

A B S T R A C T

The effect of potassium supply on the growth and net assimilation rate of tobacco plants was investigated.

The net assimilation rate of tobacco leaf discs increased when their potassium content was increased within the range of 0.54 to 6.72 mgm. K/100 cm² leaf tissue. However, under the experimental conditions described, when the potassium content was increased to a level between 8.49 and 11.38 mgm K/100 cm² of leaf tissue, the net assimilation rate bore no relationship to the potassium content of the tissue.

The age of the leaf had an effect on the net assimilation rate, as when the leaves grew older (between 15 and 40 days) the net assimilation rate was lowered. It was found also that the effect of potassium supply on the net assimilation rate is significantly different at different leaf ages.

When the potassium concentration of the cultures was increased between 1 p.p.m. and 160 p.p.m., the concentration of this element in the plant rose. This caused an increase in the growth of the tobacco plants in time, as shown by increased height of the plant, increased area of leaves as well as an increased dry matter production. The effects were most pronounced after the fourth week in treatments.

An increase in the potassium supply to the plant caused

the dry root/dry shoot, dry root/dry leaves and dry stem/dry leaves ratios to increase. These results might be due to an interference with the process of translocation at low potassium levels.

It was observed that increasing the potassium supply to the plant accelerated the unrolling of the leaves, prolonged the time of their expansion and prevented early defoliation.

It is suggested that the effect of potassium on the photosynthetic activity may be caused by increasing the 'sinks' for photosynthates, or by its effect on a stage in the photosynthetic process itself.