

Forward Farmer

The official newsletter of Yahara Pride Farms

Volume 9, Issue 1



Last August, Yahara Pride Farms hosted a field day at two different locations.

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General Information
info@yaharapridefarms.org

Soil health and observations from a soil pit



Francisco Arriaga, Associate Professor and Extension State Specialist with the Department of Soil Science at the UW-Madison and UW-Extension talked about soil health and soil properties. He also described attributes of a soil pit that was dug in a poorly drained soil where no-till practices were used for 10 years.

"Soil health includes biological, physical, and chemical factors," said Dr. Arriaga. "Better aggregation and organic matter content increase the biological activity of the soil. Tillage and crop rotations affect soil aggregation and this aggregation benefits and protects soil from compaction."

He talked about the functions of soil that include: medium for plant growth, recycling system for nutrients and organic wastes, habitat for soil organisms, system for water supply and purification and engineering medium.

Arriaga explained that soil health is the ability of a soil to function in a way that benefits humans and the environment. One of the key factors for soil health is organic matter, which is disrupted by tillage. That soil disturbance breaks aggregated clods of soil apart.

"Organic matter promotes aggregation," he added. "Tillage and crop rotations affect soil aggregation, and this aggregation protects soil from compaction." Better aggregation and organic matter content increases the biological activity of the soil.

"Plant residues and other organic matter feed the soil biology," said Arriaga. "Roots and root exudates add organic carbon to soil. These coatings and aggregates protect organic matter from decomposition and better aggregation and organic matter content increases biological activity, which further promotes more organic matter cycling and retention. Worm castings inside an aggregate is an example of biology at work."

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Kopman offered advice for future revenue streams from carbon credits



Getting paid for carbon credits may be an opportunity for farmers but it's important to decide based on what makes most sense to your farm.

"Carbon markets are promising but not a silver bullet," said Chris Kopman, general manager of Newtrient, an organization that wants to help farms navigate the developing carbon credit arena. "It's complex

to navigate, funding is inconsistent, farmers need to stack multiple benefits, multiple programs offered, and the criticism of environmental benefits within environmental groups."

Newtrient was founded in 2015 by leading dairy cooperatives and companies. Their mission is to reduce the environmental footprint of dairy and make it economically viable to do so. Kopman talked to farmers and guests during the annual Yahara Pride Farms Watershed-Wide Conference on March 2 in DeForest.

"Capturing carbon and avoiding emissions add up to carbon credits," explained Kopman and added that the information about carbon and carbon credits, have "just exploded" as concerns about climate has increased.

He explained that there are two paths to determine the value of carbon credits including: Carbon insets or reducing emissions within the supply chain and offering farmers incentives to reduce emissions or carbon offsets, selling carbon offsets outside of the dairy supply chain.

Kopman also highlighted the factors that are driving the markets.

- Companies setting aggressive carbon reduction goals or seeking to green their portfolio.
- Increased regulations on certain sectors, i.e., transportation
- Increased support for government programs for the adoption of climate-smart practices, i.e., Inflation Reduction Act, Climate-Smart Commodities and more.

He talked about the type of markets and who are currently the buyers and then he shared what it means for the dairy industry.

"The challenge for farmers is how to navigate this new space," said Kopman. "Newtrient hopes to help pull all the aspects of carbon credits together to help farmers get the best advice they can."

There are opportunities through carbon reductions including:

- 26% reduction through feed by using no or low-till farming, cover crops nutrient management, precision agriculture and water use efficiency.
- 35% reduction through enteric methane by using diet management, genetic improvement, herd management,

cow comfort and well-being and feed additives.

- 33% reduction through manure by anaerobic digestion, renewable fertilizers, nutrient and water recovery, drying technology and manure storage.
- 6% reduction through energy by using renewable energy, energy efficiency and replacing fossil-fueled engines with electric motors.

Kopman also talked about what the challenges are directly related to carbon credits. Not all farmers are ready to engage according to a recent paper by Trust In Food, A Farm Journal Initiative.

"97 percent of farmers surveyed aren't yet ready to participate in carbon markets, although 93 percent are aware they exist," said Kopman. "Currently, 3 percent are participating and 59 percent who responded said they were not joining without first seeing changes."

Kopman highlighted what farmers want to see most from carbon markets including annual payment amount per acre, credits for pre-existing practices, minimal paperwork, support from advisors, ability to use existing software, recommended from a trusted farmer, and connection to an ag retailer or dealer.

He advised farmers to "Stay curious and keep good records, you'll need them."

Kopman also provided questions for farmers to consider when deciding on carbon markets including:

- What are the payment periods?
- What is the payment amount?
- What locations are offered?
- What are the data requirements? Data ownership?
- When is the program's start date? End date?
- Can early adopters participate?
- Who pays for the verification?

He also advised farmers to evaluate and question solutions and the impacts on your farm and future markets.

"Keep your options open, knowing that many more opportunities

will be coming down the pipeline," added Kopman. "Also talk with your trusted advisors and maybe a farmer who is already in the process."

If you're interested in learning more or contacting Newtrient, visit www.newtrient.com.



Overview of study comparing the nitrogen availability and water quality benefits of manure and biosolid compost products



During the annual Yahara Pride Farms Watershed-Wide Conference speaker Chelsea Zegler, ag and water quality outreach

specialist with UW-Madison Extension, shared the results of a study comparing the nitrogen availability and potential water quality benefits of manure and biosolid compost products.

Chelsea worked with partners on the study, including Kevin Shelley, Dr. Xia Zhu-Barker and Josh Mirabella from UW-Madison and Kim Meyer and Zac Thompson from Madison Metropolitan Sewerage District (MMSD).

Zegler provided an overview of a general on-farm phosphorus balance. Phosphorus inputs, from imported

fertilizers and feeds, are often greater than the amount of phosphorus exported as animal products and grain.

This imbalance leads to excess phosphorus stored in the soil, often referred to as legacy phosphorus. As this pool grows, losses of phosphorus to surface water bodies via erosion or runoff become larger. This phosphorus balance can be scaled up from an individual farm to a whole watershed. One strategy to minimize water quality risk is to move manure nutrients from areas, or even watersheds, of high concentrations to low.

Moving organic nutrient sources like manure is not a new idea; however, there are significant challenges, including high transportation cost for the nutrient content, and grain producers are hesitant over concerns about compaction and contaminants.

Composting manure offers some solutions by decreasing the volume by 40 to 60%. The resulting lighter texture

means the product can be applied on actively growing crops. A mixed compost of manure and biosolids can potentially make a product more balanced in nitrogen, phosphorus, and potassium.

Organic nutrient sources also add micronutrients and carbon missing from synthetic fertilizers, vital for soil structure and nutrient cycling. Predicting nitrogen availability is another challenge of these organic products.

Compared with synthetic fertilizer, some of the nitrogen is in the organic form and needs to be broken down by microbes to be available to plants. That nitrogen availability is dependent on soil conditions like temperature and moisture.

The goal of this study was to measure nitrogen availability to a corn grain crop from four different manure and biosolid-based products to give

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Soil health, *continued*

“Organic matter coats soil particles and makes them sticky, which promotes aggregation.

Arriaga also talked about the composition of an ideal soil: 50% solids, 25% air and 25% water and that soil as three phases: solids, liquids and gas.

Arriaga described a soil pit that was dug in a field owned by the Bob Uphoff family south of Madison where Arriaga studied the soil profile. The soils series in this particular field included: St. Charles silt loam, Virgil silt loam, Wacousta silty clay and Palms muck.

Uphoff is vice president of the Yahara Pride Farms farmer-led group and owner of Uphoff Ham and Bacon Farm. He said that he “stumbled into no-till more than ten years ago” and that in 2013, this particular field was the last field that he put into no-till.

“It’s a field that is permanently protected from development by an environmental easement with Dane County,” Uphoff added.

By using no-till, Uphoff has documented improvements in corn production from 61 bushels per acre before no-till, to yields ranging from 212 to 214 bushels per acre, depending on the year. His soybean yields, in rotation with the corn, went from 44 bushels per acre at the beginning of no-till

practices to 72 bushels in 2022.

“Something good has been happening in those fields,” said Uphoff.

He has had several bids on tiling the land to drain it, but he isn’t sure how much good that would do “since there’s no good place to drain it to.”


He added that when storms roll through the Madison area, the nearby creek rises and stays up.

Uphoff also shared his advice with farmers who are getting into conservation practices and research.

“Be consistent with what laboratory is doing your soil sampling,” said Uphoff.

Arriaga added that because the soil types there are poorly drained, he was surprised that he found no compaction.

“It’s one of the first things I expected to find,” added Arriaga. “The management practices led to significant improvement in soil condition, including drainage.”

He added that reducing tillage and manure additions have promoted organic matter accumulation, aggregate formation and stabilization and a feedback mechanism in that recall that organic coatings on soil particles enhance aggregate formation and in turn organic carbon inside the aggregate is protected from decomposition. 

A Yahara WINS update



At the Yahara Pride Farms Watershed-Wide Conference on March 2, attendees learned that the farmer-led Yahara Pride Farms works with Yahara WINS, the Yahara Watershed Improvement Network.

Community partners led by the Madison Metropolitan Sewerage District collaborate on strategies to reduce phosphorus throughout the Yahara Watershed.

The community partners including towns, villages, cities, and other interested parties collaborate on a strategy called adaptive management.

“This includes all sources of phosphorus work together to reduce phosphorus runoff and partners pool money to help support watershed-wide conservation changes,” said Kim Meyer, former watershed programs coordinator for Madison Metropolitan Sewerage District.

She told the group that staff monitor phosphorus reductions in eight stream reaches throughout the watershed.

“We met all the goals for phosphorus reduction except for one stream reach, where there may be only one farm,” she added.

Most of that stream reach involves land that has housing developments. The streams where there are more farms met the phosphorus reduction goals.

The numbers for 2022 are not in yet, Meyer said, but in 2021 WINS had phosphorus reduction goals of 38,290 pounds and what was reported to her documented reductions amounted to 88,854 pounds.

The idea of Yahara WINS is for all sources of phosphorus – farms, towns, villages and cities – to work together to reduce phosphorus runoff. Since 2017, the WINS effort has given money to Yahara Pride Farms to be used for cost-sharing as part of that effort.

In 2017 the amount was \$110,000; this year the grant is \$425,000. That money helps Yahara Pride Farms pay farmers in the watershed for various conservation practices that improve water quality.

Meyer also shared the goals of the partners including an overall phosphorus reduction of 96,000 pounds by 2036 and that reduction is broken down by stream reach in the eight monitored stream reaches in the Yahara Watershed.

Along with the goals, Meyer shared the progress. As of 2021 the reduction was 88,854 pounds but in 2023 there is a change to how the phosphorus accounting is done.

“In the past, we were using the SnapPlus Model, which was used for all in-field crop management changes and it was a tool to help farmers balance nutrients, assess soil and nutrient losses,” explained Meyer. “When taking credit for water quality benefits, SnapPlus needs to be used differently

Yahara WINS and Yahara Pride Farms



- Yahara Pride Farms has continually surpassed annual goals for farmer sign-up and acres
 - Yahara WINS has continued to increase support to Yahara Pride Farms to support growth

2017: \$110,000

2022: \$425,000

Yahara Pride Farms has shown year after year that farmers are spending around 150% more on conservation on their farms than what they receive in cost-share from Yahara WINS

Madison Metropolitan Sewerage District

than how farmers and consultants use the tool for farm management.”

With phosphorus accounting:

- Farmers will use the critical soil that covers at least 10% of the field and want to ensure that conservation helps the most erosive part of a field.
- When taking credits for water quality benefits farmers should use the predominant soil of the field so they don’t overestimate the benefits of conservation.
- By using a different calculation, there might be 50% less pounds of phosphorus savings, in other words, underestimating rather than overestimating the benefits.

Meyer thanked farmers for their work beyond the Cost-Share Program.

“Farmers are spending 150% more on conservation practices than what they are receiving in cost-share.”



Nitrogen, *continued*

producers a better idea of how to utilize the products. These included bedpack dairy manure, both raw and composted, from Endres Berryridge Farms in the Yahara River Watershed and a biosolids cake product from Madison Metropolitan Sewerage District (MMSD).

A mixed compost of manure and biosolids was included for comparison of possible benefits. The trial was conducted at Bradley Farms, Inc., a grain producing farm near Sun Prairie. All organic treatments were applied in fall of 2021 at a total nitrogen rate of 160 lb/acre. Adjacent plots received nitrogen fertilizer at a range of rates applied in-crop in 2022.

What we learned from the study

- According to pre-sidedress nitrate soil samples, the biosolid cake product supplied a 60 lb/acre nitrogen credit, manure compost provided a 10 lb/acre credit, while bedpack manure and mixed compost (manure and biosolids) provided no nitrogen credit. This indicates 35% first year nitrogen availability of the biosolid cake product and 7% availability of the manure compost.
- Corn yield was rarely significantly different between treatments. The only significant difference was the lower yield of the zero nitrogen, dairy manure, and mixed compost treatments compared to higher 200 lb N/acre. Treatments with the same letter are not statistically different.
- The lack of yield response suggests that not all the organic nitrogen was available in the first year, and higher total nitrogen applications rates for organic treatments are likely necessary to reach recommended nitrogen fertility recommendations.
- Low soil inorganic nitrogen levels in the early season for bedpack manure and mixed compost suggest less nitrogen mineralization, possibly due to higher carbon to nitrogen ratio of the products.



- Due to fall application timing, some nitrogen could have been lost before the corn was taking up significant amounts of nitrogen.

Project Limitations

- The site was generally unresponsive to nitrogen with an economic optimum nitrogen rate around 40 lb N/ac. A more responsive site may have shown more treatment differences.
- Single site and single year of data limits what recommendations can be made.
- Manure and compost nutrient content and availability will vary depending on “ingredients” and growing season soil conditions.

Future Considerations

- Tracking long term crop yield and soil health benefits of additional carbon additions.
- Track plant available nitrogen in the soil earlier in the spring and later into the summer to better understand nitrogen release.

A message from Yahara Pride Farms Chair, Jeff Endres



Thank you to our sponsors, speakers, and staff and our masters of ceremonies, Chuck Ripp and Pam Jabnke as we concluded another successful annual conference.

During the last 10 years, Yahara Pride Farms has continued to grow due to the efforts of farmers like you who take conservation and water quality seriously and want to entrust our farms to the next generation of farmers.

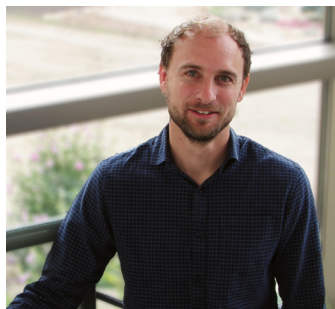
We need to work together on ideas that sustain agriculture especially in the Yahara Watershed and to collaborate with our urban partners.

The Yahara Pride Farms board of directors is committed to its purpose and is working on programs that are win-wins for farmers and water quality. Thank you for your continued support.

Sincerely,

Jeff Endres

Dane County's commitment to manure treatment project



To conclude the conference, Laura Hicklin, Director, and John Reimer, Assistant Director with Dane County Land & Water Resources shared details about the Community Manure Treatment Study.

“The Dane County Land and Water Resources Department is embarking on a multi-year project on the feasibility of a community manure treatment facility,” explained Hicklin. “The project is in the early phases and the County wants to collaborate with farmers on the vision and plans.”

They talked about the economic impact of agriculture in Dane County highlighting numbers for the 2019 UW Extension Report.

“Livestock is an economic driver in Dane County that we want to support and see continue,” said Hicklin. “We want to find projects that allow farmers to stay in business, protect our water resources and are economically feasible for everyone involved. We need to work together to increase the value that manure adds to your system.”

Hicklin provided an overview of the timeline, project goals, and concept ideas to date.

He added that manure is a valuable resource.

“Economic pressure to keep costs of production low and societal demand for farms to reduce their environmental

impact are driving the need for improved and cost-effective manure and nutrient management options,” said Hicklin. “How can we take the components of manure and further partition and recover nutrients, reduce mass, concentrate carbon material, and reduce greenhouse gas emissions? That’s what we are exploring with this project.”

He said that if there is a way to improve the beneficial uses of manure, it can create income streams back to the farmers.

“The technology needed to create manure byproducts is not feasible at the individual farm scale,” added Hicklin.

“Neither are digesters, which reduce emissions but just as importantly they create energy that helps funds the additional treatment options that are necessary to meet nutrient recovery goals.”

The goals of the project include:

- Concentrate and redistribute nutrients.
- Improve manure management for different livestock operations.
- Protect and improve water quality.
- Recover greenhouse gas emissions.

Hicklin talked about project tasks including assessing manure handling and transportation needs, assessing manure processing components, conducting a market analysis, providing an economic cost analysis, and assessing the business structure.

He then asked attendees, “How can we best reuse this manure? Can we make products that we need? How can we make manure marketable?”

“Dane County is ready to make a sizeable investment to help with infrastructure with manure management,” added Hicklin. “It is offering farmers a financial incentive to join the steering committee to help find what will work best.”



What is Farmers for Sustainable Food?

Farmers for Sustainable Food is a non-profit organization that provides resources, advocacy, support and empowerment for farmers who are innovating and demonstrating sustainable farming practices.

Established in 2016 as the Dairy Strong Sustainability Alliance, the organization has evolved, boasting a diverse set of partners and offering a robust set of services. Specifically, FSF supports seven farmer-led watershed conservation groups in Wisconsin and develops and manages sustainability projects with farmers and supply chain partners.

“Our vision is a sustainable food system in which farmers, their communities and the environment thrive,” said Todd Doornink, president of Farmers for Sustainable Food and a dairy farmer in northwestern Wisconsin. “Our focus is on uniting stakeholders to collaborate across organizational lines, inspiring farmers to be leaders of change and empowering our partners to meet their goals.”

The Dairy Business Association, Edge Dairy Farmer

Cooperative and The Nature Conservancy originally organized the alliance in



Farmers for Sustainable Food

Wisconsin around the goal of helping farmers make tangible improvements to the environment and other aspects of their farms.

Since then, additional partners have come aboard representing various parts of the food supply chain, from individual farms and agricultural groups to food processors and food companies. The group is facilitating greater opportunities to achieve environmental goals and promote progress in Wisconsin and throughout the upper Midwest.

FSF supports Yahara Pride Farms with a variety of services, including social media and events and will be continuing to increase support based on the needs of the group.

To learn more, visit FarmersForSustainableFood.com. 

Yahara Pride Farm's 2022-2023 Cost-Share Program

Thank you for your continued support of Yahara Pride Farms. Without farmers like you who are committed to trying and implementing conservation practices, we wouldn't see the continued improvement in water quality throughout the area.

This information outlines the 2022-2023 Yahara Pride Farms Cost-Share Program available to farmers in the Yahara Watershed. This program is designed to help minimize the risk associated with trying new conservation practices on your farm.

It's our hope that you will find value in the practices and implement these practices or combine for even greater environmental impact. The results from the 2021 Phosphorus Reduction Report indicated that farmers in the program reduced the risk of phosphorus delivery to the Madison Lakes and the Yahara River by 61,706 pounds.

Last fall, farmers enrolled in the 2022-2023 Yahara Pride Farms Cost-Share Program. Our only requirement is that you submit a 590-nutrient management plan for the acres enrolled in the program.


From there, the acres that were enrolled were verified against the 590-nutrient management plan. Payment amounts are calculated based on the verified number of acres per practice, up to the maximum number of acres as stated in the enrollment form and information sheet.

We applaud the efforts of so many of you who have planted more than those maximum acreage amounts and encourage you to keep that positive impact going. In the nine-year history of the Yahara Pride Farms Cost-Share Program, we have paid-out the maximum amounts stated on our

enrollment form for all acres that have qualified. We strive to continue this level of payment into the future. The target to distribute cost-share checks is May 2023.

Your participation is crucial to the continued success of Yahara Pride Farms, and our collective commitment to clean water, productive farms, and pleasant communities. The positive improvements we see are due in large part to the ongoing and impressive work by all of you.

The following incentives were offered for 2022-2023:

- **Strip tillage:** \$15 per acre up to 100 acres (max. payment of \$1,500/farm).
- **Low disturbance manure injection:** \$20 per acre up to 100 acres (max. payment \$2,000/farm).
- **Cover crops:** \$50 per acre for up to 100 acres of over-wintering crops \$30 per acre for up to 50 acres of nonover-wintering crops. Deferred fall killing of alfalfa until spring (*Requires waiting until spring to kill alfalfa (hay) in fields that will be rotated into other crops or re-seeded): \$30 per acre up to 50 acres.
- **Low disturbance deep tillage and cover crop planting:** \$55 per acre up to 50 acres.
- **Winter headland stacking** (*Requires spring/summer application): \$8 per yard up to 350 yards.
- **Composting manure:** \$12 per yard up to 350 yards.
- **Adding grass to alfalfa (hay) seedings or seeding grass forage mixtures (alternatives to pure alfalfa stands) on highly erodible (HE) land:** \$25 per acre up to 50 acres.
- **No-till planting into soybean stubble, cover crops or alfalfa:** \$25 per acre up to 50 acres. 



Yahara Pride Farms
229 Douglas Dr.
Brooklyn, WI 53521

yaharapridefarms.org

