GROWING BEEF

Iowa Beef Center's monthly newsletter
@ Iowa State University

March 2009 • Volume 1 Issue 8 • www.iowabeefcenter.org • beefcenter@iastate.edu

Important factors impact manure value

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Feedlot managers are moving away from once-a-year manure application on the closest field to one of multiple strategies, all of which are designed to improve the timing, rate, value, and stewardship of this natural resource.

A great deal of interest has surfaced recently regarding feedlot manure. It really started in Iowa with the feedlot registration effort (2001) and continued on through the application and receipt of NPDES permits for many farms.

Sediment control structures, surface run-off ponds, and regular pen scraping have been the most notable improvements in manure recovery, retention and recycle.

Soil sampling analysis provides clues to where the greatest return on manure nutrients applied are gained. Manure analysis helps determine the rate of application (Supply side of the equation). Crop rotation in the system determines the amount of nutrients extracted from the soil on an annual basis (Demand side of the equation).

Other issues involved in determining manure values are moisture conditions of the manure, ambient temperatures, wind speed (environmental influences), and management issues such as labor availability, size of manure handling equipment, distance to application field, rations fed (including DGS) and bedding used. Other influences on manure value may be determined by the square feet of space per head. More space equals more surface area for manure nitrogen to volatilize. If we counted all the opportunities to influence manure values the decision tree could grow close to 100 different decision forks. Let's look at a couple of the big ticket decisions.

Table 1 compares two fields, each receiving the same application rate and manure analysis. The primary difference in the fields is the nutrients in the soil already. One field has a soil phosphorus and potassium test in the low range, while the other has values in the very high range and manure value will only apply to the very next crop produced.

Let's say the Nutrient Management Plan calls for 16 tons of manure per acre applied (a three-year application rate for P and K and one year for N). The difference between putting the manure on a field going to soybeans and a field going to corn with the low soil test is $123 per acre. This is using $0.55 /lb N. P, and K, all very modest values today. This comparison also is calculating the three major nutrients in manure at regular commercial fertilizer values. No value has been assigned to the improvement in water infiltration, tilth, etc.

Another management decision involves regular pen scraping versus cleaning at the closeout of the pen. (See Table 2 for a comparison compiled by the University of Nebraska.) You can see that by regularly scrapping pens versus cleaning the pens at closeout increases the nitrogen recovery by 7 lbs. per head (21 lbs vs 14). At today's nitrogen values, the difference is a potential improvement of $3.85 per head from regular scraping.

There are many other management decisions that can improve the value of your manure. If you'd like to make better use of this natural resource, decide what changes you can make that will offer you the most return for your investment and start implementing your changes.

Table 1: Crop nutrient value budget

Field 1	**Field 2**	
Commercial Anhydrous	Manure Costs	
160 lbs/ac actual	*Nitrogen*:	160 lbs
$0.55/lb	$0.55/lb	
$88.00/ac	*P205*:	72 lbs
	$0.55/lb	
	K20:	60 lbs
No P and K needed	$0.55/lb	
	total =	$160.00
	Residual P and K	
	(next year)=	$169.40
	total value=	$329.40

Table 2: Decreasing surface area Cleaning frequency

	2001		2002	
N manure	Monthly lbs/T.	End	Monthly	End
DM	1464	803	1529	1103
OM	440	230	449	269
N manure	21.3	12.3	21.3	15.8

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Technology plays a role in evaluating manure value

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Software programs are becoming a valuable tool for producers seeking to better understand their operation's expenses, revenues and profits.

The Iowa Beef Center has a variety of software available for producers to use, including the Manure Nutrient Value Calculator with Iowa P (phosphorus) Index. To learn more about accessing this software, go to www.iowabeefcenter.org and click on "IBC Software."

Program Use

This calculator is a spreadsheet-based tool (operate with spreadsheets compatible with MS Excel 97 or later versions of MS Excel) that allows an individual to arrive at a monetary value of livestock manure from both a nutrient content as well as a handling and disposal cost.

The program also contains the Iowa P Index as part of the program's appendices. This component can be used in tandem with this program to arrive at appropriate application rates of livestock manure based on P content for Iowa soils.

Program Input, Outputs, and Print Out

Inputs

- Manure form and quantity (or storage capacity dimensions)
- Manure handling cost per unit or for total
- Manure nutrient analysis
- Soil analysis report
- Desired manure application rate
- Commercial fertilizer price

Outputs

- Commercial fertilizer requirement after desired manure application
- Acres covered
- Financial breakdown based on manure and commercial fertilizer values

Printout

A summary printout of your information can be obtained from the "Printout" tab. Select this tab and then select the print option from your MS Excel menu (see example below).

Manure Nutrient Value Calculator printout example

Nutrient liquid manure	Analysis % as-is	Retention Factor	Fertilizer requirement lb. per acre no manure	with manure
Nitrogen	0.3	0.98	191	-12
Phosphorus (P_2O_5)	0.21	1	40	-105
Potassium (K_2O)	0.25	1	50	-122
Sulfur	0.01	1	3	-4
Calcium	0.01	1		-7
Magnesium	0.01	1		-7
	ppm			
Boron	0.1	1	0.5	0.5
Zinc	0.6	1	2.0	2.0
Manganese	0.7	1		0.0
Copper	1	1		-0.1
Iron	0.7	1		0.0

Manure quantity	*gal.x1000*	1
Manure required	*gal.x1000*	*acres*
for N requirement	*7.8*	*0.0*
for P requirement	*2.3*	*0.0*
for K requirement	*2.4*	*0.0*

Commercial fertilizer requirement	no manure	with manure
Total $ per acre cost	$210.00	$180.00
Application cost	$5.00	$5.00
Manure application cost		$83.00
Cost per acre:	$215.00	$268.00
	w/o manure handling	$185.00

Manure	
Value	$15.40 per 1000 gal.
Handling cost	$10.00 per 1000 gal.
Net value	$5.40 per 1000 gal.
Prepared by:	

	x 1000 gal.per acre
Manure application rate	8.3

Gallons of manure available	1
Acres covered with manure	0.0
Total value with handling	$0.01
Total value without handling	$0.02

Joe Lally

Getting to know an IBC nutrient specialist

Counties served: all 99

What sort of typical activities do you do in your position?

- Stay abreast of USEPA's rules and regulations' impact on Iowa's livestock and poultry industries (Regional office in Kansas City referred to as R-7, which includes the states of Kansas, Missouri, Nebraska and Iowa)
- Assist the livestock industry in Iowa with coordination of Nutrient Management Plans, Permits, current topics of interest (manure values), research results
- Contributing across all disciplines in Agriculture on efforts to improve efficiencies, foster a culture of stewardship, and industry growth.

What made you want to work as a nutrient specialist?

Frankly, that specialty evolved following a series of assignments during my previous life with Farmland Foods. A team of swine specialists were asked to build the contract hog production system, and I coordinated the field office in Denison. Manure storage, handling, and application became a significant component of farmers management activities. So many decisions were being made in the late 80's-early 90's, and all were new concepts and business structures evolving out of the 80's farm crisis. Reminds me of many of today's financial issues.

What advice would you give for farmers who want to improve their manure management?

Think in terms of your farm as a production system. The closer you can get to a balance of all inputs with outputs in terms of natural resources, the more likely you can achieve a "lowest cost" status, and sustainability will be your choice.