

## INTRODUCTION.

(1) Control (no treatment)  
(2) Lime  
(3) Pen Manure  
(4) Lime + Pen Manure

During the past few years the sugar cane industry of Trinidad has been affected to a considerable degree by the incidence of a disease commonly known as froghopper blight. The extent of this disease varies from year to year, but has been of such magnitude as to warrant the institution of a special Froghopper Investigation Committee to study the disease from various aspects. This Committee later gave rise to the Sugar Cane Investigation Committee of Trinidad, and among other of its activities are extensive manurial trials laid down by P. E. Turner, Soil Chemist to the Committee.

Previous investigations had shown that froghopper blight was more prevalent and destructive in cane grown on acid soils, while the damage done to the crop grown on alkaline soils was found to be considerably less, although there were many notable exceptions to this generalisation.

Further investigation by Hardy showed that soils supporting unblighted canes usually possessed exchange alkalinity, i.e., were alkaline in presence of a neutral salt. This fact was taken into consideration when manurial trials were laid down, and as a result it was found that liming cane land not only decreased the extent of damage due to froghopper blight, but also independently resulted in a material increase in yield of cane.

The present work is an attempt to study the fluctuations in moisture content and in nitrate content of soils under cane which form part of an extensive trial laid down by P. E. Turner. Two experimental fields were selected, one at Usine St. Madeleine and the other at Waterloo Estate. Periodic samples were taken from plots under different treatments, which were -



REVIEW OF PREVIOUS LITERATURE.

(1) Control (no treatment).

This particular study embraces many aspects, each of

(2) Lime.

them so wide in application that it is quite impossible to

(3) Pen Manure.

cite all the relevant literature that has been published.

(4) Lime + Pen Manure.

Moisture fluctuations have been studied to a great

extent. In addition, an effort was made to obtain some comparison of the moisture content and nitrate content of untreated soil under supporting cane against untreated fallow land. Rainfall records were also kept, with a view to finding some correlation between rainfall, moisture content and nitrate content.

treatment, show that the effect of dung is markedly to increase the water holding capacity and hence the moisture content of the soil.

Alway (2) stated in 1919 that organic matter greatly increases the water holding capacity of a soil, and this fact, quoted as far back as 1892 by King (28), now proved and accepted for temperate soils, has been presented by many authors in a number of ways.

Much literature has been written on the effect of lime upon soils, but in this case more attention seems to have been paid to the sterilising effect of the lime than to its effect upon soil moisture, and it was not until the study of soil colloids was undertaken that the true effect of lime and dung upon the water retaining capacity and moisture content of soils was understood. Hutchinson (34) (25) described the effect of lime as "a general amelioration marked by an improvement in tilth"; and other earlier writers, while noting an improvement of condition due to flocculation, do not explain the reason for it.

The effect of rainfall upon moisture content of soils has received little direct attention, this no doubt being due to the fact that there is obviously a relation but that this