

CHANGES IN SOIL STRUCTURE AS AFFECTED BY RAIN

INTRODUCTION

Aggregate size distribution determinations have long been recognized as a means of evaluating soil structure in relation to plant growth. The soil aggregates must have a certain degree of stability to be of value. The purpose of this study was to examine the change in stability of aggregates and percentage of organic matter in the soil during part of the period of change between the two ecological equilibrium states represented by the bamboo and cultivation on the New Farm nearby.

The whole of the New Farm was originally covered by bamboo planted about 1920 and the major soil type is River Estate Fine Sand. (Chenery (1)). This soil is a fine sand of alluvial origin and is described as an immature ground-water Podzol (Higgins (2)) and frequently suffers from impeded drainage. Some data on the upper portions of the profile are given in Appendix I.

This study had the original purpose of examining the effects of cultivation of the soil under bamboo. The method of clearing the bamboo used on the New Farm north of the Churchill-Roosevelt Highway was bulldozing out the roots, which, as it involves a great deal of earth moving, would make it difficult to obtain results of partial clearing and cultivation on the soil. Therefore an area that had not been under cultivation for a long time was used.

A new method for estimating the stability of soil aggregates, based on work by McCalla (3) has been put forward. This has been named the "Drip Test".

An attempt was made, in conjunction with Harvie, to adapt the method of Torstensson and Ericksson (4) for determination of pore space using a 90.8 ml. volume core and water in the manometer. It was concluded that an insufficient degree of reproducibility could be obtained and the attempt was abandoned. The use of mercury

as a manometric fluid was not tried owing to shortage of time.

An attempt to use the volume of "crater" excavated by falling drops of water on a surface clod was given up owing to the difficulty of interpreting the results.