LASA
Lafayette Ag Stewardship Alliance

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lafayetteagstewardship.org

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THE AG STEWARD NEWS

'Conservation is a good fit for everybody'

Research shows Lafayette County farmers' efforts making difference

By Mary Hookham for LASA

Mike Berget began no-till farming because he saw the conservation practice as a way to make the soil healthier and, at the same time, improve his farm's bottom line.

Berget, who owns a swine farm and works 11,000 acres, has been doing no-till for nearly 15 years and planted 1,000 acres of cover crops this year. The drought-like conditions in the spring of 2021 have many farmers worried. Berget is surprised by how his corn crop has responded under no-till and cover crop conservation practices.

"I think it is the structure of the soil that is keeping the moisture for the crop," he said. "Our corn is showing a lot less stress this year than I thought it would. Tilling the land destroys the soil structure, and instead of losing 3 to 4 tons of soil from wind erosion, we now lose only a half-ton. The soil is important to us."

Berget is a member of the Lafayette Ag Stewardship Alliance, a farmer-led conservation group in Lafayette County that collaborates with university researchers, environmental groups and community leaders.

Cover crops and other field practices adopted by LASA farmers are significantly reducing the chance of harmful runoff into streams and lakes, according to research. A recent study conducted by the state Department of Agriculture, Trade and Consumer Protection, the University of Wisconsin-Madison, and The Nature Conservancy showed LASA farmers potentially prevented 75,700 pounds of phosphorus and 12,125 tons of soil erosion in 2020.

For comparison, a mid-size dump truck can carry 10 tons of sediment, and 1 pound of phosphorous in a lake or stream has the potential to cause the growth of up to 500 pounds of algae, which can degrade water quality.

The analysis calculated an estimate of the potential impact of three innovative practices — cover crops, strip-tillage and no-tillage — compared to more conventional methods typical to that area.

"LASA takes great pride in caring for the soil and water in Lafayette County," Jim Winn, a dairy farmer who leads LASA, said. "Farmers like Mike are what make LASA's efforts so rewarding. He pushes himself to get better every day to protect the environment and his work in the fields are paying off."

The Nature Conservancy, a key supporter of LASA, helped fund the analysis, which is

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Soil aggregation with cover crops and no-till

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based on surveys from the farms.

In addition to the cover crops, strip-tillage and no-tillage, LASA members are regularly practicing conservation techniques like basic soil sampling, plant tissue sampling, nitrogen stabilization, nutrient management plans and planting harvestable buffer strips. They are also figuring out how to make these practices financially sustainable through increased productivity.

Berget is confident his efforts to preserve the soil and improve water quality will have a lasting impact.

"I am looking at the future," he said. "Rather than being mandated to implement conservation practices, we as farmers need to do it voluntarily. A lot of people are worried about climate change and I think conservation is a good fit for everybody. Future generations will have more soil to farm if we make the effort now."

CONSERVATION PRACTICES

LASA farmers have made noticeable changes to their practices. The 2020 numbers:

- 29,424 acres of conservation tillage practices (either strip-till or no-till planting in spring)
- 26,970 acres covered by nutrient management plans
- 7,389 acres of cover crops

Tillage: Benefit or detriment?

By Josh Kamps, Lafayette County agriculture educator

Preparing the soil for next year's crop is an important area of crop production. Tillage is a commonly chosen practice to prepare soil ahead of planting by burying crop residue, incorporating applied nutrients, or loosening compacted soils. Simply stated, tillage is the mechanical modification of soil in preparation for crop production. Depending on the type of soil and the type of tillage, soil health is at risk with routine tillage.

Soil health is a measure of the ability of soil to function properly. Healthy soil has an even balance of physical, chemical and biological characteristics. Examples of proper soil function include equal balance of water to air, symbiotic plant to soil microbe relationships, and adequate levels of available crop nutrients.

The results of a three-year field and laboratory study at Iowa State University report no significant difference for the rate of Bt corn residue breakdown between tillage or no-till. Burying the residue, processing the residue into smaller pieces or applying decomposition agents did not show an increased rate of decomposition.

In healthy soils with adequate soil microbial activity, the maximum residue decomposition rate occurs when soil moisture is at field capacity and soil temperatures are above 50 degrees F. Putting corn residue in close contact with healthy soil begins this process on the soil surface. Tillage as a residue management tool does not address the main driver of decomposition, which is soil biological health and proper soil conditions.

The importance of incorporating soil-applied nutrients is specific for each nutrient. Nitrogen losses resulting from surface application due to volatilization are common during certain weather conditions. Incorporating crop nutrients through banded placement can promote crop production efficiency. Certain reduce-till options and planter set-ups are available to accomplish this process. Healthy soils with established cover crops and microbe activity transport nutrients from the soil surface to the plant-rooting zone. Earthworm and root channels along with adequate water infiltration levels provide the necessary route. Cover crop research completed at the University of Minnesota reported a significant reduction in soil nitrate level following manure application with a rye cover crop compared to no rye.

Soil compaction is a result of applied pressure to the soil surface during times the soil is at or near field capacity. Compacted soil has reduced soil aggregation, which leads to lower water infiltration, limited soil biological activity and limited plant root penetration. Excessive soil compaction limits a soil's ability to function properly and limits crop production. As soil moisture decreases, air pockets form between soil aggregates, which increases the soils' load-carrying capacity. A soil penetrometer or a soil spade are both tools capable of identifying the presence and depth of soil compaction. If consistent compaction across a field is not present, a tillage pass may increase the risk of soil compaction in the field.

Healthy soils balanced for physical, chemical and biological characteristics are equipped to resist erosion. Strong soil aggregates, living roots and increased soil microbe activity come with less tillage. Healthy soils infiltrate and store water and capture and store carbon, which increases soil organic matter levels. The first step towards healthier functioning soils is to take a step back and determine the reason for choosing a tillage pass.

Friends of LASA

By Jim Winn, LASA president

As I write this column in early December, it's hard to believe it's wintertime as temperatures are in the low 50's with bright sunshine. But

looking back at this fall our weather today is what we've been experiencing all fall. Absolutely beautiful weather was the normal this year in our neck of the woods. So as the year comes to an end let's look back at the 2021 crop year and see what is new with LASA.

We had a great spring, and all crops were planted in a timely matter. Although quite dry all summer, we were fortunate to get some late summer showers and in turn received great grain yields recorded in our county. So hopefully our members are going into winter with a good feed supply for livestock and selling crops. Due to Covid it still made it difficult to gather for the normal events as we have done in the past, but we did manage to have some sort of normalcy.

In May, with the help of UW-Extension specialist Josh Kamps and LASA member Jason Rowe, we held a planting green field day, which was well attended and very informative. In July at the Lafayette County fair, LASA had a cover crop booth in conjunction with our county Land Conservation Dept., Sustainable Agriculture Research Education (SARE), The Nature Conservancy (TNC), Natural Resources Conservation Service (NCRS) and Josh Kamps, which garnered a lot of interest. Then later in July, LASA – along with the help of Josh Kamps (I think everyone is getting used to hearing his name as he is a great asset to our group) –held a field day at the Extension offices with the help of TNC and Dennis Busch from UW-Platteville. Kamps hosted a summer annual species tour and Busch demonstrated a rainfall simulator. Again, the event was very well attended. Then in September, LASA helped Kamps

Greg Siegenthaler of Grande Cheese, Jay Stauffacher and Lauren Brey of FSF receiving award.

with a Pest Management workshop at Jason Rowe's soybean plot along with several UW -Extension specialists. As difficult as it is in these times, LASA still found ways to keep our members engaged with some field days. We hope to get back to normal in 2022 with more traditional types of field days. We will be working on planning future field day events over the coming winter months.

We are wrapping up our third year with the pilot sustainability project with Grande Cheese. Not enough can be said about what this pilot project means to our group.

As you may know, we were honored in November by the Innovation Center for U.S. Dairy for "Outstanding Supply Chain Collaboration" in conjunction with Farmers for Sustainable Food (FSF) and Grande. I would like to thank Houston Engineering, our good friends at Extension and Southwest Wisconsin Tech College, FSF and a host of others too numerous to list in this space. Most of all, we thank Grande for supporting us and bringing this idea to us. We will cherish this award for many years to come. I would also like to personally thank Jay Stauffacher for attending in my place, along with other staff of FSF for accepting the award for LASA. I encourage you all to visit our website and see the real numbers of what our member farmers are doing to help the environment and keep our communities healthy. We are very proud of our accomplishments, but our work is not done yet. There is much more to do.

We encourage all our members to attend our monthly board meetings, not just board members, to see what is going on with LASA. I challenge each of you to come to a few board meetings throughout the year. We would like to see input from everyone, not just a few. Let's get everyone involved. As I stated, we are busy working on next year with our annual meeting coming up on February 25 with UW-Extension specialist, Paul Mitchell. Keep an eye on our website for any news concerning LASA.

I am honored to lead such a forward-thinking, like-minded farmers group. Special shout out to TNC, FSF, DATCP, Dairy Business Association and Edge Dairy Farmer Cooperative for their continued support. It would be impossible without all your help. Thank you! Let's make this the best year yet and I look forward to a healthy prosperous year for all our members. Bring on 2022!

Sincerely, Jim

Upcoming Events

- Jan. 19-12 – Dairy Strong & FSF annual meeting, Madison
- Feb. 23 - DATCP producer-led annual workshop, Rothschild
- Feb. 24 – WI cover crop conference, Rothschild
- Feb. 25 - LASA annual meeting (details page 6)

Influence of cover crops on soil loss

By Dennis Busch, Terry Loeffelholz and Will Keast, Pioneer Farm Agroecosystems Research Program University of Wisconsin-Platteville

The mission of Pioneer Farm Agroecosystem Research is to support the local farming community by conducting systems and applied research investigating the impacts of agronomic practices on farm sustainability. Recently, we have been conducting on-farm research investigating the impacts of cover crops on water quality. More specifically, this research project was focused on evaluating how the use of cover crops impact surface-water runoff, soil loss, and nutrient loss from cropland acres at multiple positions and slopes within cropland acres. Our goal for this project was to quantify soil loss reductions from cover crops across the landscape to help farmers better prioritize where to establish cover crops when resources do not allow them to cover all acres.

To evaluate how the use of cover crops impacts soil loss, rainfall simulations were conducted on cropland operated by Darlington Ridge Dairy and Stone Front Dairy in southwest Wisconsin. Cover crops were seeded in fields at Darlington Ridge Dairy (winter rye, 70 lbs./acre) and Stone Front Dairy (winter rye, 70 lbs./acre) in the fall of 2020. However, portions of the fields at multiple landscape positions were left unseeded to serve as comparisons for rainfall simulations (Photo 1). Each treatment was replicated four times. At Darlington Ridge Farms, corn was planted on April 29, 2021; cover crops were terminated on May 5, 2021; and rainfall simulations were conducted on May 27, 2021. At Stone Front Dairy, cover crops were terminated on April 19,2021, corn planted on May 5, 2021, and simulations conducted on June 4, 2021. Plots at the Darlington Ridge Farms were dominated by Ashdale silt loam soils, while soils at Stone Front Dairy included both

Photo 1: Cover crop and non-cover crop plots located at Stone Front Dairy on April 24, 2021.

Fayette and Palsgrove silt loam soil series.

Rainfall simulation plots were located on multiple positions on the landscape with slopes ranging from 1.5 to 12 percent to determine how slope influenced runoff and soil loss. At Darlington Ridge, rainfall simulations were conducted at the shoulder and backslope positions but not at the summit. In contrast, simulations were conducted at the summit as well as shoulder and backslope positions at Stone Front Dairy.

The rainfall simulator is designed to apply uniform rainfall at a rate of 2.8 inches per hour with rainfall droplets similar in size and energy to a typical rainfall event. Windscreens measuring 10 feet tall, 10 feet wide, and 10 feet long were used to isolate field plots (2 meters x 2 meters) from which runoff was collected. Field plots are isolated by pressing steel plot boundaries into the soil to a depth of 2 inches. Collection trays were connected to the downslope side of the plot boundaries to support collection of surface-water runoff from plots.

The duration of a simulated event is variable and is dependent on how long it takes for runoff to begin after starting the simulated rainfall. A simulated event is ended 30 minutes after runoff is first observed from the plot. Typical simulations will last 35 to 45 minutes. Simulated events were conducted on two consecutive days on each plot (day 1 simulation wets soils to field capacity, and data is collected from simulation conducted on day 2). All runoff from plots was collected, measured, and thoroughly mixed prior to collection of samples. Collected samples were submitted to laboratory and analyzed for total solids, nitrogen and phosphorus.

Rainfall simulations resulted in consistently higher soil loss from plots without cover crops. At Stone Front Dairy, the largest difference observed was on the shoulder slope where plots without cover produced 38 lbs. of total solids per acre compared to 12 lbs. of total solids lost from plots with cover crops. This difference was statistically significant (p= 0.10). Differences observed at the summit and backslope were not statistically significant.

There was no cover crop residue vis-

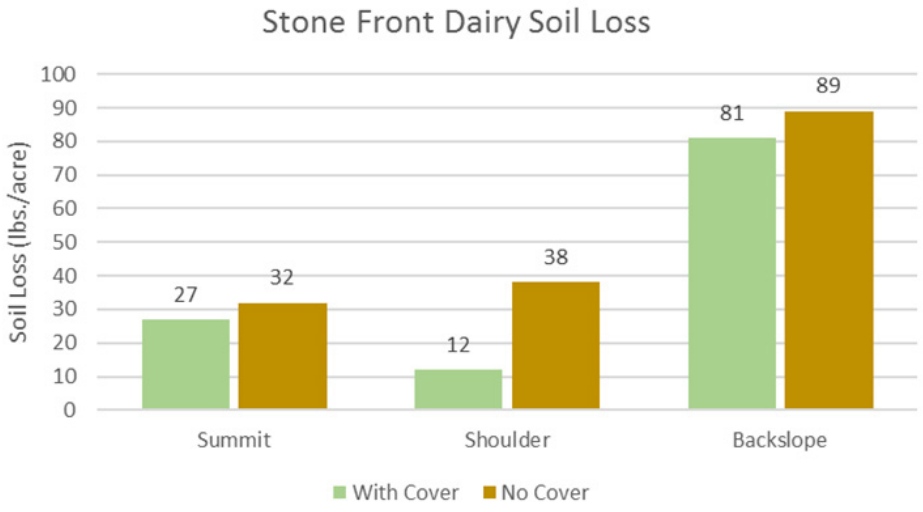

Figure 1. Soil loss measured from rainfall simulation plots at Stone Front Dairy.

Farmers are citizen scientists too

By Steve Richter,
Director of agriculture strategies,
The Nature Conservancy

A recent story on the front page of the Wisconsin State Journal featured the happy reunion of a young owl and its family after it fell out of its nest. This was the first sighting of a barn owl in Wisconsin in over 20 years. The story got me excited about my annual participation in the Christmas Bird Count, where I will identify every bird I see on Jan. 2. These bird counts are done across the world, as citizens like you and I are assigned a count territory to drive and walk.

Counts have been taking place every year for over 100 years. It's one of the best examples of citizens pooling their observations together to help identify trends in population status. Today, in Wisconsin alone, citizens can take part in a Sandhill crane count, a frog and toad survey, or a Loon watch, to name just a few of the possibilities.

The same kind of citizen activism is taking place in farmer-led groups. Farmers use incentive funds to try new practices and share observations at field days or sit on a panel at winter meetings.The Natural Resources Conservation Service has created demonstration farm networks across the eastern half of Wisconsin, another example of farmers sharing their findings. Farmers have always been citizen scientists, trying out many new practices and products in their fields and barns.

For the seventh straight year, The Nature Conservancy will offer incentive funds to farmer-led groups in 2022, encouraging farmers to try new practices. Additionally, we'll encourage each group to have field days, take advantage of social media, and utilize newsletters as a platform for farmers to share their stories with neighboring farmers.

Members of farmer-led groups do some of our nation's most important environmental work. Now, I am off to do my part for nature with binoculars in hand to count chickadees and juncos!

The first barn owl in Wisconsin in 20 years was documented recently.

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Photo 2: Stone Front Dairy plot with cover crop. No residue visible after termination.

ible in the cover crop plots at Stone Front Dairy. The lack of cover crop residue at Stone Front Dairy is likely due to the longer time between cover crop termination and conduct of the rainfall simulation. This may partially explain why soil loss from cover crop plots was nearly as large as the soil loss from non-cover crop plots.

Greater differences in soil loss from cover crop and non-cover crop plots were observed at Darlington Ridge Farms. On the backslope, plots without cover crops lost an average of 301 lbs. of soil per acre compared to 24 lbs. of soil loss per acre from the plots with cover crops. However, this difference was not statistically significant due to treatment variability. On the shoulder landscape position, the difference in soil loss between cover and no-cover plots was statistically significant. Plots with no cover crop lost an average of 175 lbs. of soil per acre compared to only 3 lbs. of soil loss per acre from plots with cover crops. No simulations were conducted at the summit landscape position at Darlington Ridge Farms.

Cover crop residue was visible in the plots at Darlington Ridge Farms at the time rainfall simulations were conducted. The cover crop residue is likely the reason why soil loss from the cover crop plots is much lower than loss observed in plots with no cover crop.

Results of this study have shown that cover crops reduce soil loss, and the amount of soil loss reduction varies across the landscape. However, it also illustrates that the benefit of cover crops varies with time and may diminish quickly after termination. Data suggests that the longer termination of cover crops is delayed, the more protection the cover will provide from erosion. However, delayed termination of the cover crop also may result in reduced soil moisture which may reduce yield. More research is needed to quantify this trade-off to improve on-farm decision making.

Photo 3: Darlington Ridge Dairy plot with cover crop residue visible after termination

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2022 Annual Meeting

Mark your calendars for Feb. 25

Join us in person to hear about LASA's accomplishments from the past year and plans for 2022.

When: 10 a.m. - 3 p.m. Friday, Feb. 25
Where: Multi-purpose building, Darlington
Agenda: Paul Mitchell, manure and grain crop management; Doug Thomas, pilot project update; Dennis Busch, UW-Platteville Project updates; Josh Kamps and Ryan Temperly, cover crops & nutrient management.

Watch your email and check lafayetteagstewardship.org > Events for full details.

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