

THE FATE OF NITROGEN IN TROPICAL SOILS. ¹G.E. FRANÇA*, ¹A.M.COELHO AND ¹A.F.C. BAHIA FILHO ¹National Maize and Soghum Research Center/EMBRAPA, Sete Lagoas, Minas Gerais, Brazil.

Nitrogen is one of the major constraints to high cereal productivity in acid soils from the tropics. It is also the most expensive of the three primary macronutrients. Nitrogen use efficiency by plants is low, and due to its high mobility in soil as nitrate, it always represents a potential hazard to the environment, polluting superficial and underground sources of water. Then, it is important to develop management strategies to improve soil and fertilizer utilization and reduce environmental contamination. There is already indication that soil and fertilizer nitrogen transformations go slower on acid soils than usually stated. The nitrification rate decreases with pH reduction, causing N-ammonium to stay longer in the soil, reducing nitrate leaching and affecting plant mineral nutrition. Nitrogen (¹⁵N) budget in soil-plant systems, for different soils and climatic conditions, indicated only small variations on N fertilizers recovery by plants (53 to 64%), 56% on average, with the application of 60 to 100 kg of N/ha. The majority of the N fertilizers was accumulated on the top 0-30 cm soil layer. There was no indication of nitrate moving down the profile. From the measured leaching losses of 10 to 20 kg of N/ha, only 20% were derived from the fertilizer. The great amount of residual N fertilizer immobilization in the soil upper layers, 70 to 90%, plays an important role in the total losses of N from the system. Considering the soil-plant system, the total N recovery rate was found to be 85% on average.