Proper management of manure resources can not only mean added value for this precious commodity, but it can also be a vital means of protecting the area environment. Although there are countless manure management techniques, let’s consider the following management methods we utilize before the manure is applied to our fields: handling, storing, sampling and analyzing of manure.

Handling Manure
Cleaning open lots frequently can increase the amount of nutrients captured, as well as make runoff less of a problem if it is then properly stored. Stockpiled manure will also lower the amount of manure that is subject to ammonia volatilization. Bedded confinements are typically managed by cleaning either the feeding apron regularly with a bedded pack that is cleaned less frequently or by cleaning the entire facility on a regular basis. Limited sampling of both shows little difference in nutrient concentration in the manure.

Storage of manure
Manure is produced year round and application for row crops basically can occur in spring before planting and in the fall after harvest. For pit manure, storage is provided in the pit. The anaerobic environment limits loss of nutrients. Solid manure from an open feedlot or bedded building can be stockpiled following regulations, composted, or land applied. From an economic and environmental standpoint the question becomes, can solid manure be stored economically without nutrient losses between spring and fall periods?

University of Nebraska research comparing nitrogen recovery of stockpiled or composted open beef feedlot manure to fresh scraped manure was 86% and 56% respectively. A recovery of 86% N in stockpiling would be slightly better than land application without incorporation and also lower the opportunity for surface runoff if the stockpile is managed correctly. Building the stockpile so surface exposure is limited will help prevent volatilization and also locate the stockpile away from waterways etc. Composting did provide the advantage of a lower quantity of manure to be land applied.

Sampling and analysis of manure
Sampling manure is not an exact science. Getting a representative sample can be difficult if there are large variations within the lot. For starters, in open lots sampling could be done during summer and winter and sample areas could contain different nutrient concentrations separately. Maintaining a history of when and where samples are taken and looking at the variation in samples can be a guide in determining when and where samples need to be taken. Getting a good sample involves taking several sub-samples of the area and then combining those to get a representative sample. The sample sent to the lab only needs to be a small sample. In addition to sampling from the pen or lot a sample could be taken from the spreader during application but lab analysis would probably not be available to help make management decisions for that application.

A lab analysis should be done for moisture, total N, P2O5 and K2O. Adding an analysis for ammonium can help determine what portion of the N is organic and what inorganic and how much of the N is available to the crop.

There are several other manure management decisions to consider, including applying manure to land in an environmentally responsible manner. To read an extended version of this article and learn more about manure management for the environment, go to www.iowabeefcenter.org.

The Iowa Legislature, through the passage of SF 432, made changes that will affect some beef producers’ application of manure in the winter and how they stockpile their manure. The law deals with the following:
A. applying manure in winter
B. stockpiling solid bedded manure
C. constructing bedded barns and bedded manure storage structures.

The details of the law set limitations on when liquid manure can be applied, as well as where manure stockpiles, bedded barns, and manure storage structures can be located. To read up on the details of this law and how it affects you, go to www.iowabeefcenter.org.
Poor grazing management can contribute to pollution of pasture streams with sediment, nutrients, and pathogenic microorganisms. Grazing at excessive stocking rates decreases forage height and increases bare ground, thereby creating conditions that allow soil erosion and transport of manure nutrients and pathogens in precipitation runoff. Even at appropriate stocking rates for the total pasture, congregation of grazing cattle near pasture streams for drinking and body temperature regulation may increase bare ground, soil compaction, and manure accumulation on stream banks that will contribute to pollution of pasture streams if grazing cattle have unrestricted access to the stream.

Exclusion of grazing cattle from pasture streams with fencing will reduce pollution of pasture streams by maintaining vegetative cover and preventing soil compaction and manure accumulation in the streamside area. Such a vegetative buffer has the added advantage of providing wildlife habitat and, thereby, hunting opportunities. However, complete exclusion would require the development of an alternative water source outside the riparian buffer and decrease the amount of land available for grazing within a pasture. Furthermore, research has shown that eliminating grazing of smooth bromegrass pastures for three years reduced plant root density which may reduce its ability of prevent soil erosion over a number of years.

There are several alternatives to complete exclusion that are nearly or as effective in preventing water pollution of pasture streams. Stabilized stream access sites placed within riparian buffers allow cattle access to water. However, in research at the Iowa State University Rhodes Farm, cattle do not congregate on the 16-foot wide crossings constructed of polyethylene webbing and crushed rock. Cattle in this treatment spent less than 0.5% of their time within the stream and less than 3% of their time within 110 feet of the stream. Depending on the type of crossing, stabilized access sites may have the additional advantage of providing a crossing for vehicles.

Short-term or flash grazing of the riparian paddock will allow utilization of the forage in the paddock while maintaining adequate vegetative cover to minimize soil erosion. Grazing of this paddock to a minimum forage height of 4 in for no more than four days maintains forage growth above ground and forage root density in the soil. Furthermore, use of this paddock in a rotational grazing system allows control of the timing of grazing to avoid periods when the stream banks may be wet and most susceptible to hoof traffic damage.

Beyond management practices involving fencing, pollution of water in pasture streams may be reduced by practices that alter the distribution of cattle within the pasture. Because cattle primarily congregate near pasture streams to relieve thirst and control body temperature, providing off-stream water and/or shade may reduce bare ground and manure accumulation near pasture streams. Similarly, placing feeding sites for minerals or other nutritional supplements away from pasture streams is likely to reduce the risks of water pollution. In addition to reducing the risks of polluting pasture streams, proper location of off-stream water, shade or nutritional supplementation sites may actually improve pasture utilization by increasing the uniformity of grazing across the pasture.