Other BMPs

Site and environmental factors to remember

To establish actual manure application rates, manure application records should be maintained. The records should include date of application, amount of manure applied per acre by tract number and field number, most recent manure analysis and soil test report, and the R.Y.E. N rate. This record-keeping process is discussed in ***Lesson 35, Land Application Records and Sampling***.

If you do not own adequate land to properly use the manure, consider a written agreement with third-party landowners or applicators. The agreements will help you document where the manure generated on your farm will be used. An example agreement is presented in Appendix C.

Producers are encouraged to sample groundwater and surface water on farms where animal manure is routinely applied. Samples should be analyzed for nutrients and bacteria and these records should be kept with the other farm records. In any case, animal manure should not reach state wetlands or surface waters by runoff, drift, man-made conveyances (such as pipes or ditches), direct application, or direct discharge during operation or land application. Neither should manure be applied to saturated soils, during rainfall events, or when the soil surface is frozen (if at all possible). It also should not be surface spread as liquid manure on slopes steeper than 6% unless sufficient crop residue is present or unless injected or incorporated into the soil. Check with local city and county officials for applicable regulations on zoning, health, building code, setback distances, etc.

Evaluating the environmental suitability of your application sites is one method you can use to identify those fields where manure application is most appropriate. Table 32-2 enables you to measure the relative "risk" to the environment of various land application sites. You should consider such an evaluation for each field when you develop and review your manure utilization plan.

Evaluate the environmental suitability of your application sites. ...Complete such an evaluation for each field and include it as part of your manure utilization plan.

Pasture management

Grasslands or pastures are essential to many livestock operations. They provide nutrition for cattle or other livestock as well as food and cover for wildlife. Well-managed grasslands protect valuable soil resources and improve water quality. The fibrous root systems of healthy grasses hold the soil in place so surface water supplies are not contaminated with sediment. They also provide a nutrient sink for many elements in animal manure.

There are several keys to maintaining adequate, sustainable pastures. Plant selection is critical, because the plant must be adapted to both the soil and climate to ensure adequate cover throughout the year. Determining the appropriate livestock stocking rate is also essential. If damaged, the vegetative cover could result in increased soil erosion. Similarly, controlling livestock traffic can prevent bare spots that could lead to gully formation. If application sites are grazed, producers are encouraged to develop a grazing plan. The plan should encourage controlled, frequent rotational grazing; multiple drinking water sites; and strategic harvesting to optimize manure and urine distribution by grazing animals. These practices will minimize potential point sources from stock camps, shade trees, water tanks, and heavy use areas. Lastly, the annual application amount should be reduced to account for nutrient recycling by grazing animals. Experts in some states have recommended reductions of 25% to 50% of the annual N requirement (based on a hay crop).

Table 32-2. Field assessment for manure application.

Category		Field # _____
1. Planned crop (check one)		**Points**
a. Continuous corn or corn not following legume	10	
b. Second-year corn following legume	8	
c. First-year corn following legume	1	
d. First-year corn following nonforage legume	8	
e. Nonforage legume	2	
f. Small grains (for grain)	6	
g. Small grain with seeding (removed as grain)	2	
h. Small grain with seeding (removed as hay or silage)	4	
i. Prior to direct seeding legume forage	8	
j. Topdress (good legume stand)	1	
k. Topdress (fair legume stand)	2	
l. Topdress (poor legume stand)	3	
m. Grass pasture or other nonlegumes	6	+ _____
2. Soil test P & K (check one for each category)		
a. Phosphorus		
1. > 150 ppm	1	
2. 75–150 ppm	3	
3. 30–75 ppm	5	
4. < 30 ppm	10	
b. Potassium		
1. > 200 ppm	6	
2. 100–200 ppm	8	
3. < 100 ppm	10	+ _____
3. Site/soil limitations (check one for each category)		
a. Surface water or groundwater proximity		
1. Applied and incorporated within 10-year floodplain or within 200 feet of surface water or groundwater access	1	
2. Application outside these restrictions	5	
b. Slope		
1. Slope > 12%	1	
2. Slope 6–12%; > 12% (incorporated, contoured, or terraced)	3	
3. Slope 2–6%; 6–12% (incorporated, contoured, or terraced)	5	
4. Slope < 2%; < 6% (incorporated, contoured, or terraced)	10	
c. Soil texture		
1. Sands, loamy sands	1	
2. Sandy loams, loams/sands, loamy sands; spring applied	3	
3. Other soils/sandy loams, loams, clays, spring applied	5	
d. Depth to bedrock		
1. 0–10 inches	0	
2. 10–20 inches	1	
3. > 20 inches	5	+ _____
4. Total Points		
(higher field score = higher priority for land application)		= _____

Runoff control structures

No matter how well you manage your operation, there will be times when runoff occurs. Since all water flows downhill, the total amount of surface runoff going past a given point will increase as you move downhill. As the runoff concentrates in rills and gullies, its erosive force and its ability to transport pollutants will continue to increase. Often, however, structural practices such as terraces, diversions, grassed waterways, sediment basins, subsurface drainage, or even farm ponds can be used to control the flow of water and to protect water quality. While these practices are often costly to install, they usually have production and aesthetic benefits in addition to their environmental benefits.

Steep slopes and irregularities on the land's surface contribute to increased flow concentrations and to the formation of rills and gullies. Land smoothing and leveling can be used to improve drainage and reduce erosion by spreading the flow over a larger area. Terraces and diversions can be used on steep or long slopes. Both of these practices are effective because they slow the runoff by encouraging flow across the hillside rather than down the steeper hill slope. A grassed waterway is a natural or constructed channel, usually broad and shallow, planted with perennial grasses to reduce the erosion caused by the concentrated flow. These waterways serve as conduits for transporting excess rainfall and diverted runoff from fields or pastures without initiating excessive soil erosion. The vegetation also acts as a filter to remove suspended sediment and some nutrients. However, grassed waterways require careful maintenance and periodic reshaping, especially after large or intense storms.

A well-placed pond can collect the runoff from a farm and have a positive impact on water quality.

Using sediment basins or small farm ponds is one final method of preventing off-farm pollution. A sediment basin is a barrier or dam constructed across a waterway to reduce the velocity of the runoff water so much of the sediment and associated nutrients settle to the basin bottom. Small sediment basins require regular sediment removal, while larger basins almost appear to be a pond and may support fish and wildlife. A well-placed pond can collect the runoff from a farm and have a positive impact on water quality. It acts as a detention basin by removing sediment and nutrients from the flow and by reducing the volume of flow during storms. If aquatic vegetation or fish are added, it can also filter many nutrients. Finally, the pond can act as a buffer between the farm and the external environment.