

I N T R O D U C T I O N .

From earliest times permanent agriculture has been distinguished from primitive shifting cultivations by the measures taken to maintain the fertility of the soil more than by anything else; and among these, the practice of manuring has always held a prominent place. From time immemorial organic manures, made by rotting down plant material such as cereal straw with animal excreta, have been among the most characteristic commodities used on the farm: but of late years inorganic fertilisers, produced cheaply and in large quantities by synthetic methods have found increasing use in agriculture: augmenting, and in some cases replacing, the well-known farmyard manure. There is nevertheless little doubt that on many soils a high level of fertility can be maintained only by periodic applications of organic matter.

The supply of this type of manure presents no great difficulties where stock are kept on the farm; but where cattle are scarce, either because the environment is unsuitable, owing for instance to the ravages of the tsetse fly, or because there appears to be no place for them in the system of farming, as in mechanised cereal production, then organic manures must be made without the agency of stock. Much can be done by green manuring, a practice which has to recommend it more than the mere supply of organic matter to the soil. In this dissertation xxxxxxxxx attention is given to methods of decomposing waste vegetable materials into humified products resembling farmyard manure, by the process of "composting".

This process, although relatively new to western agriculture, has long been known to the peasant cultivators of the

Far East. Vegetable refuse, including the stalks of various crop plants and other unwanted materials, provides an obvious source of organic manure. Fresh material may affect harmfully the crop which immediately follows its application; the reasons for this will be discussed later. Decomposed matter can more safely be applied, and it is the practice of the "farmers of forty centuries" to return all refuse to the soil, only after submitting it to a process of decay by composting in heaps, pits, or "compost houses" with night soil, canal mud, and wood ashes. The object of composting is to bring about a pre-decomposition of vegetable material before mixing it with the soil, converting it into humified products, resembling farmyard manure, which can more readily be incorporated in the soil, and which are not likely to have harmful effects on the crop which follows the application.

Research on composting has found a place in the work of modern experiment stations, following the production of "Adco" at Rothamsted, and owing much to the publicity given the subject by Sir Albert Howard. The studies to be described in this dissertation are part of a series of experiments on composts initiated by Professor R.C. Wood at the Imperial College of Tropical Agriculture, Trinidad. Knowledge of the biochemistry of the composting process has in recent years been greatly extended by work in both tropical and temperate countries. Interest has now shifted more to the utilisation of this knowledge in devising practical methods of composting for use on the farm, and in adapting these methods to different conditions, with special reference to costs of production; further, to study the effect of composts on crops under field conditions. It is with these essentially practical questions that the dissertation is concerned.