

Winter Manure Application Tips by, Dan Andersen, ISU Agricultural and Biosystems Engineering

Challenging weather conditions are causing some tough manure management decisions. When injection/incorporation is not an option, surface application should be considered. However, surface application can result in additional nitrogen loss so application rate adjustments may be appropriate. Surface application on frozen or snow-covered ground pose additional runoff risks. Based on potential nutrient losses and water quality impacts, winter manure application is not recommended. However, if you do need to apply manure yet this fall or winter because of limited available storage capacity, there are several things to consider to minimize nutrient losses and water quality impacts.

Best management practices for winter manure application include applying to level ground and where soil erosion is controlled. If you do need to apply, timing and weather conditions are two of the most important factors affecting the amount of manure nutrient we lose. Nutrient loss requires something to move the manure nutrients from the field to a water body; this is usually either snowmelt or a rainfall event onto the frozen soil. If these events are small, nutrient losses tend to be low; if it is a larger runoff event then nutrient losses are higher. In general, the more time that passes between the manure application and the first runoff event, the less risk of environmental impact from nutrient transport. This means watching the weather forecast and avoiding manure application for a few days before anticipated snowmelts or rainfalls can make a big difference in limiting manure nutrient loss.

The other thing to remember is that the amount of snow in the field is a critical component in how much runoff will occur. Although it may seem counter intuitive, often times fields with lots of residues will tend to accumulate deeper amounts of snow. Research by Jeff Lorimor showed that runoff losses were higher from standing corn stubble than from soybean stubble, which they attributed to the deeper snow cover in the cornfield as compared to the soybean field. Additional recommendations include incorporating the manure when you can, avoiding areas of concentrated flow such as waterways, ditches, or similar areas, using setbacks from sensitive areas like stream banks, sinkholes, and similar, and if possible avoiding application near areas that drain to surface tile inlets. If these areas can't be avoided add protection around drainage tile intakes to prevent entry by manure or runoff water.

There are a few other legal requirements to keep in mind. Most importantly, follow the required separation distances (available at www.iowadnr.gov/Environment/LandStewardship/AnimalFeedingOperations/AFOResources/AFOFactsheets.aspx), make sure to update your manure management plan to reflect surface application rates, and if your Master Matrix said you'd use injection or incorporation contact Iowa DNR before applying to get written permission to surface apply. Additionally if you have an NPDES permit or comprehensive nutrient management plan, make sure you know what's in them and follow them accordingly. Finally, keep records of the rate, date, method of application, field, and other application precautions taken when applying the manure.

Iowa's restrictions on application to frozen or snow covered ground will be in effect this winter for confinement operations with more than 500 animal units. Iowa law prohibits liquid manure application from these larger operations between Dec. 21 and April 1 if the ground is snow-covered, unless manure can be properly injected or incorporated or an emergency exemption is granted. Snow-covered ground is defined as soil having one inch or more of snow cover or one-half inch or more of ice cover. Also, once the calendar reaches Feb. 1 confinement producers with 500 or more animal units are limited to emergencies only for applying liquid manure on frozen ground unless the manure is injected or incorporated. A press release from the Iowa DNR at <http://www.iowadnr.gov/insidednr/socialmediapressroom/newsreleases/vw/1/itemid/2304> provides additional clarification of these requirements.

If winter manure applications are not avoidable:

- Take into account soil and weather conditions
- Avoid applying before a snowmelt or rainfall event
- Apply to areas of level ground and where soil erosion is controlled
- Apply to areas with less snow cover
- Follow appropriate setback distances
- Update your Manure Management plan to reflect surface application rates and if subject to Master Matrix requirements for injection or incorporation get approval before surface applying

Stay safe and happy hauling,
Dan