

# Kirkwood Red navel orange

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Figure 1. A Kirkwood Red navel orange tree.

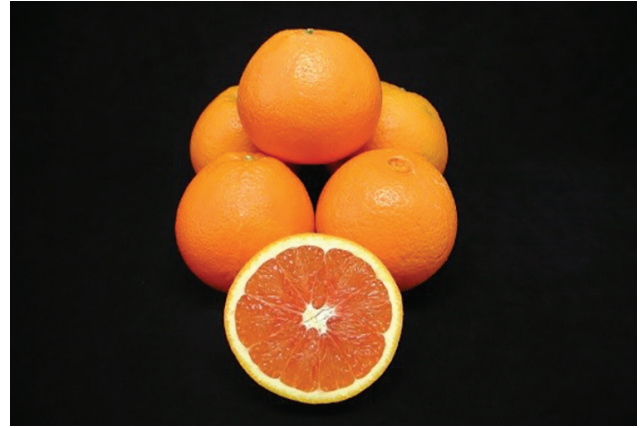


Figure 2. Kirkwood Red navel oranges.

## Estimated maturity period

Region	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sunraysia												

## Origin

The Kirkwood Red navel orange was discovered in South Africa as a limb mutation of Palmer navel orange. The Kirkwood Red variety has Plant Breeder's Rights (PBR) protection and its development in Australia is managed by Variety Access.

## Fruit quality

Table 1. Kirkwood Red navel orange fruit quality\* characteristics.

Skin	Easy to remove at full maturity, orange to dark orange colour, slightly pebbled.
Average rind thickness (mm)	5.2
Internal quality	Good sugar-acid balance with a high juice content. Distinctive, pleasant flavour that is likely related to the lycopene pigmentation in the flesh.
Average number of seeds	Usually nil but an occasional seed can be found in some fruit.
Juice per cent (%)	52
°Brix	11.1
Acid per cent (%)	0.91
Brix:acid ratio	12.2
Average fruit weight (g)	270
Average fruit diameter (mm)	81

\*Juice quality levels considered adequate for harvest and developed by sequential analysis of fruit from top-worked evaluation trees.

## Comments

- A red-fleshed navel orange mutation similar to the Cara Cara navel, but discovered on a Palmer Washington navel orange from the Eastern Cape region of South Africa. Some fruit grown in South Africa was said to have a slight external red blush, which helps to distinguish it as a red-fleshed navel.
- The fruit was produced in Australia on top-worked Valencia trees in 2014, but no blush was evident with the first or subsequent crops. Fruit set was throughout the canopy, but no blush occurred even on fruit held long past its ideal maturity period.
- Kirkwood Red fruit maintained its condition and adherence to the tree for an extended period, which supports the South African conclusion that it is slightly later maturing than the Cara Cara navel.
- Kirkwood Red fruit appears less affected by sunburn than Cara Cara navel possibly because Kirkwood Red produces most fruit within the tree canopy and is less exposed to heat damage.

Table 2. Average yield per tree\* on trees top-worked to Valencia orange.

Rootstock	Average yield per tree (kg)				
	2014	2015	2016	2017	2018
Cleopatra	47	72	98	82	104
Trifoliata	44	66	70	95	118

\*Average yield per tree results are from a small number of evaluation trees and should only be used as a general indication of the variety's potential yield.

Table 3. Average yield per tree\* on trees top-worked to Valencia orange in 2005.

Date	% Juice	°Brix	% Acid	Brix:acid ratio	BrimA
24.4.2014	46	8.5	1.20	7.1	61
2.5.2014	50	9.0	1.15	7.8	72
12.5.2014	51	9.2	1.13	8.1	77
23.5.2014	54	9.6	1.02	9.4	91
3.6.2014	51	9.7	0.90	10.7	100
12.6.2014	56	10.2	1.01	10.1	102
26.6.2014	56	10.4	0.93	11.2	110
14.7.2014	52	11.1	0.91	12.2	123
30.7.2014	51	11.2	0.93	12.1	124
13.8.2014	52	11.6	0.88	13.2	134
1.9.2014	56	11.7	0.80	14.6	140
11.6.2015	50	10.4	1.00	10.4	105
22.6.2015	49	11.0	1.02	10.7	114
9.7.2015	47	11.2	0.93	12.0	123
17.7.2015	49	11.3	0.91	12.4	126
29.7.2015	49	11.5	0.87	13.2	132
1.9.2015	47	12.1	0.84	14.3	144
26.4.2016	47	10.4	1.13	9.2	97
6.5.2016	50	10.7	1.01	10.6	110
16.5.2016	51	11.0	1.08	10.2	111
27.5.2016	50	11.6	0.97	11.9	127
7.6.2016	49	11.4	0.95	12.0	125
21.6.2016	50	11.8	0.93	12.6	133
4.7.2016	47	12.4	0.87	14.2	147
18.7.2016	48	12.3	0.90	13.6	143

Date	% Juice	°Brix	% Acid	Brix:acid ratio	BrimA
29.7.2016	48	12.0	0.78	15.4	146
22.5.2017	53	10.4	1.32	7.9	84
5.6.2017	51	10.9	1.27	8.6	96
15.6.2017	53	11.0	1.23	9.0	100
26.6.2017	51	10.8	1.15	9.4	102
7.7.2017	52	11.3	1.09	10.3	114
17.7.2017	53	11.8	1.06	11.2	125
28.7.2017	53	11.7	0.99	11.8	128
11.8.2017	50	12.1	0.94	12.9	138
Orange minimum standard	38	9.0	-	9	90

**Kirkwood Red navel could help to extend the current (Cara Cara) red-fleshed navel harvest period by several weeks.**

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The information contained in this publication is based on knowledge and understanding at the time of writing (December 2019) and was generated from field and nursery trees at Dareton Primary Industry Institute, Sunraysia, NSW, unless otherwise stated. Where quantitative data are presented (e.g. % Juice or rind thickness) they are based on measured properties. Where qualitative data are presented (e.g. thorniness or tendency to split), they are based on observations or brief notes recorded in the field.

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