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Using Biosolids to Fertilize Ryegrass

By Jack Rechcigl

University of Florida, Range Cattle REC

For questions or comments regarding this publication contact



[Jack Rechcigl](#)

Annual or Italian ryegrass is an important cool season grass grown in Florida to provide high quality forage during the winter and early spring (January-April). Ryegrass is important in south and central Florida because it establishes fast and produces high quality forage in the winter. One of the important uses of ryegrass is as an energy and protein supplement for lactating cows and growing heifers during the winter. Ryegrass can be sod seeded or grown as a pure stand. It can generally be grazed two months after seeding for 120 days or more.

Ryegrass responds well to fertilizer, especially nitrogen. Nitrogen produces rapid forage growth, higher crude protein and improved digestibility. As a general fertilizer recommendation, ryegrass should receive 30 lb. of inorganic N per acre at planting, and an additional 50 lb. of inorganic N/ acre every four to six weeks. One should apply 25 lb. phosphate and 50 lb. of potash per acre at planting if the soil tests low in P and K. The optimum soil pH is 5.5-6.0.

Biosolids (processed sludge) are an alternative source of plant nutrients which is becoming increasingly popular for fertilization of pasture grasses. Not only are they good sources of nitrogen, but they contain other valuable nutrients such as sulfur, phosphorus, iron, etc. In addition, biosolids supply organic nitrogen, making it a slow release fertilizer. Biosolids can also be applied to agricultural land to improve physical properties (water retention, infiltration, aggregate stability) and chemical characteristics of soils. In the past there was concern over heavy metal contamination from sludges and biosolids. Over the past 30 years biosolids and sludges have become cleaner, and heavy metal contamination of the environment is of little concern. The concentrations of nutrients and heavy metals in biosolids should be provided.

Using biosolids as an organic slow release fertilizer for grasses grown in Florida would be a beneficial source of nutrients compared to inorganic fertilizers which can leach more readily than slow release fertilizers in sandy soils. Research studies were conducted over the last four years at the Range Cattle Research and Education Center to evaluate the potential of using granular biosolids as a source of nitrogen for ryegrass and to determine the rate of nitrogen release from biosolids. Treatments consisted of 0 to 8 tons of pelletized biosolids per acre. Results showed that ryegrass yields increased with increasing rates of biosolids. The biosolids also lasted for a longer period as compared to inorganic sources of nitrogen, thus proving to be a slow release nitrogen source. It is possible that biosolids applied only at planting will last through the ryegrass growing season. Generally 40 to 50 percent of the nitrogen in biosolids will be available to the plant the first year with the other 50 to 60 percent available the second year. Crude protein content of ryegrass was increased with increasing rates of biosolids. Thus, biosolids provide needed nitrogen for protein production in the grass.

Our study showed that biosolids increased yields and quality of ryegrass and are good alternate sources of fertilizer for forage grasses grown in Florida. Before using any fertilizer material it is important to consider the economics. It is most important to know the nitrogen content of the material. One can generally assume that applying 1 ton per acre of biosolids containing 5% N will supply 50 lb. N per acre the first year and an additional 50 lb. N per acre the second year. There are different forms of biosolids, some are granular while others are cake or liquid material. All have a place in fertilizing pasture grasses in Florida.