



Dry Season Information: Stone Fruit

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November 2003

AG1036

ISSN 1329-8062

This Agriculture note provides information on dry season management options for stone fruit (peaches, nectarines, apricots, and plums).

Introduction

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

1. Pre flowering

- Root growth commences from 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
- Thin early and aggressively to maximise fruit size if water availability for irrigation is low and flowering and fruit set have been strong.

3. Fruit growth - early maturing varieties

- Very early maturing stone fruit varieties (apricots, early plums, nectarines and peaches maturing up to mid January) must be irrigated fully from flowering until harvest to ensure commercially viable fruit size.

4. Fruit growth - mid to late maturing varieties

- Mid to late season maturing stone fruit varieties do not continue to size fruit during November to early to mid January. Moisture stress during this time reduces the growth of leaves and shoots - but not the fruit. This presents an opportunity to use Regulated Deficit Irrigation (RDI). A water saving of 1 to 1.5 megalitres per hectare are possible during this 6 to 8 week period.
- Fruit growth by cell expansion, and the accumulation of sugars by the fruit depends heavily on optimum soil moisture and good irrigation during the final rapid fruit growth stage in the last 6 to 8 weeks to harvest.

5. 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 most of the day. Some 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. Set up a frost alarm system and have a frost protection strategy in place. If there is no frost damage, heavy fruit set is possible because of fine weather during flowering.

There may be excessive fruit shedding in November from dry soil during the first 4 weeks from budswell to flowering and fruit set.

Strategies for a dry season - Stone fruit

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, incorporating RDI strategies 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. Heavier thinning may offset some of the loss in fruit size.
 3. Do not irrigate. Remove the crop and cut back branches to restrict tree size. Alternatively, some older trees may be close to being non-viable. This may be a good time to pull them out earlier than planned - especially if they are a late maturing

variety which would require more irrigation to get them to harvest.

Incorporate the following orchard management to save water:

- Measure soil moisture to schedule irrigations - particularly from flowering to the end of October and during "fruit fill" in the last 6 to 8 weeks before harvest.
- Irrigate to a depth of 45 - 60cm only (check with probe or auger or sensor).
- Eliminate tree-line weeds early and widen the weedicide strip. If micro-irrigated, then spray weeds in the wetted area during the growing season.
- 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.
- Summer prune water shoots and cut back leaders to reduce the tree leaf area.

Irrigation Requirements for Early Maturing Stone Fruit Varieties (November to mid January)

- Early maturing stone fruit varieties (harvested November to mid January) need to have good soil moisture from flowering to harvest to size the crop.
- Irrigate carefully to prevent leaching and only irrigate to the depth of the root zone (45 to 60cm - depending on soil type).
- Summer prune early to relieve pressure from a larger than needed leaf area.
- Flower bud thinning, flower thinning or fruitlet thinning (immediately after shuck fall) is critical for good fruit size at harvest for early maturing varieties. However early thinning increases split stones on susceptible varieties. Unfortunately early thinning also puts at risk money spent on thinning if subsequent frosts or hail severely reduce the crop available at harvest.
- Reduce irrigations after harvest. This can be done by reducing irrigation run times – aim to irrigate to a depth of 30 to 40cm when irrigations are applied. It is like RDI, only after harvest.
- In orchards with tile drains and prone to salt accumulation in the root zone, a leaching irrigation may be needed after harvest.

Irrigation Requirements for Mid and Late Season Varieties (Mid - January to March)

- Mid to late maturing varieties of stone fruit need optimum soil moisture from budswell to stone tip change (late October to early November). Adequate soil moisture at this time enables the tree to grow its root system, set fruit and develop early fruit size by cell division.
- From November to early December or mid January - dependant on harvest date - is a period of slow fruit growth. Regulated Deficit Irrigation (RDI) is a water stress strategy that can be applied during this period. RDI reduces leaf and shoot growth but does not affect final fruit size. It can save up to 50% of the water applied during this low fruit growth period (1 to 1.5 megalitres per hectare). As an example, the RDI period for Tatura 204 is from November to the first week in December in a 'normal' year. For Taylor Queen peaches, the RDI period is from November until mid January.
- Full irrigations must be applied during the last 6 to 8 weeks before harvest to maximise fruit size
- An average of about 2 megalitres/ha of water will be needed for the final 6 to 8 weeks of the 'fruit-fill growth stage' in southern Victoria and 3 megalitres/ha in northern Victoria.
- After the RDI period, at the start of the "fruit fill" growth stage, ensure irrigation fully wets up as much of the root zone as possible down to a depth of at least 45 cm.
- Soil moisture levels during the "fruit fill" stage should be kept in the range of 10 to 40 kPa until harvest.
- Fruitlet thinning of canning peaches at the 6mm seed length stage with ethephon will lead to better fruit size by seed tip change stage. Blossom thinning, by hand or chemically, will have an even better effect on final fruit size because it is done earlier in the season.
- Ensure any follow-up hand or stick thinning is completed and done thoroughly soon after tip change for all mid to late season varieties of stone fruit
- Peaches and nectarines highly susceptible to split stones will often have more split-stones if thinned early (at flowering or before tip change).

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