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Effects of beef-cattle grazing and biosolids application on P concentration in soil solution from a bahiagrass pasture in North Florida

The agronomic rate is usually recommended for biosolids application on pasture. While N-based application of biosolids has the potential to improve grass forage it might increase P concentration in amended soils. A monitoring program was implemented under a CSREES-funded project to assess among other nutrients the P status in soil solution in a pasture under two grazing beef-cattle groups – with (G2) and without (G3) medicated feed, and to determine potential aftereffect on soil solution P of a single biosolids application six years earlier at the agronomic rate (B1) and twice that rate (B2) in comparison with a mineral-fertilized control (C1). This study was conducted at the University of Florida Santa Fe Beef Research Center, situated near Alachua in North Florida on Ultisols of the Milthopper series. The suction cup lysimeters were assigned to the treatments and installed at the depths of 61, 122, and 183 cm. Water samples from the lysimeters, the three wells on the farm, the nearby stream and rain events were collected from November 2002 through August 2003 and were analyzed for pH, EC, and P concentration. The P in the water samples are discussed in relation to mobility and leaching possibility. The results indicated that the mean P concentrations in the soil solution were low and ranged from 0.001 to 0.691 mg L-1 with no significant difference between the grazing treatments although a tendency for higher P values from middle lysimeters was observed. For the biosolids aftereffect, however, under both agronomic and double application rates the P concentration was higher when comparing to the non-treated with biosolids control. No significant differences between the depths were detected although a tendency for higher P concentration from both shallow and middle lysimeters was detected.

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