North Carolina State University is a land-grant university and a constituent institution of The University of North Carolina

Department of Crop Science

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Memorandum

TO: North Carolina Certified Technical Specialists

FROM: NC State University Forage Production Workgroup

DATE: July 13, 1998

SUBJECT: Crop Management Practices for Select Forages Used in Waste Management

The following is a four-page summary of suggestions for management practices for some forage crops that can be used in waste management plans. These suggestions are a result of discussions within the NC State University Forage Production Workgroup, a group comprised of NC State faculty and NRCS agency personnel with expertise with the crops.

There are limited documented research responses of some of these practices on the many soils and environments where these crops are currently being grown. The Forage Production Workgroup has taken the available data and used the combined experiences and realistic estimates of key people to come up with suggestions that will allow farmers to incorporate these crops and practices into waste management plans. As data become available to substantiate or refute these suggestions, the Forage Production Workgroup will make appropriate changes.

Bermuda Overseeded With Cereal Rye and Annual Ryegrass

Currently two types of "ryegrass" are being used for winter overseeding in fields used for animal waste management. Cereal rye is a winter annual smallgrain that looks similar to wheat, barley and oat. Annual ryegrass is a winter annual grass that looks much like tall fescue. Both of these grasses, when growing during the winter on bermuda sod, can have significant impact on subsequent bermuda yields. In effect, the total yields from an acre growing the combination of bermuda with these winter annuals will usually yield between 1-2 tons more per acre than bermuda growing alone for the year. Therefore, the total amount of PAN/acre for the year is about 100 lbs more than bermuda alone. Although cereal rye and annual ryegrass are suitable crops for overseeding, the management of the crops are different and thus practices implemented are dependent on the crop selection.

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Cereal Rye

The cereal rye should be planted by October 15 to provide the best opportunity to get winter growth. The most consistent stands are obtained from drilling rye into short (less than 3 inches tall) bermudagrass sod. If drilling is not possible, the seeds may be broadcast on short bermuda sod followed by a light cultivation with a disc or tillage implement. The seeding rate for broadcast planting of seeds should be 1.5 times the rate for drilled seeds. The last application of animal waste is to be applied to the bermuda prior to August 31. An application of 50 lbs/acre of Plant Available N (PAN) may be applied between September 15 and October 30. An additional 50 lbs/acre of PAN may be applied in February-March. If rye growth is harvested on time and does not significantly shade the bermuda, PAN rates for the subsequent bermuda crop are based on realistic yields of bermuda. A harvest is required prior to heading or April 7, which ever comes first. This is necessary to minimize the potential for shading bermuda and reducing its yields. The PAN rate for grazed systems with bermuda overseeded with cereal rye must be reduced in accordance with NRCS Technical Standard #590.

Annual Ryegrass

Annual ryegrass should be planted by October 15 to provide the best opportunity to get winter growth. The most consistent stands are obtained from drilling ryegrass into short (less than 3 inches tall) bermudagrass sod. If drilling is not possible, the seeds may be broadcast on short bermuda sod followed by a light cultivation with a disc or tillage implement. The seeding rate for broadcast planting of seeds should be 1.5 times the rate for drilled seeds. The last application of animal waste is to be applied to the bermuda prior to August 31. An application of 50 lbs/acre of (PAN) may be applied between September 15 and October 30. An additional 50 lbs/acre of PAN may be applied in February-March. If additional PAN is applied to the ryegrass in April-May, the PAN rate for the bermuda must be reduced by a corresponding amount. This is necessary because ryegrass growth during April-May will reduce bermuda yields and shorten the time bermuda can fully utilize the N. A harvest is required by heading or April 7, which ever comes first to prevent shading of emerging bermuda during April-May period. To favor the production of the bermuda, additional harvests of ryegrass will be required when the ryegrass canopy reaches 12 to 15 inches height. The PAN rate for grazed systems with bermuda overseeded with annual ryegrass must be reduced in accordance with NRCS Technical Standard #590.

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Eastern Gamagrass

Limited data are available on the response of gamagrass to various levels of N and soil types in North Carolina. However, until further data is collected, the following guidelines may be used.

1. On sandy textured soils that are well drain or excessively well drained, gamagrass may yield similar to hybrid bermudagrass at similar PAN rates.

2. On heavy textured soils that are poorly to somewhat poorly drained, gamagrass may yield 1.5-3 times more than hybrid bermuda

Garnagrass establishes slowly and will not usually produce much harvestable forage during the establishment year. It is best to allow the growth during the seedling year to accumulate for most or all season; if it is to be harvested, it should be done after full seedhead formation on a majority of the plants. Therefore, PAN for the seedling year should be modified accordingly. Overseeding gamagrass with winter annuals is not currently advised because the harvesting or grazing management of the winter annual crops during February-April would be detrimental to the survival of gamagrass. Gamagrass should not normally be harvested or grazed below 6-8 inches stubble.

Application rates are to be based on the realistic N rates that address the N needs per ton of hay, a realistic yield and an appropriate application window. When harvested as hay in the 24-36 inch stage of growth, the N rate ranges from 40-50 lbs/ton of dry matter. The PAN rate for grazed systems must be reduced in accordance with NRCS Technical Standard #590.

The application window for gamagrass is slightly earlier than for bermuda; gamagrass starts growing about 3-4 weeks earlier than Coastal bermudagrass and about 2-3 weeks earlier than Tifton 44. Gamagrass is dormant from frost to March. The last application of PAN in the summer should be prior to August 31.

Rescuegrass (i.e. Matua)

Rescuegrass is a cool season grass and makes most of its growth from March-June and September-November. It should receive most of its N during the September-October and late February through May months. Limited data are available for realistic yields of rescuegrass on various soils and at various N levels in North Carolina. However, until further data is collected the following suggestions may be useful

1. On sandy, well drained to excessively drained soils, rescuegrass may yield 1.5- 3 times fescue, assuming a uniform and dense stand of grass is present.

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2. On wet or poorly drained soils, rescuegrass may yield .75 -1.0 times as much as fescue.

3. On soils where both are well adapted the yields of rescuegrass may be 1-1.5 times more than fescue,

The above RYE estimates assume that stand density is maintained through natural reseeding every year. Although rescuegrass is a "perennial" it does not maintain dense, satisfactory stands unless it is allowed to reseed every year. Even under this management it is likely that disease will affect one or more growths in some years.

Application rates are to be based on the realistic N rates that address the N needs per ton of hay, a realistic yield and an appropriate application window. When harvested as hay, the N rate is similar to other cool season grasses such as fescue, ranging from 40-50 lbs/ton. Rescuegrass may also continue some growth in June-August if moisture is available. During these off-seasons, rescuegrass should not receive more than about 25 lbs N/acre/month. Only apply 25 lbs N/acre in June-August if the equivalent of 1-inch of water can be applied at the same time. If the crop does not respond with at least a 1000 lbs of growth within a 3-5 week period do not make another application until the plants have had the opportunity to use the previous application.