ABSTRACT

The effects of potassium supply and light intensity on the growth of callaloo, chinese cabbage and lettuce plants were investigated.

In callaloo and chinese cabbage, an increase in light intensity (from 20 to 60 per cent of the natural illumination) caused increased productivity in terms of dry matter and leaf area. However, productivity decreased when the light intensity was further increased to 100 per cent of the natural illumination. Within the limits of the experiments, the relative light intensity of 60 per cent of the natural illumination gave the best results.

In lettuce plants however, the optimum light intensity seems to be higher than that required by callaloo and chinese cabbage, since the plants grown in full sunlight gave higher dry matter yields. It is also felt that the optimum light intensity for the expansion of lettuce leaves is lower than that required for dry matter production, since, in some cases, the lower light intensity of 60 per cent of the natural illumination gave the highest leaf area while the 100 per cent treatment gave the highest dry weight in the same plants.

In callaloo and chinese cabbage, the production of flowers, fruits and seeds was significantly increased with increases in the light intensity. However, it was observed that the potassium supply had no effect on flowering in these plants.

The total amounts of nitrogen, phosphorus, potassium and calcium per plant generally bore a direct relationship to the total dry weight of the tissues. However, the percentages of these elements in the dry tissues, decreased with increased light intensity. This was mainly due to a dilution effect.

When the supply of potassium to the plant was increased, an increase in the content of both nitrogen and potassium in the plant tissues was observed. This in turn led to increased growth as measured by the dry weight and leaf expansion. In chinese cabbage, however, there were some instances where the dry weight and leaf area decreased with increased potassium.

In many cases, the percentage calcium and phosphorus in the tissues were not affected by the potassium supply.

It is suggested that the effects of potassium and light on growth may be due primarily to their effects on the photosynthetic processes.