SOIL AND LEAF ANALYSES AS INDICATORS OF FERTILISER REQUIREMENTS IN SHAMOUTI ORANGE GROVES

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Soil and leaf analyses were used in estimating the N and P requirement of Shamouti orange groves on sandy soils in the Israel coastal plain.

5 — 8 leaf samples were needed in a grove area of 2 dunams in order to ascertain its nutritional status, whereas 20 or more soil samples were required for an estimation of soil nitrates within the same area.

The seasonal fluctuations of soil nitrates and of the nitrogen and phosphorus content of leaves, as infuenced by differential fertilisation, were examined. The seasonal curves indicated spring as the most suitable season for soil sampling. Leaf composition reflected differences in tree nutrition most conspicuously in summer, whereas nutritional deficiencies were best detected in winter, after ripening of the fruit.

Nitrate levels in the top 30 cms. of soil varied in different groves from 4 to 12 p. p. m. Nitrate values above 10 p. p. m. indicated an adequate nitrogen nutrition of trees.

Available phosphorus (Truog) fluctuated in the top layer of soil (0 — 60 cms) from 12 to 93 p. p. m. The phosphorus level was mainly determined by the phosphorus fertilisation of the groves. Application of superphosphate in solution considerably increased the availability and percolation of phosphorus.

There was generally an inverse relationship between the N and P content of the leaves. With an ample N supply, however, a positive correation between the two elements was observed.

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(1) This is a summary of a paper which will be published in full elsewhere.

In most of the examined groves nitrogen content of leaves was low (about 1.8% of dry weight) and indicated the need for N fertilisation. Phosphorus in leaves was generally high because of N-deficiency, but in some cases also due to superphosphate application. Excessive P-percentages in leaves were found after fertilisation with superphosphate in solution.

(See also tables 1 — 15, p. 112 — 132, and figures 1 — 3, p. 118, 121, 122, resp., in Hebrew text of this paper).