

LEM NEWS



Get on the Bus, Gus!

There are 55 seats available to transport you and your colleagues to the North American Manure Expo, which runs August 15-16 in Brookings, SD. The bus will depart in the early afternoon from Jamestown on Tuesday, August 14, and return on the evening of August 16. NDSU Livestock Environmental Management is securing sponsors to cover the motor coach rental. There will be a \$150.00 fee to secure your seat on the bus and cover your hotel room (2 nights/double occupancy). You will be responsible for meals and other incidentals. Register here: https://epayment.ndus.nodak.edu/C22800_ustores/web/classic/store_main.jsp?STOREID=29&SINGLESTORE=true.

Wednesday morning, August 15, is tour day at Expo. Tours are \$20.00/person which include a noon meal. You can learn more about this year's tours and register here at: <https://www.eventbrite.ca/e/2018-north-american-manure-expo-tickets-41089628184>. Wednesday afternoon free programming includes manure agitation demonstrations and industry educational sessions.

Thursday, August 16, is the Expo: seminars, field application demonstrations, and the NAME tradeshow. The grounds and tradeshow open at 7:30am, with educational sessions from 9am to noon. Field demonstrations will run from 1-4pm, and the Expo closes at 5pm. One jam-packed day! Admission to the grounds on August 16 is free.

Information on presentations, tours and times can be found here: <http://www.manureexpo.org/2018-south-dakota.html>. Keep checking back as new information is added regularly.



Participants at the 2017 Expo getting a close-up view of compost rows in various stages at a dairy farm.

He put a RING on it!
(Linda here, taking over Mary's greeting box.)
Congratulations and our very best wishes to Mary Berg and her fiancé Nick Keena on their engagement! We are so happy for both of them, and for their new little pup, Ruby, who helped seal the deal. Mary and Nick are planning a wedding celebration this fall at their farm.

**North American
MANUREXPO**
Professionalism in Nutrient Management

Brookings 2018 South Dakota

Register for the bus at
www.tinyurl.com/CRECstore



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Johne Disease, Jon's Disease or Johne's Disease?

No matter how you say it, the end result is the same: excessive herd culling, suboptimal milk production decreased fertility and death loss. I received a handful of questions about Johne's disease this winter in regards to winter feeding systems. As we transition into spring grazing and breeding season, I wanted to share the NDSU Extension publication regarding Johne's disease with you. I've picked out parts and pieces that I would like to draw your attention to but you can read the publication in its entirety here: <https://www.ag.ndsu.edu/publications/livestock/johnes-disease-in-beef-and-dairy-herds>. -Mary

Johne's (pronounced "yo-knees") disease is a chronic wasting disease in ruminants caused by the bacterium *Mycobacterium avium*, subspecies paratuberculosis. This bacterium is closely related to bacteria that cause tuberculosis in cattle and humans. H.A. Johne, a German veterinarian, first described this disease in 1895; his name is used as the common name for this disease, also known as paratuberculosis.

Johne's disease historically has been thought of as a "dairy" disease, but many beef herds also can have it. In dairy and beef cattle, Johne's is a slowly progressive disease that costs the producer through excessive culling, suboptimal milk production, decreased fertility and death loss. It also is a possible cause for litigation if knowingly infected breeding stock are sold as non-infected animals.

Johne's-affected cattle usually exhibit clinical signs between 2 and 5 years of age, but animals can be much older (10 to 15 years of age) and much younger (as young as 10 months).

The animals may appear unthrifty, are often weak and typically do not have a fever. The bacteria attack the lining of the intestine and cause a thickening of the intestinal wall. This causes two things to occur:

1. Nutrients cannot be absorbed through the intestinal wall, so the animal starts to lose weight.
2. The animal develops diarrhea because it cannot absorb nutrients and fluids. The diarrhea is mild at first, then becomes severe. Diarrhea may be intermittent at the onset of clinical signs.

The disease will not respond to antibiotics.

No medication or dietary change will result in a long-term cure.

Young calves ingest the organism from colostrum of infected cows, contaminated milk, sucking and nursing contaminated udders, or suckling or licking on any other contaminated surface. Johne's also can be transmitted in utero (while the calf is still inside the cow).

Animals affected with Johne's disease eventually shed the organism in their manure, with the number of organisms increasing through time. The Johne's organism can live for up to 18 months in soil or manure, depending on environmental conditions.

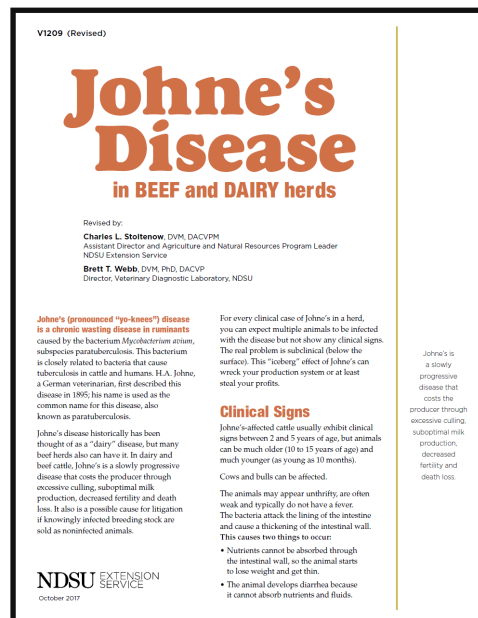
The bacteria also can be found in the semen of infected bulls. Transmission of Johne's via natural service theoretically is possible but has not been proven.

The best way to avoid introducing this disease into your herd is to be as certain as possible that animals brought into the herd are not infected. Second best is to work with a producer who knows the level of Johne's disease in his or her herd, follows good infection control practices and then purchases test-negative animals from test-negative dams.

Remember that Johne's disease is a *herd problem*, and knowing the test status of *numerous adults in the source herd* will give you a much better sense of the risk of purchasing an infected animal than the one test result you might get on the single animal you wish to buy. A single test on an individual animal may not detect every infected animal.

Johne's control relies primarily on testing to identify infected cows. Cull the positive cows and maintain clean calving/nursing pasture areas.

For more information on the [North Dakota Voluntary Bovine Johne's Disease Control Program](#), contact the North Dakota Department of Agriculture – State Board of Animal Health by calling 701-328-2655.



The Ripple Effect

This “spring” weather we’re all tired of talking, thinking and living with doesn’t just affect calving and planting. Delays like we experienced have a domino effect on the entire agriculture industry. Prolonged winter weather means the cows likely calved in the lot or a more confined area this year. This means more bedding, which leads to more loads to be hauled out to the fields this spring or fall. The extended cold we experienced also set spring field work behind. Consequently, when it’s time to haul manure, it is also be time to start planting and that means a very small amount of manure will be hauled this spring. Our ND custom manure haulers will be finding alternative work for spring/summer but will have twice as much work to complete in the fall. Despite not being able to spread as much manure this spring, livestock owners will likely still want to clean out their pens, either so the pen surface can dry or to get ready for another turn of feeders. There are a few things to keep in mind when stacking or stockpiling manure.

- ☑ There are two types of stockpiling areas: short-term (< 9 months) and permanent.
- ☑ No matter what kind of stockpile area you have, it may **not** be located:
 - In gravel pits, or any other excavations;
 - Along streams or lakes;
 - Within a flood plain; or,
 - Within 50 feet of a private water supply well or 100 feet of a public water supply well.
- ☑ Short-term areas must be moved to a new location each year, whereas permanent remain in the same place but need to have proper soil investigation done to ensure runoff and/or leaching does not affect surface and/or groundwater.
- ☑ The size of a short-term area (most often called “edge of field storage”) is limited to what surrounding land application areas need.

Short-term areas are best for smaller livestock owners as this allows manure to be removed from the lots all year and spread in a timely manner (pre-planting/post-harvest). Permanent areas are better for livestock owners with a high volume and continuous supply of manure.

When it’s time to spread it is important to analyze the manure and soil, no matter which stockpile method you choose. Know what you have and use only what you need for that piece of land and the next crop.

A complete list of manure stockpiling guidelines is available by contacting the [NDDH Division of Water Quality Animal Feeding Operations Program](#) at 701-328-5200. — *Mary Berg*

<https://www.ag.ndsu.edu/lem/documents/nd-custom-manure-haulers-march-2018>



Make your plans now to attend the [North American Manure Expo](#), August 15-16, 2018 in Brookings, SD. Expo tours have a \$20.00 fee (includes lunch), but the Expo on August 16 is free. Register for the tours here: <https://www.eventbrite.ca/e/2018-north-american-manure-expo-tickets-41089628184>. There will be a [sponsored motor coach](#) leaving from Jamestown on August 14, returning on the evening of August 16. A \$150.00 fee (based on double occupancy) will secure your seat and pay for hotel rooms. You will be responsible for meals and incidentals.



Neville joins CREC Staff

Dr. Bryan Neville has joined the NDSU Carrington Research Extension Center as Animal Scientist. Dr. Neville's first official day was March 26.

Dr. Neville's research interests include nutrition and management strategies in backgrounding/feedlot settings and drylot cow management. He will carry on the tradition of the CREC's live-stock program, conducting applied research that our ND producers can implement into their operations.

Dr. Neville earned his Ph.D. in Ruminant Nutrition from North Dakota State University in 2010. Bryan earned his M.S. degree also in



Ruminant Nutrition from NDSU in 2007. Most recently he has worked in the nutrition consulting industry; previously, Dr. Neville served as the Director and Animal Scientist at NDSU's Central Grasslands Research Extension Center near Streeter.

Bryan and his wife Tammi enjoy hunting with their dog, Bella, fishing and are excited to join the Carrington community.

Dr. Neville can be contacted by calling the Carrington Research Extension Center at 701-652-2951 or by email at

North American MANUREXPO

Professionalism in Nutrient Management

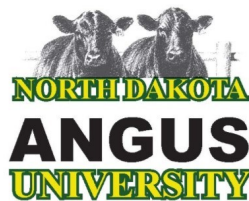
Brookings 2018 South Dakota

August 15-16, 2018.

Get on the bus!



This year's ND Angus University will begin shortly. The focus of this year's project will be looking at the impacts of bunk management during adaptation on animal performance, carcass characteristics, and hydrogen sulfide concentrations in steers fed modified-Distillers Grains with solubles, addressing a gap in research with regard to feeding distillers' grains.



Feed-Out Program

June 2018

The North Dakota Angus Association, in partnership with the NDSU Carrington Research Extension Center announce the seventh annual North Dakota Angus University Calf Feed-Out Program.

- Do you use Angus sires in your operation?
- Would you like to know how your calves perform and grade when fed to a finish weight?
- Are you interested in the potential profitability available through retained ownership?

The NDSU Carrington REC is currently accepting consignments of 800-900 lb calves for June 4-8, 2018 delivery.

Participants in NDAU will receive periodic reports on their calves' performance as well as a final report on the overall performance, efficiency, and carcass traits for their calves.

Contact information



NDSU Carrington REC: Bryan Neville, Ph.D., Animal Scientist; phone 701-652-2951, email Bryan.Neville@ndsu.edu. Karl Hoppe, Ph.D., Extension Livestock Systems Specialist; cell 701-650-1180, email Karl.Hoppe@ndsu.edu.



ND Angus Association NDAU Feed-Out Program Chair: Mike Wendel, ND Angus Association Past President and current board member. Phone 701-710-0425, email northdakotaangus@gmail.com.

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Manure Storage Structures: Maintenance

With spring thaw under way, manure storage structures may require extra attention by producers. This is a great time to evaluate your manure storage structure and take note of any maintenance that may need to take place during the year. Management of vegetation, the solid separator, and bank stabilization are key items to stay on top of to run an effective collection and treatment system.

Vegetation management

Vegetation management is key in maintaining the integrity of a manure storage structure. By keeping vegetation short and removing trees and shrubs you help protect your investment.

By not managing vegetation you run the risk of:

- Reduction in holding pond capacity due to build up in vegetation over growth.
- Bank destabilization due to root growth from trees and shrubs or from burrowing animals.
- Damage to clay liner due to root growth from trees and shrubs.

Some simple steps can be taken to help reduce these problems. Regular mowing and spraying of vegetation on manure storage structures, and the removal trees and shrubs will go a long way in protecting treatment efficiency and your investment.



This properly functioning solid separator has been scraped of its solids.

Solid Separator Management

A proper functioning solid separator is crucial to maintaining design capacity in a manure storage structure. This requires routine maintenance checks and dredging/scraping of the solid separator. When neglected, the solid separator can clog preventing the flow of dirty water to the manure storage structure.



This solid separator is no longer functioning. The corrugated pipe is plugged and dirty water is backing into the feedlot. The solid separator should be dredged and cleared of plant growth.



Rip rap has been placed at the base of this manure storage structure to reduce the potential for erosion.

Bank Stabilization

Bank stabilization is an important part of manure storage management. Many clean water bodies abut holding ponds, and in these cases bank stabilization such as rip rapping with rock can greatly reduce erosion of the manure storage structure.

If you have any questions or concerns about the management of your manure storage structure, please contact the North Dakota Department of Health, Division of Water Quality, at 701.328.5210 or by visiting our website at deq.nd.gov. --Rachel Strommen, ND Department of Health, Livestock Program



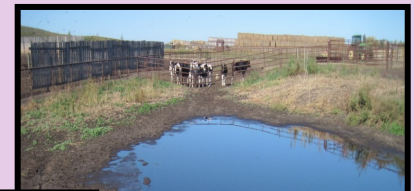
Commentary from the CAFO Corral



This manure storage structure needs vegetation management. The grass should be mowed, and trees and shrubs should be removed from the inside bank and from close proximity to the structure.



This manure storage structure depicts proper vegetation management.



Effects of liquid manure injection into a winter rye cover crop: on-farm trials



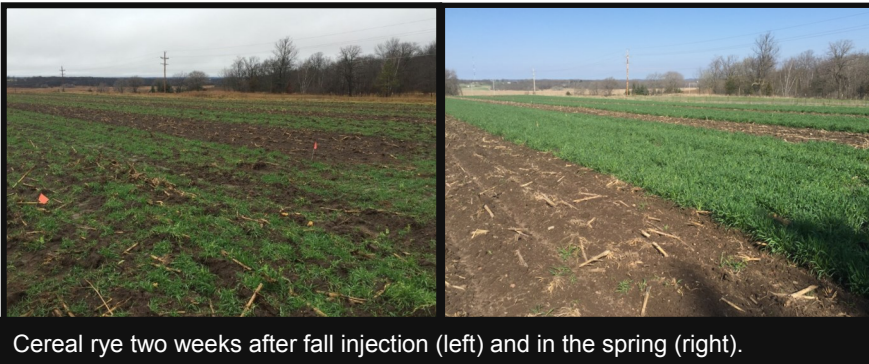
Soil Health Nexus blog post March 4, 2018

Nitrate levels above the drinking water standard of 10 ppm are frequently found in subsurface drainage tile water or groundwater below farm fields of the upper Midwest. Nitrogen comes from applied manure and fertilizer, along with natural mineralization of organic matter.

What was done

Winter cereal rye planted as a cover crop has been shown effective in capturing nitrate before it leaches from the root zone. We conducted on-farm trials in central and southern Minnesota to determine if a rye cover crop would capture significant root-zone nitrate in the fall and spring but release it in time to maintain yield in the subsequent corn crop.

In the fall of 2015 and 2016, we partnered with 19 farmers (ten in 2015 and nine in 2016) to drill strips of cereal rye immediately after harvest of corn silage or soybean. After the rye was established and soil temperatures began to fall, we injected liquid dairy or swine manure into the cover crop and check strips. Three replications (with and without cover crop) were planted as wide or wider than the farmer's combine or silage chopper. The following spring, we sampled the cover crop for biomass and nitrogen content. We also soil sampled the cover crop and check strips to a 24-inch depth for nitrate. The rye was



Cereal rye two weeks after fall injection (left) and in the spring (right).

terminated, usually before reaching eight inches in height. In most cases, the rye was terminated with herbicide and tilled in. Corn was planted in the cover crop and check strips, usually with a small amount of starter nitrogen. We measured yield and nitrogen content of the corn at harvest.

Our results indicated

1. In both years, adequate growing season existed to establish the rye cover crop after either corn silage or soybean harvest, but above-ground fall growth was limited.
2. The rye was very resilient to manure injection, however, stand reduction was considerable at two sites where shank injectors or disk coverers were too aggressive.
3. Spring rye growth was good at most sites, with soil nitrate reduced under the cover crop compared to the check strips at all sites.
4. Rye growth and nitrogen uptake were greater in southern than central Minnesota.
5. Across sites, there was no significant difference in silage or grain yield between the cover crop and check strips.

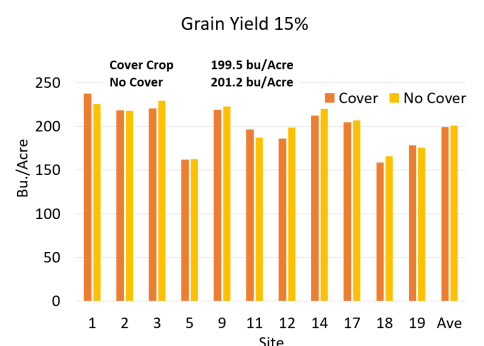
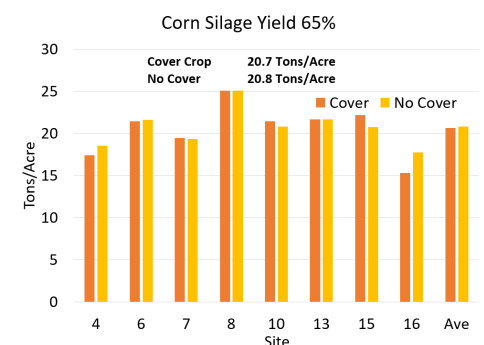
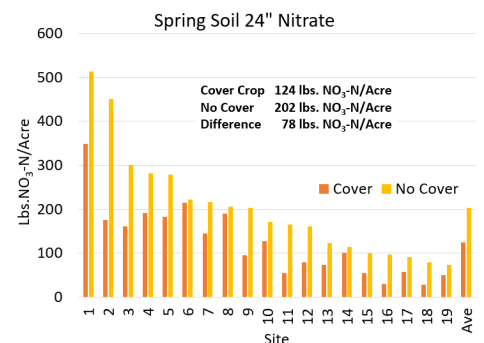
Take home message

We concluded that, in central and southern Minnesota, it is feasible to establish cereal rye cover crop after corn silage or soybean harvest, inject liquid manure, capture root-zone nitrate with the rye, and deliver sufficient nitrogen to the subsequent corn crop.

Additional experiments are needed to determine any nitrogen recovery effect of no-till vs tillage termination, as well as supplemental nitrogen needs if the rye were terminated at a later maturity.

Authors: Les Everett, University of Minnesota Water Resources Center and Randy Pepin, University of Minnesota Extension

Reviewer: Melissa Wilson, University of Minnesota and Mary Berg, North Dakota State University



Soil quality impacts of agricultural and municipal biosolids applications

Soil Health Nexus blog post January 8, 2018



Background

Soil health management refers to the preservation and improvement in soil physical, chemical, and biological properties to maximize the productive capacity of soil. Cover crops and reduced tillage are promoted for improving soil health; however, soil amendments such as application of livestock manure and municipal biosolids have received less attention as a soil health improvement practice. A literature review, funded by the [North Central Region Water Network](#) and the [Soil Health Institute](#), was conducted to summarize and discuss results of studies reporting chemical, physical, and biological soil properties from application of livestock manure, animal by-products (i.e. compost), and municipal biosolids and to identify further research needs.

Current State of the Science and Understanding

The effects of manure and municipal biosolids on soil physical and chemical properties are well documented in scientific literature (and previously in this blog). When applied at agronomic rates, these amendments:

1. increase soil [organic carbon](#),
2. increase soil [cation exchange capacity](#),
3. provide beneficial micronutrients for crops,
4. decrease soil [bulk density](#),
5. improve soil resistance to compaction,
6. increase soil [aggregate stability](#),
7. increases [water retention and plant available water](#), and
8. increase [water infiltration](#), which reduces risks for runoff and erosion.

The effects of these amendments on soil biological properties have not been, however, well researched, likely due to cost and time constraints for these measurements.

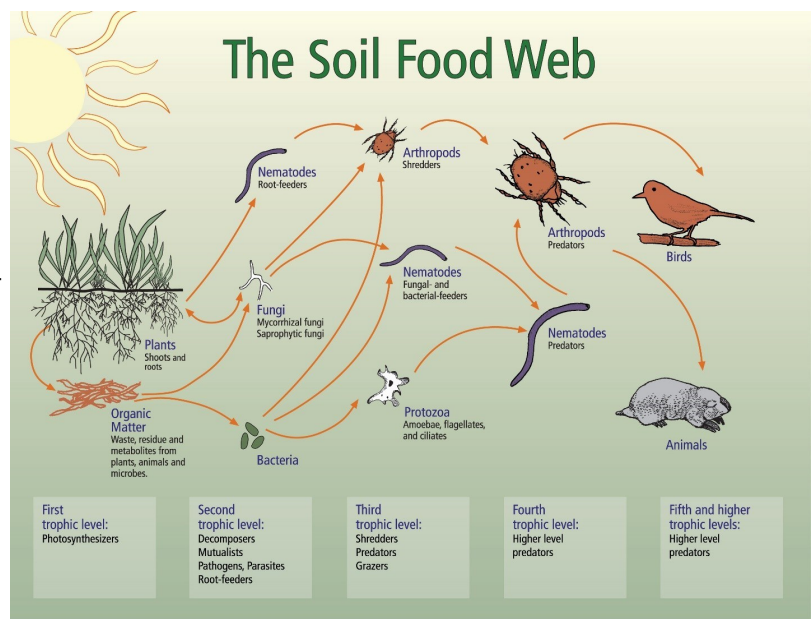
Three main soil biology measures are microbial abundance, diversity, and activity, with abundance being the most commonly reported. These reveal the types (diversity), quantity (abundance), and roles (activity) of soil microbes. Overall, manure and biosolid applications increase the abundance of bacteria, fungi, and earthworms but does not affect abundance of higher order soil microarthropods (i.e. shredders and predators) (figure 1). Increased microbial activity (e.g. respiration and mineralization), an indicator of nutrient cycling, increases with organic amendments; however, faunal diversity does not appear to be positively impacted compared to inorganic fertilizer.

Challenges and Research Needs

Most published research reporting on the impacts of manure or biosolids on soil properties, crop production, and water quality is based on studies involving annual application of the amendment. If annual application rates exceed crop nutrient requirements, risks of leaching, runoff, and accumulation of nutrients (e.g. N, P, K, salts and heavy metals) increase. While few studies have investigated the residual effects of manure or biosolids, improved infiltration and decreased runoff and erosion have been demonstrated to have enduring effects in the years immediately following the last manure application.

Future research endeavors should:

1. incorporate quantification of soil biological metrics to improve understanding of manure and biosolids effects on ecosystem services such as nutrient cycling;
2. investigate short- and long-term effects of a single manure or biosolids application to support identifying the optimal frequency of application for soil health and
3. provide discussion clearly relating research findings to management decisions relevant to agricultural crop producers.



Coming Events

June 14	NDSU Carrington REC Crop Management Field Day
June 19	ND Stockmen's Association Feedlot Tour
July 17	NDSU Carrington REC 59 th Annual Field Day
July 20-28	North Dakota State Fair, Minot
July 25-26	NDSU Soil Health Bus Tour (based out of Valley City)
August 14	NDSU Oakes Irrigation Research Site Field Day, Oakes
August 15-16	North American Manure Expo, Brookings, SD
August 22	NDSU Carrington REC Nutrient Management Day
September 11-13	Big Iron, West Fargo

Center Points: Easy as 1-2-3...

The Carrington REC has a weekly blog with updates on what's happening now and information on coming events. Read online at www.ag.ndsu.edu/CarringtonREC or subscribe to receive a weekly reminder and quick link.

Subscribing is as easy as 1-2-3:

1. Send an e-mail to Listserv@listserv.nodak.edu
2. Leave the subject line of the email blank
3. In the body (not the subject line) of the e-mail enter the following:
SUB NDSU-CARRINGTONREC-CENTERPOINTS yourfirstname yourlastname

OR: Simply send a regular email to Mary.Berg@ndsu.edu.



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