

# **Activity # 1- Assessing Horticultural Crop Suitability for the Queensland Murray Darling Basin Study Area**

## **Specific Biophysical Crop Information – Citrus**

(1 August 2014 to 30 June 2016)

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## Citrus

Based on the biophysical requirements and limiting factors, Citrus is a potential crop for the Balonne-Border Rivers Region of the QMDB where only light frosts occur.

### Crop Matrix:-

	Perennial Crop	Mandarin
Currently Grown (Y/N)	Qld	Y
	QMDB	N
	NSW	Y
	Vic	Y
Frost Sensitivity (Y/N or Deg C)	Seedling	Y
	Growth	Y
	Reproductive	Y
Low Temp Sensitivity (Y/N or Deg C)	Seedling	Y
	Growth	N
	Reproductive	Y
High Temp Sensitivity	Seedling	N
	Growth	N
	Reproductive	Y
Rainfall Sensitivity	Y/N	Y
	Growth Phase	Maturation & Harvest
Special Soil Requirements	Y/N	Y
	Requirement	Well drained
Chilling Req.	Y/N	N
	(Hours)	
Water Quality	Sensitivity (dS/m)	1.1 (1.6)
Harvest Months	(Months)	May-Aug
Length of harvest	(Weeks)	16
First Harvest	(Years)	
Full Production	(Years)	8
QMDB	Y/N	Y

## Biophysical Requirements and Limiting Factors (climate)

### Temperature

Citrus are evergreen plants and will tolerate high temperatures provided the trees are well supplied with soil moisture, but are sensitive to frost. Sensitivity varies with variety, age of the planting and health of the tree.

Young trees are sensitive to very light frosts, whilst mature trees which are hardened for winter can survive a -5°C frost, although fruit and leaf damage will occur.

Flower induction occurs in the winter for flowering in the spring (this is the normal citrus cycle, which can easily be upset by out of season rainfall, abnormally high winter temperatures and other stresses such as drought).

Planting citrus is not recommended in areas where heavy frosts occur regularly (Owen-Turner, et al., 1997).

### Soils

Well drained soils at least 60cm deep (preferably 1m) are required for citrus.

### Density and Yields

Yields need to be considered in conjunction with tree density. In an orchard of normal density, tree spacing would be 7.3 m between rows and 3.5 m to 5 m between trees. In this orchard, average yields would range from about 9 kg (half a citrus carton) per tree in the third year to about 150 kg to 180 kg (8 to 10 citrus cartons) for a mature tree in the tenth year. Using these figures, a mature orchard should be expected to produce 2500 to 3000 citrus cartons per hectare per year.

Higher, early yields per hectare can be obtained with high density planting. This is now a well established practice and is recommended for new plantings. High density orchards are normally based on the same 7.3 m row spacing (sometimes less for some mandarins), but use double the density of trees within the rows. This effectively doubles the early yields per tree up to about the sixth year and makes much better use of available land. However, close planting requires a higher level of management with more regular pruning and possible tree removal. Mature orchards yield about 2500 to 3000 citrus cartons per hectare per year, the same as normal density tree spacing.

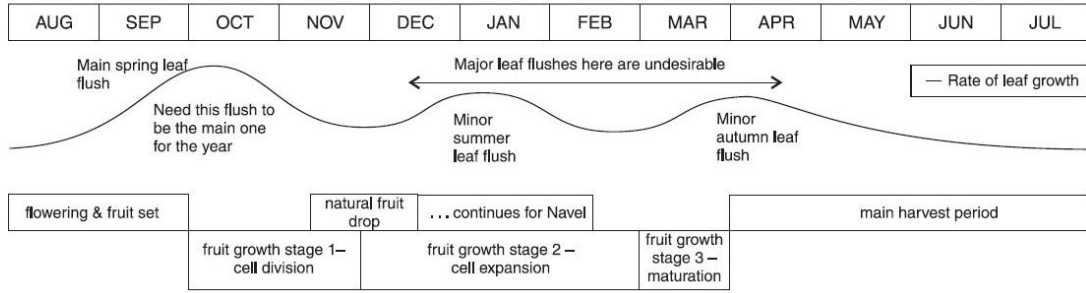
### Irrigation

One hectare of mature trees will need 8 to 9 megalitres of high quality irrigation water (below 1800microSiemens/cm).

### Management

Citrus are labour intensive, and mandarins, particularly under high density plantings, require exceptionally high levels of management (fruit thinning and pruning).

# Crop Lifecycle (Queensland)



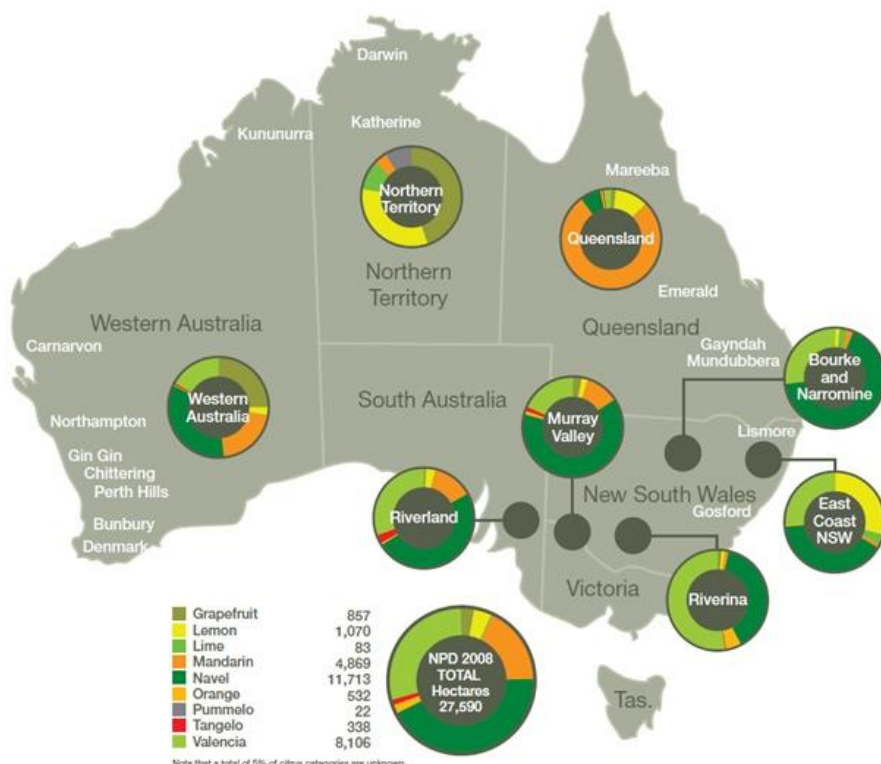
Desired annual cycle for bearing trees (timing is for Navel orange)

## Comparison Regions

Availability of Australian Citrus - [Citrus Australia – what's in season](#)



### What's Available Where



Note that a total of 5% of citrus categories are unknown.

## QLD

In Queensland, mandarins and oranges are the main citrus fruit grown with smaller areas of lemons, grapefruit and limes, mostly for the fresh fruit market because early harvests are possible which can produce higher returns – i.e. the majority of fruit are harvested between March and July (with some production occurring from January in some locations).

Mandarins are grown mainly in Queensland and are harvested from April to October, Imperials being the most popular mandarin variety.

## NSW

The largest and most important production areas in NSW are in the Riverina and Murray Valley regions, with smaller plantings located around Bourke, Narromine and the Central and North coast regions of NSW. The main citrus fruits grown in NSW are navel and Valencia oranges, mandarins, lemons, limes and grapefruit. Harvesting commences in May and runs through to December

## Crop in the QMDB Region.

Based on the biophysical requirements and limiting factors, Citrus is a potential crop for the Balonne-Border Rivers Region of the QMDB, where only light frosts occur.

## Industry Potential

Variety selection is critical to being able to supply a profitable market, as well as meet the climatic requirements of each variety. Owen-Turner et al. (1997) “Key Issues” - pp25-29, provide a useful summary of the “Prospects” of a range of citrus varieties in Queensland.

## References

- Owen-Turner, J., Smith, D, Mayers, P. and Vock, N. (1997) *Citrus Information Kit. Agrilink, your growing guide to better farming guide*. Manual. Agrilink Series QAL9703. Department of Primary Industries, Queensland Horticulture Institute. Brisbane, Queensland.
- DPI NSW (2015) Citrus Fruit. [DPI NSW citrus](#)
- Citrus Australia (2015) - [Citrus Australia](#)

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Disclaimer: The candidate crop information presented in this QMDB study area report (Activity 1) are based on the analysis of the published biophysical needs of the crops (e.g. temperature, frost sensitivity, chill requirement, water quality, etc.) and current climate records for the QMDB study area. The candidate crops are deemed suited to the study area where the biophysical needs are met either year round or for portion of the year and will allow crop production.

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