

Forage Matters: More on cover crops, grazing, nitrogen fixation

BY JAMES ROGERS

A few years ago, I listened to a forage specialist from Auburn University giving a talk at a national meeting. His opening line was, "In the South, we love three things: football, NASCAR racing and legumes." I remember him going on about the benefits of growing legumes, including their ability to fix nitrogen.

In last month's Forage Matters, we talked about cover crops, grazing cover crops and legume nitrogen fixation. As a quick review, the amount of nitrogen that is fixed by a legume varies depending on several factors: legume species, whether it is grown as a monoculture or mixture, length of the growing season, yield, environmental conditions, soil-available nitrogen and soil pH.

So, how does nitrogen fixed by the legume move from the legume to plants that are not legumes?

The eighth edition of *Forages: An Introduction to Grassland Agriculture* points out seven pathways through which fixed nitrogen from legumes can be transferred. The first four are major pathways and the latter three are minor.

1. Nitrogen in urine from grazing. This can account for 70%-75% of the nitrogen consumed, but much (50%-80%) can volatilize and be lost as ammonia.

2. Nitrogen in manure from grazing. The manure must decompose to be eventually available to the plant.

3. Decay of legume roots and nodules. This amount of transfer will vary widely.

4. Decay of leaves, stems and stolons.



In annual systems, legume nitrogen fixation may benefit subsequent crops more than the current crop. (NDSU photo)

5. Nitrogen leaching from leaves.

6. Root exudation of nitrogen from roots to the soil.

7. Direct legume-to-grass transfer.

To maximize the benefits of nitrogen fixation by legumes, we need to consider their long-term benefits and how best to capture them. Consider these things in capturing legume nitrogen fixation benefits:

- The majority of nitrogen is removed when legumes are baled and transferred to another location.

- When legumes are grazed,

the majority of the fixed nitrogen will be recycled back to the soil as dung and urine -- good grazing management improves the distribution of urine and dung across the grazed area.

- Nitrogen fixation increases with the longevity of the legume -- perennial legumes will fix more nitrogen than annual legumes, and annual legumes will fix more nitrogen the longer they are allowed to grow.

- As legume yield increases, nitrogen fixation will increase.
- Legumes will use soil available nitrogen before fixing their own.

- Legumes must form a symbiotic relationship with rhizobial bacteria for fixation to occur.

- If soil pH, phosphorus, and potassium levels are limiting to legume growth, nitrogen fixation will be limited. (The little things are important!)

- Legumes grown as monocultures will fix more nitrogen than when grown as a mixture.

- Major pathways of nitrogen transfer involve the decay of the plant, meaning that the inclusion of a legume may benefit subsequent crops more than the current crop.

Be patient. In annual systems, legume nitrogen fixation may benefit subsequent crops more than the current crop. In perennial grass-legume mixtures, maintaining a sufficient percentage of the plant population as legumes and grazing them can create a sustainable system.

Legumes are wonderful plants and should be utilized if they meet your goals. Be aware that many of the fixed nitrogen rates for legumes are based on a full year of growth from full stands grown as monocultures. To maximize legume benefits, there needs to be a cycling of above- and below-ground plant parts back to the soil as part of a systems approach. The goal is to capture as much of this fixed legume nitrogen as possible and retain it in our soils, livestock, farms and ranches.

James Rogers is an NDSU Extension forage crops production specialist at the North Central Research Extension Center near Minot.

Be proactive in herd management during drought



During drought, cattle may be moved more frequently to reflect forage production and availability. (NDSU photo)

Much of the High Plains is experiencing varying intensities of drought, and North Dakota has had below-normal precipitation all year.

While never an easy decision to make, cow-calf producers may need to decrease herd size during drought conditions to reflect a decrease in pasture carrying capacity, according to Lacey Quail, NDSU Extension livestock management specialist.

"Reproduction is the largest driver of profitability in the cow herd," says Quail, "so it is critical to prioritize reproductive efficiency in retained females if faced with culling decisions during drought."

Consult calving records
Marketing nonpregnant females may often be a more straightforward decision.

"While it may require a more detailed look through herd management records, it is equally as important to examine when pregnant females became pregnant during the breeding season and subsequently calved during the calving season," says Quail.

Cows that become pregnant in the first cycle of the breeding season (first 21 days), thus calving at the beginning of the calving season, are more productive. On average, calves born to these females are heavier at weaning compared to calves born later.

Not only do these females raise more pounds of weaned calf, but early-calving females are also more likely to conceive in the next breeding season compared to females calving near the end of the calving season. This is an especially important detail to consider for first-calf heifers, says Quail.

Heifers that calve in the first 21 days of their first calving season continue to calve early in future calving seasons and stay in the herd a full year longer, on average, compared to heifers that calve later in their first calving season.

"This pattern promotes herd longevity, building a foundation of females whose lifetime exceeds their break-even point, improving efficiency and profitability of the operation," says Quail.

For more details from NDSU Extension on the importance

of early-calving females, visit ndsu.ag/first-21-calving.

Minimize heat stress

Quail says it is best to proactively manage cattle to minimize heat stress by managing water, transportation, shade and fly control. When temperatures rise above the thermoneutral zone, cattle must utilize more energy to dissipate heat and maintain their internal temperature.

For more NDSU Extension information on identifying and managing heat stress, visit "Dealing With Heat Stress in Beef Cattle Operations" at ndsu.ag/beef-heat-stress.

Minimizing heat stress is especially critical during the breeding season, as high temperatures (often experienced during drought) can negatively impact the fertility of both sires and dams. Increases in temperature can impair the production of good-quality sperm, eggs and embryos -- all of which may result in decreased pregnancy rates.

During drought, cattle may be moved more frequently to reflect forage production and availability, as well as to reach dependable, good-quality water sources.

"Plan to handle, transport or trail cattle in the morning when the risk of heat stress is typically lower," says Quail.

For a daily forecast of cattle heat stress risk, visit the ND Agricultural Weather Network website: <https://ndawn.info/>

agriculture_cci.html

Nutritional stress may also be evident during drought as forage quality and availability decrease. For spring-calving herds, the grazing and breeding seasons overlap.

To optimize health and pregnancy success, forage and water resources, as well as nutrient requirements, need to be carefully managed together. When cattle lose body condition and become thin after calving due to unmet nutrient requirements during lactation, their likelihood of conceiving during the breeding season decreases. Supplementation may be required to meet energy and protein requirements while grazing drought-impacted pastures.

Prepare for other drought factors

Quail provides some additional tips for managing a herd in a drought:

- Accurately determine pasture carrying capacity and stocking rate.

- Prioritize females that consistently become pregnant in the first 21 days of the breeding season and calve early in the calving season.

- Handle and transport cattle in the morning (the coolest part of the day).

- Supplement if necessary to meet nutrient requirements.

For more information about dry conditions, visit ndsu.ag/drought-26.

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Project FXTA-0003(051)

Lake Ibsen Township, Benson County, North Dakota

NOTICE IS HEREBY GIVEN that the Lake Ibsen Township Board of the County of Benson, North Dakota, will received sealed bids for Lake Ibsen Township Project: FXTA-0003(051) – Various Township roads in Lake Ibsen Township approximately 4 miles SE of Leeds at the office of the County Auditor of said County until 8:00 A.M., CDT on June 16, 2026, at which time said proposals will be opened and read aloud.

Complete digital project bidding documents are available at www.woldengr.com or www.questcdn.com. You may download the digital plan documents for \$30.00 by inputting Quest project #10202986 on the website's Project Search Page. Please contact QuestCDN.com at 952-233-1632 or info@questcdn.com for assistance in free membership registration, downloading, and working with this digital project information. An optional paper set of project documents is also available for Non-Refundable price of \$100.00 per set. Please make your check payable to Wold Engineering, P.C., 915 East 11th St., PO Box 237, Bottineau, North Dakota, 58318. Please contact Wold Engineering, P.C. at 701-228-2292 if you have any questions.

The improvements consist of the following approximate quantities of materials:

Reshaping Roadway	1.442 Mile
Aggregate Base Course CL 5	3,013 Ton
Cement Stabilized Base Course – 9 IN	20,127 SY
Portland Cement	449 Ton
Incidentals	

Each bid is to be submitted on the basis of cash payment for the work and is to be enclosed in a sealed envelope addressed to the Township Chairman at the office of the county auditor. Each bid is to be accompanied by a Bidder's Bond in the amount of five (5) percent of the bid, as specified by the North Dakota Century Code Par. 11-11-28, to be forfeited to Lake Ibsen Township should the Bidder fail to effect a contract within ten (10) days after notice of an award. Bidder will execute and effect a contract in the amount of the bid and a Contractor's Bond as required by law and regulation and determination of Lake Ibsen Township.

The work on said project shall be started on a date set by the Lake Ibsen Township, and shall be completed by **October 17, 2026**, from such date liquidated damages shall be paid.

The right is reserved to reject all bids, and to waive any informality in any bid, and to hold the bids for a period not to exceed thirty (30) days from the date of opening bids.

DATE: **May 5, 2026** SIGNED: **Bryan Leapaldt**
Township Chairman
5812 57 St NE
Leeds, ND 58346

Protect dogs against Lyme disease

Lyme disease is not exclusive to human beings. Dogs are susceptible to this significant vector-borne threat as well. Caused by the bacterium *Borrelia burgdorferi*, Lyme disease can lead to debilitating joint pain, lethargy and even life-threatening kidney failure in extreme cases. It behooves pet parents to safeguard their animals from Lyme disease.

The American Veterinary Medical Association says Lyme disease is primarily transmitted through the blacklegged tick, commonly called the deer tick. As tick populations expand due to shifting climates, Lyme disease is no longer localized to the Northeast. In 2024, the



Companion Animal Parasite Council found 7 percent of dogs tested in Wisconsin and more than 10 percent of dogs in parts of New England tested positive for Lyme antibodies. Tick-borne illnesses are on the rise even in

historically low-risk areas like California.

Pet owners can take several steps to protect a dog from Lyme disease.

- **Maintain flea and tick prevention all year long.** Ticks are showing up in areas where they weren't always found and in months when people thought they were dormant. It's essential for pets to be protected with repellents and tick-preventatives all year long. These defenses can be purchased as chewables, topicals and specialized collars. According to the AVMA, a tick typically must be attached for 24 to 48 hours to transmit the Lyme bacteria. Preventatives aim to eliminate the tick within this window.

- **Consider vaccinating the dog.** Dogs that live in areas with high tick concentrations could probably benefit from receiving the Lyme vaccine. The efficacy can vary between 60 and 90 percent, but the Cornell University College of Veterinary Medicine notes that vaccinated dogs who do get Lyme disease often experience less severe symptoms.

- **Keep the yard tidy.** Ticks thrive in tall grass, leaf litter and wooded areas. Homeowners can keep their lawns short to eliminate the moist, shaded environments that ticks like. They also should clear leaf debris and brush from the yard.

- **Conduct a visual inspection.** After time outdoors, it's important for pet owners to check their dogs for ticks and remove any they find. Attention should be paid to the ears, eyelids, under the collar, between the toes, and under the tail.

- **Avoid walks in wooded areas.** When walking dogs in parks and other areas with a lot of trees, it's important to stick to the trails and keep the pets out of the brush where ticks are bound to be lurking, especially during peak times when ticks are active. The New York State Department of Health says ticks are most active from March to mid-May, and then mid-August to November.

-metrocreativeconnection

Seeking donations

Knox Lutheran Cemetery (North) is seeking donations for maintenance and upkeep. Send them to the treasurer, Karen Tufte, 5995 46th Ave. NE, York, ND 58386

MINUTES OF REGULAR MEETING MINNEWAUKAN SCHOOL BOARD April 20, 2026

A regular meeting of the Minnewaukan School Board was held April 20, 2026. Members present: Anna Tice, David Ambers, Michele Anderson, Samantha Sears. Member absent: Leona LaRoque. Others present: HS Principal Jordan Lunde, Elementary Principal MacKenzie Moen, Superintendent Kent Dennis, Business Manager Tracie Volk, and Brian Baumtrog.

The meeting was called to order at 4:30 p.m. by President Anderson.

Agenda -- A motion was made by Tice, seconded by Sears, to approve the agenda. All members present voted yes. The motion carried with a 4-0 vote.

Public Comment -- None.

Board Communications -- None. Minutes -- A motion was made by Ambers, seconded by Tice, to approve the minutes with corrections. All members present voted yes. The motion carried with a 4-0 vote.

Bills -- A motion was made by Ambers, seconded by Tice, to approve the bills. All members present voted yes. The motion carried with a 4-0 vote.

GENERAL FUND	
TMS	\$83.20
ND Telephone Co.	473.50
Stein's	293.52
BC Farmers Press	343.20
Otter Tail Power Co.	12,522.66
CentDak	11,076.64
NAPA--Devils Lake	101.37
Hartley's	2,679.28
Advanced Business	
Methods	2,507.17
City of Minnewaukan	1,712.93
Johnson Plumbing	242.50
NDSBA	214.50
Farmers Union Oil	
--York	292.03
Altru	95.00
Cole Papers	115.58
CCCC	5,265.16
Bravera Insurance	2,432.00
Stone's Mobile Radio	285.21
DL Journal	425.27
NDCEL	250.00
Corner Home Medical	65.00
Allard Trophy Co.	101.00
HMH	22,280.47
Decorate Wearables	435.00
Lake Chevrolet	961.33
Tate Topa Tribal	
School	17,375.00
Old National Bank CC	8,553.01

Fund Total	\$91,181.53
HOT LUNCH FUND	
US Foods	\$15,355.28
ONB Credit Card	59.97
Leavers	36.96
Fund Total	\$15,452.21

ACTIVITY FUND	
ONB Credit Card	\$672.42
Fund Total	\$672.42

Financial Reports -- A motion was made by Tice, seconded by Sears, to approve the financial reports. All members present voted yes. The motion carried with a 4-0 vote.

Cognia Report -- An update was given by Principal Moen.

Principals' Reports -- Elementary Principal Moen reported on enrollment, attendance, PT conference attendance was 54%, state testing, professional development, CSI update, upcoming events.

Superintendent Report -- Superintendent Kent Dennis reported on athletic banquet at Four Winds April 29, Lions All-Star Games 50th anniversary, election update, Warwick co-op update, May 8 school activities with Warwick, May 12 picnic, staffing update, spring sports update, NESD meeting.

Old Business -- None.

New Business --

Approval of Teacher Contracts: A motion was made by Tice, seconded by Sears, to approve the last of the contracts. All members present voted yes. The motion carried with a 4-0 vote.

Staff Resignations: A motion was made by Ambers, seconded by Tice, to approve the resignations of Randii Reed and Shelby Adam. All members present voted yes. The motion carried with a 4-0 vote. Thank you, Mrs. Adam and Miss Randii, for your years at MPS!

Loyalty Bonuses: A motion was made by Tice, seconded by Ambers, to approve the \$600 loyalty bonus for full-time and prorated for part-time. All members present voted yes. The motion carried with a 4-0 vote.

Next meeting is May 18, 2026 at 4:30 p.m.

A motion was made by Tice, seconded by Sears, to adjourn the meeting. The meeting adjourned at 5:19 p.m.

Tracie Volk
Business Manager
Michele Anderson
President