Best Management Practices for Fall Manure Application

The extended period of dry weather has caused low water flow in many Iowa streams. Low flow coupled with high temperatures has put a strain on aquatic life in many Iowa streams and can cause the streams to be highly vulnerable to any nutrients that may reach it.

Recently a group of state government, academia and industry professionals met to discuss fall manure application issues and to develop a list of Best Management Practices (BMPs) that can be implemented by all livestock farmers and commercial manure applicators to maximize use of manure nutrients for crop production and reduce potential impacts of water quality this fall. Here is a top ten list of BMPs for nutrient application this fall:

1. Soil and Water Conditions

Know and understand your soil conditions prior to land application. Much attention has been given to dry and cracking soils and manure application. Generally speaking cracking soils and preferential flow of manure to a tile line is not an issue in Iowa. Tillage prior to manure or fall fertilizer application may actually shatter soils such that no structure will remain and intense rainfall may cause surface crusting that reduces water infiltration and could cause runoff of nutrients. Be aware of conditions and take appropriate actions; this may include delaying manure application.

Know where tile lines and tile inlets are located. If you think preferential flow to a tile line is possible, consider plugging the tile to prevent movement of manure to water sources or installing a flow control structure to manage drainage. If runoff conditions are present, take time to cover or block tile inlets.

If early spring rains caused erosion and formed gullies on your farm, take some time to map out these conditions so caution can be used during land application to prevent breaking axles on manure tanks wagons or even possibly tipping over a tank wagon.

2. Keep an Eye on the Forecast and Heavy Rainfall Events

While not 100% predictable, the amount and intensity of rainfall greatly affects nutrient retention. If you surface-apply manure, you could lose nutrients from runoff of nutrients on the soil surface. If you inject or incorporate manure an intense rainfall event could increase soil erosion and possible off-site movement of nutrients due to the soil disturbance of injection or incorporation. In either case, a low intensity rainfall could benefit movement of nutrients into the soil, but a high intensity rainfall could cause loss of nutrients from runoff and erosion. Again attempt to apply manure on fields away from water sources and keep an eye on the weather forecast.

3. Calibrate, Inspect and Maintain Manure Application Equipment

As with all farm equipment, calibration of manure application is necessary. Calibrating manure application equipment takes a little time, but helps to meet the correct application rate and make manure nutrients more effective and efficient.

Calibrating Liquid Tank Manure Applicators

Calibration and Uniformity of Solid Manure Spreaders

Also take time to inspect and do maintenance on equipment. This will help protect employees and reduce the chances of equipment malfunction that can lead to over or under-application, cause serious damage to equipment or could cause a manure spill.
4. Separation Distances for Land Application

All animal feeding operations, regardless of size, are subject to manure application separation distances from designated areas (water sources). Get a copy of an aerial photograph of all fields to which manure is applied. Map out neighbors’ houses, churches, businesses, schools, cemeteries and other public use areas as well as all designated areas such as sinkholes, wells, including abandoned wells, cisterns, designated wetlands, water sources, high quality water resources, ag drainage wells, and tile inlets to ag drainage wells. Identify all other sources of concern for manure application. Sketch out separation distances. Train your employees to read the maps and stay away from areas where manure is not allowed to be applied. Read the DNR Fact Sheet 113 on separation distances for manure application.

5. Irrigation of Manure Sources

Irrigated manure sources often have low nutrient concentration which allows for high application rates. These rates can sometime be in the tens of thousands of gallons per acre. When irrigating manure be sure to understand soil infiltration rates to prevent over-application of liquid that could lead to surface runoff of manure sources. These sources of manure may need to be applied over a course of multiple application events. Check to make sure all irrigation equipment is properly calibrated and in good working order. Continuously monitor the equipment to make sure it is working properly and no runoff is occurring.

6. Savvy Stockpiling and Dry Manure Management

Be sure to follow all dry manure stockpiling rules. Information is available on the DNR’s Animal Feeding Operations Web page. The goal is to make sure the stockpile is located such that runoff or leaching from the stockpile does not affect water sources.

Dry-Bedded Manure Stockpiling Regulations for Cattle and Swine Confinements

Confinement Dry Manure Stockpiling Regulations

Open Feedlot Manure Stockpiling Regulations

Open feedlot producers should take advantage of the dry weather conditions to scrape manure from feedlots so if we do receive rain there are less nutrients on the feedlot to move through the settling basin. This helps reduce potential impact on water sources and provides a nutrient source that can be used for crop production next year. Producers should also consider removing manure from settling basins. Dry conditions offer a great opportunity for thorough settling basin cleaning and maintenance.

7. Develop an Emergency Spill Response Plan

Hundreds of millions of gallons are safely applied each year in Iowa, yet manure spills can occur, so plan accordingly. Train employees and family members in manure spill response. Ask your commercial manure applicator if they have a plan of action in the event of a spill. If they don’t have a plan, require one. Keep important phone numbers and contact information for excavators, neighbors with pumps and tractors, and local officials and emergency response units up-to-date and posted where everyone knows where to find them. Remember to contact DNR if a manure spill or release does happen. You must report any spills or releases within six hours. Call the 24-hour spill hotline at 515-281-8694.

Emergency Action Plans
8. Evaluate Soil Temperatures

Much like avoiding fall anhydrous ammonia application until soil temperatures are 50 degrees and cooling, the same applies to liquid manure with high amounts of ammonium-nitrogen such as liquid swine manure. Producers and commercial applicators should consider delaying manure application until soil temperatures cool down to slow the rate of nitrogen conversion and the potential loss of nitrogen if conditions turn wet yet this fall or next spring.

9. Plan for Next Year

Remember to account for the nitrogen and phosphorus needs of your crop next spring. If liquid manure is applied early this fall and loss conditions occur, supplemental nutrients may need to be applied next year. Keep in mind what your manure or nutrient management plan allows for application rates. In most cases, it pays to plan ahead when using manure as a nutrient source even a year in advance.

Understand your manure storage needs through the next 12-14 months. If you haul manure in late summer or early fall of 2012, will you have enough storage to get you through next year if the spring is wet or fall harvest is delayed in 2013? Make sure you have adequate storage or land available for manure application after next year’s growing season.

10. Be Safe

Fall is a busy time of year for farmers and commercial manure applicators. Get plenty of rest, take breaks and slow down. Observe all laws of the road and watch out for the “other driver”. They may not realize you are moving at a much slower rate of speed or how long your tractor and tank wagon are when they attempt to pass you on the road. Check “slow moving vehicle signs” and replace as needed. Check lights to make sure they are working and are visible. Install additional lights as needed to improve your visibility and to help people see you. Make sure employees and family members meet manure applicator certification requirements and are well trained to handle various situations. Take time to train new employees and refresh the memory of experienced employees.

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You can read more about manure management issues by visiting the IMMAG Web Page at: http://www.agronext.iastate.edu/immag/