## Soil

Soil texture is probably of greater importance than soil fertility, for upon the soil texture depends to a great extent whether the tree is able to absorb water and mineral requirements in solution. Soils can be analysed chemically and mechanically. mechanical analysis the soil particles are separated into four distinct fractions depending upon particle size—coarse sand, fine sand, silt, and clay. If the soil contains too much of the coarse sand fraction or the soil particles are large, then the soil is readily worked, but soil water and mineral salts will be rapidly leached from such a soil, and it will soon become dry in summer. If the soil contains too much of the clay fraction, the soil will be sticky when wet and will bake hard when dry. A soil intermediate between these extremes and known as a sandy loam should be selected. This will retain adequate moisture in summer and provide adequate drainage in winter.

After the mechanical composition of a citrus soil must be ranked the depth of soil. There should be no hard pan which will restrict the tree roots to the upper strata of soil. A hard pan under a light soil, with a large coarse sand fraction, will accentuate the trees' difficulty in obtaining adequate moisture during dry weather, whereas a hard pan under a clay soil will tend to create water logging and thus have equally adverse effects on the trees.

Finally, comes soil fertility. Adequate organic matter or humus is desirable. Colour is a guide in this respect—the darker the soil the warmer and more fertile it generally is.

Topography is an important factor. A citrus orchard site in New Zealand should have a gentle slope facing north so that the trees may receive maximum sunshine, both in duration and in intensity. A steep slope is not recommended, as erosion may become a problem, the retention of soil moisture will be more difficult, and the undertaking of all orchard practices—cultivation, spraying, pruning, and picking—will also be made more difficult.

## Shelter

A naturally sheltered locality is definitely of value, provided the area is not in a frost pocket or liable to be too damp through poor drainage.

Shelter is essential for every citrus orchard, and it should receive most careful consideration in the planning and establishment of the plantation. A citrus orchard cannot be oversheltered except from the point of view of the difficulty in working very small areas and in the exclusion of direct sunlight. Shelter is important not only because it prevents citrus trees from being broken or blown over, but also because it reduces the constant rubbing of developing fruits

