

## Managing Manure Increases Its Value

NEWARK, Del. — In a single year, the average dairy cow produces manure containing almost 200 pounds of nitrogen, approximately 100 pounds of phosphate and 150 pounds of potash. Barring losses in storage, the nutrients in this manure can supply the fertilizer needs for an acre of corn.

By storing the manure in a way that preserves these nutrients, testing it for specific nutrient content, and then making calibrated applications, dairy farmers can save money and protect groundwater supplies.

The way manure is stored and handled affects the amount of nutrients that remain available to the crop. For example, nitrogen in the ammonia form can escape to the atmosphere if it is not quickly incorporated into the soil after application.

Dairy manure in a lagoon can lose 70 to 80 percent of its nitrogen while in storage, says J. Ross Harris Jr., University of Delaware extension environmental

specialist. If stored in an anaerobic pit, on the other hand, it will lose only 15 to 30 percent of its nitrogen, while in earthen storage it can lose 20 to 40 percent. Stored as a solid, nutrient loss will occur at a rate similar to that in slurry or earthen storage.

Additional nitrogen losses can occur after the manure is applied to the land, the specialist says. If broadcast and not incorporated, 10 to 30 percent of the nitrogen can escape into the air. Most of this loss will occur during the first 24 hours after spreading. So immediate disking or other cultivation is essential. Incorporation after application will cut nitrogen losses from 1 to 5 percent, as compared to losses of from 0 to 2 percent when knifed in.

Phosphorus and potassium losses are likely to be negligible except when manure is stored in open lots or lagoons. Harris estimates that approximately 20 to 40 percent of the phosphorus and 30 to 50 percent of the potassium contained in dairy manure can be lost by runoff and leaching in open lots, while up to 80 percent of the phosphate in lagoons can accumulate in bottom sludges where it remains unavailable unless the sludge is removed and applied to the land.

The specialist strongly encourages manure testing and spreader calibration — practices that enable dairy producers to effectively manage the manure from their herds as a resource and at the same time prevent groundwater pollution.

Harris has written two fact sheets that describe the calibration procedures for spreading livestock manure in a liquid, solid or semisolid form. Copies of these fact sheets are available in Delaware from county extension offices in Newark 302-451-8934, Dover 302-697-4000, and Georgetown 302-856-7303. For further information on the use of manure in crop production, he suggests farmers contact their extension agricultural agent.



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