

Valencia selections on two rootstocks

In this final iteration, we share remaining outcomes of trials done in Mbombela to determine suitable Valencia cultivars on two rootstocks.
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We further explore the outcomes of our trials that were done to determine suitable Valencia cultivars on Swingle citrumelo (SC) and US-812 (SxB) citrandarin rootstocks for an intermediate citrus production area. In the SA Fruit Journal Aug/Sep '25 edition, we shared results relating to Jasi Valencia and Kobus du Toit Late Valencia selections. Now, we will look at Late Valencia, McClean SL Valencia and Midnight Valencia and conclude on the suitability of these Valencia selections.

Late
The Late Valencia originated as one of the original "Old Clone" selections, referring back to the very first Valentias planted in SA. Seeds typically numbered two to four per



This is part two of a two-part series on rootstock evaluation.

Table 1: Internal fruit quality data for Late Valencia orange at Crocodile Valley Estate (Nelspruit)

Late									
Rootstock	Date harvested	Juice %	°Brix	Acid %	Ratio	Avg. seed	Fruit external colour	Count 88 (% crop)	Count 105 (% crop)
SC	06/08/2019	52.9	11.3	1.40	8.1	0.0	T1-4	20	76
	22/07/2020	55.6	11.1	1.35	8.2	0.7	T1-3	48	11
	19/07/2022	53.6	10.3	1.20	8.6	0.0	T1-2	48	17
	17/07/2023	51.0	11.6	1.20	9.7	1.3	T1-3	47	32
US-812 (SxB)	06/08/2019	57.8	11.1	1.25	8.9	0.0	T1-4	33	42
	22/07/2020	56.4	12.0	1.50	8.0	1.7	T1-3	42	9
	19/07/2022	58.7	11.1	1.35	8.2	1.0	T1-2	51	20
	17/07/2023	53.5	11.4	1.30	8.8	0.7	T1-3	42	28

Figure 1. Valencia maturity indexing

		June				July				Aug				June	
	Weeks	1	2	3	4	1	2	3	4	1	2	3	4	1	2
Open	Midnight														
CGA Cultivar Company	McClean SL														
Sun World International	Kobus du Toit late														
Open	Jasi														
Open	Late (Old Clone)														

The higher acids induced in the fruit, and delayed external colour, differentiate Swingle citrumelo from other commercial rootstocks.

fruit and fruit size peaked at medium-size with a round to oblong shape. Late Valencia was included in the trial as one of the control cultivars to evaluate typical Valencia characteristics, as well as to determine the production performance on US-812 (SxB). Chimeras on the rind of the fruit remained prominent on Valencia cultivars and more specifically on the Late Valencia selection. Maturity corresponded with Jasi and Kobus du Toit Late; from the third-last week of July towards the middle/end of August (Figure 1). Fruit size on both rootstocks peaked at count 88, followed by count 72. The internal quality represents a late-maturing selection with lower ratios indicating higher acids and average Brix content, good juice levels and fairly low seed counts (Table 1).



Late Valencia tree on Swingle citrumelo rootstock with bud-union bulge and mature tree in full production

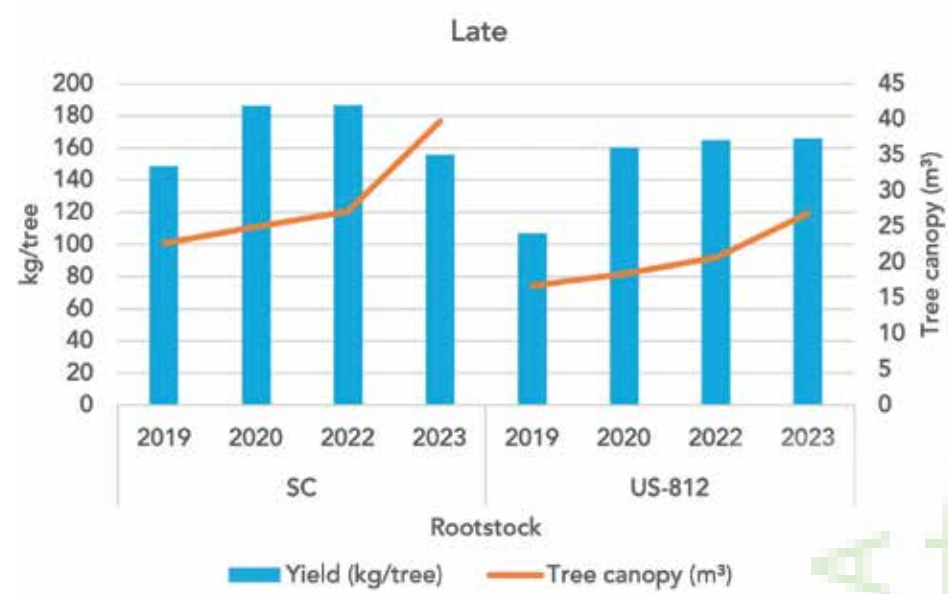


Figure 2. Yield (kg/tree) and tree canopy volume per tree for Late Valencia from 2019-2023

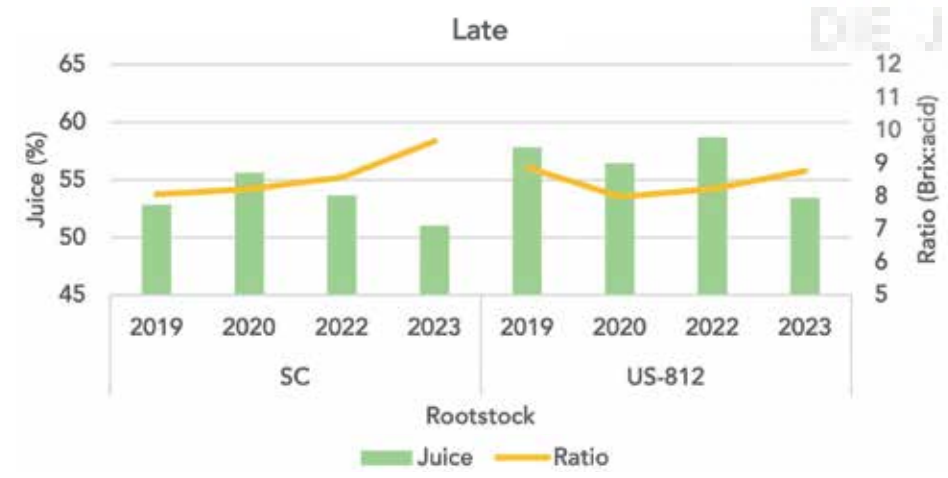


Figure 3. Juice content and Brix:acid ratio for Late Valencia from 2019-2023

Fruit production remained good, between 150 and 180 kg per tree on Swingle on a large tree canopy. Production on US-812 with a smaller tree canopy, ranged between 100–160 kg per tree (Figure 2).

McClean SL
A seedless mutation of the nucellar McClean Valencia was selected in the Swaziland Irrigation Scheme (SIS) due to its low to completely seedless fruit and good fruit size. This selection was planted on a semi-commercial scale at SIS, renamed IYSIS and is now the property of Swaziland Fruit Canners (Pty) Ltd. Crop set practices (girdling and/or Gibb applications) are required due to the seedless characteristic of the cultivar, to ensure a good fruit set. In the trial, the best fruit production was



Deep orange rind colour on a McClean SL Valencia tree and typical fruit shape

obtained in combination with Swingle, which yielded up to 200 kg per tree. Swingle was also associated with a larger tree size (Figure 4). McClean SL is a promising addition to the new range of Valencia cultivars, available to growers when establishing or replacing orchards. This is a mid to slightly later maturing Valencia determined by the higher Brix/acid ratio (Figure 5). Colour development was between T1 and T2, with juice levels above 54% and acceptable Brix levels (Table 2). Swingle and US-812 induced higher fruit acid levels than the other rootstock options. Fruit size is medium (avg. between count 88 and 72) with smooth rinds. The tree shape and growth are similar to that of other Valencias for this production area.

Table 2. Internal fruit quality data for McClean SL Valencia orange at Crocodile Valley Estate (Nelspruit)

McClean SL								
Rootstock	Date harvested	Juice %	°Brix	Acid %	Ratio	Avg. seed	Fruit external colour	Count 88 (% crop)
SC	06/08/2019	56.1	11.0	1.15	9.6	0.0	T1-3	50
	22/07/2020	59.7	11.9	1.30	9.2	0.0	T1-3	41
	19/07/2022	55.6	10.6	1.05	10.1	0.0	T1-2	39
	17/07/2023	54.3	12.2	1.15	10.6	0.0	T1-2	44
US-812 (SxB)	06/08/2019	54.5	10.9	1.10	9.9	0.0	T1-4	53
	22/07/2020	63.0	12.1	1.45	8.3	0.0	T1-3	50
	19/07/2022	55.0	11.2	1.05	10.7	0.0	T1-2	47
	17/07/2023	54.2	12.0	1.15	10.4	0.0	T1-2	43



Figure 4. Yield (kg/tree) and tree canopy volume per tree for McClean SL Valencia from 2019-2023



Figure 5. Juice content and Brix:acid ratio for McClean SL Valencia from 2019- 2023

Midnight

The Midnight is a South African selection that was discovered by Mr. A.P. Knight during the 1930s in the Sundays River Valley area of the Eastern Cape, but it only came to prominence in the late 1970s, early 1980s. The high Brix levels and juice percentages resulted in the fruit meeting the minimum export standard earlier than other Valencias. Hence, the cultivar is named Midnight. As mentioned previously, the Nelspruit area is known for some of the best quality Midnight in the country and therefore, used as a control for this trial. The fruit size was larger compared to the other cultivars in the trial and peaked towards count 72, slightly on the smaller side due to an overall, heavy crop load (Table 3). Fruit maturity starts at the end of June and continues until the end of July, depending on the season and the rootstock. For example, Swingle and US-812 induced higher acids and therefore, delayed fruit maturity (Figure 6). Juice levels were high for the 2019, '20 and '22 seasons (58% plus), but below Midnight export standards on Swingle for 2023. Yield production reached levels above 150 kg per tree, resulting in crops of 80 tonne per ha with a 555-tree planting per ha (Figure 7). The higher acids induced in the fruit, and delayed external colour, differentiate Swingle citrumelo from other commercial

Midnight Valencia fruit on a mature citrus tree



Table 3. Internal fruit quality data for Midnight Valencia orange at Crocodile Valley Estate (Nelspruit)

Rootstock	Date harvested	Juice %	°Brix	Acid %	Ratio	Avg. seed	Late				
							Fruit external colour	Count 88 (% crop)	Count 72 (% crop)	Count 56 (% crop)	Count 48 (% crop)
SC	06/08/2019	58.4	11.2	1.05	10.7	0.0	T1 3	32	30	15	7
	22/07/2020	61.3	12.7	1.35	9.4	0.0	T1-3	17	21	24	25
	19/07/2022	58.5	11.1	1.15	9.7	0.0	T1	28	21	20	17
	17/07/2023	51.0	12.3	1.20	10.3	0.0	T1-2	22	25	17	9
US-812 (SxB)	06/08/2019	60.3	12.1	1.05	11.5	0.0	T1-3	38	15	6	2
	22/07/2020	60.9	11.9	1.15	10.3	0.0	T1-3	26	19	18	31
	19/07/2022	57.2	11.4	1.15	9.9	0.0	T1-2	47	20	12	6
	17/07/2023	52.9	11.4	1.20	9.5	0.0	T1-2	37	16	12	9



Figure 6. Juice content and Brix:acid ratio for Midnight Valencia from 2019-2023

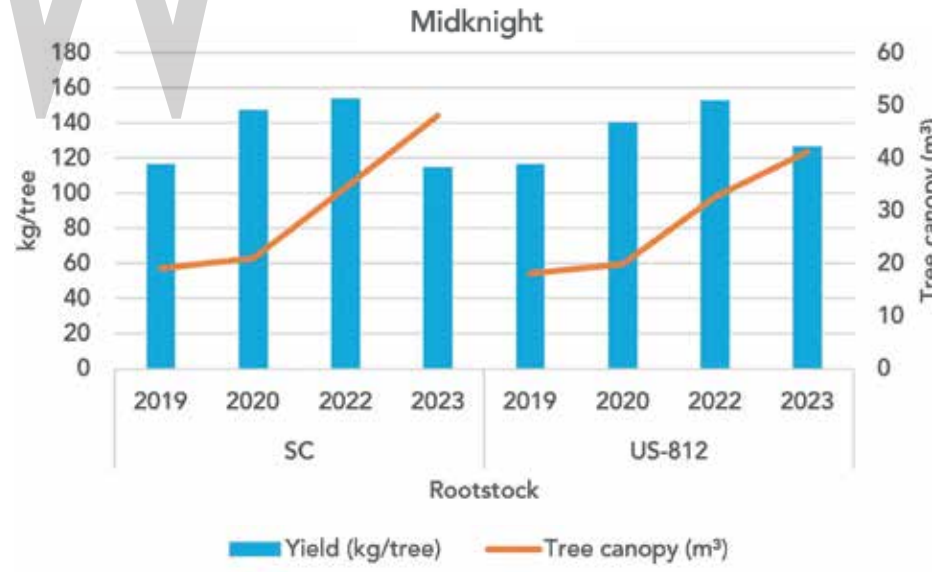


Figure 7. Yield (kg/tree) and tree canopy volume per tree for Midnight Valencia from 2019-2023

rootstocks. US-812 showed similar qualities with regards to colour development, as well as higher associated acids in combination with the Valencia cultivars, similar to scion combinations on Swingle. Larger tree canopies develop on Swingle and this aggressive rootstock requires wider orchard spacing compared to US-812. Using US-812 could result in lower production costs due to less pruning and lower chemical spray volume applications.

Regarding fruit quality and crop set, Midnight performed well on both rootstocks, although the fruit size was smaller (peak between count 88 and 72). The Valencia maturity range kicked off with Midnight as a mid-late selection for the intermediate production region, followed by McClean SL. Ending off the season for the Nelspruit area was Kobus du Toit Late, followed by Late and Jasi Valencia in middle to end of August.

The best options are Midnight and possibly McClean SL, followed by one of the late maturing selections determined by the maturity window and specific needs for the grower.

