

INTRODUCTION

The valuable properties of humus in directly supplying nitrogen and mineral elements, increasing the water-holding capacity of the soil and improving its tilth, and in providing a source of food and energy for the micro-organisms engaged in nitrification and nitrogen-fixation, render it the most important factor in soil fertility. In the majority of soils humus is a strictly transitional substance, and its decomposition and consequent loss is especially rapid under the conditions of high temperature and good aeration found in well-drained, cultivated, tropical soils. Consequently, it is generally agreed to be a matter of the first importance in the tropics to maintain the humus content of the soil by fairly frequent applications of organic manures. It is, therefore, not surprising that the early experiments of Hutchinson and Richards (1918-1921) on the preparation of artificial organic manure have been followed by a considerable amount of similar investigational work in tropical countries where scarcity of dung is often an important factor in limiting the production of manure. The preparation of such artificial manure, or compost, involves the decomposition of vegetable material by micro-organisms with the formation of a product comprising synthesised microbial tissue, plant residues, and intermediate products, the whole in such a condition that it can be easily incorporated into the soil and will readily add to the store of humus. The objects of such a process are:

- (i) The economic utilization of waste plant material to form an organic manure, without loss of the nutrient substances they contain.
- (ii) As distinct from the preparation of ordinary pen manure, the process either dispenses entirely with the use of faeces and urine, or aims at a much more efficient use of such materials than is obtained in making pen manure.
- (iii) To avoid temporary nitrogen starvation and other difficulties which arise when fresh plant material is added to the soil.

The essentials of a satisfactory process are rapidity of decomposition, absence of any loss of nitrogen or other fertilising ingredients, and a cost in proportion to the value of the manure. It cannot yet be

said that the principles underlying composting are in any way thoroughly understood, but a considerable amount of information has been obtained on the control of the various factors involved in the process, and in the first part of this paper some attempt will be made to summarise this work.