

# Handle with Care



PHOTO BY SHAUNA ROSE HERMEL

## Right steps can maximize manure value.

by **Barb Baylor Anderson**, field editor

**M**anure can be an asset to your own crop production or that of a neighbor. However, solid manure must be handled, stored and spread with care for you to maximize its value.

“Cleaning pens and hauling manure for application on crop acres is an expense and can consume considerable time,” says Russ Euken, Iowa State University (ISU) Extension livestock specialist. “But with higher fertilizer prices, there is opportunity for economic benefit for an operation if manure is managed correctly.”

### Understand variability

That begins with understanding variables that affect manure content and nutritive value. Euken says nutrients excreted in manure vary with diet, cattle size and performance. Most nutrients originate in the feed consumed. He estimates in finishing rations an average of 10%-15% of nitrogen

or phosphorus fed is retained by the animal, while the rest is excreted.

“Facility type and environment affect how much of the nutrient excreted is captured,” he says. “Moisture, bedding or soil can affect nutrient concentration.”

Euken says solid manure characteristics from an open lot will vary with the weather and amount of moisture. Typically, as manure is more exposed to the environment, more of the nitrogen in the ammonia form may volatilize and be lost to the atmosphere. He cites University of Nebraska research that accounted for nitrogen loss of 71% through volatilization from earth feedlots in the summer. Winter loss was 47%. He says losses can be lowered by cleaning pens frequently.

Volatilization from the feedlot surface also can be minimized by adding bedding or a carbon source. Ted Funk, engineer and former University of Illinois Extension specialist, says that’s the general case in the

Midwest. Manure scrapings from open lots have less bedding and carbon.

University of Nebraska research found that using sawdust bedding in open earth lots increased nitrogen in manure by 45% during a winter feeding period, while adding bedding in the summer did not decrease volatilization losses. The research also found that more organic matter in the diet also increased nitrogen in the manure during both summer and winter.

### Handle properly

Since the nutrients in manure are subject to loss in a number of ways, manure must be handled with an eye on the environment and regulations.

Funk recommends producers consult federal and state environmental regulations to assure manure is handled and stored properly. For example, if you clean the barn twice a year and make temporary stacks,



know the rules for protecting temporary stacks from runoff and leaching. Assess your risk before you scrape the concrete from the feedbunk area and stack it.

“Outside feedlots may have a concrete lot and runoff must be controlled,” he says. “We didn’t pay as much attention in the past to the runoff, and manure may have been overapplied close to the barn. There may be high phosphorus levels, so there’s some concern for water pollution.”

Euken says producers with solid manure basically have two choices once it is removed from the lot: application to a field or stockpile in a level area where it will not be contacted by surface-water flow or where runoff from the stockpile cannot be contained.

“Regulations may limit the length of storage for stockpiles, but typically, producers can land-apply at least every six months before or after the growing season for row crops, or on small grain or hayfields during the summer,” he says. “Although composting manure is not as common as stockpiling, you can haul it farther and it is a more uniform

product, so it might be easier to market. The main disadvantage is the time and equipment needed to compost the manure. You also lose some of the nitrogen in the composting process.”

Other types of facilities, such as confinement units with bedding or a pit for liquid manure, can capture more nutrients in the manure. There also is more manure to store and land needed.

To make improvements, Funk urges producers to take advantage of resources available from the Natural Resources Conservation Service (NRCS) and other agencies. Environmental Quality Incentives Program (EQIP) dollars are available to build structures and control systems.

### Determine value

Managing and storing manure is only half of the equation. You need to determine the manure’s worth to your fields or a neighbor’s to maximize its economic value. You can sell it as fertilizer or consider trading it for cornstalks to use as bedding, for example.

“Row crop applications are probably your first choice of use, especially for corn acres,” says Funk. “You have to know what is in the manure to broker it. Get a good sampling. Determine through lab analysis what the dollar value is per ton of the nitrogen, phosphorus and potassium, along with the organic matter and micronutrients.”

Euken adds getting a good sample usually involves taking several subsamples and combining them to get a representative sample. Lab analysis at a minimum should include moisture, nitrogen, phosphorus and potassium. Knowing the amount of nutrients allows you to determine the amount of manure to apply to meet crop needs. Ash content can indicate how much soil is removed with manure from an earth lot or the amount of bedding in the manure.

“Understand you need good samples and analysis to know what nutrients you need to apply,” stresses Funk. “Soil testing is important to match the crop to the nutrients in the manure.”

“With most livestock manure and crop rotations, the exact amount of each nutrient the crop needs for one year is hard to match to a manure application rate. Phosphorus and potassium can carry over for more than one year, but nitrogen can’t,” adds Euken.

He says most producers will try to apply part of the nitrogen requirement from manure nutrients and part from commercial fertilizer. If that rate applies additional phosphorus or potassium than required during the crop year, then subsequent manure applications should be rotated to another field until the phosphorus and potassium are used by the crop.

“The key to capturing economic value is to take credit for nutrients applied when they will be used. If nutrients from manure aren’t needed or replace commercial fertilizer, they don’t have value,” he says.

Transportation is part of the value equation, as well, as the manure will need to be moved with a solid spreader or truck. Funk advises not moving it more than 3 or 4 miles to capture the economic value and minimize any environmental risk to country roads.

“When you haul it, there is potential to track manure on roadways or risk spills. If that happens, make sure you clean it up as best you can and report it as a spill to the appropriate agency,” says Euken. “Make sure the manure doesn’t move to a tile line or stream.”

### Apply correctly

Once it’s time to apply solid manure, Funk encourages producers to talk with neighbors. The manure should be broadcast and incorporated with a tillage tool as soon as possible to reduce odor and lock in nitrogen. Timing is important because of potential soil compaction issues, too. Manure should not be applied on top of snow or on frozen soil, especially if melting conditions or rain is in the forecast. The manure and nutrients can move with the runoff.

Ron Wiederholt, North Dakota State University Extension southeast district director, recommends manure be incorporated within 24 to 48 hours of application.

“The challenge with solid manure is it’s harder to apply uniformly,” says Euken. “Equipment varies. You need to understand the spread pattern and calibrate for more uniform application.”

Most solid manure equipment is truck-mounted or tractor-towed to disperse manure with single or double beaters in a horizontal or vertical configuration on the side or rear of the implement, says Wiederholt. Vertical beaters have greater discharge capacity, swath width and uniformity. Solid manure typically is applied using truck-mounted spreaders with 3- to 20-ton capacities.

Several manure resources can be found online or through your Extension Service. If you want to calculate the value of your manure, or learn more about manure management, resources include [www.iowabeefcenter.org/feedlot.html](http://www.iowabeefcenter.org/feedlot.html) and [web.extension.illinois.edu/lfmm/](http://web.extension.illinois.edu/lfmm/).



**Editor’s Note:** A former National Junior Angus Board member, Barb Baylor Anderson is a freelancer from Edwardsville, Ill.