

ROOTSTOCKS and scion varieties



Rootstocks can significantly impact scion variety behaviour. By Jon Roberts

Prioritising rootstock and scion cultivar selection equally, is critical to growers' decision making when planting an orchard, or deciding whether to remove or top-work it.

Speakers at the recent CGA Summit echoed the same narrative: we are navigating very tough times, but with the right tactics, the industry can turn the situation around. Sharing sobering forecasts for the citrus industry, the Bureau for Food and Agricultural Policy (BFAP) also offered various scenarios of change that the industry could apply to start seeing an improvement. Arguably, we haven't experienced such adversity since the last world war.

The scenarios presented by BFAP were of change targeting the different levels of our industry.

- At grower level: increase expenditure to improve packout percentage, higher class 1 export percentage and better count peak percentage.
- At industry level: industry coordination early warning market system to prevent oversupply into any one market.
- At government level: negotiation of more favourable trade measures, improved port efficiency, for example.

Achieving the targets set out in these scenarios could markedly improve the percentage of growers with a fair/favourable/good risk profile in terms of earnings before interest, taxes and amortisation (EBITA) p/ha.

Growers can tackle the criteria above within this season. But the outlook will



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A patch graph

Current outlook (no change)	Scenario with all three levers of change achieved
32% Good/favourable EBITA/ha	65% Good/favourable EBITA/ha
27% Fair EBITA/ha	24% Fair EBITA/ha

remain challenging (as illustrated), and it is critical that growers also confront the medium- and longer-term issues affecting their business. As stated in "No room for passenger cultivars" in the Dec'22/Jan '23 edition of the SA Fruit Journal, now is the time for growers to remove the "passengers" (i.e. oversupplied and old unwanted cultivars) from their businesses. This principle has been applied successfully with table grapes. Added to this is optimum production of healthy trees. Growers are advised to replace 5% of their orchards per annum to optimise tree age.

It is important for growers to know the effects of rootstock on the scion variety that they are planting or top working. The following are just some of the criteria to consider:

- Compatibility to scion
 - Suitability to soil
 - o optimum PH
 - o soil quality, heavy – sandy
 - o resistance to soil-borne pathogens and longevity, depending on age of trees in top work.
 - Production
 - o fruit set
 - o optimum yield
 - o fruit canopy/yield in terms of economics of management.
 - Quality
 - o colour development, internal and external maturity development
 - o internal juice quality, Brix-acid – ratio – juice percentage
 - o hanging ability
 - o size
 - o hanging ability, physiological effects, creasing, postharvest rind integrity, etc.
 - o certain rootstocks provide much more pigmentation than our current rootstocks.
- In Italy C22 has outperformed all rootstocks dramatically in terms of pigmented fruit.
- Disease tolerance of plant to HLB in future?
 - Economics: With the rising cost of production – specifically Chemical,

fertiliser and labour costs – a more compact tree will reduce costs due to:

- o ease of harvesting
- o ease of pruning
- o less tree canopy to spray and fertilise.

However, the compact tree must be as productive per hectare, compared to the current normal-sized tree.

Trials in SA and around the world show Sunki Benecke and C22 rootstocks to be achieving the required results in terms of a compact, high production tree in high PH replant soils. In the acid soils of the California Central valley, Rich 16/6 is



Above: Cultivar Day Left: Staff setting out rootstock trials



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becoming the rootstock of choice over Carrizo and Swingle.

The considerations are intricate and need a lot of thought. Therefore, rootstock selection on a 40-year-old orchard should not be reduced to what the nursery has available for you. This would be like taking a knife to a gunfight.

In recent years the CGACC imported several rootstocks (Bitters C22, Carpenter C54, Furr C57 and Rich 16/6) that are now being managed by CRI in trial sites around the country. CRI has imported more and cultivars to watch are 79AC and Cox. Those who attended Johan Joubert's CRI report back on rootstocks at the CRI Symposium would have heard that we are starting to get

the results that other countries have had. You may find this information on the CRI website, and do visit the next CRI workshops.

Interestingly the International Citrus Conference in Turkey at the end of last year included evaluation of the same rootstocks that are, in some cases, being planted commercially. Clearly one of the rootstocks to keep an eye on, C22, was commonly mentioned in various discussions and in presentations. As previously mentioned, cultivars – especially rootstocks – travel a long journey from breeding/discovery to evaluation to adoption by growers. Swingle rootstock took 115 years from breeding in 1907 by W.T. Swingle to the present, when it finally became the mainstream cultivar

that we know today. There are no "silver bullet" rootstocks. Please investigate the following (notwithstanding other site-specific criteria) when planning the scion/rootstock combination suitable for your farm:

- soil pathogen status (virgin or replant soil)
- compatibility with scion
- soil and water PH of your farm
- effect on productivity, fruit size, and canopy size
- effect of the rootstock (internal and external quality requirements of the scion)
- climate (e.g. some rootstocks are frost hardy)
- possible tolerance to certain diseases (HLB).

Fortunately, the citrus industry has the CRI evaluation team led by Johan Joubert. They have an intensive rootstock evaluation programme used to evaluate available rootstocks in all our climates – hot dry, hot humid, semi-desert, intermediate, cool inland, cold – for each scion type that is suited to that area (i.e. Midnight in Nelspruit/Karino area).

This value-adding work is due to growers' hard-earned carton levy, which makes them part owners of the data that it provides. Stay informed about the workshops, and grower demonstration field days where this technology transfer happens. Evaluators work hard throughout the country and are encouraged by growers' interest in their work. 🌱