

New cultivar excels on historic citrus farm

By Wouter Kriel January 25, 2022 at 2:25 pm

According to Errol Hewson, director of Riverside Kat River Farm, the relatively unknown Orri mandarin cultivar is shaping the future of the enterprise's citrus production.



Frost is a threat to Orri trees in the low-lying areas on the farm. *Photo: Wouter Kriel*

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The Roberts family planted the first citrus trees on the original Baddaford farm, outside Fort Beaufort in the Eastern Cape, in 1903. In 1908, the first fruit was exported in wooden crates.

Baddaford farm amalgamated with Riverside, owned by the Painter family, in the 1990s, and has been a citrus farm since then in the Kat River Valley. Errol Hewson, director of Riverside Kat River Farm of the Lona Group, manages 11 production units comprising 400ha of land stretching 20km along the banks of the Kat River. They produce around 14 000t of citrus per annum.

"We have productive navel orchards dating from the 1950s on the farm. Normally a citrus tree will give you 30 years of productive life, but it all depends on how you manage it from inception," Hewson says.

Lona Group purchased Riverside and surrounding farms in 2012 after becoming a shareholder in 2004, and has been implementing a rejuvenation process since then. The programme has two important focus areas: cultivar selection and water management for quality fruit. "We're building Riverside into a leading soft citrus, orange and lemon producer in the Eastern Cape," says Hewson.

"To be successful and sustainable, you need to have the correct varieties sought by the market, but you also need to be able to produce the fruit at the right time. Our area lends itself specifically to good-quality soft citrus and, as such, more than 50% of Riverside is planted to soft citrus varieties."

When Hewson joined the farm in 2015, it was planted to Satsumas, Clementines, navels, lemons, and Nadorcott mandarins. There were also 6ha planted to Orri, a late-ripening mandarin variety developed in Israel.

Orri

While Orri is not planted to the same extent as other late-mandarin varieties in South Africa, Hewson took a keen interest in this lesser-known cultivar. “

Orri now plays an important role in our long-term plans for the development of the farm,” Hewson explains.

Orri is a vigorous grower and produces fruit with very good taste and internal quality, says Hewson.

“The fruit also has a light, uniform orange colour, making for good presentation. It is harvested from the end of July to mid-August in South Africa.”

Orri trees are hardy, and resistant to *Alternaria* and citrus black spot. There have been reports from Florida in the US that Orri is also showing signs of resistance to citrus greening.

One of the reasons why farmers are still hesitant to establish this cultivar in South Africa is its reputation for difficulty in fruit setting. Added to this is its tendency towards alternate bearing.

“But we found these challenges can be mitigated with a good management programme. This includes correct pruning, girdling, and nutrition,” Hewson says.

The pruning schedule for Orri is more intensive than for Satsuma and Nadorcott. An initial late-winter pruning is important to open the trees to enable access to the inside of the canopy.

This is followed up with multiple sucker removals during the growing season. Pruning is crucial for light penetration, especially with older trees. This spreads fruit set throughout the canopy, and not only on the periphery. Branch girdling during full bloom is essential for good fruit set, and therefore access to the inner branches is an important consideration when pruning.

“A summer prune also recently gave us positive results. We discovered this as a result of COVID-19, which prevented us from following our normal schedule,” Hewson says.

Hewson recently visited Israel to see first hand how they manage Orri production.

“They seem to have less of a fruit size problem than we do. This may be because they hang their fruit a lot longer than we tend to do. I also realised that there are no silver bullets, as different producers have different approaches and views on the efficacy of the available strategies,” Hewson says.

Although the cold winters of the Kat River Valley enhance quality soft citrus production, it affects cultivar site options.

“We often experience frost in the low-lying orchards next to the river. This means that a late-ripening variety such as Orri cannot be established in these areas. We plant early varieties like Satsuma and Clementine in

these areas, allowing us to harvest before the winter cold sets in," he says. There is also a risk of trees dying from severe frost in the first year after planting.

"A local practice is to wrap the young trees in grass for protection. We also tried nappy liner fabric to protect the young trees, but grass seems to be best, as it is less restrictive to tree growth," says Hewson.

Rootstock and yield

All Orri trees on Riverside are from Troyer, C35 or Carrizo rootstock. New orchards are planted to a tree density of 555 trees/ ha, and trees are spaced 6m x 3m apart. The trees are kept at a height of 3,5m.

"I try to maximise growth during the first two years after establishing a new orchard, with the focus shifting to yield and fruit quality thereafter," Hewson says.

Fruit size and yield are managed with water and nutrient availability. "We try to avoid the setting of too big a crop on the 'on' year, as this will invariably exacerbate the alternate-bearing pattern the next year."

Leaf samples are taken in February, the results of which dictate the feeding programme for the year.

"We do another two follow-up leaf sample tests to see if the programme is working or if it needs to be adjusted. We believe that by keeping nutrient levels optimal for each growth phase during the year, fruit set is improved and alternate bearing is reduced for our Orri trees."

Hewson says they do not perform any fruit thinning. "I won't venture into reduction until I've gained more experience," he says. Timeous picking is also important, as this allows for the maximum resting period for the trees.

"We started with low Orri yields of between 15t/ha and 20t/ha in 2015, but this has increased to between 45t/ha and 65t/ha in 2020 for the same production units, and we are expecting an even higher yield for 2021. We are also seeing less pronounced alternate bearing [when] looking back over the past few years," Hewson says.

Markets

The commercial appeal of Orri is that it does not fall into the same retail lines as other widely planted late-mandarin varieties, and varieties are not competing against each other in certain market segments.

"Orri has excellent eating quality, with very few seeds. Retailers often select Orri as a 'finest line' product," says Hewson.

"At the same time, Orri benefits our basket of offerings. It fits in well with our greater marketing plan as the maturing window in our area does not clash badly with the other late-mandarin varieties produced in the earlier-ripening areas of the north of the country. Orri also travels and stores well, which adds to the favourable market response we've received so far."

Riverside has 40ha planted to Orri, and Hewson is planning to expand this in 2022.

Water management

Water management is the other crucial leg of Riverside's rejuvenation programme, Hewson says.

"Water is a challenge for all farmers in our area. "We are a member of the Kat River Water Users' Association and are, as such, dependent on water from the Kat River Dam, with its catchment in the Winterberg Mountains. Inflow for the past few years has been below average. In order to manage this situation, our goal is to optimise the use of water per kilogram of export fruit produced without affecting our yields and fruit quality. We realise that a key component towards sustainable farming in our area starts with water efficiency."

With that in mind, Riverside has embarked on a programme of cleaning and improving the holding capacity of the farm's dams, while at the same time revisiting its existing methods of irrigation.

"We find conventional drip lines and sprinklers to be inflexible and difficult to adapt to unique orchard or tree requirements. We also find both systems tend to aid soil compaction, particularly in areas of high silt content. In order to improve on these existing irrigation systems, we are in a process of converting our irrigation systems to low-volume dripper systems.

"So far, we have converted an established 30ha farming unit, which had a 1,6ℓ/hour double-drip system, to a low-volume drip system operating at an 1ℓ/hour flow rate. Included in this area is a new 15ha Orri unit."

Hewson says that low-volume drip irrigation limits water wastage to a minimum as water percolates past the plant's root zone, giving the tree exactly the amount of water it needs.

"The new system is fully automated and designed to work 24/7. This allows for more frequent, but shorter, water allocations. We can now irrigate the entire production unit over a 24-hour period, should the need arise.

"We also installed variable speed drive pumps to work in tandem with this system. We had to replace our water filters with finer ones to prevent blockages, as the drippers are smaller. This arrangement enables us to irrigate orchards according to age and soil type with complete flexibility," Hewson explains.

The low-volume drip system also enables Riverside to apply pulse irrigation. Pulse irrigation uses weather data and soil and crop information, together with soil moisture data, to calculate real-time optimal irrigation needs. To make use of this functionality, in-field weather stations and soil probes need to be integrated in the system.

"In the established orchard conversion, we replaced single-dripper lines with double-dripper lines. The dripper spacing remained the same at 1m, and the trees did not skip a beat in terms of health or yield.

"Moving from 1,6ℓ/hour drippers to 1ℓ/hour low-volume drip, together with the new scheduling, has realised a 20% water and electricity saving so far. Depending on what system you are replacing, these savings could be even higher," Hewson says.

For the new 15ha Orri orchard with low-volume drip, provision has been made for double lines, but only a single line is installed for the first two years.

Hewson also uses clamps to block the drippers between the trees where there are currently no roots. The clamps will be removed as the trees grow. For now, there is no water or plant fertigation wastage, as everything is focused on the existing root zones of the young trees.

Hewson is happy with the results of the low-volume drip system.

“The trees are responding excellently. The availability of water, as and when needed, even though it is low, has enabled us to keep a very good soil moisture profile. General tree health has improved because of improved root health. The growth of the young trees has been good. Because we use less water, the risk of overwatering is also greatly reduced.”

One aspect of the new system Hewson is still considering adapting is the inclusion of an automatic flush point to assist with keeping the dripper lines clean. Overall, he is motivated to continue installing more low-volume drip systems as the opportunity arises on Riverside.

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farmer's weekly

