

## A B S T R A C T

Various levels of nitrogen and phosphorus were applied on the River Estate loam carrying a stand of pangola grass (*Digitaria decumbens*). The levels of ammonium and nitrate nitrogen were measured in the 0 - 3 and 3 - 6 inch layers at weekly intervals for the first five weeks following fertiliser application and then at monthly intervals for four months.

The level of ammonium nitrogen decreased rapidly over the first five week period; treatments up to 150 lbs. N per acre had reached the level of the control plot. The 200 lbs. N per acre and 300 lbs. N per acre treatments showed a more sustained ammonium content and dropped to the level of the control plot after twelve weeks. The nitrate content was significantly large despite the actively growing sward and the high soil acidity. There was little evidence of leaching below the three inch depth of either ammonium or nitrate nitrogen, although the rainfall data favoured movement.

The fate of added phosphate fertiliser was also followed at monthly intervals by a fractionation technique, and changes in available phosphorus by Truog's and Bray's methods. The levels of available phosphorus were low after the first month and on the whole decreased with time. The two methods of extraction were equally effective on this soil.

A large amount of the added phosphorus was fixed in the surface three inches of soil in available forms - mainly as aluminium and alkali extractable iron phosphate. This behaviour is due to the high content of hydrated oxides of aluminium and iron in the soil. The reductant soluble and occluded iron and aluminium phosphate found are residual fractions and are not important in plant nutrition in a largely oxidative environment.