

ABSTRACT

Growth analysis was used in these studies to investigate the effect of nitrogen levels and time of nitrogen application on leaf area and tuber production of Ipomea batatas in a high and a low leaf area cultivar.

Leaf area index (LAI) and leaf area duration (LAD) increased with nitrogen supply. Plants which received high levels of nitrogen at planting maintained larger leaf areas during late growth. LAI increased after each application of nitrogen at different phases of growth, hence mean LAI and LAD were not much different whether nitrogen was applied early or late. Changes in LAI were closely related to changes in the per cent nitrogen content of leaf dry weight.

Nitrogen supply and LAI influenced tuber production. High levels of nitrogen depressed tuber development of the high leaf area cultivar when conditions favoured extensive vine growth. This was most pronounced during early to mid-growth. With an extended growth period these plants bulked tubers rapidly and the depression tended to disappear. Tuber yield of the low leaf area cultivar increased with increasing increments of nitrogen and with increase of leaf area.

Under conditions of stress induced by water shortage where vine growth was not extensive, 40 lb N/acre increased the tuber yield of both cultivars. Application at planting, at four, eight and twelve weeks after planting did not have a significant effect, *on tuber yield during a crop cycle of 25 weeks.*

The results are discussed on the hypothesis that cultivars may be divided into high-nitrogen-response and low-nitrogen-response types as determined by tuber production in response to nitrogen fertilisation during a given growth period.

Suggestions are made for future study in order that plant breeders and agronomists may be given the basic information required for efficient production of improved varieties and for the attainment of higher tuber yields.

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