

SUMMARY.

A brief description is given of typical profiles of the soils used for this investigation with accompanying analytical data of each series.

The nitrifying capacities of these soils were studied over a 12 week period, using the method of Kresge and Merkle (1957). Laboratory incubation experiments to examine the influence of some of the essential elements of plant nutrition (Ca, P, Mg) on natural soil nitrogen mineralisation, on three acid loams, and a nearly neutral loam, were performed.

It is shown that nitrification goes on, even in the very acid soils studied; probably carried on by nitrifying bacteria adapted to acid conditions. The nitrate produced, was measured fortnightly, over the 12 week period; the soils being returned to the incubator after leaching off the nitrate.

It is also established, that as well as acidity having a decisive influence on the nitrifying capacity of the soils studied, deficiencies of P or Ca, also inhibited natural soil nitrogen mineralisation.

The exchangeable ammonium content of one of the soils was followed over a period of 15 months, and it is shown that $\text{NH}_4\text{-N}$, is low at high moisture content of the soil, and very high as the moisture content of the soil approaches the wilting point-long dry periods. That in these acidic, freely draining, sandy loams, with low total Nitrogen, the exchangeable ammonia content, almost invariably forms a greater proportion of the total mineral nitrogen ($\text{NO}_3\text{-N} + \text{NH}_4\text{-N}$) present in the soil at low moisture levels of the soil.

Finally it is shown that fixation of added ammonium salts, is negligible or nil in one of the soils studied.