2008 USDA-CSREES National Water Conference
Sparks, NV

Effect of fertilizer management on nitrate concentration in soil solution from a pastoral-silvopastoral system

Gueorgui Anguelov

Abstract Text:

Fertilizer management is important to maximize nutrient-use efficiencies and reduce losses, especially on sandy soils. Both organic and inorganic fertilizers have been used for increasing crop/forage productivity.
A research was initiated under a USDA-NRCS funded project to study land use alteration in urban-rural interface. Urban treatment facilities have been processing wastewater and producing biosolids that are suitable for using in nearby rural pastoral systems. While application of biosolids can improve forage quality and livestock performance, biosolids-treated sites have been also evoked as a source of pollution. The magnitude of N-cycling in pastoral systems is higher than other nutrients. Although studies have been carried out to clarify acceptable rates for applying biosolids on grassland, the N-based rate is site specific and still challenging.
The objective of this study was to assess potential leaching by monitoring NO3-N concentrations in soil solution from bahiagrass pasture plots fertilized with both inorganic and organic sources of nitrogen.
The study was conducted at the Florida A&M University Research & Extension Center, Quincy on Ultisols of the Orangeburg series. Soil solution was sampled from tension (suction cup) lysimeters randomly installed below root zone of silvopastoral and pastoral plots. The samples were analyzed for pH, EC, and NO3-N concentration. The preliminary results are discussed in relation to the potential leaching and an attempt is made to find possible relationships and distribution patterns. The proposed research will improve our understanding of beneficial effects from recycling biosolids on pastoral system and some potential detrimental impacts on water quality as well. The study aims to develop an integrated agenda for assisting students, local communities, and USDA agencies in their conservation efforts.

Impact Statement: