Producer-Led Watershed Protection Grants

E-News Update

Nitrogen management has become a focus for several producer-led groups

December 2019

Kevin Masarik, Groundwater Quality Specialist with UW Stevens Point, has been making his way around the state to speak at several producer-led events to discuss groundwater quality. Kevin noted that we generally have a good handle on what areas of the state have higher levels of nitrates, which can be found using the Wisconsin Well Water Viewer available here: https://www.uwsp.edu/cnr-ap/watershed/Pages/wellwaterviewer.aspx A perspective is that we need to do more long-term monitoring of practices to identify what will make the most impact on groundwater quality improvement.

Why is it so important?

Nitrate is Wisconsin's most widespread groundwater contaminant, according to the WI Groundwater Coordinating Council Report 2019 (GCC Report 2019). The report states that the health-based groundwater quality enforcement standard (ES) for nitrate-N in groundwater and the maximum contaminant level (MCL) for nitrate-N in public drinking water are both 10 ppm (WI NR 140.10, WI NR 809.11). Everyone should avoid long-term consumption of water containing nitrate above this level. Infants below the age of 6 months who drink water containing nitrate in excess of the MCL are especially at risk, and could become seriously ill with a condition called methemoglobenemia or "blue-baby syndrome".

What practices are effective?

The question many are asking is what practices can significantly improve groundwater quality with respect to nitrates. The answer is, it depends. Even the best managed system has nitrate losses. This is particularly true in areas vulnerable to nitrate contamination, including intrinsic susceptibility (think well drained soils or karst geology) and land use (higher percentage of cultivated land) as stated by the GCC Report 2019. Losses from row crop agricultural systems can be significant due to the amounts of nitrogen inputs to those systems and the duration of actively growing vegetation. Other factors like precipitation, soil temperature, previous crop, and tillage also are important.

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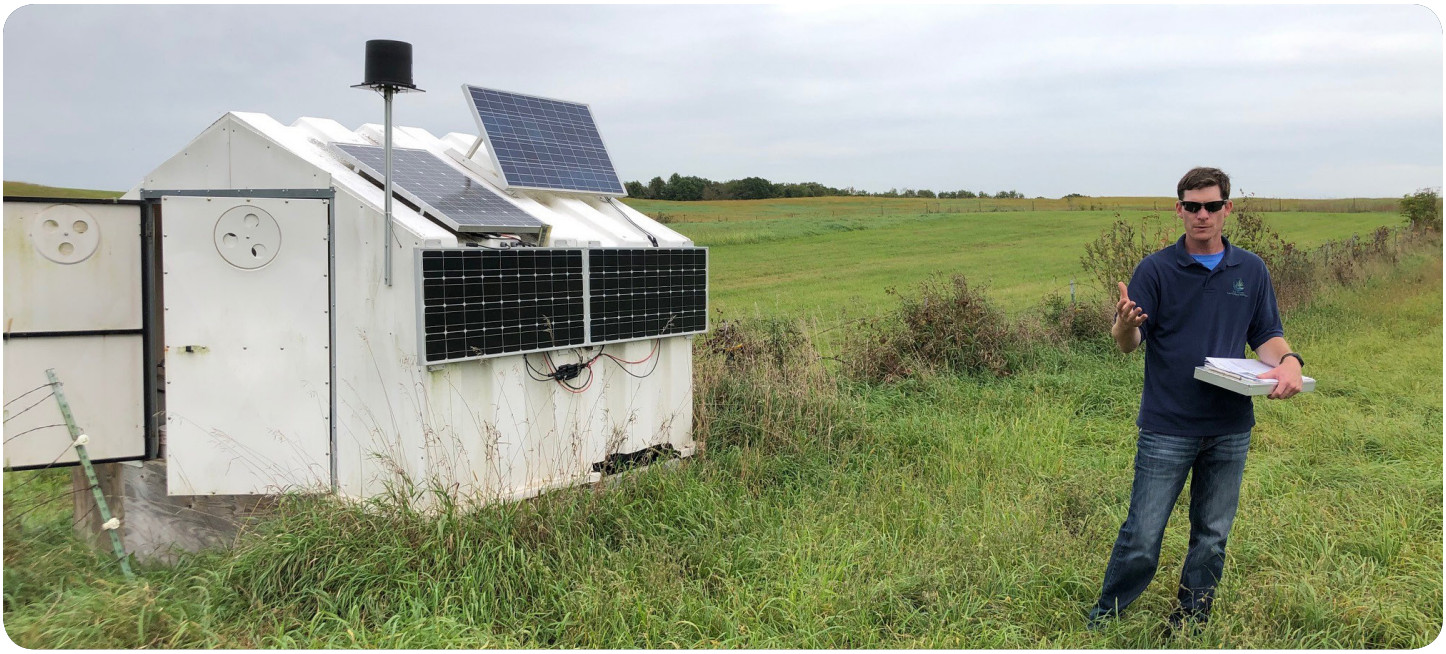
About the program

- **Began in Spring 2016**
- **Encourages innovative thinking related to conservation improvements**
- **Fosters locally-led decision making by farmers**
- **Works to improve water quality and soil health**

Nitrogen management *continued*



Masarik discusses that to truly reduce nitrogen losses in some of those highly sensitive areas that we will need to go above and beyond simply the right place, right source, right rate, and right time. **More experimentation is needed by farmers to understand what makes sense for both water quality and farm profitability.**

Adding diversity and cover crops helps

Strategies that are needed include adding diversity into cash grain operations by incorporating hay/alfalfa or other less nitrogen intensive cropping systems. This change is easier said than done. More research and investment needs to be put towards developing markets, processing capacity, and products for some of these less nitrogen intensive crops if we expect farmers to grow them.

Cover crops could also serve a valuable role, however establishment is key and our Wisconsin winters don't always make it easy to establish a healthy cover crop. Cover crops that overwinter are preferable for nitrate reduction, because significant nitrogen loss can occur in the springtime, particularly during early warm/ wet springs. While cover crops can't be expected to entirely solve our nitrate and groundwater concerns, they are definitely part of the solution and have other benefits as well.

Precision ag and innovative planting methods

Another method used to reduce losses is utilizing precision management techniques. For instance, taking portions of fields that aren't profitable (most years) out of production and planting something like perennial grasses. Other innovative strategies such as higher in-row planting densities for corn with 60 inch rows and cover crops between rows may have potential as well.

More monitoring needed

To determine the efficacy of these practices and others, we will need more groundwater quality monitoring. First, to establish a baseline, and then to monitor changes. Masarik noted a significant lag time that occurs when trying to evaluate the impacts of an on-field management practice on any type of waterbody, stream tributary, or well. That lag time between what happens on a field and what is observed in a well or stream can be frustrating for those that implement conservation strategies and want to show that their hard work is making a difference.

Monitoring strategies that can more quickly assess the

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Nitrogen management *continued*

effectiveness of various strategies are often expensive, but necessary in order to quantify the benefits of certain practices.

There is also the issue of variability. Variability of the landscape, variability of soils in a field, and most importantly weather variability. The effectiveness of certain strategies may vary quite substantially depending any of these variables. Overcoming this variability requires experimental designs that account for different soil types, geology, wet/dry/average precipitation years, as well as different spring/fall temperature scenarios. Even though it's a long process, it's worth the wait to ensure that practices are improving groundwater quality and that everyone has access to safe drinking water.

For more information, visit: https://dnr.wi.gov/topic/Groundwater/GCC/NitrateInGW.html where you can access the GCC 2019 report.

Where to find groundwater data in your area?

- WI Well Water Viewer: https://www.uwsp.edu/cnr-ap/watershed/Pages/wellwaterviewer.aspx
- Local Health Department
- County office

Questions?

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Full storage, frozen fields and mud: What are the options?

Provided by Kevin Erb, UW - Division of Extension

2019 is a year of frustrating challenges for manure application. Early season cold weather is not making things any easier. If there is a silver lining, it's that the industry and agencies are really working together to help farmers through this difficult time - things go better if the farmer is proactive rather than reacting to a problem the neighbor noticed. While there are no "simple solutions", there are things to keep in mind over the next few months.

CAFO/permitted operations should check with both the WI DNR and the county Land and Water Conservation Department (LWCD) before taking any action, as pre-approval may be required.

"My storage is full! I don't have enough room to make it through the winter"

- Find other storage: The easiest solution for producers is to find space in someone else's existing storage. Work with the county LWCD as they likely have a list of manure storages built according to proper engineering standards. Do not assume that any older storage is ready to use – check with the LWCD first. Your farmers may know of dairies that are no longer milking cows nearby that have available storage as well.

- Add to/Modify existing storage: Some farms have already added soil on top of their existing berm to add capacity. The problem is – this greatly increases the risk of seepage or storage collapse. The topsoil between the storage's compacted clay and what is added can allow seepage, and un-compacted soil will move with only a small amount of head pressure. Seepage between compacted and un-compacted soil is causing issues across the state. As wet as it has been, any equipment on the berm may create more problems. Work with county LWCD staff to determine how to safely modify the storage, and the right way to do it.

- Take to a sewage treatment plant: This option can be very expensive, but not knowing what you are doing can make it much more expensive. Some plants have the capacity to take manure, others do not. Start the conversation with the plant manager a few days before you need this option. The fee per gallon will depend on the nutrient and solids concentration, so take the most diluted water. A couple of tips are to not agitate and load out from the corner of the storage farthest away from entry points of barn pipes/concentrated silage leachate. Work with the treatment plant manager to determine best time of day for delivery, gallons per hour that can be accepted, and where to unload into their system.

"I have no option but to land apply"

- The farmer should work with the farmer's Nutrient Management Planner/Agronomist and the County Land/ Water Conservation Department (CAFOs should also include their DNR contact): These people are going to be able to help identify the fields with the lowest risk and alert you to any permissions/permits needed. They may also be able to connect the farmer with non-livestock neighbors who may have fields suitable for application.

- Apply to fields with the lowest risk: Risk factors for manure moving off the field include field slope, soil type, soil roughness and previous crop as well as how wet the soil is. A low risk field when you can inject/ incorporate may become a high risk field when the ground freezes. The agron-omist/agency staff person can help decide which fields are lowest risk based on current and expected conditions. Don't be afraid to ask about using different fields in the farmer's plan.

- Consider non-traditional fields: Pastures, grasslands and CRP (Conservation Reserve Pro-gram) acres may be options in limited cases. Most of these likely don't have a recent soil test, so identifying these fields before the ground freezes, and having the agronomist pull soil samples and prepare setback maps/determine rates is critical. Some fields (CRP, other programs) may require additional permissions before application can occur.

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Full storage, frozen fields and mud: What are the options?

Provided by Kevin Erb, UW - Division of Extension

- Watch the weather forecast, and take screenshots: Use the Runoff Risk Advisory Forecast (RRAF) to gauge the risk. http://www.manureadvisorysystem.wi.gov/runoffrisk/index Document both the weather forecast and the RRAF for each field by taking screenshots used to inform your decision. Combine this information with the advice of the agronomist/ agency staff.

- Reduce rates/cover only part of the field/inject across the slope: With the soil saturated, ma-nure ponds on the surface and remains more slurry-like when injected. Lower rates will reduce the chances of movement. In saturated conditions, injected manure can ooze, over time, downslope and pond weeks after application in low areas of the field. Inject across the slope rather than up and down. Cover only part of the field (in strips) and come back later and apply in between previous strips.

- BEWARE OF CONCRETE FROST: In a normal winter, liquid manure and slowly melting snow will soak into the soil. After several January thaws, sometimes all of the air pockets (pores) in the soil are full of water when the soil refreezes, forming concrete frost. This year, many fields will have concrete frosts as soon it freezes this fall. With concrete frost, very little manure or melting snow soaks in and runoff occurs every time it warms up throughout winter.

- Frozen/snow covered soils: If these can't be avoided, work with the agronomist and agency staff to modify both setbacks and rates.

- Working fields before land application: Rough soil has depressions that will contain some runoff, (it's almost always a good idea to think working the field borders before a regular application before the ground freezes, even more so this year). Be careful, however. Working part of, or an entire field may impact the farmer's eligibility for crop insurance and other benefits (not following their conservation plan) or impact their soil health management system. This decision needs to be made by the farmer and their agronomist.

- Walk the field, increase setbacks: New sinkholes and wet areas may have developed during this wet year, so take a close look at the field before applying. Don't be afraid to increase the set-back from water resources/ receiving waters and sinkholes to reduce the risk.

- Borrow/rent a tanker and get some applied: Taking out even a small volume may give you some breathing room this fall until the custom applicator is available. Work with your agronomist to make sure you have the most up to date information on rates and setbacks.

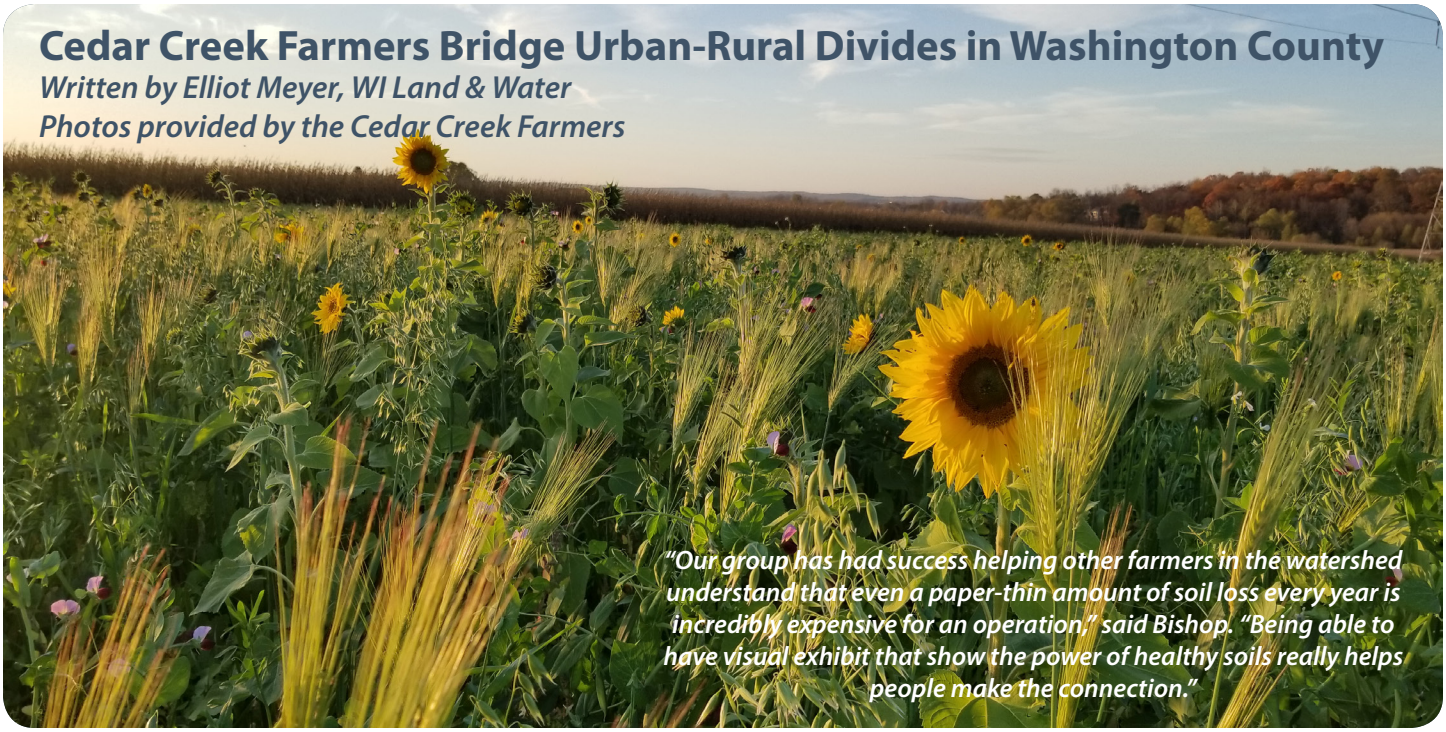
- Document that you did the best job possible. Take photos to document the work that you completed. If a spill happens/runoff occurs, calling the DNR Spills hotline (800-943-0003) is an essential part of documenting that you are taking the right steps to address a situation.

The information above was gathered with input from staff with UW Discovery Farms, UW Madison Division of Extension, county LWCDs, NRCS and DATCP.

Cedar Creek Farmers Bridge Urban-Rural Divides in Washington County

Written by Elliot Meyer, WI Land & Water

Photos provided by the Cedar Creek Farmers



"Our group has had success helping other farmers in the watershed understand that even a paper-thin amount of soil loss every year is incredibly expensive for an operation," said Bishop. "Being able to have visual exhibit that show the power of healthy soils really helps people make the connection."

Traveling east on Route 60, it's impossible to miss the true beauty of southern Wisconsin. The gently rolling cropland and pastures, dotted with old barns, are occasionally broken up by the main streets of small towns. The region seamlessly mixes the past with the present. At the crossroads with U.S. Route 45 in Washington County, the Village of Jackson encapsulates the mixing that many of these communities are experiencing. Over the past 30 years, the Village has more than doubled in size. The growth has converted much of the adjacent farmland into subdivisions for families. It was a fitting place for the local producer-led group, Cedar Creek Farmers, to organize and co-host the Cedar Creek Community Connection last September, a first-of-its-kind public event to showcase what urban and rural folks can do to protect water quality.

The event was divided into two adjacent tents, one for urban and one for rural. The urban half focused on the Village's wastewater treatment system and educated attendees about stormwater runoff. The rural tent hosted a variety of educational stations, including a soil pit, soil sampling station, and most notably the Soil Your Undies display, which showed how powerful microorganisms in the soil are in breaking down and converting cotton underwear into nutrients. For the roughly 100 families at the event, this was their first opportunity to learn how both municipalities and farmers protect water quality through interactive displays and direct conversations. For the Cedar Creek Farmers, this was an important moment to spread awareness about soil health and how sustainable farming benefits the community as well as the crops. "It was very important for the farmers to be able to tell their story," said Stephanie Egner, Washington County Conservation Technician. "This was a moment to show both the urban and non-agricultural public what farmers can do to improve their communities."

Helping the public better understand the connection between land use and water quality has been a particular concern for communities big and small across Wisconsin. Discussions about harmful contaminants in public drinking water have been elevated since Governor Tony Evers declared 2019 the Year of Clean Drinking Water and the legislature launched the Speaker's Task Force on Water Quality.

For the Washington County Land and Water Conservation Division (LWCD) and the Cedar Creek Farmers, they knew that this was a moment to exemplify how farmers are making a positive difference in the watershed with conservation practices like cover crops and no-tillage. "Cover crops really amplify the biology and the strength of the soil," said Ross Bishop, local farmer and member of the Cedar Creek Farmers. "No-till by itself is great and I have no-tilled for 25 years. On top of that, I've been using cover crops for over 10 years. And in the last five years, I've seen the cover crops make these yields really shine. It's all about building and increasing the fertility of the soil and the cover crops have really helped me get up between 4-4.5% organic matter in the soil." Building organic matter is fundamental to the soil health movement. Organic matter, or the decomposed humus from organic materials, provides a huge nutrient supply to crops. According to the Noble Research Institute, 1% of organic matter releases

20-30 pounds of nitrogen every year. Importantly for Wisconsin fields, organic matter helps decrease erosion and improve water infiltration. Organic matter acts like a sponge, with the ability to absorb and hold up to 90% of its weight in water that is then available to plants. This has been one of the critical factors for farmers over the past five years as Wisconsin experiences unprecedented storms and flooding events. Conservation practices like cover crops and no-till have helped farmers manage much larger storm events, as the fields better absorb rain water and hold the soil in place. In the short term, this can save operations a lot of time and money as the fields dry out faster, less soil is displaced, and the crops need less inputs.

"Our group has had success helping other farmers in the watershed understand that even a paper-thin amount of soil loss every year is incredibly expensive for an operation," said Bishop. "Being able to have visual exhibit that show the power of healthy soils really helps people make the connection."

The Cedar Creek Farmers is a relatively new group that formed in 2016. It began by Washington County LWCD reaching out to 10 farmers who they had worked with in the past. These farmers were early adopters – farmers who were experimenting with conservation practices, like reduced or no-till and cover crops, before the soil health movement become popular. The conservation department then invited them to a local coffee shop to pitch the program and see what they thought. "After we explained the producer-led program and that there was new grant funding available to support soil health practices, these guys said right from the start – "we're already doing this and we already feel like we've been successful at adopting these practices using NRCS's EQIP funds. Let's use this program to give funds to other farmers in the watershed for them to try it," recalled Paul Sebo, Washington County Conservationist. "These guys weren't after the money for themselves. They believe that these practices have benefitted their operations and continue to make a positive difference in water quality, so let's try to get more farmers to do it," continued Sebo. "It is as an easy way to offset the costs that come with experimenting with new practices in a very simple process. The one-page contract is straightforward and the hope was that if we get some other farmers to try out these practices and they want to do more, we will help them secure more funds for long-term adoption."

"I think our group, although we're small, are helping other farmers take the leap to try what we're talking about," said Bishop. "Just this past year, I was able to work with a 70-year-old farmer to help him do no-till soybeans on cover crops for the first time. Although he wasn't someone that would have been inclined to try this, after we did it, he's very pleased with how it turned out."

Diversity was another important detail to the success of the Cedar Creek Farmers. The group intentionally included grain, dairy, beef, and vegetable farmers to bring a well-rounded discussion about how to implement soil health practices correctly for different producers. Additionally, a diverse age of farmers created a unique mix of experience and enthusiasm. "We have guys in the group in their early twenties and guys into their sixties," said Egner. "The group is led by farmers like Ross Bishop, who have been farming for 25 years, that are mentoring and teaching the younger generation. It's really a special opportunity for these experienced farmers to lead by example, and what better way to get the younger farmers involved than to say 'hey, come be a part of something – this is going to be great for you.'"

"The new generation is very open to trying soil health practices," noted Bishop. "It's much harder to break old habits than teach new ones." Within the farming community, passing down the generational knowledge within families is a deep tradition. Many farmers first learn how to farm from their parents, who learned from their parents, and so forth. Unfortunately, the inherited knowledge of farming is lessening as farmland continues to consolidate and medium-size family farms shut their doors. Although there are many factors that contribute to this national trend, one stands out – the average age of farmers is slowly increasing, as less young people are farming full time.

"People don't farm forever. Land is going to get passed down to the next generation and it's really important for them to access the knowledge that the older guys have and to learn how to improve their soil health and water quality through conservation practices," said Egner.

For upcoming events, reimbursement forms, report templates and other resources, please visit our Producer-Led webpage

Questions?

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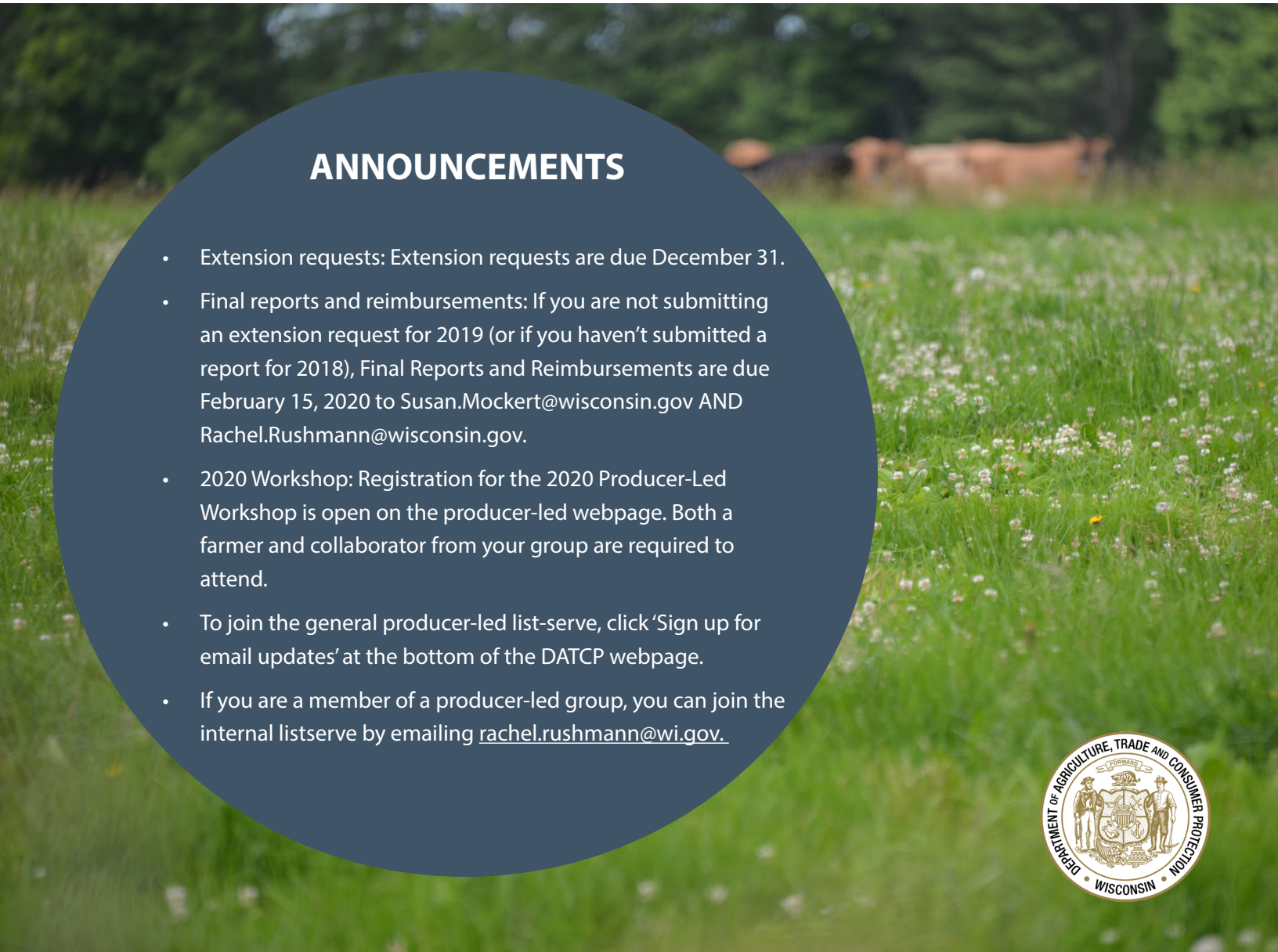

ANNOUNCEMENTS

- Extension requests: Extension requests are due December 31.
- Final reports and reimbursements: If you are not submitting an extension request for 2019 (or if you haven't submitted a report for 2018), Final Reports and Reimbursements are due February 15, 2020 to Susan.Mockert@wisconsin.gov AND Rachel.Rushmann@wisconsin.gov.
- 2020 Workshop: Registration for the 2020 Producer-Led Workshop is open on the producer-led webpage. Both a farmer and collaborator from your group are required to attend.
- To join the general producer-led list-serve, click 'Sign up for email updates' at the bottom of the DATCP webpage.
- If you are a member of a producer-led group, you can join the internal listserve by emailing rachel.rushmann@wi.gov.