

# AN INCUBATION PROCEDURE FOR MEASURING NITROGEN AVAILABILITY INDEX IN COAL MINE SOILS

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## ABSTRACT

An incubation procedure that determine nitrogen mineralization and CO<sub>2</sub> evolution in coal mine soils was evaluated. It was recommended that 50 gram of soil (oven-dry basis) be incubated in a 16 litre plastic bin for 16 days at 20 °C and mineral N content (NH<sub>4</sub>, NO<sub>3</sub> and NO<sub>2</sub>-N) and CO<sub>2</sub>-C evolved be determined at 4 days interval. The method seemed to be more rapid and precise for the assessment of nitrogen supplying power of coal mine soils.

## INTRODUCTION

Incubation methods are probably the most meaningful in determining the plant availability of nitrogen in disturbed soil materials. Reeder and Berg [1977a] suggested that laboratory incubation tests could be useful in estimating the plant available nitrogen potentials of certain drastically disturbed lands prior to extensive revegetation programme. They found a high correlation between mineral nitrogen content of laboratory incubation samples and total nitrogen uptake by barley grown under greenhouse conditions. Research workers have used various incubation techniques differing with respect to quantity of soils, use of physical or chemical amendments, temperatures, water level, incubation periods, type of incubation vessel, method of estimating mineral nitrogen production etc. Williams [1975] and Williams and Cooper [1976] incubated 10 g coal mine soil samples in the dark at 15 % moisture and 27°C, in loosely capped 250 cm<sup>3</sup> bottles, corrected the moisture lost after every two days and measured mineral nitrogen content after 0 and 40 days of incubation. Reeder and Berg [1977b] used an incubation procedure for studying mineralizable nitrogen, carbon dioxide evolution and nitrification by incubating 40 g coal mine soil wetted to field capacity at 31°C for 3, 6, 12, 21, 42, 84 or 168 days. They used the entire 40 g sample for extractable nitrogen at the end of a specific incubation period. Jafferries *et al.*, [1981] used the aerobic incubation method of Keeney and Bremner [1967]. The method involved determination of the inorganic nitrogen (ammonium, nitrite