

ONA REPORTS

published in

THE FLORIDA CATTLEMAN AND LIVESTOCK JOURNAL

March-1992

Impact of Pasture Fertilization on Water Quality

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Water quality is becoming a major issue to the general public today. In particular, Floridians are concerned about the potential of nitrates leaching into ground water. One potential source of these nitrates is believed to come from fertilization of pastures. Florida is particularly susceptible to ground water pollution due to the sandy soils which have a very low nutrient holding capacity. In addition, during the rainy season there is a greater potential for fertilizers to leach and run off into water ways. With the heavy reliance of ground water as a source of drinking water, it is essential that we preserve the quality of our water.

Recently, there has been concern over whether Florida ranchers are one of the major sources of ground water pollution as a result of their pasture fertilization practices. With over 2.5 million acres of land in bahiagrass pastures there is the potential for ground water pollution.

An important mission of IFAS and the Ona AREC is to develop judicious fertilization practices which help to preserve the environment and maintain good agricultural production.

Over the past five years researchers at the Ona AREC have been studying the impact of pasture fertilization on water quality in an attempt to develop improved fertilization practices which would not only help to preserve the environment but would also save growers money.

Preliminary results of green house and field experiments conducted at the Ona AREC indicate that nitrogen fertilization of bahiagrass pastures (up to 150 pounds nitrogen per acre) do not result in ground water pollution. Regardless of time of sampling, nitrate levels in ground water samples were below the 10 ppm standard for drinking water set by the Environmental Protection Agency.

One of the reasons that very little nitrogen leaches into ground water under bahiagrass pastures is that bahiagrass has a very good nitrogen recovery rate. Bahiagrass has an extensive root system which extends over four feet permitting bahiagrass to take up nitrogen from a very large soil area. In fact, recent studies showed that bahiagrass recovered from 60 to 80 percent of the applied nitrogen with the rest of the nitrogen staying in the soil. One other reason for reduced nitrate leaching is that the predominant soils on which bahiagrass is grown contain a hard pan layer which starts approximately two to three feet below the soil surface. This hard pan has a high nutrient holding capacity. Thus nitrogen which leaches from the surface can be retained in this layer and made available to the plant at a later date.

Field studies are currently being conducted to compare various sources of nitrogen fertilizers (example: ammonium nitrate vs. ammonium sulphate) to determine whether certain sources of nitrogen fertilizer are retained in Florida soils longer. This would permit less fertilizer to be applied to pastures saving growers money and having beneficial effects on the environment.