

Extension Publications Providing Guidance on Winter Application of Manure and Fertilizer Nutrients

The following excerpts from selected extension publications provide guidance on winter application of manure and fertilizer nutrients. The four excerpts were compiled in May 2008 by John Sawyer, associate professor of agronomy, with extension and research responsibilities in soil fertility and nutrient management.

1. From *Managing Manure Nutrients for Crop Production*. PM 1811. Revised November 2003. Iowa State University Extension.

Applying manure to frozen soils increases the potential for environmental contamination. Nitrogen and phosphorus movement into surface water can be significant and nitrogen losses can be high. If manure must be applied to frozen ground, it should be applied on relatively flat land (slopes less than 4 percent and well away from streams and waterways, see IDNR rules on setback distances).

2. From *Winter manure application*. Iowa Manure Manager Series. Volume 3. Iowa Manure Management Action Group, Iowa State University. [Published December 2006]
(<http://www.agronext.iastate.edu/immag/pubs/imms/vol3.pdf>)

Based on potential nutrient losses and water quality degradation, winter manure application is not recommended. However, if you do need to make winter manure applications because of limited storage or an early fall freeze, there are several things to consider to minimize nutrient losses and water quality degradation.

Best Management Practices

Anytime manure is applied on frozen ground, there is an increased risk of environmental degradation. If manure application must take place in the winter time, the following are some guidelines to minimize runoff and subsequent loss of nutrients:

- Apply manure to level ground.
- If applying on manure on a terraced field or sloping field, avoid application to areas that drain to tile intakes that directly discharge to surface or ground water.
- Do not apply manure in grassed waterways.
- Apply the manure early in the winter prior to significant snowfall.
- Stay away from tile intakes, creeks, streams and other surface water. (Iowa law prohibits manure application within 200 feet of surface water or within 800 feet of a high quality water resource unless the manure is incorporated on the same day or an area of permanent vegetation cover exists for 50 feet surrounding the water resource.) See DNR 113 for additional information.
- Do not apply manure on top of deeper snow cover, especially later in the winter.
- Applying manure on soybean stubble where less snow is captured is preferable to applying to standing cornstalks.

- If applying manure in late winter, wait until the snow has melted before applying manure.
- During any application season, watch the forecast for predicted rainfall, snow or warming conditions that could cause snow melt or runoff.

When winter manure applications are not avoidable, please take weather conditions, soil conditions and application timing into consideration.

3. From *Agricultural nitrogen management for water quality protection in the Midwest*. RP189. 2006. Heartland Regional Water Quality Initiative, University of Nebraska-Lincoln, Iowa State University, Kansas State University, and University of Missouri-Columbia. University of Nebraska-Lincoln Extension, Lincoln, NE.

Risk of nitrogen loss to runoff and erosion to surface waters is increased with manure application on snow or frozen ground, especially where late winter or early spring melt events result in runoff.

4. From *Understanding your soil test report*. Pm-429. Revised July 1989 (out of print). Iowa State University Extension.

Winter application of P and K fertilizer is feasible in areas of traditional fall plowing. Whether fertilizer is applied in winter depends on slope of fields, crop residue or crop cover, conservation practice, and snow cover.

The major considerations are having fertilizer in contact with the soil surface, moving the fertilizer into the soil, and not losing it through sheet erosion. Because most fertilizer materials are water soluble, loss can occur in snow melt runoff if the fertilizer does not come in contact with the soil surface. Fertilizer can be applied on fields that are level to nearly level, with or without snow cover. Some snow melt runoff would be expected because fertilizer spread on snow must melt through the snow to contact the soil.

Fertilizer can be winter-spread on fields with slopes not exceeding 5 percent if crop residue, contour rows, or other conservation practices are there to slow runoff. The fertilizer can be spread on a light snow cover if the fertilizer can melt through the snow. Do not spread fertilizer on fields in winter where sheet erosion is likely to occur.

Fields with predominant slopes greater than 5 percent should be carefully judged before winter application of fertilizer. Do not apply fertilizer in winter on such fields if runoff will be rapid, or if sheet erosion probably will occur.