

LEM NEWS



Livestock Environmental Management Newsletter

Volume 6, Issue 4. December 2017.

Greetings!

Yikes, where have the last three months gone?! In the blink of an eye the last quarter of 2017 is gone. The manure is hauled, the calves are in the background-ing lot and corn harvest (for most people) is actually completed.

While this last quarter was probably the most appetizing of the year, most of us are saying “good riddance” to 2017’s blizzards, cold winds, lack of rain and crummy prices.

Many of us use this time of year to recuperate and reenergize. To you, that may look like a week in the Bahamas. To me, it’s a good cup of coffee and a book. Whatever your method is, it is important to take time to debrief from the previous year’s commitments as we excitedly anticipate what’s to come. Sometimes clearing our minds of the old is the only way to make room for new things.

One event I’m looking forward to is being a co-host of the 2018 North American Manure Expo (NAME). The NAME will be held in Brookings, SD and I can’t wait to share two days of manure talk with you! We’ll cover everything from education, to demonstrations, to equipment. You’ll find more information here <http://www.manureexpo.org/> as we continue to work on the schedule.

I hope you too have something you’re looking forward to. Maybe it’s a new seed variety or maybe it’s seeing what the calves from the new bull look like. Whatever it is, I hope it makes you smile.

Thank you for being a part of my program. I look forward to working with you in 2018.

Merry Christmas and Happy New Year!

-Mary

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Are You Giving Credit Where Credit Is Due?

Thoughts on nutrient management planning

In between trying to get corn off the field and hoping the snow waits just a little longer, you are also supposed to be thinking about a field plan for next year. What will you plant, what herbicides you will need and what fertilizers will you use? Did you spread manure on your fields? If you did, does that manure have a fertilizer value and are you considering that when you make your fertility plans?

The total nitrogen (N) in solid beef manure is 50% available to plants during the first growing season. That means if the manure you used has 13 pounds of total N/ton of manure (ND beef manure average), 6.5 pounds of that is available for plant growth. Given you spread 25 tons of manure/acre you have 325 pounds of total N with 162.5 pounds of that available during the first growing season. What happens to the other 162.5 pounds? In year 2, 20 percent of the total N, or in this example, 65 pounds of N would be available during the second growing season. Are you taking that credit into consideration as you map out your nutrient management plan for the next growing season?

Let's say you plan to plant corn grain in eastern North Dakota in medium-textured soils with historic yields greater than 160 bu/ac. You have a previous crop (soybean) credit and you have 20 pounds N/ac in your soil. (You know all of this because you tested your soils and you used the ND Corn Nitrogen Calculator.) The N recommendation for your yield goals would be 162 pounds/ac.

According to this example, in year 1, you wouldn't need to add any

(Continued on page 3)



August 15-16, 2018

WEDNESDAY

TOURS

AGITATION DEMO

INDUSTRY SEMINARS

THURSDAY

SEMINARS

FIELD APPLICATION DEMOS

Wish you'd gone to the 2017 NAME in Wisconsin?

Check out these online presentations (24 of them!)

<http://www.manureexpo.org/2017-presentations.html>

Table 9-9. Corn P and K recommendations, East River, nonirrigated, pounds P₂O₅ or K₂O per acre.

Olsen Soil Test Phosphorus, ppm					Soil Test Potassium, dry method				
VL	L	M	H	VH	VL	L	M	H	VH
0-3	4-7	8-11	23-15	16+	0-40	41-80	81-120	121-160	161+
104	78	52	39	10	120	90	60	60	60*

*rate in conventional till is 0. Use the 60-lb K₂O rate for no-till/ridge till.

other nitrogen fertilizer to reach your yield goals. Looking at phosphorus (P), if you have 6 pounds of P/ton of manure (ND beef manure average) and you're spreading at 20 ton/ac you have 120 pounds of total P. Eighty percent of the total P in solid beef manure is available for plant growth during the first growing season, so 96 pounds of P/ac would be available. If your soils are in the medium range (8-11 ppm) according to the Olsen test, you would need 52 pounds of P/ac. So your N and P requirements are already met.

Let's move on to year 2. You're going to plant soybean in the field described above following the corn crop. You have no previous crop credit. Your soil test says you have 15 pounds of N and you know from above that you have 65 pounds of N from manure. So you have 80 pounds of N fertilizer right off the top. According to the [North Dakota Fertilizer Recommendation Tables and Equations](#), you will need zero pounds of N fertilizer for a 60 bu/ac yield potential. Ten percent of the total P in manure is available in year two for plant use. The P credit from the manure would be 12 pounds/ac. Because of the excess P that was applied during year 1, your soil test P will very likely be in the high to very high range, neither of which require additional P fertilizer.

Often times in the Midwest, producers aren't instructed to give manure fertilizer credit value but we have to remember that along with the added organic matter and beneficial organisms, we are also adding useful nutrients when manure is spread on a field. Let's give credit where credit is due.

Additional resources:

Find a North Dakota custom manure hauler: <https://www.ag.ndsu.edu/lem>

Regional Manure and Soil Health Blog: <http://soilhealthnexus.org/blog/>

e-Xtension Animal Manure Management: <http://articles.extension.org/pages/8647/manure-nutrient-management>

-Mary Berg

What is the Economic Value of Manure?

[Soil Health Nexus blog December 1, 2017](#)

Manure has value. That value may result from improvements in soil quality, increases in yield, and replacement of commercial nutrient required for crop production. Previous articles on manure's value have focused on its [soil health](#), [environmental benefits](#), and [tools for estimating manure's value](#). This article will focus on the economic benefits of manure. Key take home messages include:

- ☑ **Targeting fields requiring supplemental phosphorus (P) produces the largest economic value from manure.**
- ☑ **Targeting fields requiring supplemental potassium (K) significantly increase manure's value.**
- ☑ **Additional value result from manure nitrogen (N) and micro-nutrients as well as from yield increases. However, these benefits are typically less important than P and K.**



The assumptions used for this analysis are found at the end of this article ([i]).

Phosphorus Value

Manure is a supplemental source of P, organic-N, ammonium-N, and micro-nutrients commonly required by many fields. Cropland receiving surface applied manure (not incorporated) benefits from both the organic-N and P. The value of the nutrients in beef feedlot manure is heavily influenced by the value of the P and to a lesser extent the organic-N (see Figure 1 and assumptions for all figures presented. All assumptions are found at end of article ([i]). Because feedlot manures and many solid manures contains little ammonium-N, incorporation to conserve N would produce little additional value. Similar graphics for other animal species are found in Figure 4.

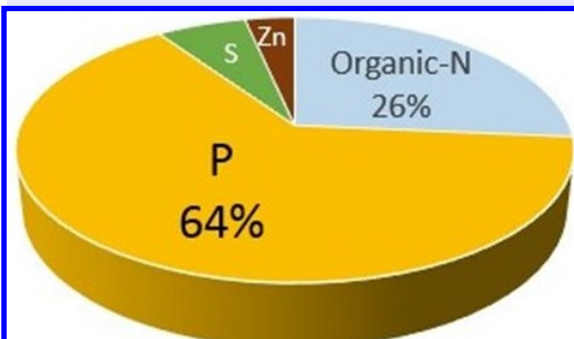


Figure 1: The nutrient replacement value of beef open lot manure is approximately \$14/ton* when surface applied. *This assumes supplemental K is not needed and no yield increase results. Additional assumptions found at the end of this article.

For many liquid and slurry manures, immediate incorporation of manure is important for gaining value from their significant ammonium-N content. Figure 2 illustrates the value of incorporating swine finishing barn manure. Approximately one-third of its value results from the ammonium-N conserved by direct injection.

Note the importance of P to achieving value from both of these manures. Half or more of each manure's value will only be realized by applying manure to fields requiring P supplementation

(typically, fields with Bray soil P levels below 30 ppm). Thus, farmers wanting to gain the greatest value from manure should target those fields with low soil P levels. A 25 ton load of feedlot manure has a fertility value of \$350. However, 2/3 of this value will not be realized if applied to a field with high soil P levels.

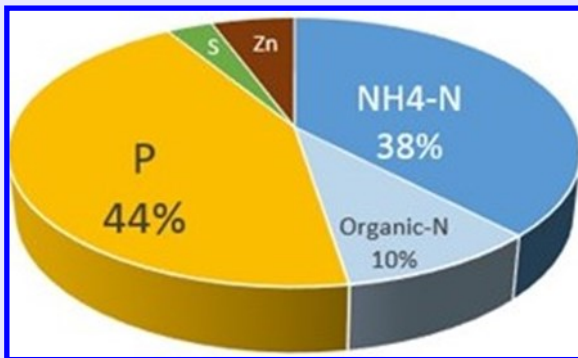


Figure 2: The nutrient replacement value of swine finisher manure is approximately \$37/1,000 gallons* when injected. *This assumes supplemental K is not needed and no yield increase results. Additional assumptions found at the end of this article.

Potassium Value

To further enhance the value of manure, targeting those fields that have a K requirement offers additional value. Soil tests for highly productive fields are increasingly identifying a need for K supplementation. Manures are an excellent source of K. For the beef feedlot manure example shared in Figure 1, the manure's value has almost doubled by applying it to a field with a K requirement (Figure 3).

Yield Response

Economic value can also be gained from a yield response due to manure. Such yield responses can be a result of improved soil structure and greater drought tolerance of the soils receiving manure or from the increased biological activity in the soil producing a number of benefits such as greater nutrient availability to the plant. A recent worldwide literature review of 159 research comparisons of the nutrient replacement value of manure observed an average yield increase of 4.4%. Adding a 5% yield increase to a 200 bushel/acre corn crop will produce some additional value. However, note that this yield boost does not compare with the value of the P and K in manure (Figure 3).

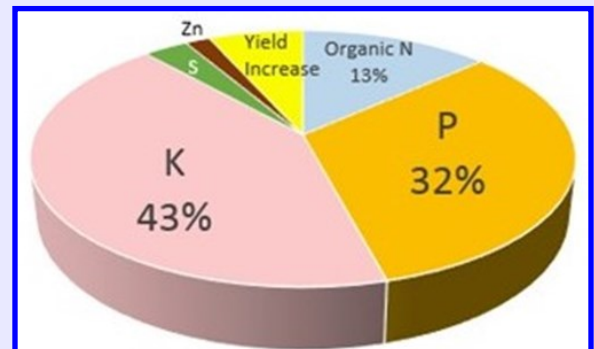


Figure 3: Value of beef open lot manure assuming crop benefits from potassium supplementation and 5% increase in yield. Estimated manure value is \$28/ton.

Keys to Manure Value

Key to gaining the economic value from manure nutrients is the rate at which manure is applied. To receive the returns shown in this article's graphics, the following practices must be followed:

Manure should be applied at a rate that does not exceed the crop N requirements for a single year. Excess manure N application is likely to be leached beyond the root zone and be lost. See [Determining Crop Available Nutrients from Manure](#) for more information.

Manure applied at rates near the crops N requirement typically over apply P and K. However, these nutrients will continue to be available to crops in future years. To gain the manure's P and K value, target those fields requiring supplemental P and K (see [Nutrient Requirements for Agronomic Crops in Nebraska](#) or your state specific recommendations). In addition, avoid re-applying manure to the same field until soil testing suggests need for

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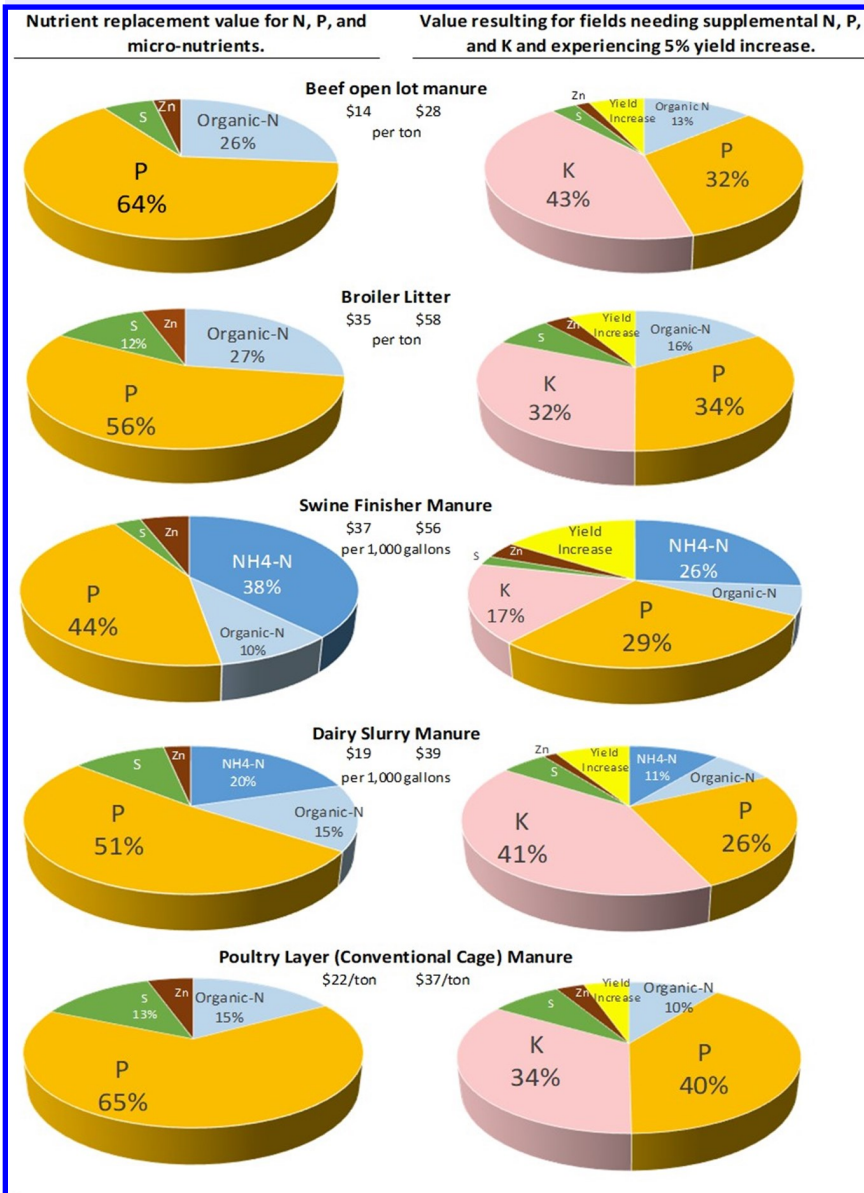


Figure 4: Low and high economic value estimate of different animal manures based upon nutrient replacement value for manure N, P and micro-nutrients (column 1) and additional value assuming benefit from manure K and crop yield increase of 5% (column 2).

supplemental P and K.

Assessing the economic value of manure begins by targeting fields low in P and K. Similar benefits are observed for other manures as illustrated in Figure 4.

[i] Assumptions for graphs: Price of nutrients was assumed to be \$0.35/lb. N, \$0.40/lb. P₂O₅, \$0.35/lb. K₂O, \$0.35/lb. sulfur, \$2.90/lb. zinc. For some figures a yield increase of 5% was assumed and allocated to a manure application rate designed to meet 75% of N requirement of a 200 bushel/acre corn crop (e.g. 19 ton of feedlot manure/acre). Corn was valued at \$3.50/bushel.

[ii] [How Does Recycling of Livestock Manure in Agroecosystems Affect Crop Productivity, Reactive Nitrogen Losses, and Soil Carbon Balance?](#) Environ. Sci. Technol., 2017, 51 (13), pp 7450–7457.

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Livestock Unit welcomes Jesse Nelson

Jesse Nelson joined our Livestock Unit staff as a Livestock Research Technician on Monday, September 11. His job, in his words (and ours!) is “to assist in anything related to managing our herd, from feeding to calving, and anything else in between.”

We took a few moments to get to know Jesse a little better and wanted to share our conversation with you.

Jesse is from the Carrington area so he already had some familiarity with the CREC. He was previously working for Neumiller Farm & Ranch and jumped right into our work and fits in well with our crew.

When we asked Jesse about his expectations for working at the CREC, he commented, “I’m looking forward to learning about the different ways and different types of feed rations.”



Jesse Nelson, Livestock Technician, Carrington REC.

Design Your Succession Plan

Empowering families to get started on their succession plan

The first step is the hardest. Creating a succession plan takes time, effort, family communication and working with professionals. **Design Your Succession Plan** will help you explore what you want for your business, how to discuss it in the family and how to get started creating a succession plan. It also will help you choose and prepare to work with professionals who will make the plan legal and viable.

This program will explore the four components of succession planning: planning for your business, retirement, transition and estate.

You will be prepared to communicate, plan, vision, write and shape the legacy of your family farm/ranch business, as well as save hundreds of dollars by completing these crucial planning steps before visiting with professionals.

You will receive a resource binder and workbook to use during and after the sessions. Starting the workbook during class will give you a jumpstart on your succession plan. When you leave the program, you will be motivated to continue communicating and working on the family farm/ranch legacy.

Materials developed for this course are available only to registered attendees.



TRANSITION
FARMING
AGRICULTURE
RANCHING
FAMILY
BUSINESS
ESTATE
RETIREMENT

DESIGN YOUR
SUCCESSION
PLAN

Attorneys reviewing this program have applauded NDSU Extension for giving families a roadmap to communicate together before visiting the attorney's office.

The schedule and registration information can be found at www.ag.ndsu.edu/succession.

Fees for this workshop are structured to encourage family members to participate together. The registration fee of \$125 for the first family member covers the cost of meeting expenses and includes a resource binder and workbook. Additional family members may attend for \$50 each which includes a workbook. Additional resource binders may be purchased for \$75 each.

Design Your Succession Plan is delivered in two or three sessions or as one full day session, depending on the site. Attendance at all sessions is necessary. This program will be taught by NDSU Extension agents and specialists, and participants will be guided through activities in their workbook. Video and other activities will be used to generate discussion on the many family and business issues families face when designing a succession plan.

Coming Events

- Dec. 19. Central Dakota Ag Day at the Carrington REC.
- Jan. 9-10. Lake Region Roundup, Memorial Building, Devils Lake.
- Jan. 16,18,22. Design Your Succession Plan Workshop, McHenry Co. Courthouse, Towner.
- Jan. 18,25. Design Your Succession Plan Workshop, Stutsman Co. Ext. Office, Jamestown.
- Jan. 19-20. Winter Ag Expo, Jamestown Civic Center, Jamestown.
- Jan. 23,25,30. Design Your Succession Plan Workshop, Centerfield, LaMoure.
- Jan. 23-24. NDSU Feedlot School, Carrington REC.
- Jan. 24-26. KMOT Ag Expo, Minot.
- Jan. 29, Feb. 5,8. Design Your Succession Plan Workshop. Carrington REC.
- Feb. 6-7. KFYR Agri International, Bismarck.
- Feb. 9. Corn Economics Workshop at the Carrington REC.
- Feb. 13-14. Advanced Crop Advisers Workshop, Holiday Inn, Fargo.
- Feb. 27: Farming & Ranching for the Bottom Line, Bismarck.

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:

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