

A MANURIAL EXPERIMENT DESIGNED TO DETERMINE THE
BEST COMBINATION OF NITROGEN, PHOSPHATE AND POTASH FOR MAIZE.

I. INTRODUCTION.

The object of this experiment is to collect fundamental data for the manuring of maize on the College farm which will confirm or modify the present practice.

Information as to the optimum spacing of maize has already been obtained by Jameson and Mill Irving (5), and depth of planting by Gillman and Wilding-Jones (6). It was hoped, therefore, that the present investigation would help to complete the information required for the most satisfactory cultivation of maize on the College farm and, to some extent, for Trinidad.

Maize is not grown on a commercial scale in Trinidad, and it is highly improbable that it will replace crops such as sugar-cane, cacao, coconuts, citrus, etc., already established in this position. It is usually peasant grown in small patches in gardens or clearings, and is given little attention. Thus it cannot be claimed that the results of this experiment will be of general interest in Trinidad; however, maize is grown to a considerable extent on the College farm and for this reason alone it is essential that a fund of knowledge should be accumulated which will enable the crop to be grown most profitably under Trinidad conditions.

As far as can be ascertained, there have been no previous investigations into the question of the optimum dressing of artificial fertilisers for maize in Trinidad, the policy adopted on the College farm being based on experience and the supposed requirements of the crop. It was, therefore, necessary that the scope of this investigation should be wide in order that avenues of exploration might be opened up, facts established, and profitable indications for future work obtained.

The soil on the farm is on the whole poor, consisting mainly of a wash loam of low fertility and generally low in organic matter. An experiment (9) was run concurrently with

this investigation to test the effects of compost supplemented with artificial fertilisers on the yield of maize, but no effects were shown. The amounts of compost used, however, were very small, the heaviest dressing being only 8 tons per acre, and may have been insufficient to show any effect. The green manure crop on field 24, on which this investigation was carried out, was only approximately 8 tons per acre when mown, and this probably wilted down to about 2 tons before being ploughed in. Organic matter in the soil helps drainage, improves the water retaining capacity, and greatly improves the texture of the soil by preventing the mass from running together and forming solid clods on drying. The improved ^{Structure of Soil} texture encourages root development, and the plant suffers less during dry spells and is also able to make better use of any nutrients added to the soil. It is possible, therefore, that organic matter has been somewhat of a limiting factor on this field, and may account for the rather small increases obtained from the larger application of fertiliser which cannot be explained on the grounds of general high fertility of the field.

Large amounts of organic matter are not generally available in the tropics in general and, up to the present, on the College farm in particular, and as this experiment was laid down to determine the effect of artificials on maize subject to the conditions under which it is generally grown, the green manure crop was not supplemented with additional organic manure.

By testing a large number of combinations of the fertilisers and comparing these with the yields of plots not receiving one or two of the three fertilisers, it is possible to detect any interaction between them, and a quantitative measure of this effect can be obtained. The experiment was designed, therefore, to show any interaction between the fertilisers, and the most profitable combination to apply.

The layout of the experiment showing plot and treatment numbers is shown on the plan on page 5. It consists of five main blocks each containing 27 treatments, making 135 plots.