

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 State Department of Agriculture - Natural Resources Conservation Service (USDA-NRCS)

4405 Bland Road, Suite 205, Raleigh, North Carolina 27609

(919) 873-2105 FAX (919) 873-2154

Issue Guidance Animal Waste Application on Turf Sods

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Background: The INMC received a request from the 1217 Interagency Group to develop guidance on appropriate waste nutrient application levels on turfgrass farm sod. Sod types (Bermuda and centipede) have been found as waste application crops by state inspectors performing reviews on permitted animal operations, and waste utilization plans have had widely varying PAN application rates on sods. No Realistic Yield Expectations (RYEs) or P uptake rates have been established by the North Carolina INMC for sods—and thus consistent waste application rates could not be established through approved methods established by the NRCS 590 standard and 1217 IG guidance.

This issue is complex because of the various types of sod used and uncertainty regarding yields, harvest methods, and the ability of each type of sod to accept nutrient applications, no clear consensus emerged that would have allowed the 1217 IG to issue guidance to technical specialists and producers. Thus, the 1217 IG referred this issue to the INMC for clarification in August 2007.

After consideration of the issue, the INMC provides guidance to the 1217 IG as follows:

1. *Should application of waste on turfgrass sod farms be allowed for inclusion in waste utilization plans? **Although there is limited research that supports specific yield-based application rates on sods, there is an inherent need in turf sod crops to have nutrient applications for continued growth. The INMC recommends application rates shown in Table 1 and methodologies specified by the publications Sod Production in the Southern US; and, Turfgrass, Soil Fertility, and Chemical Problems be utilized for guidance in applying animal waste nutrients to sod types. The table below summarizes recommended nutrient application rates and application windows for common types of southeastern US turf sod types.***

Potentially significant amounts of residual organic N and P may be transferred from the turfgrass sod farm harvest site to the transplant site. Research is needed on the implications of transferring nutrients from one sod site to another, where continuing fertilization is practiced, as well as determining a scientific basis for agronomic waste application rates on sod.

Table 1: Recommended Maximum PAN Application rates for NC turfgrass sod farms

Turfgrass Type		
	RECOMMENDED MAXIMUM LBS. PAN/ACRE*	
<i>Cool Season</i>		<i>Application Windows</i>
Kentucky Bluegrass	174	Feb--Mar; Sept--Nov
Tall Fescue	131	Feb--Mar; Sept--Nov
Fine Fescue	131	Feb--Mar; Sept--Nov
Creeping Bentgrass	131	Jan--Dec.
Ryegrass	174	Feb--Mar; Oct--Dec
<i>Warm Season</i>		
Bermudagrass	218	Apr--Sept.
Zoysiagrass	87	Apr--Aug.
Centipedegrass	22	June
St. Augustine	131	May--Aug.
Bahiagrass	65	May--July
Carpetgrass	44	June--Aug.

**Rates converted to lbs/acre from given lbs/sq ft from referenced sources below*

Application information for North Carolina turf sod types compiled from:

NCDA - Hardy, D. et al. 2007. *Crop Fertilization Based on NC Soil Tests*. Cir. 1, NCDA&CS Agron. Div. <http://www.ncagr.com/agronomi/pdf/stnote14.pdf>
 NCSU – Bruneau, A., and C. Peacock. 2007. *Carolina Lawns*. NCCES. AG-69 (revised). www.turfiles.ncsu.edu/pubs/management/ag69.html

2. *What about application on centipede sod? The INMC does not encourage waste application on centipede sod as part of a waste management plan. However, the INMC does recognize that very limited amounts of PAN in a very narrow application window can be applied with careful management. According to specialists within the INMC, there are major agronomic survival issues concerning the application of N AND P to a centipede sod. Regarding N, there is an extremely narrow window where centipede sod can handle ANY N application. NCDA guidance indicates that centipede can tolerate a very low level of N in June, around 0.5 lbs/1000 sq ft. Extrapolated, this equates to about 22 lbs/ac during the entire growing season. Similarly, centipede can tolerate a very low level of soil (NCDA may recommend P up to a P index of 25). At higher levels, centipede will decline over time.*

From what is known about centipede, methods of land application, and the nature of what is desired from warm season grasses vis-à-vis swine waste application (high PAN fertilizer rates), it doesn't seem that this turf grass is practical to use as part of a waste utilization plan. There are many circumstances to consider, and while extremely careful management may allow very limited waste/nutrient applications, centipede is not encouraged for practical waste application.

3. *Must PLAT be used on sod application sites?*

Yes. PLAT should be used to assess the potential for excessive transport off-site of P, like all other waste application sites. At this point, centipede is not the databases supporting either PLAT or the Nutrient Mgmt Software.

Because of the harvest operations, it would be difficult to consider these sites as having a hydrologic condition of "Good", like most hay crops. The INMC suggests that for PLAT assessment purposes, the land use be identified using the specific crop and "pasture". PLAT would allow the user to then select a hydrologic condition of "Fair", to recognize that there will not be a good stand of grass present thru the year, and PLAT will increase the potential for surface runoff accordingly in its assessment.

4. *How do we compute soil erosion rate for sod sites (PLAT purposes)?*

Because PLAT requires the use of RUSLE 1.04, instead of RUSLE2, the nutrient management planner will need to work with NRCS to compute a C factor for these fields. Soil removed as part of the harvest should not be considered erosion loss.