

## Crop Production

# Conserving N in manure saves money

## University Insight

By PAUL WYLIE



AS fertilizer prices increase, so does farmers' interest in using manure as a primary source of nitrogen. Relying on manure to provide crop nitrogen has its drawbacks, but they can be overcome with management and the proper equipment — both of which can help prevent N loss from surface-applied manure.

Manure is often surface-applied in the late summer and fall and not incorporated until spring. This delayed incorporation leaves the nitrogen subject to rapid evaporation. Incorporating manure at the time of application means more N is available to the growing crop. Though tractor fuel is expensive, the nitrogen saved can more than offset the cost of incorporating the manure.

### Early incorporation matters

The potential for nitrogen loss when manure is surface-applied and left for days or weeks is substantial. Urea costs about \$870 per ton, so the sub-

### Key Points

- Incorporating manure can cut fertilizer costs and lessen environmental pressure.
- A single dairy manure application can supply more than \$500 worth of nutrients.
- Delayed incorporation leaves the nitrogen subject to rapid evaporation.

stitution value of N is about 95 cents per pound. One thousand gallons of liquid dairy manure, for example, contains 28 pounds of total N. Half of that (14 pounds) is ammonium N, plus 12 pounds of phosphorus ( $P_2O_5$ ) and 20 pounds of potassium ( $K_2O$ ). Research from Vermont showed the greatest ammonium N loss occurs within 10 hours of surface application. Waiting 24 hours to incorporate the application resulted in a 50% loss of the ammonium N. This N loss is not restricted to liquid manure, either. Solid and semi-solid manures lose even more N because there is no liquid to be absorbed by the soil.

If you plan to apply liquid dairy manure to meet the N recommendation for a 150-bushel yield goal of shelled corn, you would apply 140 pounds of available N, valued at \$133, or 10,000 gallons of manure. If you wait 24 to 48 hours to work it in, you are still within Michigan's right-to-farm guidelines, but you stand to lose 70 pounds of N. At the current cost of urea N, you would have

to buy \$66 worth of fertilizer per acre to make up for the loss, and then you'd have the cost of spreading the urea, too.

### Balancing nutrients is key

In the example, 10,000 gallons of dairy manure will have significant potassium — about 200 pounds, which is valued at \$114. The accompanying 120 pounds of phosphorus pentoxide ( $P_2O_5$ ) typically found in liquid dairy manure is worth about \$120. However, if you don't need  $P_2O_5$  because of a high soil test for P, it's a liability. Overapply and you risk raising your P levels too high.

If your soil and crop can use all the primary nutrients in 10,000 gallons of dairy manure, you'll have \$367 worth of readily available nutrients plus \$133 worth (140 pounds) of slow-release N. That means a single manure application offers more than \$500 worth of nutrients.

### Use the right equipment

Research in Maryland showed that incorporating manure with a chisel plow immediately following surface application cut losses by 80%. Using a disk cut losses by 90%, and a moldboard plow, by 95%. Of course, liquid manure can also be directly injected with the appropriate equipment.

Preventing N loss is only one reason to inject liquid or promptly work in surface-applied manure. Doing so also cuts odor generation and greatly reduces

the likelihood of nutrient runoff. Even if it means changing management or retooling, getting manure underground promptly will improve neighbor relations and protect the environment.

*Wylie is the Allegan County Extension director and a member of the MSU Extension Animal Agriculture and the Environment Team. Reach him at wyliep@msu.edu.*

## Cut heat bill with biomass furnace

YEAR-A-ROUND Corp. has a furnace aimed at fighting high liquid-fuel bills with its biomass-burning line of heaters.

The telephone number given for Year-A-Round Corp. in the November issue of *Michigan Farmer* was incorrect. For more information on the biomass furnaces, call 800-418-9390.

With four models rated from 100,000 to 950,000 Btu, the biomass furnaces are designed to burn solid fuels such as corn, beans, rye, flax, wood pellets and any other burnable pelletized material. In some cases, Year-A-Round says users can save up to 40% on liquid-fuel costs with their products.

The furnaces burn clean and clinker-free, and feature an operator control panel to regulate the temperature. Other features are an air-cooled corn feeder, agitator and airbox.



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