

Effect of nitrogen on growth, yield and quality of acid lime

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(Accepted : April, 2008)

SUMMARY

The slow decline in the acid lime (*Citrus aurantifolia* Swingle) resulted in the area and production of the crop especially in Tamil Nadu. Though many theories were postulated for the decline, it still remains as a complex problem. Hence, a study was undertaken to find out the influence of soil nutrient contents on growth and production of acid lime. Among various levels of nitrogen tried, 600 g N per tree in a year had influenced growth, productivity and fruit quality. Application of nitrogen at 600 g N / tree in two split doses *i.e.*, one during March and another during September along with a constant dose of 200 g of Phosphorus and 300 g of Potassium was found optimum for acid lime.

Key words : Nitrogen, Acid lime, Growth and Yield.

Citrus is one of the important fruit crops grown in India. It is raised in 244000 ha in tropical and warm humid tropics. Among different species of citrus, acid lime (*Citrus aurantifolia* Swingle) is grown in large areas of Maharashtra, Andhra Pradesh, Karnataka and Tamil Nadu.

In recent years, a slow decline in productivity of acid lime trees was observed in Tamil Nadu and elsewhere. The slow decline was generally identified by symptoms like severe chlorosis and mottling with a great reduction in leaf size. The roots become brittle. Different causes have been attributed for the slow decline. Fraser *et al.* (1966) concluded that the decline should have been due to the accumulation of nitrites under waterlogged conditions and malnutrition. Mukherjee (1949), Singh and Singh (1953) and Aiyappa and Subramanian (1959) reported that nutritional deficiency was the main reason for citrus decline. However, no definite cause for the same was indicated and citrus decline appeared to be a complex problem and as stated by Chadha (1970) it could be due to more than one factor. To find out the causes for the citrus decline in Tamil Nadu and to evolve ways and means to improve the situations, a study was undertaken to find out the influence of soil nutrient contents on growth and production of acid lime.

MATERIALS AND METHODS

The investigation was conducted at Horticultural Research Station, Periyakulam. Differential levels of nitrogen per tree were tried *viz.*, 200 g N (T₂), 400 g N (T₃), 600 g N (T₄), 800 g N (T₅), 1000 g N (T₆) and unfertilized trees were maintained as control (T₁). The whole quantity of nitrogen of each of the four different

types were tagged on the survey side of each tree. Apart from that, twenty flower clusters in 'C' type were tagged for each nitrogen level. As suggested by Lenz and Cary (1969), above 14 days prior to flowers, ten out of twenty flower clusters of 'C' type were defoliated to study the effect of leaf on growth and development of flowers. The other ten clusters with leaves were studied for the purpose of comparison. Mean flower length and flower weight were worked out. Growth measurements of vigorous and weak trees were recorded. Twenty five per cent of trees in healthy and declining orchards were identified for recording observations on tree height, trunk girth and tree volume. Since, the influence of Phosphorus and Potassium has been reported to be not appreciable on growth and yield, differential levels of Phosphorus and Potash were not tried. Martin (1942) stressed the importance of only nitrogen for growth and fruiting in citrus. The efficiency of nitrogen in different levels on maximum production was observed. The datum on various parameters were statistically analysed as suggested by Panse and Sukhatme (1957).

RESULTS AND DISCUSSION

With respects of growth, the results clearly indicated a positive effect of applied nitrogen on the tree height. The increase in height was observed upto 600 g N / tree, beyond which there was a decrease in growth. The increased levels of nitrogen enhanced the availability of Potassium, Zinc and Iron and this had helped in the multiplication of meristematic cells and increase in the number of shoots and leaves (Smith, 1969). Since bearing is terminal to citrus, the yield is much dependent on the production of new shoots. A linear trend in the height of

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