85% of the farmers who used cover crops said they have seen improvements in soil health. That reflects long-term thinking and a growing understanding of the enduring value that cover crops deliver.”

Since SARE and CTIC began their annual cover crop survey in 2012, there has been a steady increase in cover crop acreage among participants. In this year’s survey, farmers said they committed an average of 400 acres each to cover crops in 2016, up from 217 acres per farm in 2012. They expected to increase their cover crop planting in 2017 to an average of 451 acres.

One of the most important outcomes of the SARE/CTIC Cover Crop Survey is insight into what motivates farmers to use—or start using—cover crops, notes Chad Watts, Executive Director of CTIC in West Lafayette, Indiana.

“Among cover crop users, we are seeing great enthusiasm for the soil health benefits of cover crops, with a widespread appreciation for the long-term benefits of covers,” Watts notes. “We’re also seeing openness to practices like inter-seeding and planting green, which raises cover crop use to the next level in terms of creating new options for species and mixes, and new opportunities to get even greater benefits from their covers.

“Among non-users, we’re getting a strong signal that they want more information and training,” he adds. “The feedback we’re hearing through the survey will help guide the research and extension agenda to gather and share the information farmers need in order to adopt and succeed with cover crops.”

In addition to the contributions of SARE, ASTA and Purdue, support for the survey was provided by ASTA members Beck’s Hybrids, Grassland Oregon, Justin Seed Company, La Crosse Seed, Monsanto and Seedway, with additional help from Penton Agriculture.

A full summary and the complete 2017 Cover Crop Survey Report are available online at www.sare.org/2017CoverCropSurvey.



The 2016-2017 annual cover crop survey is now closed - view the results!

[Click here](#) to view the full report of the fifth annual cover crop survey. A big thank you to the USDA's Sustainable Agriculture Research and Education program (SARE) and the American Seed Trade Association (ASTA), with help from Penton Media through their Corn and Soybean Digest publication. For results from previous years, please see below.

The fifth annual cover crop survey by the Sustainable Agriculture Research and Education (SARE) program and the Conservation Technology Information Center (CTIC) draws on the insight of 2,102 farmers—88 percent of whom reported using cover crops and 12 percent who identified themselves as non-users—from across the U.S. Cereal rye remained the top choice of farmers for cover cropping, followed by oats and radish. Sixty-five percent of the cover crop users reported planting mixes in 2016



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