

Soils

It is important to understand soil characteristics and site history before planting new trees (or re-planting) in order to correct any problems. Soils should be assessed through soil pits and soil sample analysis, as well as local soil maps.



Figure 1: Inspecting a soil pit in an orchard.

Soil texture

Soil texture refers to the proportion of sand, silt and clay-sized particles in the mineral fraction. This is important as it influences soil fertility as well as water-holding capacity, i.e. the ability for water to move through the soil.

Lighter soils have a high sand content relative to clay and have poor water-holding capacity as well as lower fertility. Heavy soils are high in clay content and will generally hold more water and are more fertile. Heavier soils can be prone to water-logging.

Soil textures somewhere between clay loam-to-sandy loam types generally offer the best potential for pear production.

Soil structure

A good structure is important for water drainage and air movement through the soil. Soil structure is influenced by texture and soil particle aggregation. Soil particle aggregation can be improved by the addition of organic matter (cover crops and mulching) which helps bind soil particles together. Tillage can also improve soil structure, however this is often only a temporary effect.

Depth

Soil profiles should have at least 60cm of good quality soil for root growth. Topsoil depth can be improved by hilling up of tree lines (mounding). This will improve both the depth and provide a gradient for surface water run-off and seepage into the centre of the row in localities that are flood prone.

Drainage

Internal drainage characteristics of the soil are important factors in ensuring orchard longevity. Whilst pears are more tolerant of poorly drained soils than other fruit, water-logging can impact negatively on production and even result in tree death.

Soils should be well drained and not prone to water-logging. In some soil types underground tile drainage may be necessary to safeguard trees from water-logging.

Nutrient levels

It is important to take a soil test to determine soil nutrient levels at potential planting sites. This will indicate whether any amendments are required. Soil tests can be conducted by your local agricultural advisor.

pH

Soil pH should be between 6.0 to 6.5; anything above or below this can result in nutrient deficiencies. Alkaline soils (above pH 6.0), particularly those with high lime or bicarbonate content can result in iron chlorosis (often referred to as 'lime induced chlorosis'), particularly on quince rootstocks.

Further information

These Australian and international sites may be useful for growers. However they are intended as an information source only. Any specific recommendations may be outdated or irrelevant for Australian conditions and growers should seek local advice.

Australian Resources

Choosing and Using Lime: Victorian Department of Environment & Primary Industries Agnote AGO 091: <http://www.depi.vic.gov.au/agriculture-and-food/horticulture/fruit-and-nuts/orchard-management/choosing-and-using-lime-in-the-orchard>