

ABSTRACT

Ph.D. Thesis

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Irrigation requirements for banana production

A study to investigate the irrigation requirements for banana production was conducted at the Winban Experimental Farm in the Roseau valley of St. Lucia (14°N, 61°W). Field trials were laid down to evaluate the relative suitability of two commercially important banana cultivars, 'Robusta' and 'Giant Cavendish' (Williams hybrid) to an irrigated system of cropping. Growth and yield responses of banana to irrigation at different stages of ontogeny and to different levels of irrigation and nitrogen rates were also studied.

'Giant Cavendish' (Williams hybrid) was found to be more suitable to an irrigated system of crop production mainly because of its greater resistance to wind damage. Water stress during the latter part of the growth cycle which included bunch initiation and early bunch differentiation had its greatest influence on final pseudostem size and yield. It was essential that a non-limiting supply of water be available to the crop at this stage of growth. In the absence of an economic analysis of costs and benefits, the irrigation level of 50 per cent consumptive use less effective rainfall every four days and the Winban recommended nitrogen rate of 280 kg/ha/yr appeared to be the most satisfactory levels under the existing system of agronomy. Reducing wind damage, the major source of banana losses, which increased both

with irrigation and high nitrogen use, would certainly improve the feasibility of using higher nitrogen and water levels under conditions in the Windward Islands.