

ABSTRACT

The effect of levels of nitrogen and potassium fertilizers on the growth, development and yield together with the response of smooth cayenne pineapples in flowering to different concentrations of three growth-regulating chemicals were carried out in the field on two varying soil types. In addition, the effect of hydrogen ion concentration and ionic concentration of solution media on the absorption of the three major nutrients by rooted pineapple plants were studied in the laboratory.

There was a direct relationship between applied nitrogen leaf number, leaf area, leaf dry matter production, nitrogen content of leaf tissue, fruit yield and sucker and slip production. The effect of applied nitrogen on fruit quality was inconclusive, while the weight of crowns tended to increase with higher application levels.

The amount of potassium used had a significant effect on increasing leaf area development, potassium content of the leaf tissue, fruit yield, slip and sucker production and in decreasing the weight of crowns. Potassium had no significant effect on leaf numbers, while its effect on fruit quality was not clear.

From the results of the experiments it became clear that soil #204 (with acid reaction of pH 4.5 - 5.5) supported healthier looking plants and produced higher fruit yields.

Both naphthaleneacetic acid and gibberellic acid gave higher percentage flowering than calcium carbide which is most frequently used in Jamaica.

The absorption of the major nutrients: nitrogen, potassium and phosphorus by rooted pineapple plants from culture media was affected by the hydrogen ion concentration and the nutrient level.

Absorption of ammonium-nitrogen was greater than that of nitrate-nitrogen throughout the experimental period, and both decreased with increases in pH values. Incremental increases and rate of ammonium absorption slowed down when the nitrogen concentration of the medium exceeded 80 ppm.

There were no great differences in potassium absorption over the range pH 4.6 to pH 6.9. However, a positive relationship existed between absorption and the concentration of potassium in the external medium.

It is recommended that under Jamaican conditions a minimum of 200 lb nitrogen per acre be used, preferably in the form of ammonium sulphate rather than in the form of nitrate. Potassium should be applied at the rate of not less than 600 lb K_2O per acre.