

I. INTRODUCTION

Purpose of the Investigation

The investigations reported in this paper are an attempt to assess and analyze some of the factors which cause variation in certain pod characteristics of clonal cacao (Theobroma cacao). The particular characteristics studied are: pod length, external pod diameter, wet weight of pod contents, and number of fully developed beans in the pod.

Many writers have mentioned the high degree of variability exhibited by cacao trees in pod characteristics, as well as in yield of pods per tree. A remarkable feature of this variability is the fact that it is shown by clonally propagated cacao to as large a degree as by seedling cacao trees. Cope and Jolly (1955) state, "The most striking feature of experimentation with clonal material is the great difference in performance of trees of one and the same clone, all growing together in a plot".

It is believed that an accurate assessment and analysis of certain measurable factors on a cacao tree, and within its environment would lead to a better understanding of the causes of variation in pods and yields. In turn, this understanding could lead to a method permitting a more accurate comparison of pods from groups of trees, or of pods taken from a single tree at different seasons. Such a development would be of great value to workers with cacao and especially to those engaged in clonal evaluation and selection.

This research was planned with the intention of studying a complete annual cycle of controlled pollination of blossoms and control of number of pods developing from the pollinations. The investigation covered a period of eighteen months since there were twelve months covering the period of pollinations, and an additional six months to permit the last group of pods to reach maturity. In design, the study tests the effects on the developing pod of the following factors: weather conditions,

position of the pod on the tree, competition between pods on a tree, and period during the year when pollination was accomplished.