



## Dry Season Information: Apples

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### Introduction

There are critical stages in the annual growth cycle of apple trees that require adequate soil moisture to produce a commercially viable crop:

#### 1. Pre flowering

- Root growth commences from late August onwards, so the soil needs to be moist and soft to establish an early root system before flowering.

#### 2. Flowering and fruit set

- Bare or closely slashed tree rows with moist soil are needed to absorb heat during the day to minimise the impact of frosts.
- Adequate soil moisture until approximately 4 weeks after full bloom is critical for root growth, fruit set and to maximise cell division during the early stages of fruitlet growth.
- An aggressive blossom thinning program is needed to maximise fruit size. If water availability for irrigation is very low, further thinning after flowering and fruit set may still be needed.

#### 3. Fruit growth



- Apple varieties continue to size fruit during all of their development cycle to maturity. Moisture stress at any time during the season reduces fruit size.
- Fruit growth by cell division after flowering and the accumulation of sugars and size during the final 8 weeks before fruit harvest, remain the more critical stages of fruit development.
- If moisture stress cannot be avoided during the season, thin trees again as early as possible after this decision is made.

#### 4. Post harvest

- Irrigations after harvest can be reduced but not to the level that causes significant leaf loss. Continue post harvest irrigations to water in nitrogen fertilisers and maintain leaf activity (photosynthesis) for some of the day. Minor wilting in the hottest part of the afternoon will not be too detrimental if water is really short.
- Irrigating as long as possible after harvest ensures nutrients are accumulating in the tree for budburst, fruit set and early shoot development in the following spring.

### Dry season issues

Frosts are likely to be more severe and occur later into the season. Install a frost alarm system. Use the irrigation system, soil management and other frost reduction methods in the orchard.

### Strategies for a dry season - Apples

The following strategy is suggested if irrigation water entitlements are low:

- Prior to the commencement of the season set out a water budget for each irrigation block on a weekly basis using long term irrigation requirements, and assuming no effective summer rainfall.
- On a regular basis review water allocation, long-term rain forecasts and market potential for each variety.
- If insufficient irrigation water is available, then decide on one of the following strategies:-
  1. Purchase water.
  2. Irrigate at a deficit and suffer a fruit size loss. Applying a mild RDI early in the season (mid November and December and again 2 weeks before harvest) will reduce fruit size. In this case heavier and earlier thinning than normal plus RDI will result in lighter crops but similar fruit size compared to a full irrigation program.
  3. Do not irrigate. Lower productivity blocks could be de-blossomed or even pollarded (main limbs cut in half or pruned even lower) to reduce water needs. Wound dressing must be applied to these larger pruning cuts. Alternatively, some older trees may be close to being non-viable. This may be a good time to pull them out earlier than planned and transfer the water to productive

blocks of trees to ensure some commercially viable fruit can be harvested.

Incorporate the following orchard management to save water:

- Prune the most valuable and productive blocks first. Leave the lower value blocks to be pruned until last. This gives more time to evaluate the seasonal rainfall and means decisions about abandoning poorer blocks to save water can be left until later.
- Thoroughly and aggressively apply blossom and post-flowering thinning sprays to reduce competition between fruit as soon as possible even though there is a frost risk. This is especially needed if flowering and weather conditions are conducive to high fruit set.
- Decide if more thinning is needed at 6 weeks after fruit set and complete the thinning as soon as possible. Secateur thinning can be done in the top third of the tree (vase shaped trees) to speed up thinning until late October.
- Strip all fruit off trees one year old and those just planted. Two and three year old trees should be thinned heavily or the fruit stripped if water is short.
- Measure soil moisture to schedule irrigations.
- Eliminate all weed competition. If micro-irrigated, spray weeds emerging in the irrigated zone during spring and summer.
- Slash the orchard more often and as close to the ground as possible. Spraying out all the understorey pasture and weeds may be needed under drastic water shortages.
- If possible, mulch the tree-line and irrigate the soil shaded by the tree and not out in the traffic row area.

### Irrigation Requirements for Apples

- Irrigate to maintain good soil moisture from budswell to 4 weeks after flowering. Make sure the water penetrates to the full depth of the rootzone - but not past the rootzone.
- Tensiometers or other soil moisture measuring instruments will indicate when irrigation is needed. This will be of great benefit to guide irrigations whilst trees are leafing up and assess if there has been any effective rainfall which can save on irrigation water.
- Regulated Deficit Irrigation (RDI) will reduce fruit size in apples. RDI should only be applied to apples if there is insufficient irrigation.
- Assume 6 megalitres of water per hectare are needed to grow mid-season varieties such as Red Delicious and 7 megalitres per hectare for late varieties such as Granny Smith and Pink Lady.

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