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METHOD OF STUDYING AMMONIUM FIXATION IN COAL MINE SOILS

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ABSTRACT

Three different techniques were tested and compared to study the fixation of added ammonium in coal mine soils. Single point method II proved better than the single point method I. Q/I curve method could also be used to study the ammonium fixing ability of soils, but it was found to be time consuming and laborious as compared to the single point method II.

INTRODUCTION

It is generally observed that certain amount of added ammonium is not recovered from the coal mine soils at zero day of incubation. Some ammonium ions added as ammonium salt are held in fixed forms by clays, as K is, and then are not accessible for quick exchange with other ions or for nitrification by bacteria.

Reeder and Berg [1] found a loss of added ammonium in coal mine spoil during an incubation experiment and recovered 46 ppm ammonium-N of the added 60 ppm ammonium-N at zero time. Since the spoil sample they tested was calcareous, they attributed some of this initial loss to ammonia volatilization. As no systematic study has been carried out on this aspect, the present work was undertaken to find a simple and rapid method for studying the loss of added ammonium due to ammonium fixation in a wide range of coal mine soils collected.

In order to study the ability of coal mine soils to fix ammonium-N, two methods were tested. The first method involved treatment of the soil with a known amount of ammonium sulphate solution (100 mg NH_4-N/kg soil) and after a definite time of contact, the extractable portion was removed with 0.5 M potassium sulphate solution. The difference between the ammonium added and that recovered in the extract was considered as the ammonium fixed.

The second method, which is generally used for estimation of the capacity of soil to fix potassium was tested on 5 coal mine soil samples. As much of the basic information on ammonium fixation originates from the studies on fixation of potassium ion, the