LASA
Lafayette Ag Stewardship Alliance

January 2021
lafayetteagstewardship.org

THE AG STEWARD NEWS

OUR VISION: A community where farmers and friends of agriculture work together to protect and improve our water quality and environment.

Thirty people attended LASA's "drive-by" field day held on Sept. 30.

Lafayette County farms make progress on conservation

Innovative methods cut potential phosphorous runoff, soil erosion

By Steven Schauer for LASA

The increasing use of non-traditional farming practices in Lafayette County is making important progress toward reducing the potential for harmful runoff into streams and lakes, a new analysis shows.

Using data about farming practices among members of the Lafayette Ag Stewardship Alliance (LASA), 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.

The findings show that the livestock and crop farmers using strip-tillage and no-tillage practices as compared to conventional practices potentially reduce phosphorous runoff from farm fields by 53 percent and soil erosion by 59 percent.

Not all the phosphorus leaving a farm field will reach a stream or lake. But when it does, it can cause algae to grow and degrade waterways. For every pound of phosphorus that reaches a waterway, it feeds almost 500 pounds of algae. So, stopping phosphorus and soil sediment from leaving the fields as much as possible improves water quality.

"We have many dedicated farmers in this area who work hard to safeguard our water and soil, so to see these sorts of results is rewarding," Jim Winn, a dairy farmer who leads LASA, said. "We push ourselves to get better every day at protecting the environment. Measuring progress is critical."

The three-year-old nonprofit farmer-led watershed conservation group in southwestern Wisconsin has grown to 27 members who

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represent 47,000 acres and 23,000 dairy animals, beef cattle and pigs. The alliance collaborates with university researchers, environmental groups and community leaders. They hold field days to demonstrate various practices and they participate in scientific studies, notably contributing thousands of dollars to an ongoing groundwater study.

The Nature Conservancy, a key supporter of LASA, helped fund the phosphorous and soil loss analysis, which is based on surveys from the farms.

"We're excited to work with these innovative LASA farmer members who are not only making changes in how they farm and manage their soil but sharing their data so we can better measure outcomes," said Steve Richter, director of agriculture strategies for The Nature Conservancy. "There is a lot of interest among farmers in practices that improve soil health and increase productivity, and LASA farmers are making these practices more accessible to others by sharing lessons learned."

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.

"Trial and error are part of this, but we keep moving forward," Winn said. "We recognize we can do better, we can learn from one another and we can stand out as community leaders on environmental sustainability. That's what drives our group."

CONSERVATION PRACTICES

LASA farmers have made noticeable changes to their practices. The most recent numbers (2019):

- 23,500 acres of conservation tillage practices (either strip-till or no-till planting in spring)
- 22,300 acres covered by nutrient management plans
- 5,305 acres of cover crops
- 4,000 acres of low-disturbance manure injection

MORE ABOUT THE ANALYSIS

The analysis was completed as part of a conservation benefits tracking project initiated by the Wisconsin Department of Agriculture, Trade and Consumer Protection to evaluate impacts of the state's Producer-Led Watershed Protection Grants Program. The tracking initiative was developed in collaboration with the University of Wisconsin-Madison Department of Soil Science and The Nature Conservancy. Wisconsin's SnapPlus nutrient management planning software was used to calculate the potential annual phosphorous loss and soil erosion on fields when farms include cover crops and reduce tillage operations.

While not every conservation practice provided significant reductions for each scenario, below are examples of the amount of phosphorus loss and soil erosion that can be avoided with the adoption of conservation practices on agricultural landscapes in Lafayette County. Acreages of practices are based on the average number of acres implemented on LASA member farms in 2019.

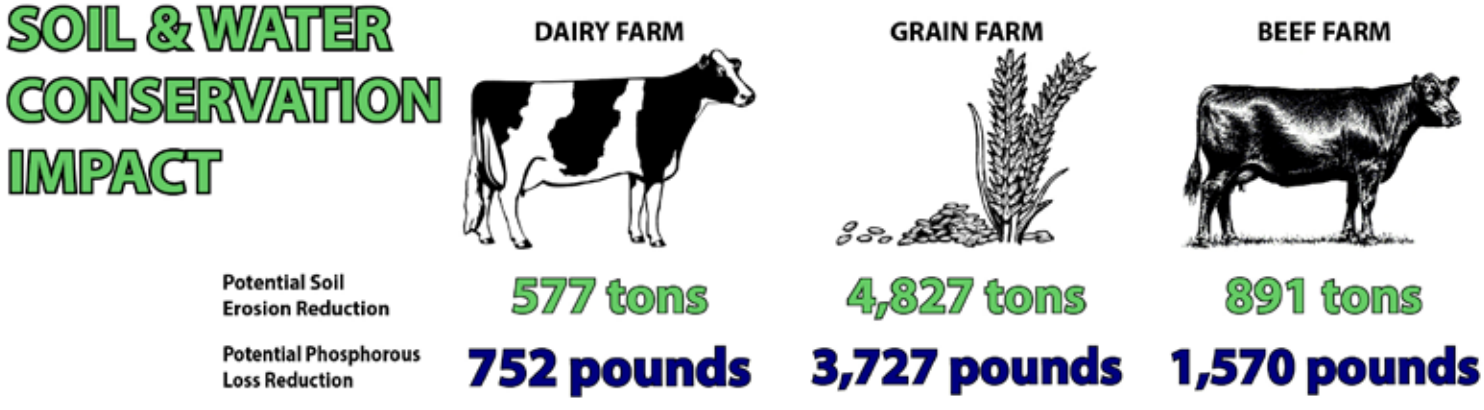
It is important to note that the calculations below are based on comparisons of generalized systems, not actual farms, and do not take into account the other watershed variables that impact how sediment and phosphorus make their way into a stream or lake.

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.

Dairy farm adopting 312 acres of cover crops following corn silage
Phosphorous loss reduction: 752 pounds
Soil erosion reduction: 577 tons

Beef farm adopting 704 acres of strip-tillage
Phosphorous loss reduction: 1,570 pounds
Soil erosion reduction: 891 tons

Grain farm adopting 794 acres of no-tillage
Phosphorous loss reduction: 3,727 pounds
Soil erosion reduction: 4,827 tons



LASA makes progress despite challenges

By Jim Winn, LASA president

Is 2020 finally over?

Looking at the calendar, it's true. We all remember the fall of 2019 and all the struggles we faced with harvest and torrential rain events. Could it have gotten much worse? Well, by March our world turned upside down again and our country was facing the worst pandemic in a century. But that didn't slow our LASA members and our ag industry down. Despite challenges, we were blessed with beautiful fall weather and a great harvest, and we rolled up our sleeves and continued to provide food for our country who was hurting.

As of today, hopefully relief from the pandemic is near and I hope, as I'm sure everyone else does, that normalcy will return in 2021. So as much as 2020 was a rough year, LASA found ways to inform our members and the public about all the good that is happening with our group. We had a great annual meeting at the beginning of the year but due to lockdowns we were forced to find other means of conducting board meetings and field events. That didn't stop us from hosting a field day – modified to be a "drive by" format. We had four sites where farmers could drive to and see the work our members are doing with cover crops. There are many types of cover crops and our members did an excellent job of highlighting the diverse types. It's our plan that we will get back to a more normal type of field day in 2021.

Our pilot project with Grande is moving along nicely, with the hope it is going to bring value to our members once it is completed. The 2019 data entry is wrapped up and we should have results to share soon. We are very proud of our accomplishments so far and eager for our future. Watch your email for more information coming soon.

We increased our membership this year by adding five new members and a couple of corporate sponsors. I hope every year we can continue to add more members.

I would like to take this time to thank our members for completing their cost-share applications and surveys in a timely matter this fall so we could get cost-share paid out before the year ends. Good work everyone!

I am very blessed to be able to lead these extraordinary farmers here in Lafayette County. Our annual meeting is scheduled for February 24 and we are finalizing details, so watch for email and social media updates down the road about that.

Finally, I would like to thank Tim Trotter and his staff at Edge Dairy Farmer Cooperative, Dairy Business Association and the Dairy Strong Sustainability Alliance for all the work they do to help us be successful. We could not do it without them

Wishing a Happy New Year and hopes of a prosperous year ahead for our farming community.

Stay safe,

Jim

Producer-led webinar series: *Planting ideas, growing conservation*

By Erica Gentry, UW-Madison Division of Extension Discovery Farms Program

Are you interested in learning what other farmer-led watershed groups are doing around the state? The Producer-Led Webinar Series: Planting new ideas, growing conservation, was started in March with the goal to facilitate farmer exchange to problem solve, try new things and innovate. It also provides a space for farmers and partners of their watershed groups to share conservation success stories and answer questions. Since March, there have been 10 webinars, occurring on the second Tuesday of each month. Webinars last about one hour each.

These are the topics we covered so far with plenty more to come:

- Interseeding rye into standing soybeans
- Planting corn into standing rye
- Alternative forages
- Increasing profitability with precision agriculture
- Hosting virtual events and other planning tools
- No-tilling into heavy red clays
- Nitrogen management, N crediting from irrigation and cover crops
- No-till, 60-inch corn and grazing covers
- Fall and winter grazing techniques
- Soil Health Partnership

The idea for these webinars came about pre-pandemic and it has turned out to be an excellent resource for farmers and watershed groups to share their efforts with a large audience, especially now when in-person gatherings are limited. The webinars are hosted by the DATCP Producer-Led Watershed Protection Grants Program, the UW-Madison Division of Extension Natural Resources Institute and the Discovery Farms Program.

"Hearing a farmer perspective helps us know what results are in field conditions in our areas. Large conferences tend to bring speakers from southern latitudes, where the dates and condition have little correlation for us," was a comment made by a webinar participant. The webinars have provided honest learning

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Cover crop establishment timing **gives farmers opportunities**

By Steven Schauer for LASA

Farmers in southwestern Wisconsin are continuing to identify new techniques to conserve their valuable soil and water resources. Soils in the region are fertile yet fragile which makes collecting and storing water in the soil profile for crop production a necessity. Farmers are presented with a set of challenges not faced in other parts of the state because of the geological landscape.

Rolling hills increase the risk of soil erosion due to surface water movement. Soil profiles with silt loam topsoil, increasing clay levels in the subsoil and bedrock at varying depths as the foundation infiltrate water at a steady pace. Managing the challenges of soil and water movement gives farmers opportunities to try different conservation practices.

Lafayette Ag Stewardship Alliance (LASA) hosted a "drive-by" field day on Sept. 30 to showcase alternative cover crop options and establishment timings. Each farm incorporated planned manure application to fit the timing of cover crop growth. Four farms served as hosts for nearly 30 farmers, agronomists, conservation specialists and the public to learn more about protecting the land and water in Lafayette County.

"Farmers are identifying techniques to create "perennial cropping benefits" within standard crop rotations. It begins with promoting living roots in the soil year-round," said Josh Kamps, Ag Educator with UW-Extension in Lafayette County. "Farmers are innovators by nature and the LASA farmer-led group puts this innovation on display by modeling new techniques on their farms. The farmers are eager to implement new techniques as part of their farming systems."

Each farm participating in the field day displayed cover crops planted during alternative times of the year. Darlington Ridge Farms planted Sorghum-Sudan grass following winter wheat harvest to be used as a forage crop, while Redrock View Farms planted alfalfa in early August to establish the stand for full production potential next year.

At Berget Farms, which was also used as a UW-Extension research plot, summer seeded cover crops are being utilized to capture the remaining 40 percent of energy during the growing season from August 1st until frost. These cover crop mixes are formulated to add fall soil cover, harvest and store nitrogen and increase soil health through plant diversity. The plot has 5 treatments that are replicated to increase the value of the data collected. The treatments will be evaluated for their ability to store nutrients, reduce soil erosion, improve water infiltration and offer a benefit to the following corn crop.

Kamps Farms displayed a cover crop plot with a mix of winter cereal rye, oats, tillage radish and red clover that was planted in early spring with frost still in the ground. The goal of this plot is to study the management and agronomic decisions necessary to receive the benefits of a growing cover crop early followed by a high yielding corn crop in the same cropping year.

"It was important to display the benefits cover crops can add to the fertile, fragile yet forgiving soils in our region of the state," Kamps said. "Farmers have an opportunity to try different cover crop practices in their fields and this event gave everyone a chance to see various planting options."

Producer-led webinar series

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opportunities for Wisconsin farmers and conservation professionals. Practice specifics, planter setup, economics and challenges are addressed. No questions are off limits during these webinars.

All webinars are recorded and posted on the UW Discovery Farms YouTube channel. Watch them at YouTube.com and search UW Discovery Farms.

If you have a topic idea or would like to be involved in this webinar series, contact rachel.rushmann@wisconsin.gov.

To participate in the live webinars, register at https://forms.gle/zZ8mf6ZNyxtPgcnA9. Webinars are also live streamed on the Discovery Farms Facebook page.

Effect of agronomic practices **on soil health and water quality**

By Dennis Busch, Andrew Cartmill, Will Keast and Matt Harper, University of Wisconsin-Platteville

Introduction

Sustainable and resilient agroecosystems are key to the future food security of the United States. Crop and livestock producers in southwest Wisconsin are efficient producers of food, fuel and fiber, and are using practices like cover crops and reduced tillage to enhance sustainability of environmental resources. Unfortunately, it is often challenging to quantify the impact of these practices on the environment and productivity. Here we present preliminary results describing the effects of conservation practices on soil health and water quality.

The data presented was collected on local farms with a variety of tillage systems and conservation practices. Tillage systems included conventional tillage, strip tillage and no-till with and without cover crops. Soil health and water quality metrics evaluated include infiltration rate, soil erosion, phosphorus loss, soil stability, bulk density, earthworm population, soil respiration and corn grain yield.

This data collection effort is part of ongoing, larger research effort supported through USDA National Institute of Food and Agriculture grant funding. Data presented is preliminary and will be augmented with addition field data collection and laboratory analyses.

Data collection methods

Water quality data was generated utilizing a rainfall simulator as described in the "National Research Project for Simulated Rainfall – Surface Runoff Studies." Briefly, this rainfall simulation methodology utilizes in-field runoff plots (1.5m x 2m) orientated with the slope to isolate and collect surface-water runoff associated with simulated rainfall events. The simulated events apply 12 cm of rain per hour (4.7 inches/hour). The duration of the rainfall simulation is variable for each site and is dependent on the time required to produce initial runoff. After runoff is observed the simulation is conducted for an additional 30 minutes. All runoff from the simulation is collected and total volume is determined. After conclusion of the simulation, the sample is thoroughly mixed and a 1-liter sample is collected for laboratory analyses.

Soil Health Data was collected using USDA NRCS methods as described in the Soil Quality Test Kit Guide.

Preliminary findings

Results obtained from the rainfall simulations indicate a difference in infiltration and runoff across the production systems. The figure on the next page illustrates the total inches of simulated rainfall applied and the percentages that infiltrated into the soil or ran off the soil surface. In general, infiltration rates were higher in the no-till and cover crop scenarios. Highest runoff amounts were observed under conventional tillage where 69 percent of rainfall applied was lost through surface-water runoff.

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Agronomic practices evaluated

Conventional Tillage (2% slope) Tillage: tandem disk, vertical tillage Previous crop: corn silage Fertilizer source: sweep injected dairy manure (28,000 gal./ac.) Cover crop: none		**No Till with Cover (4% slope)** Tillage: no-till Previous crop: soybeans Fertilizer source: anhydrous ammonia (150-160 lbs./ac) Cover crop: rye, terminated post corn planting	
Conventional Tillage with Cover (5% slope) Tillage: no-till Previous crop: corn silage Fertilizer source: injected manure (15,000 gal/ac.) Cover crop: rye		**Corn Crop with Interseeded Cover (2% slope)** Tillage: no-till Previous Crop: non-GMO wheat Fertilizer Source: beef manure Cover Crop: clover mix	
Strip Till (5% slope) Tillage: strip-till planted corn, field cultivator Previous crop: soybeans Fertilizer source: sweep injected hog manure (10,000 gal./ac.) Cover crop: rye, spring terminate			

Effect of agronomic practices

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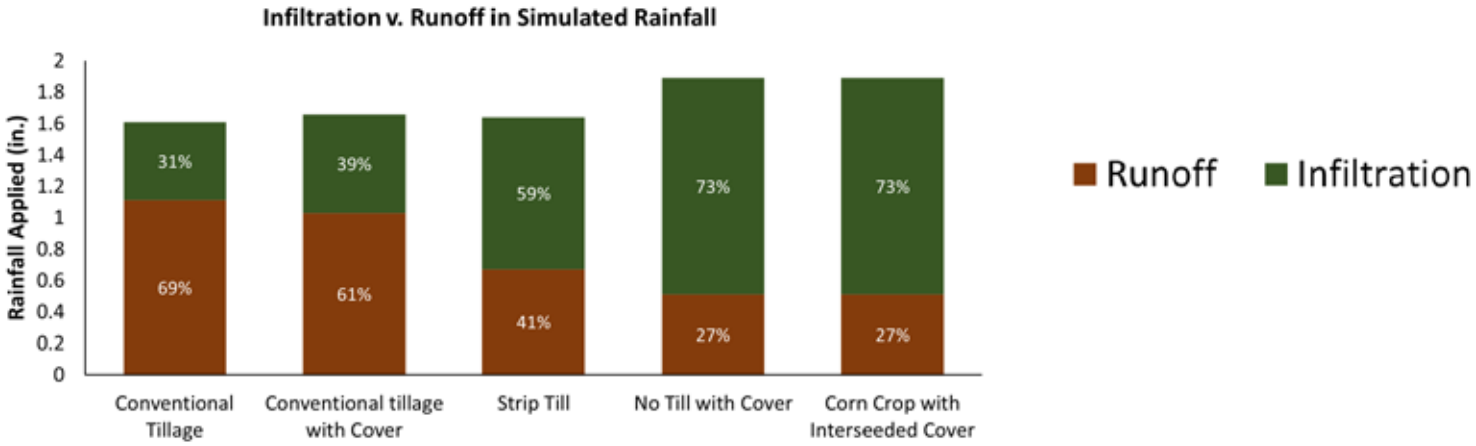
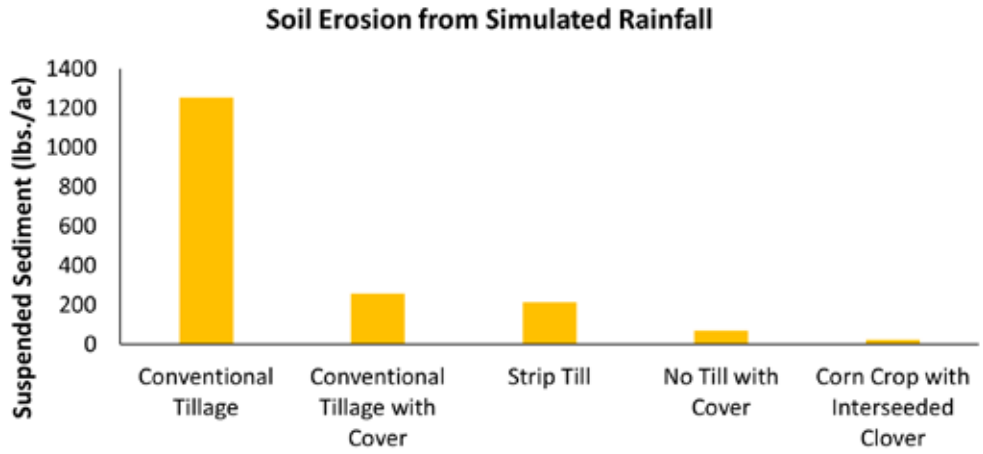


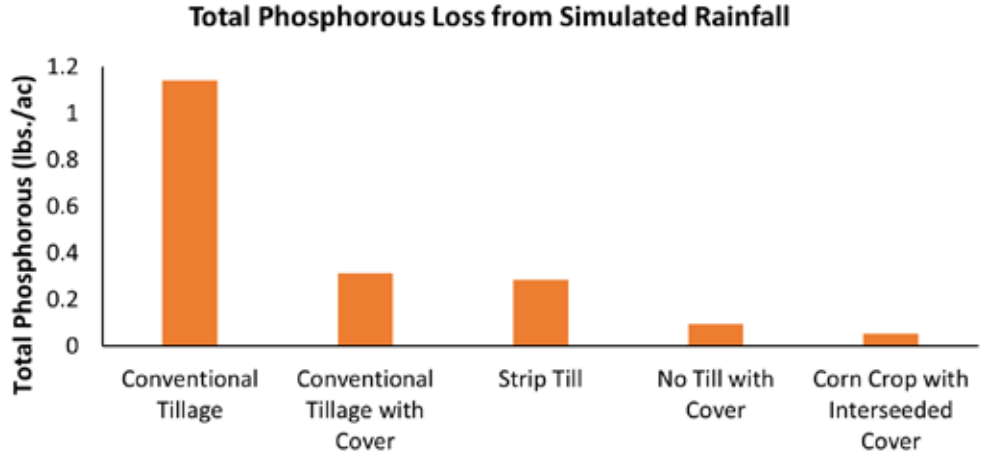
Runoff generated from the plots during rainfall simulations was captured, measured and submitted to the laboratory for analysis of suspended sediment (soil erosion) and total phosphorus. Photographs of the collected samples from the various treatments are presented to the right as a visual reference of soil loss. Amount of soil loss decreases from left to right.

Sample turbidity across sites

1. *Conventional Tillage*
2. *Conventional Tillage w/ Cover*
3. *Strip Tillage*
4. *No Till w/ Cover*
5. *Interseeded Cover*



Soil erosion and total phosphorus loss followed a similar trend as indicated by the infiltration and runoff results. The highest losses were observed in conventional tillage with losses decreasing in systems with reduced tillage and greater use of cover crops. The lowest soil erosion and phosphorus loss were observed in plots where corn was interseeded into a standing crop of clover.



The following table includes a simplified comparison of selective metrics of soil health and water quality. This evaluation is a broader, more systems-based approach as it includes physical, chemical, and economic components of a larger resilient and sustainability metric.

Systems comparison of sustainability metrics for convention and not-till fields		
Interpretation	**Production System**	
	Conventional Tillage	**No-Till w/ Cover**
Biological Indicators of Soil Health		
Earthworm Count (worms/ft^3): Data suggests conventional tillage practices negatively affect the presence of earthworms. Data does not take into consideration temporal variation and species composition.	2	16
Soil Respiration (CO_2-C/ac./day): Soil respiration is a measure of microbial and root activity and a good indicator of soil health. Respiration rates between 32 and 64 indicate strong levels of microbial activity and healthy soil. Higher respiration rates observed in conventional tillage system may be reflective of carbon loss due to soil disturbance (tillage) and enhanced break-down of organic matter.	70	51
Physical Indicators of Soil Health		
Soil Stability (0-6): Soil stability rating indicates the strength of soil aggregates, a higher number indicating greater stability. Tillage generally decreases soil stability by breaking apart soil aggregates. Data indicates that the no-till production systems have greater soil stability when compared to conventional tillage systems. A rating of ≥5 indicates a stable soil aggregate.	4	6
Bulk Density (g/cm^3): Bulk density is an indicator of soil compaction. Data indicates that neither soils were compacted at the time measurements were conducted. This may be reflective of the timing of data collection, as measurements were taken recently following a tillage event. Bulk density values <1.6 do not restrict root growth.	1.2	1.4
Water Quality Indicators		
Soil Erosion (lbs./ac.): Soil erosion in the conventional tillage system (1,200 lbs./ac.) was considerably greater when compared to the no-till system with cover crops (100 lbs./ac.). This may be a reflection of the lack of soil cover, reduced soil stability, and reduced infiltration rates as potentially indicated by the lower earthworm (macropores) in the conventionally tilled field.	1200	100
Phosphorus Loss (lbs./ac.): Phosphorus loss was considerably higher in the conventionally tilled system, 1.1 versus 0.1 lbs./ac in the no-till system. We suggest that this is a result of lack of soil stability and high soil erosion rates observed in the conventional tillage system.	1.1	0.1
Production Indicators		
Corn Yield (bu./ac.): Corn yield in the no-till production system was higher when compared to the conventionally tilled production system.	180	200

Conclusion

Our preliminary findings indicate that the production systems evaluated produce differing environmental outcomes. In general, as the use of tillage is reduced and the use of cover crops increased, water quality and soil health outcomes improve. While these findings are not unexpected, they build on the foundation of previous experience and data. Future field and laboratory analyses and data will support a better understanding of the cost-benefit relationship for conservation practices in our region. With this information farmers, stakeholders and policymakers will be better equipped to develop and implement local conservation activities.

LASA
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Save the date:
LASA 2021 Annual Meeting

When: Wednesday, February 24, 2021 - Time to be announced
Where: VIRTUAL via Microsoft Teams
Tentative agenda:

- **Annual Business Meeting (members only)**
- **Public meeting**
  - **Guest speaker Steve Groff**
  - **2019 Conservation practice survey results - Steve Richter, The Nature Conservancy**
  - **Sustainability pilot project update - Houston Engineering Inc.**

Watch our website, social media and your email for updates as it approaches. Finalized agenda, registration information and link to join coming soon.

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