



NORTH CAROLINA INTERAGENCY NUTRIENT MANAGEMENT COMMITTEE

- ◆ North Carolina Cooperative Extension Service (NC CES) and North Carolina State University – Soils Department, Crop Science Department (NCSU)
- ◆ North Carolina Department of Environment & Natural Resources - Division of Soil and Water Conservation (DENR-DSWC)
- ◆ North Carolina Department of Agriculture and Consumer Services – Agronomic Division (NCDACS)
- ◆ United States Department of Agriculture - Natural Resources Conservation Service (USDA-NRCS)

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Issue Guidance Animal Waste Application on Forestland

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Background: The Interagency Nutrient Management Committee received a request from NCSU specialists to comment on a draft fact sheet on utilizing abundant animal waste materials to address nutrient deficiencies in NC forest soils. This document summarizes the comprehensive response of the INMC that addresses technical issues within the purview of the Committee.

Guidance: The charge of the INMC (NCDA, NRCS, NCSU Departments of Soil and Crop Sciences, and DENR) is to ensure nutrient and waste management guidance and standards are based on the best available science and address both the agronomic needs of the crop as well as environmental protection. Because of its role in providing guidance to state and federally permitted animal operations through its consultative role with the Senate Bill 1217 Interagency Group as well as its review and concurrence in NRCS standards 590 (Nutrient Management) and 633 (Waste Utilization), the INMC requests that the following be included in a document section devoted to the INMC position on organic application rates in forestland.

The North Carolina Interagency Nutrient Management Committee, composed of technical representatives from the NCSU Departments of Soil & Crop Sciences, NCDA&CS, NC DENR, and USDA Natural Resources Conservation Service (NRCS), evaluated the opportunities for the forestland application of animal waste during 2006-2007. In response to this Committee's efforts, the USDA NRCS updated its Waste Utilization standard to address the application of organic materials in forest land. The findings from the INMC include:

1. Although research indicates that plantation tree growth can be increased with the application of animal waste, the potential water quality benefits are not fully understood. Because of the reduced surface runoff from forestland, the short-term impacts on water quality appear to be minimal with the silviculture-based waste application rates used in the available studies.

2. The long-term nutrient-related water quality impacts of waste application in forestland, however, are less clear. The studies generally indicate an increase in nitrate leached down through the soil profile, and/or a rapid accumulation of phosphorus in the soil surface. Soil phosphorus levels in some studies reached a level considered agronomically high or very high within a few years with annual applications. This is a concern because high Soil Test Phosphorus (STP) levels limit site availability for other uses, including further waste application, in the future. Also, research has linked high surface STP levels with increased potential for offsite transport of P, especially in sandy soils or soils with sandy surface horizons.

3. *Most of the available studies that consider water quality, express that caution and continued study is needed to fully understand the long term fate of nutrients in these systems.*

4. *Accordingly, the Interagency Nutrient Management Committee supports application guidance as specified in the NRCS 590 (Nutrient Management) and 633 (Waste Utilization) standards dated June 2007 or later. The guidance includes the following prescriptions on application rates:*

- *Organic fertilization should be a part of forestry management plan developed by a qualified professional.*
- *Nutrients should not be applied to forests that are composed of organic or poorly drained mineral soils. For pine plantations, nitrogen should not be applied during the first five years after planting.*
- *Application should not exceed 60 lbs PAN/acre/year on pine forestland, and on long-leaf pine 30 lbs PAN/acre/year due to increased disease pressure caused by Nitrogen application.*
- *Higher PAN application rates on forestland may be approved by technical specialists in situations where concentrated single waste applications may be necessary, such as lagoon closures or lagoon sludge management. In cases where concentrated single applications are needed, total application rate should not exceed 300 lbs PAN/ac.*
- *Annual soil tests, taken at a 0"-6" sampling depth, should be completed prior to pine forest applications to help determine potential for P leaching. If soil test agronomic P indices are above 50, then no additional waste application should occur on forestland. A phosphorous loss assessment (PLAT) is not needed for forestland receiving waste materials.*

5. *The INMC also recommends that the following issues be addressed in your document:*

- *North Carolina and NPDES permitted animal operations must apply waste materials in accordance with their respective waste management plans, and these waste management plans must meet technical criteria set forth by NRCS standards 590 and 633. Permitted operations that apply waste materials at rates that exceed approved 590 and 633 application rates may be subject to penalties levied by NC Division of Water Quality.*
- *Negative impacts to streams, wetlands, and riparian buffers must be avoided when applying waste materials, and appropriate application setbacks must be observed. **At a minimum, waste materials should not be applied:***
 - *In wetlands, in poorly drained or organic soils*
 - *Within 100' of a well*
 - *Within 200' of a dwelling other than those owned by the producer*
 - *Within 75' of a residential property boundary*
 - *For NC and NPDES permitted animal feeding operations, it is required that operations observe setbacks set forth by their respective permits and NC regulatory requirements. Current application setbacks for both state and federally permitted*

operations are found at:

<http://www.enr.state.nc.us/DSWC/pages/AppenxWasteAppSetbacks.pdf>

- *Some native plants adapted to low fertility sites are able to compete with introduced species because of the limited forestland fertility. Application of organic materials may increase potential for introducing and/or enhancing viability of invasive plants. Because the effects of increased fertility in native plant understory is not well understood, application of waste materials in forestland where health of native plant communities is a resource concern should be closely monitored for negative impacts. Any increase in the presence of noxious or invasive plant species in the communities should be noted and considered when applying waste.*