

Nutrient Management News

Volume 1, Issue 3

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SPECIAL POINTS OF INTEREST

- New Extension Publication: Composting Animal Manures NM-1478 is available. Copies can be found at your County Extension Office or online at www.ndsu.edu/nm.
- Composting Demonstration Day will be held at the Carrington Research Extension Center in Early August. Topics include: Compost Teas, Equipment Demonstrations, and Manure Compost Management.
- Check out the Nutrient Management Website at www.ndsu.edu/nm for more information.
- Email Chris at Chris.Augustin@ndsu.edu to receive this newsletter.

Inside this issue:

<i>Pen Scraping</i>	2
<i>Stockmen's Association Feedlot Tour</i>	2
<i>Discovery Farms Blog</i>	2
<i>Compost Dairy Barn Bedding Materials</i>	3
<i>Discovery Farms Field Day</i>	3
<i>Soil Testing for Nutrients</i>	4

<i>Extension Research Center Field Days</i>	4
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Manure Compost and Cover Crops

Cover crops are a soil management tool that can improve soil qualities. Soil benefits from cover crops include erosion reduction, increase soil organic matter, runoff reduction, suppress weeds, increase soil nutrients, break pest cycles, and livestock feed source. Cover crops have been used in the past, but the trend is switching from a mono-crop to a mixture (cocktail) of crops. The benefit of a cocktail versus a mono-crop is that biodiversity can be increased and address different soil issues in a single growing season.

Popular cocktails include a legume such as alfalfa or hairy vetch to add nitrogen. Brassicas like mustard are used to suppress pests. Deep tap rooted plants like beets can break up soil compaction layers and utilize nutrients deep in the soil. A few different grasses are usually added too.

Cover crops are normally planted by a broadcast spreader or no-till drilled. Utilization of manure and

cover crops together may increase their benefits even more. However, manure should be incorporated to reduce odors and nutrient losses. This can create problems for producers who manage land with minimal tillage. Some researchers are looking at ways to apply manure and cover crops with little or no soil disturbance.

Michigan State has taken an interesting look at cover crops and combined cover crops with low disturbance tillage and slurry manure. Harrigan et al., (2006) looked at manure slurry-enriched seeding, where cover crops (oil seed radish, oriental mustard, annual ryegrass, cereal rye, oats, wheat, forage rape, and forage turnips) are added into a slurry manure loaded slurry tanker equipped with a rear-mounted rolling tine aerator. As the manure is applied so are the cover crop seeds. The rolling tine aerator creates cracks and fractures in the soil for the manure and seeds to rest in. Manure slurry-



Cover crop cocktail on broadcast spreader beater.

enriched seeding was compared to direct drilling. It was found that the plant densities were less in the manure slurry-enriched seeding (30-70%) than the direct drilling. However, the manure slurry-enriched biomass was equal to or greater than the direct drilling. Harrigan's et al., (2006) study sparked an idea that is being looked at in a Center, North Dakota demonstration plot. The difference here is that cover crops were broadcasted on a no-till field. The previous crop was spring wheat. Composted dairy manure was applied over the broadcasted cover crop. The

Continued on page 3

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How often should I scrape my open lot pen surfaces?

"Proper maintenance of the pen ensures good pen drainage, decrease odors, and leads to better manure nutrient management."

Pen surface maintenance is probably the most important but most frequently overlooked aspect of feedlot management. Proper maintenance of the pen surface ensures good pen drainage, decreases odors, and leads to better manure nutrient management. When pens are scraped infrequently, manure accumulates and causes poor drainage, which leads to wallow development and increased odors. The animal density in the pens is directly correlated to the frequency of scraping needed to properly manage the pen surface.

If animal density is maximized,

particularly in beef finishing pens, current practices have shown best results when pen surfaces are scraped on or near a 10-day interval. When animal density in pens is low, pen scraping frequency is dictated more by weather and manure accumulation.

If it is not practical to scrape every 10 days, the operator should consider a higher frequency of scraping under these conditions:

1) when wet lot conditions are anticipated (e.g., in spring), and the potential for odor can be reduced by minimizing manure

accumulation.

2) when dry lot conditions are anticipated (e.g., mid- to late summer), and the potential for dust emissions is high.

3) immediately behind the feed bunk and around waters where manure accumulation is highest.

4) when manure nitrogen utilization is valued, and nitrogen conservation is practiced.

Scraping manure on beef open lots after each turn of cattle will result in 50% or more of the manure nitrogen being lost.

Ron Wiederholt

North Dakota Stockmen's Association Feedlot Tour: Pre-register by June 11



Cattle in a recently completed animal feeding operation.

Bismarck ~ The North Dakota Stockmen's Association (NDSA) Feeder Council will host its eighth annual Feedlot Tour in north central North Dakota on Tuesday, June 15, 2010.

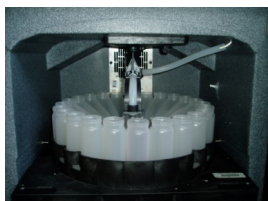
Buses will depart at 9:30 a.m. CDT from the Wal-Mart parking lot in Minot, N.D.

The tour will stop at Northern Plains Feeders of Towner, Bloms Land and Cattle of Carpio, and Dakota Sunset Feeders of Kenmare.

Buses will return to the Wal-Mart parking lot in Minot, N.D., at around 5 p.m.

The cost to participate is \$15 per person, which includes bus transportation and lunch. Pre-registration, by June 11, is appreciated.

To pre-register, contact NDSA Environmental Services Director, Scott Ressler at (701) 223-2522 or sressler@ndstockmen.org.



Automated water sampler at a ND Discovery Farms Site.

Discovery Farms Blog

A new blog has been started to keep everyone up to date with what is happening on the discovery farms as well as provide updates on nutrient management issues. You can access the blog at <http://www.ag.ndsu.edu/roller/NDDF/> where you can register your email address to get email alerts when a new posting is made.

Please follow the development of this blog while we outline background pieces on each of the cooperating farmers, results of the monitoring and other pertinent nutrient management information. Feel free to comment or ask questions as well.

Bedding Materials Used in Compost Dairy Barns

Alternative bedding materials for use in compost dairy barns is an active area of research. We know from experience that fine dry sawdust and wood shavings work very well. One research study evaluated fine dry pine shavings, finely processed soybean straw, finely processed corn cobs and soft wood chips. More information on the study is available at the Compost Dairy Barn Newsletter, volume 10 (<http://www.extension.umn.edu>

[u/dairy/Publications/compostbarnnewsMay82007.pdf](http://www.extension.umn.edu/dairy/Publications/compostbarnnewsMay82007.pdf)).

In another unpublished study, eleven possible bedding alternatives were characterized. The materials studied included beet pulp, corn cobs, corn stover, elm chips, flax straw, pine bark, pine chips, soybean hulls, soybean straw and wheat straw. In addition, compost dairy barn owners tell us about bedding mixtures they are trying based on local availability. Other materials either being

used or considered include sunflower hulls, rice hulls and cotton straw. One producer tried cedar chips and reported that the compost pack became cold and wet. We believe that the natural oils in cedar inhibit the microbial activity needed in successful compost dairy barn packs.

<http://www.extension.org/>

Kevin Janni,
Department of Bioproducts
and Biosystems Engineering
University of Minnesota

"We know from experience that fine dry sawdust and wood shavings work very well."

Compost and Cover Crops

From page 1

seed bed is made by sandwiching seeds between the soil and compost. Cover crops for this demonstration are turnip, radish, sugarbeet, lentil, sunflower, sudangrass-sorghum hybrid, millet, hairy vetch, and alfalfa. Compost was applied at 11 and 21 tons/acre.

A field day will be held this summer at Center. Other

cover crops and compost with no-till corn are also at the site. Collaborators with the demonstration include Oliver County Extension, Oliver County NRCS/SCD, and Ole Johnson of Destiny Dairy.

A synopsis of Harrigan's work can be found at <http://www.mccc.msu.edu/>

[documents/ManureSlurry-EnrichedSeedingofCC.pdf](http://www.mccc.msu.edu/documents/ManureSlurry-EnrichedSeedingofCC.pdf). The original journal article is Manure Slurry-Enriched Micro-Site Seeding of Biosuppressive Cover by T.M. Harrigan, D.R. Mutch, and S.S. Snapp. It was published in 2006 in Applied Engineering in Agriculture Volume 22 (6):827-824.



Cover crop broadcasted on soil.

Discovery Farms Field Day July, 8th

There will be a ND Discovery Farms field day held on Thursday, July 8th, 2010 at the Johannes Family Farms 7 miles west of Underwood, ND. The field day will provide background information on the runoff monitoring work being done at the Discovery Farms, the outcomes of the Turtle Lake feedout project and implications of livestock development in ND agriculture with the possibility of a beef slaughter plant being built in ND.

Doyle and Patsy Johannes and their son Matt have been involved as cooperators in the ND Discovery Farms project since its inception in 2007. They operate a grain farm as well as manage beef cows and custom feed cattle. They are very supportive of livestock development in ND and are participating in Discovery Farms to help learn more about the impacts of livestock on the environment.

The field day will start at 10 am, including a lunch, and will conclude at 2 pm. The field day is free and sponsored by the Johannes Family Farms, McLean County NDSU Extension and the NDSU Carrington Research Extension Center.

Contact Ron Wiederholt at 701-652-2951 or Ron.Wiederholt@ndsu.edu for more information.



Water Collection flume at the Discover Farm Underwood site.

www.ndsu.edu/nm

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Commentary From The CAFO Corral

Soil testing fields is an important part of nutrient management plans for animal feeding operations (AFO). Soil tests give the producer great guidance on the amount of nutrients that are available to grow crops. Phosphorus has become a major concern in other states in the nation. This is due to the amount of manure generated verses the ability of crops grown to use up the nutrient and potential to pollute surface waters. North Dakota is noted for low phosphorus soils, with a few exceptions. For example, we sometimes see a build-up of phosphorus in the fields closest to an AFO. The goal of required soil testing is to prevent environmental situations that have occurred in other states.

Large Concentrated Animal Operations are required to soil test annually. Other permitted livestock facilities identified by the department as needing nutrient management plans shall have their manure and the soil where manure is being applied tested once every three years. A number of operations in the state test their soils on a yearly basis regardless of manure being spread on the land

or not. These operators also use a three year manure application rotation to utilize the nutrients more fully. All permitted AFO's are encouraged to sample the fields yearly.

Timing of the soil sampling has made a difference on the soil test results. To get the best results for manure application rates, sampling needs to be done prior to spreading manure, this is especially critical when solid manure is involved. Past experience has shown skewed results caused by hot spots created by the nature of solid manure spreading. Manure needs to be spread at agronomic rates. The ultimate goal is to reduce water pollution by utilizing the nutrients in manure and commercial fertilizer. You are encouraged to follow the research at Carrington Research Extension Center to help better understand the connection of soil fertility with manure in conjunction with commercial fertilizers and the soil sampling recommendations.

Brady Espe, North Dakota Department of Health, 701-328-5228

Research Extension Center Field Days

Every summer the NDSU Extension Research Centers hold a field day. These events allow center personnel to share their research and educational efforts with the public. The dates have been set and agendas are being planned. For more information see below:

Central Grasslands Research Extension Center (Streeter): June 23: 701-424-3606

Dickinson Research Extension Center: July 14 phone: 701-483-2348

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Williston Research Extension Center: July 15
phone: 701-774-4315

Carrington Research Extension Center: July 20
phone: 701-652-2951

North Central Research Extension Center (Minot): July 21 phone: 701-857-7679

Langdon Research Extension Center: July 22
phone: 701-256-2582

Thanks for reading this issue of Nutrient Management News! You may distribute this in any manner you see fit. If you would like to receive future copies, email me (chris.augustin@ndsu.edu) to be added to the list.

We are always looking for different topics to cover. If you have an idea or an article you would like to submit, email it to me and I will accommodate.

Nutrient Management News is also available on the Nutrient Management Website (www.ndsu.edu/nm).

A new Extension Publication that covers the manure composting process and management is available. It is titled, "Composting Animal Manures". The publication is available at your County Extension office and on the internet at <http://www.ndsu.edu/nm>.