

Growing Citrus Successfully

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One of the oldest cultivated fruits in the world, citrus have been developed into dozens of species and hundreds of varieties of oranges, tangerines, lemons and limes and species hybrids such as tangelos and tangors.

These very versatile fruit trees are also quite adaptable, allowing them to be grown over a wide of climates and soil types. The trees themselves, with their attractive foliage and sweet floral scents, deserve a place purely as an ornamental, not just stuck down the back corner.

But many people seem to struggle to grow them properly; with small curled leaves through to leaves that are that so pale yellow they're almost white! This note explains the basics of citrus culture, and indeed avocados are almost identical.

Soil Conditions:

The first important factor is that citrus have a very shallow root system, rarely being deeper than 300mm (a foot in the old language). The fibrous working roots are mostly in the top 70 to 110 mm. This 'root plate' extends outside of the 'drip ring', by a metre or more (avocados go many metres), so they don't tolerate much competition. The shallowness of the root plate means they are not very drought tolerant.

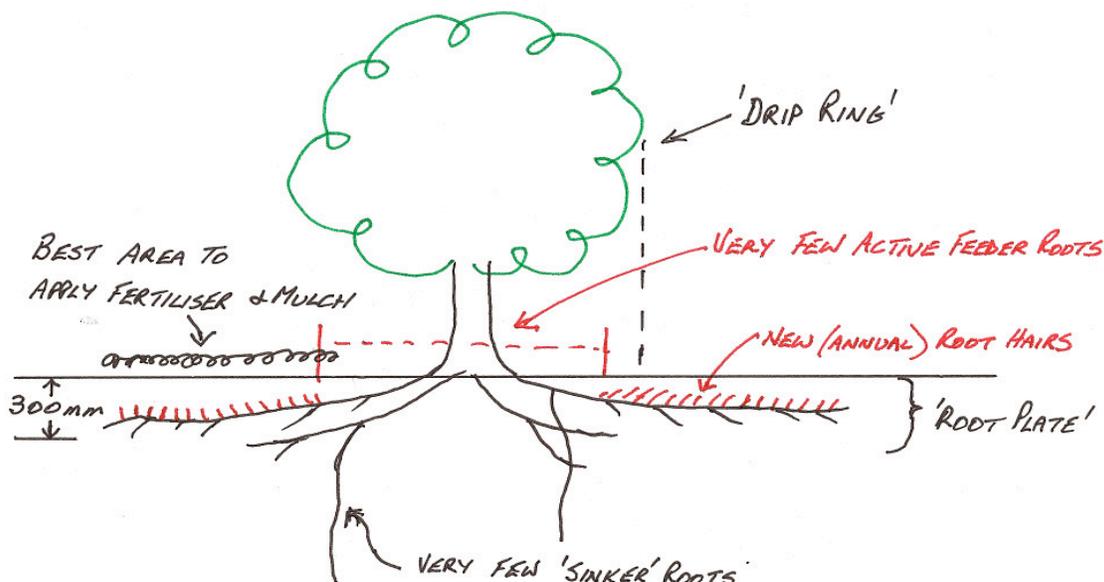
Have you ever had fruit on an Imperial mandarin get to within a few weeks from ripening, only to have them shed onto the ground? Or a Navel orange where a lot of the fruit splits, or a Valencia orange where all the fruit is small?

These are classic examples of moisture stress the previous spring. Each year, usually just before flowering, trees produce a whole heap of new little feeder roots and root hairs which are mainly responsible for taking up extra nutrients on which the new crop of fruit is reliant. Around this time (late August through September) we experience the start of the spring weather pattern with strong southeasterly winds.

These winds can dry out the top 70mm or so, thus frazzling these new roots. The tree shows no sign of moisture stress because it still has all the other roots, so it will hang on to all the fruit for as long as it can until those problems occur. So the trick is never to let the topsoil dry out and to apply good levels of a water-wise mulch before the end of August.

The second important factor is that citrus (and avocados) prefer quite acidic soils, with an ideal soil pH of 5.8, but tolerating as low as 5.3, though they suffer below this. However, they do not tolerate alkaline soils very well, with leaf deficiency symptoms appearing when the pH reaches 7.5, and the severity increases rapidly as the pH rises any further. Regular heavy mulching adds organic matter that helps to buffer pH and reduce problems caused by high or low pH.

Yellowing around the edges of the leaves, but particularly between the veins indicates trace element imbalance, especially manganese. With high pH, young leaves are very pale showing that even nitrogen is becoming deficient. This is often termed 'lime induced chlorosis', and is obviously much worse on the alkaline coastal soils.



Growing Citrus Successfully (cont'd)

So what do we do? How do we fertilise them?

Forget all the specialist citrus mixes – use a quality general-purpose fertiliser such as Cresco Garden Fertiliser® or Bailey's All-purpose Fertiliser®, and occasionally top shelf products such as N-P-K Blue® can be used sparingly. Only use products that list at least ten nutrient elements on the back of the bag or packet.

Organic-based fertilisers are the best for soil health and fruit quality, and can be used successfully if they contain enough trace elements. Blood & Bone mixes that have both potash (potassium) and trace elements added are good. Pelletised animal manures (eg, Dynamic Lifter®) can also be used, but trace elements must be added as well. Mineral rock-dust blends are also very good.

But on all soils, supplement those fertilisers with an extra application of a trace element mix such as the Manutec product in the spring. On alkaline or very acid soils, repeat this in the autumn, and every time you apply any animal manures.

Raw manures can be quite alkaline, so try not to use them if your pH is above 7.5. Even well rotted manures may not be acidic. Good levels of soil organic matter (5-10%) and good mulch layers help buffer problems with soil pH.

If your soil pH is above 7.5 trees will show leaf symptoms of nutrient imbalance. Above 8.5 you need to replace your soil or consider growing the trees in pots where you can use an acidic soil mix. Remember that organic matter helps buffer pH problems. Legumous materials such as pea hay or lucerne hay are also very good, but only as a soil improver, so water-wise mulch should always be spread over the top.

This brings us to the growth habits of citrus. Being an evergreen, they have a major flush of growth in the spring (August to November/December), and another smaller flush in the autumn (around April). Although they have a heat induced semi-dormancy in summer and a cold induced semi-dormancy in winter, they can respond to fertilising for six months of the year or more (during growth flushes, as these indicate feeder-root activity).

However, the best time to get most of the fertiliser on is the spring, with the chance to 'top up' in the autumn. During milder early summers, they can continue to flush or have a series of mini flushes of growth. These are obvious by the appearance of new growth, and are times when they will respond to fertilisers.

Pests and Diseases:

Citrus trees get few diseases, with exception of a fungal disease called anthracnose, which can cause leaf drop, even defoliation, in late autumn and winter. Copper sprays are the answer. Collar rot attacks mostly lemons (and mangoes), causing dieback and eventual death if left untreated – I have a separate fact sheet on this.

Citrus fruit can be attacked by fungal rots, most causing pale soft spots on the skin and early fruit decay. They are worse during warm wet autumns. Once again, copper sprays are the answer (see my fact sheet 'The Musts for Successful Fruit Growing'). Sooty mould affects leaves and fruit, and is caused by scale and aphids, can be partly controlled by with copper sprays, but it's always better to control the insects that cause it (see below).

Scales: Apart from fruit fly (which is another topic on its own), the worst pests of citrus are the scale insects, mainly White wax scale and Citrus red scale, which also cause Sooty mould. The key to control of both of these are monitoring for when the eggs start hatching and then applying carefully target pest oil sprays to kill the juveniles (adults are near impossible to kill). This is usually in late spring/early summer for White wax scale and mid summer for Red scale.

Black aphid can cause serious damage to new growth and cause Sooty mould. Applying organic sprays as soon as the pests appear is the best way. Soap sprays (even water sprays) and pyrethrum based sprays are the best, though you may have to do two or three applications over a couple of weeks.

Citrus white-fly can also build up, attacking young growth and also leading to Sooty mould. Insecticidal soaps have some effect, but usually a thorough pyrethrum spray is necessary (it's important to spray the underside of the leaves, as with spraying for scale insects).

Citrus leaf miner is the most frustrating pest, causing curled, deformed leaves on new growth. It looks much worse on young trees because they have predominately young growth. It cannot be totally controlled, let alone eradicated. Two pest oil sprays in the spring, plus one in the autumn when infestation is first noticed will have some affect. Adding an insecticide to these sprays will enhance the effect. NB: Limit oil applications to 3-5 per year, as too much can asphyxiate the foliage.