



## CANE GROWTH STUDIES IN BRITISH GUIANA.

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### INTRODUCTION.

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So far as is known no detailed observations have previously been carried out on the growth and ripening of cane in British Guiana. The need for such work is now being felt and it is thought that it may be possible, advantageously, to modify various cultural practices, if more be known of the physiological processes of the crop under local conditions. This paper presents the results of a preliminary investigation conducted at the British Guiana Sugar Planters' Experiment Station.

The production of cane sugar is the most important industry of British Guiana, the value of sugar and its by-products representing about 70 per cent. of the total value of the Colony's exports. Cane cultivation is restricted to narrow strips along the coastlands and on the banks of the Demerara, Berbice and Corentyne Rivers within a few miles of their mouths.

There are two main soil types: the frontland clays and silts, often very difficult to drain, and the pegasse (peaty) soils. The former consist of heavy-textured, markedly acidic top soils overlying neutral or alkaline clay subsoils charged with soluble salts of sodium and magnesium. The pegasse soils, which only represent about 25 per cent. of the cane area, consist of highly acidic top soils possessing a considerable amount of organic matter of wide carbon: nitrogen ratio (indicating incomplete breakdown and humification of the organic debris) overlying highly acidic

bleached



bleached clay subsoils.

The cane lands of the Colony are generally below sea level and have to be protected by dykes from the seas and rivers on the one hand, and on the other from the savannah waters in time of high rainfall. The surface is remarkably level, the general drop from the inner cane land to the coast being only about one foot per mile. The estates are all intersected by a complicated system of navigation and drainage canals, transport being effected on the former. The layout of the fields has already been described by Deerr (1). It will suffice here to say that all fields are surrounded on three sides by navigation water, and on the fourth by a main drainage trench. Smaller internal ditches divide the fields into beds, usually 37 feet wide, and the water from these ditches is led by a collector into the main drainage trench. The last named leads eventually to the sea or river front and empties itself at low tide. On a few favourably situated plantations this natural drainage suffices, but it is more usual to have powerful pumps (300 to 500 tons per minute) to lift drainage water over the dykes at high tide.

On the land side of the plantations is a considerable area of savannah swamp which serves as a water reservoir and feeder for the navigation system. Water from the navigation trenches is used for irrigation and for flood-fallowing fields out of cultivation. It is pumped into the fields by means of mobile pumps (6,000 gallons per minute) and, in the case of irrigations, allowed to run off about twelve hours after the tops of the beds have been covered. Unfortunately, serious water shortage is not uncommon at the height of the dry season, especially in the County of Demerara, and even



in Berbice, where several estates are connected to the Canje Creek, it becomes an expensive item to pump in water from the creek when the savannah supply becomes inadequate.

Since cane sugar cultivation has almost disappeared from the County of Essequibo, it will suffice to describe the weather conditions which prevail in Demerara and Berbice.

Ample rainfall data are available for many points in each county and other meteorological observations are available for one station (Georgetown) in Demerara, and one (New Amsterdam) in Berbice.

Temperature is remarkably uniform throughout the sugar region and throughout the year. The ten-year maxima and minima points at Georgetown and New Amsterdam show that the general seasonal march of temperatures tends to be alike at both places, but the maximum in New Amsterdam is about two degrees higher and the minimum about one degree lower than that at Georgetown, i.e., the range is about three degrees greater. This statement is borne out by Table I and shown graphically in Figure I.