

Using Manure In Corn Crop Production

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Crop nutrients are a major part of the cost in corn production. Substituting manure for fertilizer can result in savings for the corn producer in many situations.

Development of highly concentrated animal production facilities has created large quantities of manure which need to be marketed to other operations for use in crop production.

If you are considering using manure as a source of crop nutrients, you should first consider the advantages and disadvantages of using animal manures.

Low cost is a primary advantage that one can realize using manure. In concentrated animal production areas, manure is available for less than the commercial value of the nutrients. In some situations the manure is free.

Manure can also add organic matter, which helps to improve the soil's water-holding capacity. Micronutrients are a bonus that comes with manure as well. Some of the nitrogen that is in the manure is available slowly over time, which can contribute to the nitrogen needs of future crops.

As with everything, using manure comes with disadvantages as well. Weed seeds can be a problem, especially with bedded pack manure. This is less of a concern with poultry or hog manure.

Another problem with manure is that the nitrogen, phosphorus, and potash come in a fixed ratio. For example, your soil tests may indicate your corn crop needs only nitrogen and potash, but to meet that need with manure means that you will be applying phosphorus as well. Most soils in Pennsylvania have the capacity to store phosphorus, but it is important to monitor your fields with soil tests to avoid buildup of extremely high levels.

Odors and flies can be a problem with manure, especially if your field is in an urban area. Prompt incorporation is the best way to minimize problems with your neighbors.

The biggest disadvantage

with manure is the handling costs and potential compaction from application equipment. Ultimately, an evaluation of the nutrient value of the manure versus what it will cost you to get it on the field will determine whether it is the right move for you.

In order to make that evaluation, you need to know the fertilizer value of the manure. Ask the supplier of the manure to give you a manure test indicating its fertilizer value. Then it is a fairly simple calculation to determine the what the nutrients are worth.

When calculating the value of the nitrogen, remember that only a portion of the nitrogen will be available to the crop the first year. Refer to Table 21 in "The 1993-1994 Agronomy Guide" to determine nitrogen availability for your manage-

ment system. Multiply the percentage of the nitrogen available times the pounds of nitrogen per ton times the commercial value of the nitrogen per pound and you will have the value of the nitrogen per ton. Multiply the pounds of phosphorus per ton times the market value for a pound of phosphorus and you will have the value of the phosphorus per ton of manure. Repeat this same process for potash and you will have the value for potash per ton. Then add the values for the nitrogen, phosphorus, and potash to arrive at a total value of the manure.

Remember, this calculation assumes that you need all three nutrients. If your soil tests indicate you only need nitrogen, then the value of the nitrogen is really all that the manure is

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How Much Is Manure Worth?

1. Determine the current market price for N, P₂O₅, and K₂O for your area and use those prices in the following example formulas.

2. Use a manure test to determine the N-P₂O₅-K₂O content of your manure. If no manure test is available use book values in the agronomy guide.

3. Use table 21 in the 93-94 Agronomy Guide to determine the N availability factor for the manure nitrogen under your management system.

For Example: A poultry layer manure sample has a nutrient content of 38 lbs. of N, 48 lbs. of P₂O₅, and 25 lbs. of K₂O per ton. The manure will be spring applied and incorporated within one day. The value per ton would be:

38 lbs. N X .50 (Availability Factor) X \$0.25 per lb. = \$ 4.75
48 lbs. P₂O₅ X \$0.22 per lb. = \$10.56
25 lbs. K₂O X \$0.18 = \$ 4.50
\$19.81

Note: This calculation assumes that the crop requires all the nutrients in the manure. However your soil test may show for instance that your corn field requires only nitrogen. In that case you could only justify paying for the nitrogen in the manure if you were buying it.

Table 21. Percentage of total manure nitrogen remaining available to crops after storage and handling, as affected by application method and field history.

A. Current year, time of application, and incorporation Manure applied for CORN or SUMMER ANNUALS the following year:	N availability factor		
	Poultry manure	Other manure	
Applied in spring			
incorporation the same day	0.75	0.50	
incorporation within 1 day	0.50	0.40	
incorporation within 2-4 days	0.45	0.35	
incorporation within 5-6 days	0.30	0.30	
incorporation after 7 days or no incorporation	0.15	0.20	
Applied previous fall or winter with no cover crop ¹	0.15	0.20	
Applied previous fall or winter with cover crop harvested for silage ²	0.15	0.20	
Applied previous fall or winter with a cover crop as a green manure	0.50	0.40	
Manure applied for SMALL GRAINS:			
Applied previous fall or winter	0.50	0.40	
¹ There is the potential of significant nitrogen loss to the environment when manure is applied in this manner.			
² These low availability factors do not indicate a net loss of N. A large amount of N is removed in the cover crop silage but is recycled in the manure when the silage is fed.			
B. Historical frequency of manure application on the field	N availability factor		
	Poultry manure	Other manure	
	Rarely received manure in the past	0	0
	Frequently received manure (4-8 out of 10 yrs)	0.07	0.15
Continuously received manure (>8 out of 10 yrs)	0.12	0.25	



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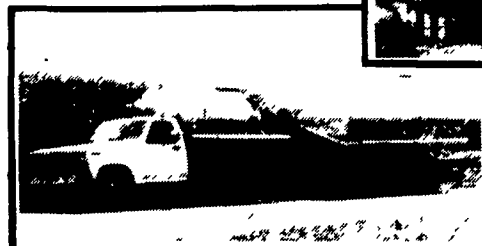
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