NEWSLETTER

Driftless Ag Update

Ag news for La Crosse, Vernon, and Crawford Counties from UW-Madison Extension

TABLE OF CONTENTS

Please contact your local extension office for the print version of any article included in this newsletter.

Here's your March Driftless Ag Update!

Hello and congratulations on receiving our March Driftless Ag Update! This newsletter is co-written by your local UW-Madison Extension Ag Educators, Beth McIlquham (livestock) and Sam Bibby (crops).

Notes from your Regional Crops Educator- Sam Bibby

- The 2025 Wisc Weeds Research Report is now published. This is a great resource to compare some of the newest chemistries on different weed species.

-If you missed your chance to soil sample in the fall and plan to sample this spring, this article by Shawn Conely highlights the potential changes in P and K levels reported in the soil test result between spring and fall. *https://badgercropnetwork.com/the-seasonality-of-soil-sampling-understanding-variability-in-p-and-k-test-results/*

Notes from your Regional Livestock Educator- Beth McIlquham

-Save the Date for a Small Ruminant Workshop: A hands-on small ruminant workshop with be held in the afternoon on May 1 in Gays Mills. Topics to be discussed include parasite lifecycle, management strategies, and a hands-on fecal egg count of your flock! Stay tuned for more information. Call or email Beth (information at bottom of newsletter) with any questions.

-Protect Your Farm Premise with Biosecurity Mapping: Livestock biosecurity means preventing disease outbreaks by limiting the spread of germs to, within, and from farms, by using practices such as mapping farm premises, setting clear lines of separation, and ensuring people, equipment, and vehicles don't move germs between locations. The WI Department of Agriculture, Trade and Consumer Protection and UW-Madison Division of Extension have teamed up to provide Holding the Line premises biosecurity mapping workshops around the state to help livestock producers and veterinarians draft maps for their livestock operations. These FREE workshops are funded by a USDA NADPRP grant. Attendees will leave the workshop with their draft premises maps in hand.

-Disease Digest: To see HPAI updates in dairy herds in Wisconsin, check out the Extension Dairy webpage. HPAI was confirmed in poultry flocks in Dane and Jefferson counties in the last two weeks. To see HPAI updates in poultry flocks, visit the Extension Livestock webpage. There have been no cases of New World Screwworm in the U.S. in livestock, but more information can be found here. For information on Asian Longhorned Ticks, check out the recorded Beef Roundup Webinar session where Dr. Olds presented the latest information. For animal owners of all kinds, please evalutate your biosecurity protocols, including pest management.

Camelina Conversation on March 19th

Join us to talk about the hottest new cover crop ahead of corn and what may be Wisconsin's newest potential oilseed. Industry perspective, new research, and hands on experience all combined for one event.

Regional Workshops on Fine Tuning Nitrogen Management through On-Farm Research: NOPP and more

These late-winter workshops explore strategies to advance nitrogen management for improved profitability and water quality through local research results and discussions with participating farmers, agronomists, and other regional partners.

Register:
https://uwmadison.co1.qualtrics.com/jfe/form/SV_9Rbpq08VB4NyM6y

Lambing School

Four Winds Farm will host a full-day Sheep Lambing Workshop on March 28 in Fitchburg, Wisconsin. This immersive, hands-on learning experience is designed for both new and experienced shepherds seeking to improve their lambing knowledge, confidence, and on-farm success.

Register:
https://www.ticketleap.events/tickets/fourwindsfarmfitchburg/sheep-lambing-workshop-625026477

Spring Cow-Calf Workshop

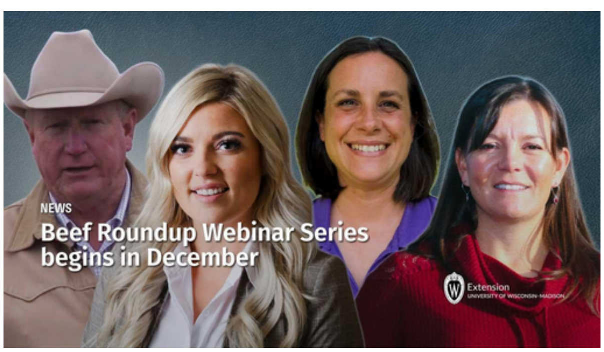
UW–Madison Division of Extension will host a spring cow–calf workshop on Wednesday, March 18 at 6:00 PM, offering beef producers timely guidance as they prepare for the spring and summer season. The program is designed for cow–calf operators seeking to strengthen herd health, improve management practices, and increase profitability.

Free - RSVP to Crawford County Extension Office by March 17th. 608-326-0223

Focus on Forage

Focus on Forage is a four-part webinar series highlighting research-based information and farmer strategies to optimize forage yield, quality, and profitability in Wisconsin. Webinar speakers include forage industry experts, UW–Madison specialists, and extension educators. Certified Crop Advisor CEUs and ARPAS credits are available for each webinar. Webinars are free and online, but registration is required.

Register:
https://uwmadison.zoom.us/meeting/register/x27nFKErTqWJHbwp3p0NWw#/registration



Beef Roundup Webinar Series

Beef producers are invited to attend a series of free educational webinars this winter. The Beef Roundup Webinar Series will be hosted by the University of Wisconsin-Madison Division of Extension featuring Extension specialists and industry experts from across the country covering timely topics relevant to today's beef producers.

Free Registration: https://go.wisc.edu/BeefReg

Small Ruminant Webinar Series

The UW–Madison Division of Extension Small Ruminant Webinar Series returns in 2026 with three expert-led sessions designed to equip sheep and goat producers in Wisconsin, Iowa, and the Upper Midwest with practical, research-based tools to support flock and herd success. Hosted by Small Ruminant Outreach Specialist Carolyn Ihde, the series connects producers with leading specialists in marketing, animal health, and direct-to-consumer strategies

2026 Cold Climate Fruit Webinar Series

Join the UW Fruit program for four cold-climate apple-growing webinars focused on disease management this spring. Webinars are free and online, but registration is required.

More information and registration:
https://fruit.wisc.edu/webinars/apples/

Shearing Day Preparation and 2026 Sheep Shearers Directory

As professional shearers become fewer and schedules fill quickly, Wisconsin producers are encouraged to reach out several weeks to a couple of months ahead of their intended shearing date to ensure the shearer can fit the flock into the route and that the schedule works for both parties. The 2026 Wisconsin Sheep Shearers List was compiled by Lisa Paskey, Coordinator of the Pen of 3 Carcass Evaluation and Hall of Breeds Exhibit for the Wisconsin Sheep & Wool Festival. Paskey contacted shearers across the state to confirm the most current phone numbers, service areas, and any details they wanted producers and returning clients to know. Good communication is key to a successful shearing day. When contacting a shearer:

- discuss facility needs (lighting, electrical, gates and pens, shearing space)
- labor requirements
- start and finish times
- expected shearing pace
- wool-handling preferences
- shearer's experience with your breed or type of sheep.

Shearers often appreciate learning about the facilities available, how sheep will be penned and sorted, and what help will be on hand. It is also courteous and helpful to discuss meals and breaks in advance. Providing snacks, lunch, and plenty of water creates a positive working environment and helps the shearing team maintain energy and focus throughout the day.

Producers can help ensure a cleaner, higher-quality wool clip by reducing contamination from polypropylene twine, net wrap, and grain-tote and tarp fragments; by using only scourable paint for marking animals; and by keeping wool breeds separate from hair sheep to prevent contamination from shed hair. Vegetable matter (VM) can enter the fleece through overhead hay feeding or by fresh straw or wood shavings added to pens leading up to shearing. Consider your feeding and bedding strategy carefully in the days leading up to shearing to reduce VM. Sheep will need to be dry and kept out of snow and rain. Sheep are not shorn when wet, so remember that high humidity can also make wool damp, even when housed indoors.

Fasting sheep prior to shearing supports animal comfort, human safety, and helps minimize contamination of wool and the shearing floor. WorkSafe New Zealand's Fasting of Sheep Prior to Shearing guide outlines fasting times for the varying production stages of sheep.

Sheep should be fasted from all feed and water based on their age and production stage, in accordance with the recommended minimum and maximum fasting periods. Withhold feed for adult, non-pregnant, non-lactating sheep for 20–32 hours and 12–24 hours without water. Ewes in early to mid-pregnancy can generally have food withheld for 18–30 hours and water withheld for 12–24 hours. Ewes in late pregnancy or lactation require shorter fasting periods of 12–24 hours without feed and 8–20 hours without water. Unweaned lambs should remain with their dams until the ewes enter the shearing pens. Caution must be taken to adhere to fasting times, and they should never exceed the maximums, as this increases the risk of metabolic or clinical disease.

To further protect wool quality and maintain a smooth workflow, shear white fleeces first, then colored fleeces or wool with medullated fibers, and shear sick or compromised animals last. If shearing occurs during winter, immediately after shearing, provide warm, draft-free shelter with ample bedding so animals remain comfortable and protected from cold stress.

No matter whether your flock is managed for wool, meat, seedstock, fiber arts, or land stewardship, good preparation supports both a successful shearing day and the health and welfare of your sheep. Early communication with your shearer, proper facility setup, and thoughtful handling help reduce stress, improve safety, and create a smoother experience for both animals and people. For an easy-to-follow checklist that covers everything from pen setup to handling sheep on shearing day, check out the American Sheep Industry Association's Preparing for Shearing guide. And remember to call early, prepare properly, prioritize animal comfort—and enjoy the harvest!

Quantifying Nitrate Leaching from Agricultural Soils

Introduction

Minimizing nitrogen (N) loss to groundwater is important for human health, the environment, and long-term farm profitability. Quantifying nitrate leaching – a primary pathway of nitrogen loss from agricultural fields – can help you understand the influence of different management practices on water quality, and identify options for reducing nitrate leaching.

Here we outline several common ways to quantify nitrate leaching (Figure 1). We focus on the nitrate form of nitrogen (and not nitrite or ammonium) because nitrate is typically present in higher concentrations. Most of the methods described can be used to measure other forms of N leaching as well. Each method has different benefits and tradeoffs in terms of data accuracy, equipment needed, and time and labor requirements, which are discussed below.

When choosing a method, start with the specific question you want to answer and work backwards to determine the most appropriate and feasible approach. Table 2 at the end of this article highlights some common research questions around nitrate leaching and agricultural practices.
No matter which method you use, it's important to keep detailed records of the amount of N applied (e.g., in fertilizer, manure, or through irrigation) and the crop yields. These values will help put your results in context.

Estimating Potential Nitrate Leaching

A mass-balance based nitrogen budget can help you estimate nitrogen losses without taking any additional measurements. A nitrogen budget considers nitrogen that goes into the field (inputs like synthetic fertilizer, manure, and biological fixation) and nitrogen that is removed from the field (outputs like crop removal) or stored in the soil to estimate the amount of nitrogen vulnerable to leaching during and after the growing season (Figure 2).

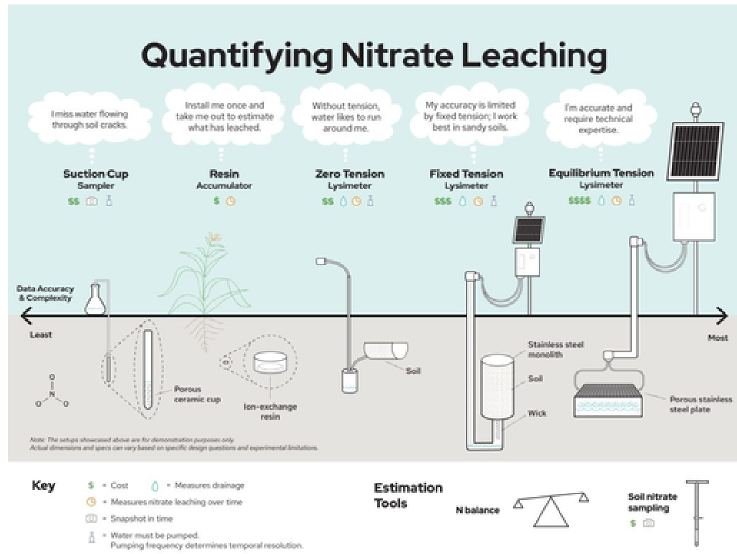


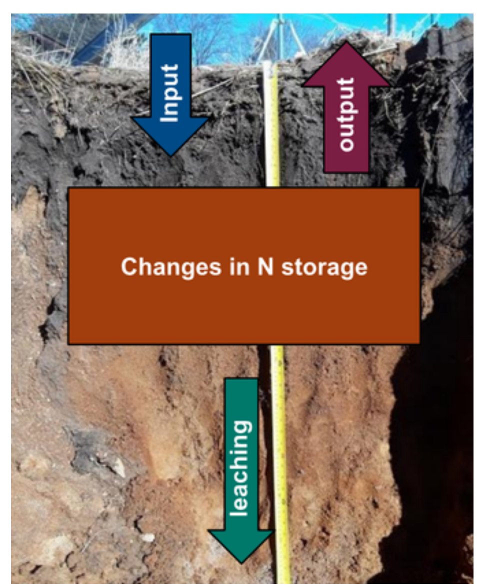
Figure 1: Common ways to quantify nitrogen leaching. Credit: Holly Bobula

By comparing nitrogen budgets under different management scenarios, you can identify opportunities to reduce nitrate leaching through management changes. For a more detailed guide on how to build a field-based nitrogen budget, read the article, "Manage nitrogen as a budget to reduce groundwater contamination," or jump to the Nitrate Leaching Calculator Tool, which uses the nitrogen budget approach.

Figure 2: Equation commonly used to estimate nitrate leaching using the mass-balance approach: Leachable N = N inputs – N outputs – Change in N storage. Portions of the balance most relevant to on farm use (e.g., fertilizer inputs, harvest outputs) are shown here; note that there are other smaller components to the nitrogen balance that are included in the Nitrate Leaching Calculator. This approach requires consistent in-field data on N input and yield. Photo credit: Kevin Masarik

N inputs - N Outputs - Changes in N Storage = Leachable N

N inputs	N Outputs	Changes in N Storage
Fertilizer	Harvest	Change in Inorganic N
Manure	Ammonia Loss	Change in Organic N
Symbiotic N Fixation	Denitrification	
Irrigation		



Soil profile nitrate sampling after crop harvest is a simple way to assess nitrate leaching potential during the shoulder seasons. The assumption of this method is that nitrate remaining in the soil after crop harvest is vulnerable to leaching, especially if plants are not actively growing, like a cover crop. This method is most effective during years of normal to dry precipitation; during wet years, most residual nitrate may be leached during or near the end of the growing season, prior to the collection of post-harvest soil samples. Routine soil fertility samples (0-1 ft) can be used to measure residual nitrate in topsoil, but for completeness it is better to sample to a depth of 2 or even 3 feet, as the subsoil may also contain substantial soil nitrate (Figure 3). Residual nitrate is calculated as the product of the soil nitrate concentration and bulk density for each depth increment (e.g., 0-1 ft, 1-2 ft, 2-3 ft), and these values are summed and expressed on an area basis (e.g., lb NO_3-N/ac) (Table 1). Nitrate (NO_3^-) is often expressed in terms of nitrate-N, the nitrogen component of the nitrate ion. Importantly, although soil nitrate concentration data are often expressed in commercial lab reports as "ppm", this refers to the mass of nitrate-N per dry mass of soil (mg N/kg soil), rather than the concentration of nitrate-N in water as discussed below (i.e., mg N/L), which is also commonly referred to as ppm. Soil bulk density can be estimated through resources such as the NRCS Web Soil Survey or from equations that use measurements of other soil properties (texture and organic matter)[1], or it can be measured directly if appropriate equipment is available. It is important to emphasize that soil measurements represent only a "snapshot" in time, and biological processes (e.g., nitrogen mineralization, immobilization, denitrification) occurring after sampling influence the actual amount of nitrate vulnerable to leaching[2].

Figure 3: Soil sampling at various depths. Common soil sampling with a manual 1-foot corer is shown on the left and a hydraulic setup for deep soil core up to three feet is shown on the right. Photo credits: Elizabeth McNamee and Adam Von Haden

For each depth increment in the profile, the equation is:

Residual Nitrate-N (lb/ac) = depth (in) * 2.54 (cm/in) * soil nitrate concentration (mg/kg) * bulk density (g/cm^3) * (0.1) * 0.89 (lb/ac / kg/ha)

In this equation, 2.54 is the conversion between inches and cm, 0.1 converts the product of the previous metric terms in the equation to kg/ha, and 0.89 is the conversion from kg/ha to lb/ac. Table 1 shows example data and the resulting calculation. Residual nitrate values from each depth increment (last column) are summed to estimate total nitrate leaching potential for 0-3 feet (e.g., 145 lb NO_3-N/ac).

Depth increment	Depth of sample	Texture	Soil nitrate concentration (mg NO_3-N/kg)	Bulk density (g/cm^3)	Residual nitrate (lb NO_3-N/ac)
0-1 ft	12	Silt Loam	10	1.42	39
1-2 ft	12	Silt Loam	10	1.50	41
2-3 ft	12	Loam	15	1.60	65
Total, 0-3 ft	36	-	-	-	145

Table 1: An example for calculating nitrate leaching potential from fall soil profile nitrate samples in an Antigo Silt Loam.

Measuring Nitrate Leaching With Lysimeters And Other Methods

Broadly speaking, lysimeters are instruments that collect agricultural drainage (water, and any chemicals carried by that water, including nitrate), as it moves through the soil profile (see Box 1 for more on the definition of “lysimeter”). Lysimeters are most useful when installed below the deepest crop root in a rotation (typically 2-6 feet).

Lysimeters measure soil water drainage for different purposes, like estimating crop water use or chemical leaching. If leaching is the main goal, the lysimeter must capture drainage water for chemical analysis and has to be emptied periodically with a pump. When emptied, the volume of agricultural drainage pumped from the lysimeter is recorded. This can be converted into a water flux, which is the amount of water moving through the lysimeter footprint area during a given time period (e.g., 1 inch of water per week). A small sample, typically 100 mL (3 oz) or less, of the drainage water is collected and measured for nitrate concentration in a laboratory.

The water flux is multiplied by the nitrate concentration to determine the nitrate load or nitrate yield exported to the groundwater during a period of time (see glossary for units). Because nitrate leaching can be highly variable within a particular field, multiple lysimeters should be installed and sampled to calculate average values.

A large portion of nitrate leaching often occurs during the "shoulder" seasons (early spring and fall), therefore it is important to frequently measure and empty water accumulated in the lysimeter storage reservoirs during these periods for accurate drainage capture and estimation. To check if a lysimeter is operating correctly, you can compare drainage from the lysimeter to drainage estimated from the remainder of the water balance (e.g., drainage = precipitation + irrigation – evapotranspiration + runoff +/- changes in soil moisture). If lysimeter drainage is significantly higher than estimated drainage, the lysimeter may be over-estimating drainage; if lysimeter drainage is lower, the lysimeter may be under-estimating drainage. The design of the lysimeter affects their drainage collection performance.

The Soil Science Society of America defines a lysimeter as:

"(a) A device for measuring percolation and leaching losses from soil under controlled conditions. (b) A device for measuring gains (irrigation, precipitation, and condensation) and losses (evapotranspiration) from soil.[3]"

In practice, the term lysimeter has also been used to describe other methods that sample soil water or provide an estimate of nitrate leaching, but do not strictly meet this lysimeter definition, because they do not measure or collect drainage water. For example, suction cup samplers can be used to measure the nitrate concentration of soil water but they cannot measure drainage water, which is necessary to quantify nitrate leaching amounts. The best methods for measuring nitrate leaching include assessment of drainage water amount as well as nitrate concentration, a distinction that is important for practitioners to remember when choosing measurement approaches and evaluating results of previous studies.

Box 1: What is a lysimeter, and why should I care?

How Lysimeters Work

Lysimeters function best when they are able to mimic the soil matric potential, a measure of how tightly water is held (also referred to as "tension" or "suction"), of the surrounding soil. If the lysimeter suction is stronger than the surrounding soil, lysimeters may pull in more pore water from the adjacent soil ("convergent flow"), overestimating the true drainage (Figure 4). If the lysimeter suction is weaker than the surrounding soil, soil water may flow around the lysimeter ("divergent flow"), underestimating drainage[4]. A lysimeter may experience convergent, divergent, and steady water flow depending on how the soil matric potential changes over time. There is a spectrum of simple to complex lysimeters based on their ability to accurately mimic the suction of the surrounding soil as it changes in response to precipitation, irrigation, and plant water use. This in turn influences the quality of the data collected and the types of questions that each lysimeter type can address. Increasing the number of lysimeters (replication) can improve estimates by capturing more variability and increasing measurement confidence. For capturing canopy-scale drainage measurements (measurements that represent the crop canopy and spaces between rows), larger collection surface areas (on the top of the lysimeter where drainage enters) are required.

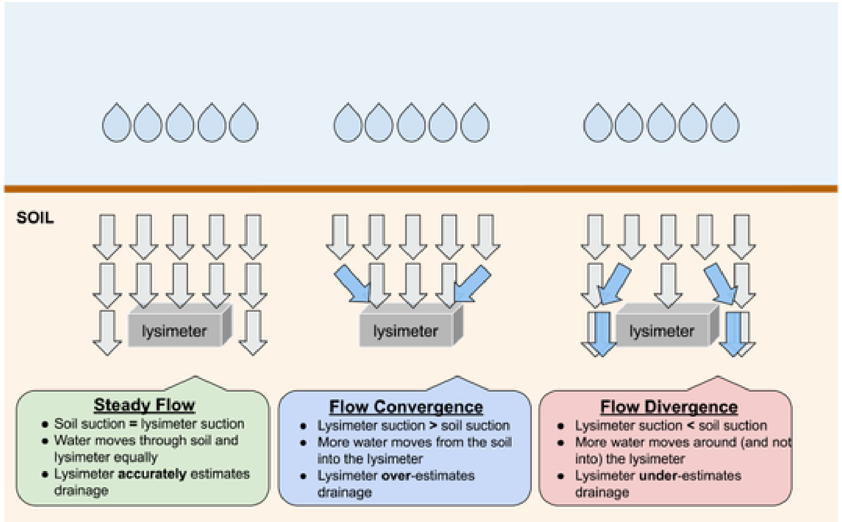


Figure 4: Simplified illustration of steady, convergent, and divergent flow into lysimeters. Steady flow results in the most accurate drainage measurements. Arrows represent direction of water flow, with blue arrows indicating differences from steady flow.

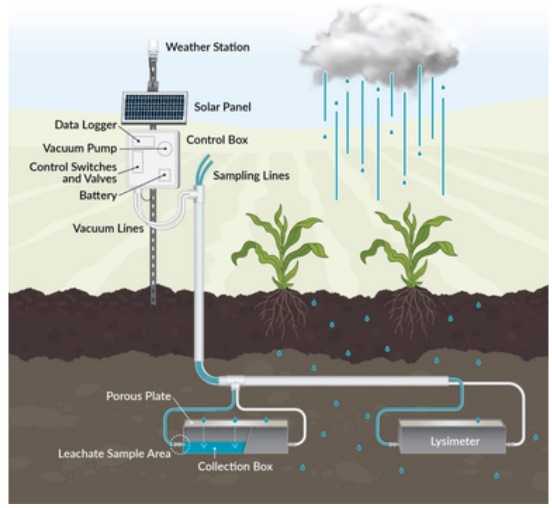


Figure 5: Illustration of two equilibrium tension lysimeters (ETLs) and the instrumentation (e.g., data logger, vacuum pump, solar panel) needed to operate them. The lysimeter on the left demonstrates how water transfers through the porous plate and can be pumped up from the leachate sample area. Lysimeter water must be pumped routinely throughout the sampling period. Graphic credit: Wisconsin Discovery Farms

Types of Lysimeters

Among the most complex lysimeters for capturing agricultural drainage are equilibrium tension lysimeters (ETLs), which are often similar in size to the canopy of an individual crop plant (e.g., > 2 ft^2). ETL collection boxes are typically made of stainless steel and are installed below the crop root zone, ideally beneath an undisturbed soil profile (Figure 5). ETLs have sensors that measure soil suction at the depth where drainage is captured. Suction is applied to the ETL through an electronically controlled vacuum pump to mimic surrounding soil suction. Thus, ETLs can capture realistic agricultural drainage volumes and provide some of the most accurate estimates of nitrate leaching. ETLs can remain installed and sampled for multiple years with minimal interference on field operations, allowing for data collection across crop rotations, varying weather events, and seasonal changes. Nevertheless, ETLs are not commercially available and difficult to install, often requiring excavators and other heavy equipment, which can be costly and disruptive to the field site. Construction and maintenance of these lysimeters is expensive and requires advanced technical expertise. When soil suction conditions change rapidly (e.g., storms, snowmelts, heatwaves) lysimeters may not align with the surrounding soil suction, causing errors. Finally, ETLs may be completely filled with water during large drainage events (e.g., snowmelt) depending on the size of their collection reservoirs[5, 6]. Overall, ETLs are a “gold standard” for measuring nitrate leaching, but their use is typically limited to long-term applications and research partnerships.

Fixed tension lysimeters (e.g., passive capillary wick lysimeters) maintain a constant suction through a wick (often fiberglass), typically designed to mimic the soil suction at field capacity (the water content after water has drained from larger soil pores). These lysimeters are most reliable in sandy soils where the range of soil suction the soil experiences is narrow and closely matches the wick. Even in sandy soils, however, these lysimeters can over- or under-estimate agricultural drainage when the surrounding soil suction does not match the constant suction at the drainage capture boundary. Maintaining undisturbed soil above the wick helps minimize divergent or convergent flow around the lysimeter, improving drainage estimates[7]. Because of the constant suction applied, fixed tension lysimeters are less accurate than ETLs in measuring drainage, but also tend to be much less expensive and easier to maintain for the same reason. As a result, they can be a "middle ground" that decreases cost without significantly sacrificing measurement accuracy, particularly in sandy soils.

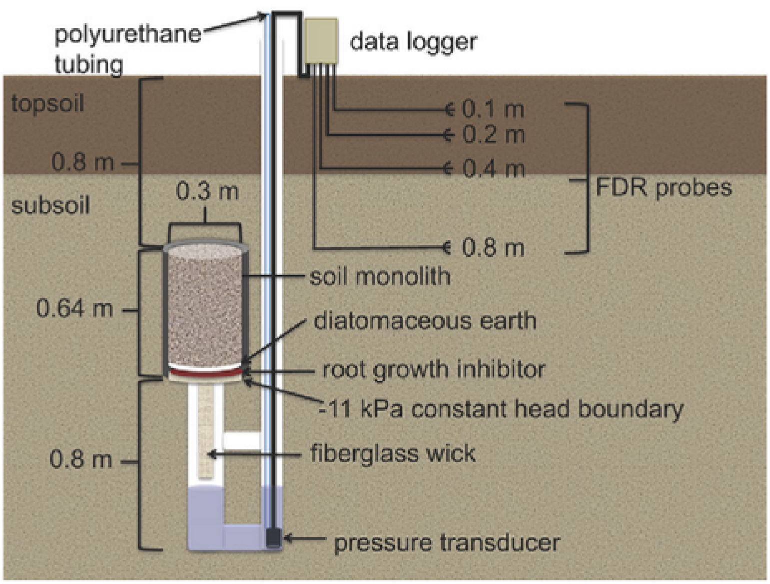


Figure: 6: Illustration of a fixed tension lysimeter installed with a soil monolith (a large, undisturbed core of soil taken from the same depth) above the wick to improve lysimeter measurements by reducing convergent or divergent flow. Installation and sampling requirements are similar to those of equilibrium tension lysimeters. Graphic credit: Nocco et al., 2018[4].

Zero-tension lysimeters are installed under soil without any mechanisms to mimic the naturally occurring soil suction. They rely solely on a saturated soil zone above the lysimeter and gravitational flow to move soil water into the lysimeter. Zero-tension lysimeters can be fabricated at low cost, but because of the high likelihood of divergent flow (due to no suction applied), they cannot reliably measure the amount of agricultural drainage, preventing the direct calculation of nitrate yield[5]. Nevertheless, zero-tension lysimeters can provide useful information about patterns in nitrate concentrations (or other chemical constituents) of soil drainage, enabling evaluation of management practices or addressing other questions where "relative" rather than "absolute" results might suffice[8]. Zero-tension lysimeters have been fabricated out of a wide range of materials including half-sections of pipes (Figure 7), trays, boxes, and barrels, depending on the particular application.

One approach to eliminate divergent flow in a zero-tension lysimeter design is to enclose a volume of soil on the sides and bottom (e.g., within a steel box or barrel), forcing drainage to leave through a single outlet[9]. This design may be attractive for long-term research applications but is less feasible for use on commercial farms given the difficulty of conducting typical field operations with these lysimeters in place.

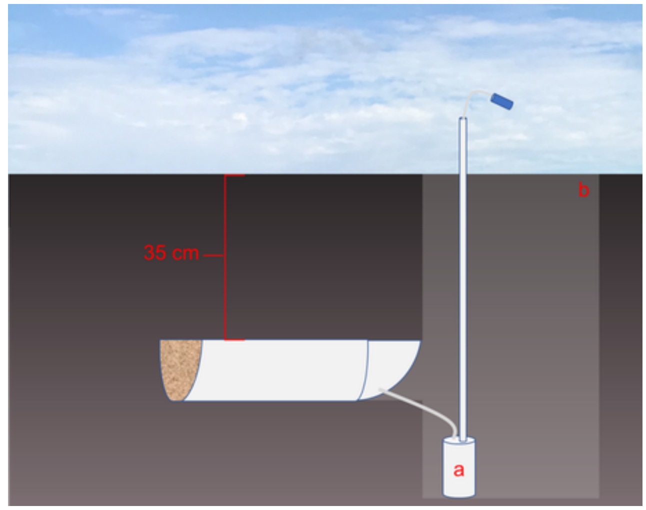


Figure 7: Illustration of a zero-tension lysimeter installation. Particular design details of these and the other lysimeter types can vary substantially among different projects. Graphic credit: Lawrence and Hall, 2024[8].

Figure 8: Illustration of an extreme example of a zero-tension lysimeter installation, where intact soil profiles were enclosed on sides and bottom in steel boxes with a single drain, which allowed complete measurement of drainage volume and chemical composition. Photo credits: Steven Hall (left, center); Loper et al., 2024[9] (right).

Other Methods

Suction cup samplers consist of a sampling tube connected to a porous cap (typical diameter < 1") which is buried in or beneath the root zone. Suction is applied to the sampler and an attached collection bottle, which accumulates water from soil through the suction cup pores until the collection bottle fills, or until suction applied to the sampler matches the surrounding soil. Measurements of nitrate concentration in suction cup samplers are often highly variable over space, requiring many replicates to understand trends. Importantly, suction cups may not effectively sample water from the larger soil pores ("macropores") that are responsible for much of the drainage and nitrate leaching. Also, suction cups do not provide any information about the amount of drainage (drainage volume) because they operate under a gradually decreasing vacuum instead of continuously collecting drainage water like, for example, ETLs.

To estimate nitrate leaching using suction cup lysimeters, measured nitrate concentrations must be multiplied by approximate drainage volumes, which can potentially be estimated using hydrological models[10]. Similar to zero-tension lysimeters, suction cup samplers can be useful for characterizing relative impacts of different management practices on soil nitrate (e.g., cover crops vs. no cover crops), but by themselves they do not provide total estimates of nitrate leaching from a field[11].

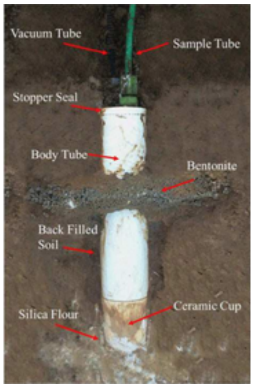


Figure 9: Side view of a suction cup sampler installed in soil. These samplers must be installed with good connectivity between the porous cup and soil to avoid divergent flow. A sodium bentonite seal is pictured here to prevent preferential flow down the sides of the sampler. The vacuum tube connects to a pump and the sample tube to a collection bottle. Suction cup samplers need to be removed during field practices that disturb the soil, like tillage. Graphic credit: Singh et al. 201811

Resin accumulators have often been termed “resin lysimeters” in the scientific literature but do not meet the strictest definition of a lysimeter (Box 1) given that they do not measure drainage volume. They consist of a layer of ion-exchange resin installed between porous mesh within a plastic pipe (typical diameter and length of ~2 inches) capped with sand on both ends. After digging a hole, the small pipe is placed vertically into a pocket carved beneath a profile of undisturbed soil, typically at a depth of two or three feet, and the excavated soil adjacent to the accumulator is replaced. Location is recorded with high-precision GPS to enable accumulator retrieval, often after one growing season or one calendar year. The nitrate in drainage flowing through the pipe is trapped by the resin. After retrieval, the resin is extracted in a salt solution to release the accumulated nitrate for measurement. Cumulative nitrate leaching during the period of deployment is then expressed as mass per unit area of the pipe (nitrate yield). This method is relatively inexpensive and does not interfere with farm operations. However, resin accumulator data should generally be used only to compare management treatments within the same field, and not necessarily interpreted as an absolute value[12]. Because the resin accumulator alters the physical properties of the soil and could promote flow convergence or divergence, measured values may overestimate or underestimate actual nitrate leaching from a given site[13].

Answering questions such as how nitrate losses vary under different management practices, high replications within each treatment can help capture the potential variability. Nevertheless, resin accumulators are gaining popularity for use in on-farm research across Wisconsin and elsewhere in the Midwest, because they can help address real-world questions posed by producers at a relatively low cost when compared with many of the other methods described above.

Figure 10: Illustration of resin accumulators prior to installation (left), during installation in a soil pit (middle), and after installation, before the pit is refilled (right). Geolocating the lysimeters is highly encouraged to facilitate retrieval. Photo credit: Lindsey Rushford

Lastly, if you have tile drainage on your farm, measuring nitrate concentrations at tile drainage outlets can be informative. To calculate the total nitrate load, the nitrate concentration would need to be multiplied by the volume of drainage flowing through the tile. On-farm research conducted by Wisconsin Discovery Farms found that taking bi-weekly grab water samples for nitrate concentration over the entire year accurately approximates the average annual nitrate concentration of outlet water (compared to more cost prohibitive 24/7 automated flow samplers). While this approach does not quantify nitrate leaching to groundwater (water from tile drainage outlets typically enters surface waters), it is still a cost-effective way to assess the effect of in-field nitrogen management practices on water quality. Read more about this approach in the article, **"A cost-effective approach for on-farm tile monitoring".**

Conclusion

There's a lot to consider when quantifying nitrate leaching. Table 2 can help you weigh advantages and disadvantages of different methods. Identifying the question you are asking is an important first step to finding the approach that works best for you.

Be realistic about the resources (time, labor, funds) you can invest in a project. For example, while equilibrium tension lysimeters (ETLs) provide excellent nitrate leaching data, they require a lot of technical knowledge, are costly, and not commercially available. Conducting a simple N budget may help answer your question at much lower cost. Measurement timing is another important consideration, as nitrate leaching often occurs in the shoulder seasons, especially in fields without well-established cover crops or perennial plants. If measurements only happen during the growing season, they do not give the full picture of nitrate leaching dynamics in your system.

If you have questions about nitrate leaching or lysimeters, want help deciding on an approach, designing an experiment, or making sense of the data you've collected, please contact the Agriculture Water Program for experts who can help!

Livestock Risk Protection Insurance: A Tool to Help Manage

Feeder calf and fed cattle prices are currently high, and so are the input costs to raise them. Price volatility has increased over the past decade, and factors such as trade disruptions, and media reports of health scares can quickly cause national prices to drop. Beef producers are taking on a lot of risk. To help mitigate that price risk, beef producers can look at using Livestock Risk Protection Insurance (LRP) to protect against unforeseen price drops.

There have been several changes in the last few years to make LRP more favorable for farmers to use. Some of these changes are as follows:

- Increased subsidy levels from the original 13 percent subsidy to 35 to 55 percent depending on the percentage of the expected ending price a producer wants to insure.
- Changing the premium due date to the end of the coverage period rather than the beginning.
- Expanding the sale window from 30 days to 60 days prior to the ending coverage. Cattle can be sold up to 60 days prior to the ending coverage date without affecting coverage of the policy purchased.
- Producers may purchase coverage on animals they have a valid purchase agreement for with a fixed price but have not taken possession of as long as possession is taken 90 or more days before coverage ends. Check with your agent to make sure the purchase agreement qualifies for coverage.
- There are new categories specific for dairy producers, that offer coverage for cull cows and unborn calves (beef dairy cross, and beef calves sold within the first two weeks after birth). Details on these two categories are not addressed in this article.

Taken together, these changes have reduced out-of-pocket costs, improved cash-flow timing, and increased flexibility, making LRP more comparable to other price risk management tools.

LRP is an insurance policy from USDA that can be used to implement a price floor, similar to a put option, while still allowing the opportunity to capture higher prices should they occur. Some advantages of LRP over buying a put option is that LRP covers the actual number of animals a producer has in a group rather than being confined to futures market contract sizes of 40,000 pounds of live cattle or 50,000 pounds of feeder cattle. Additionally, the LRP premium is subsidized. The policy does not cover poor animal performance or animal death. It protects against unforeseen price declines in national market prices during the coverage period. Because indemnities are based on national price indices rather than individual sale prices, LRP is best viewed as protection against broader market downturns rather than farm-specific pricing outcomes.

LRP is offered for feeder cattle and fed cattle. Feeder cattle coverage is offered in different categories based on expected ending weight (less than 600 pounds, and 600 to 1,000 pounds), breed type (beef, predominantly brahma, or predominantly dairy), and sex, as some categories require that heifers and steers have separate coverage while other categories do not. There are also feeder cattle categories for unborn calves that allow producers to purchase coverage prior to the calf crop being born. Producers should work with their insurance agent to determine the correct policy for the type of feeder cattle they want to purchase coverage for, and what type of proof of ownership and sales records are needed. Fed cattle coverage is not divided into different categories. Producers can select coverage lengths ranging from 13 to 52 weeks, and coverage rates can be chosen from 70 to 100 percent of the expected ending value. Because coverage categories vary by weight, breed type, and sex, producers should work closely with an insurance agent to ensure the correct endorsement is selected.

Coverage prices offered for feeder cattle are based on the expected ending value, which is derived from Chicago Mercantile Exchange (CME) feeder cattle futures contracts. Price adjustment factors are used to reflect differences in market prices of the different categories of feeder cattle relative to the type of feeder cattle the CME futures contracts and CME feeder cattle index represent (which reflects prices for 700-899 lb. #1 and #2 muscle steers). Coverage prices and premiums are also adjusted for the different percentages of coverage offered. Fed cattle expected ending values are derived from the CME fed cattle futures contracts with coverage prices and premiums adjusted for the different percentages of coverage offered.

The actual ending value for feeder cattle specific coverage endorsements is derived from the CME feeder cattle index price, which is an index of feeder cattle prices at auctions in 12 states. Fed cattle actual ending values are derived from the five-area weekly weighted average direct slaughter cattle price. While Wisconsin prices are not included in those calculations, feeder and fed cattle prices in Wisconsin generally move in the same direction as these national price indices, even if local price levels differ. For example, if feeder cattle prices drop in those states they usually drop similarly in all states.

Let's look at an example to get an idea of how LRP works.

Cattle feeder Todd purchased 40 head of beef x dairy cross steers weighing 500 pounds in mid-August 2025. He submitted the initial application paperwork to his insurance agent and was set to purchase specific coverage endorsements. From experience, he knows that these cattle will be finished and ready to sell in 280 to 300 days (about 40 weeks) at a finished weight of approximately 1450 pounds. On August 18th, he sees the expected ending price for fed cattle at 39 weeks is $229.52 per hundred weight and decided to insure coverage at the 100% coverage level of $229.52 per hundred weight, for a premium cost of $10.41 per hundred weight. The ending date for the coverage is June 18, 2026.

Looking ahead, USDA Risk Management Agency will determine the actual ending value based off the five-area weighted average slaughter price for June 18, 2026. The indemnity calculation is based solely on the difference between the coverage price and the national actual ending value, regardless of Todd's actual sale price. If the actual ending value is less than $229.52 an indemnity payment would be made for the difference between the coverage price of $229.52 and the actual ending value. Todd will pay the premium at the conclusion of the coverage period, regardless of whether an indemnity payment is triggered.

As Todd purchases additional groups of feeder cattle to fill pens at his farm, he can purchase separate specific coverage endorsements for those groups based on when he expects to market them but is not obligated to do so.

LRP can be used alongside forward contracts, futures, or other marketing tools, depending on a producer's marketing plan and operation. When doing so, producers should consult with their insurance agent to ensure program rules are followed and that coverage eligibility is not affected. Like most insurance, cattle producers should not purchase LRP hoping to collect on it. It is intended to help protect producers against unforeseen price drops that could occur for various reasons.

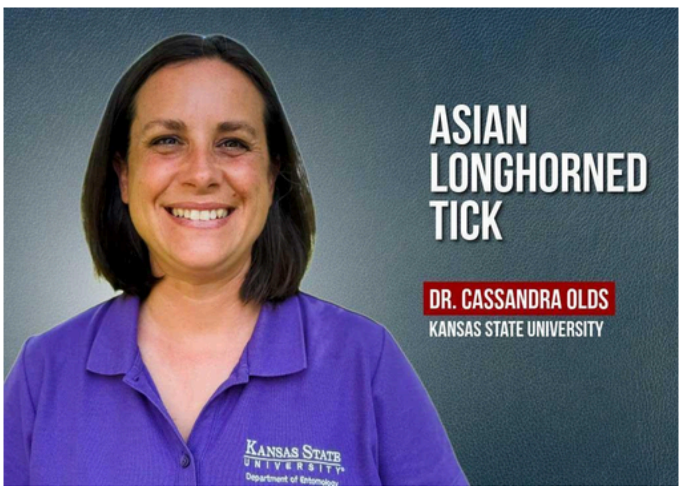
When used as a regular part of a market risk management plan, LRP insurance can help protect profits in years when markets turn for the worse. The recent changes to the program have made LRP insurance more appealing to cattle producers. It is difficult to predict when the price will drop. LRP insurance is a safety net, reducing downside price risk by providing a floor using national price expectations while also allowing producers to take advantage of higher national prices if they occur.

Producers interested in LRP coverage can contact a crop insurance agent who is authorized to sell livestock insurance products. A search tool to find insurance agents authorized to handle LRP can be found at USDA RMA Agent Locator

Wisconsin Field Crops Pathology Fungicide Test and Disease Management Summary 2025

This report is a concise summary of pesticide related research trials conducted in 2025 under the direction of the Wisconsin Field Crops Pathology program in the Department of Plant Pathology at the University of Wisconsin-Madison.

https://badgercropnetwork.com/wp-content/uploads/2026/01/2025-Fungicide-Test-Summary_FINAL.pdf



Asian Longhorned Tick Video

Dr. Cassandra Olds, Kansas State Entomologist shares information about the Asian Longhorned Tick and Theileriosis, their potential impact on cattle in Wisconsin, prevention and treatment options, what Wisconsin beef producers can do now, and what to expect next.

https://livestock.extension.wisc.edu/articles/asian-longhorned-tick/

Field Management of High Oleic Soybeans for Feed

As high oleic soybeans become more available in Wisconsin, growers are interested in how these soybeans can improve the economics on their farm. Local markets commercially selling these soybeans at a premium price are developing, as much of the interest in high oleic soybeans in Wisconsin is centered around the dairy feed industry.

https://livestock.extension.wisc.edu/articles/asian-longhorned-tick/https://cropsandsoils.extension.wisc.edu/articles/field-management-of-high-oleic-soybeans-for-feed/?utm_source=newsletter&utm_medium=emma&utm_campaign=WCM

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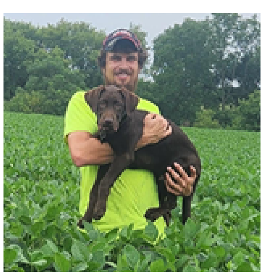

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