

## Citrus fruit loss in the home garden

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One of the most exasperating problems experienced by the home gardener is when citrus trees so often fail to produce a satisfactory crop of fruit, even though blossom has been abundant and the initial set of fruit is apparently normal. Two common reasons for this are that fruits shed prematurely or they split. A common cause for these losses is plant stress, and similar management strategies are recommended to combat both disorders.

### Premature shedding of citrus

This problem is a recurring one that is difficult to prevent but the following explanation may help in understanding the situation.

Normally about 98 per cent of the fruitlets that originally set on orange trees shed before reaching maturity. The remaining 1 to 2 per cent is sufficient to produce a commercial crop of fruit. Most of this drop or loss of fruitlets occurs at the end of flowering or shortly afterwards when the fruit is about pea sized.

A second fall, known as the 'midsummer' or 'December' drop usually determines what the ultimate production of fruit will be. The fruit is then 2 to 2.5 cm in diameter.

Trees growing in the sandy soils of metropolitan Perth often suffer a very severe midsummer drop. At this time of the year rapidly rising temperatures and desiccating easterly winds intensify the fall with the result that despite normally acceptable care and apparent good health, the tree is practically denuded of fruit.

### Citrus fruit splitting

Citrus fruit splitting may start as early as mid summer, but most of it occurs in autumn. Navel oranges are most susceptible, followed by tangelos, some tight-skinned types of mandarins, and other oranges. The split usually starts at the blossom end of the fruit, which is the weakest point in the rind. The split may be short and shallow or it may be deep and wide, exposing the segments of the juice vesicles. Young trees are more



Figure 1. Split oranges.

prone to fruit splitting than older trees. As well as being wasteful, the splitting creates a good breeding ground for fruit fly, so the split fruit should be removed and treated.

Splits probably occur when water and sugars are transported from the roots of the tree to the ripening fruit, and the rind is unable to expand quickly enough to accommodate the added volume. The rind bursts open under the pressure.

Splitting appears to be most closely related to extreme fluctuations in temperature, humidity, soil moisture and fertiliser levels. It is thought that the trouble is caused by a combination of these factors rather than by a single cause. Splitting is usually observed when growing conditions become erratic such as under water stress, uneven fertiliser supply, temperature fluctuations like hot and cold nights, and sudden rainfalls.

Some varieties are more susceptible to splitting than others, so select stocks that resist splitting.

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Table 1. Average daily irrigation requirement of citrus trees in the metropolitan area of Perth.

Month	Apply irrigation mm/day	Applied water (l/day) for small tree (1m x 1m)	Applied water (l/day) for medium tree (2m x 2m)	Applied water (l/day) for mature tree (4m x 4m)
January	7	7	28	111
February	6	6	25	102
March	5	5	20	82
April	4	4	14	56
May	Rainfall	Rainfall	Rainfall	Rainfall
June	Rainfall	Rainfall	Rainfall	Rainfall
July	Rainfall	Rainfall	Rainfall	Rainfall
August	Rainfall	Rainfall	Rainfall	Rainfall
September	Rainfall	Rainfall	Rainfall	Rainfall
October	3	3	13	54
November	5	5	19	75
December	6	6	24	95

## Reducing the loss

### *Irrigation and fertiliser management*

There is no specific remedy to completely overcome this premature shedding or fruit splitting, but heavy losses can be reduced by extra attention before and during the critical periods. Reasonable cultural practices should aim to supply optimal growing conditions. Trees should always have access to sufficient water and nutrients. In a garden situation with sandy soil and water restrictions, as apply currently to the metropolitan area of Western Australia, a number of steps can be taken:

- Use trickle irrigation with enough drippers to supply the area covered by the canopy (one dripper per square metre) and supply enough irrigation to ensure a continuous supply of soil moisture. Under normal conditions apply moisture as per Table 1. Water output (L/hr) is usually marked on the drippers so it is easy to work out the amount of water supplied to the tree per hour. Make sure that more water is supplied if conditions are unseasonably hot (Under current restrictions, a trickle irrigation system can only be used two days per week, unless bore water is used. To apply water as per Table 1, a hand held hose should be used on non watering days).
- Use compost and slow release fertilisers to feed the tree. This will stop sudden spurts of nutrients. Citrus trees use comparatively large quantities of nitrogen. During active spring growth, shortages of this important element can retard the tree and accentuate fruit fall. Make sure soil supplies are replenished and available from August to December. Also make sure the tree has enough trace elements. If the tree looks deficient in trace elements, apply a foliage spray. The most receptive time to apply nutritional sprays is following a flush of new growth. Use a proprietary mix such as Thrive®.
- Use mulch to retain soil moisture by reducing evaporation.

## Insects

Parasitic insects, particularly the black citrus aphid which is active while the fruit is still small and vulnerable, directly contribute to excessive shedding of fruit. Observe trees carefully, and control aphids if necessary.



Figure 2. Black citrus aphids.

## Location

The position of the tree in the garden is often responsible for excessive fruit fall. If possible, when planting new trees, avoid windy and shaded situations, and possible competition from adjacent trees and plants. Lawn, particularly, should be kept well away from fruiting trees by shallow hoeing or by applying suitable safe weedicides. If lawn is allowed to compete with the tree, extra water should be applied to ensure the tree's needs are met.

Deep digging around citrus trees should be avoided as it causes considerable damage to their relatively shallow roots.

## Disclaimer

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