

Section A.

INTRODUCTION

The history of the cacao industry in all the major producing countries is one of exploitation. The exploitation of the natural soil fertility which was built up when the land which is now planted with cacao was supporting natural forest. Under these conditions a state of ecological equilibrium was attained between the soil and the vegetation, the deeply ramifying tree roots withdrew mineral nutrients from the lower layers of the soil, and these were ultimately deposited on the soil surface by the agency of leaf fall, thus a surface soil layer rich in nutrients and organic matter was built up.

The equilibrium was upset when the forest was cleared and the land planted with cacao. The substitution, of a less dense plant population, led to an increase in the rate of oxidation of organic matter and of leaching of soil nutrients by the greater exposure of the soil to the influences of rainfall and high temperature. Less organic matter has been returned to the soil and in addition mineral nutrients are removed from the fields in the form of the cacao crop. The inevitable result of all these influences has been a gradual decline in soil fertility with corresponding deterioration in cacao yields.

This exploitive stage of cacao cultivation is now finished in Trinidad and in large areas of the Gold Coast, particularly where the effects of poor management have been accelerated by the ravages of Swollen Shoot disease, thus it is obvious that, if cacao production is to be continued, it is necessary to introduce a sound system of cultivation, based upon the maintenance and improvement of soil fertility.

The Imperial College of Tropical Agriculture has recently initiated a series of experiments in an attempt to investigate some of the problems connected with this necessary change over to orchard cultivation of cacao. This dissertation is concerned with one of these experiments, which was designed to observe and record the influence of soil treatments upon young cacao plants, and to see how far differences in vegetative growth during

the pre-bearing period of a cacao tree's life can be correlated with subsequent yield. If a correlation can be established it may be possible to obtain preliminary information on the effect of soil treatment upon yield much earlier than by the conventional long term experiments, which have been necessary with tree crops. In other words, an attempt is being made to discover whether preliminary information can be obtained by "short cutting" long term investigations.

A pot experiment has also been carried out in order to investigate the influence of drying on clay soils and the effect of soil structure on the early growth of cacao seedlings.

A full description of these investigations will be found in Sections C and D.