

ABSTRACT

Thirty one soils and 28 types of vegetation were sampled and assayed using the acetylene reduction technique to assess the extent of non-symbiotic nitrogen fixation in soils of Trinidad and Tobago. Little activity was observed even when soils were supplemented with glucose. Most soils showed either only traces of acetylene reduction activity or none at all. Root activities as high as 688 n moles $C_2H_4/hr/g$ root were observed but, on the other hand, many other samples showed little or no activity.

The effect of some factors thought to influence nitrogen fixation, including C/N ratio, pH, moisture content, addition of carbon sources and the growth cycle of plants were studied. Soil pH and moisture content appeared to have most influence on acetylene reduction activity.

Nitrogen-fixing populations were present in most of the soils, as indicated by the isolation of many strains capable of reducing acetylene. Facultative anaerobes predominated in both rhizosphere and non-rhizosphere soils.

It was concluded that the non-symbiotic nitrogen fixation contribution to the nitrogen economy of soils of Trinidad and Tobago is small and responses to attempts to increase rates of acetylene reduction were too erratic to justify hopes that this type of fixation could be successfully exploited agriculturally.