

CGA CULTIVAR BRIEF

Rootstocks from Florida

JON ROBERTS

Up to the mid 18th century citrus trees were mainly grown from seedlings. With the spread of *Phytophthora* in sweet oranges began the budding of a scion onto sour orange as a rootstock. Then, in the early 20th century, Citrus Tristeza Virus (CTV) began devastating many regions where the sweet on sour orange rootstock combination was used. This led to the use of various Trifoliate rootstocks, and at present varieties such as Carrizo and Swingle have gradually become the most popular rootstocks as they ticked most of the boxes, including tolerance to Nematodes. More recently, as citrus development expanded into areas with climates, soil types, water qualities not previously recommended for citrus, the requirements have increased to rootstocks showing tolerance to PH, salinity, drought and temperature. Cultivars such as X639 and Sunki Benecke have shown promise in recent years. We now know that rootstocks also bring other advantages to the scion, such as improved yield, quality and size, and some cause earlier or later ripening.

After the devastating arrival of HLB in Florida, rootstocks again came into focus due to their apparent ability to assist scions, as they did with *Phytophthora* and CTV. The search has been on

in Florida for rootstocks which might help enhance the strength and disease resistance of HLB-sensitive varieties, as one of a multi-systems approach to manage the disease.

I visited Florida in January 2014, just after HLB had taken a firm hold of their orchards. I had been invited by Profs Fred Gmitter and Jude Grosser to visit and attend a fruit tasting display at the University of Florida, CREC. After the fruit tasting we visited the Indian River area. The devastation was depressing, as Vaughan Hattingh had warned me: "It looks like aerial sprayed Round Up." My assessment was that it now looked like Molopo had been added to the mix. One of the orchards we visited was on the farm of one of the top local farmers. The orchard was on 7 ha of five-year-old Star Ruby. Many trees had already died.

The farm owner showed us a tree that had him confused. We rounded a bend in the orchard and there it was, an "Escape Tree"! For whatever reason, the tree was completely asymptomatic, with excellent colour and crop that would be expected for an orchard such as this in its early prime.

RIVER BIOSCIENCE BRIEF

Investing in the future

ROB ELFICK

River Bioscience (RB) is a fully owned commercial subsidiary of the Citrus Growers Association (CGA) of Southern Africa. Its main objectives are to commercialise innovation, developments and detections arising from Citrus Research International (CRI) research, and to provide the southern African citrus industry with innovative and useful products aimed at improving global competitiveness. The insect culture establishment facility of RB, in Addo, was recently expanded. The expansion includes a dedicated research laboratory, quality control office, canteen and an additional production area which will allow for advanced research into commercial production systems. These systems will benefit our current development projects including four new viruses. The space is also critical to ensure that the commercial production of our new NPV virus is of the highest quality.

The skilled RB team has grown to make the best use of the development, with five new appointments made in the last two months. Miss Lumka Modonda recently joined RB from XSit, to fulfil a quality control co-ordinator role and Mathew Goddard, who has joined as our production researcher, heads up the team. The expansion will allow for continuous improvement in all areas of production and quality control, which is what we continually strive for and will help secure the future for our business.

XSit monitors on the move

XSit, which is wholly owned by RB, aims to provide a solution to the False Codling Moth (FCM) challenge in the citrus industry, through the application of the sterile insect technique (SIT). The distribution of sterile moths in the citrus orchards disrupts the



Jude muttered, "I still don't think this is a 'silver bullet'." I asked Fred what their thoughts were. He said that the often-repeated dogma regarding HLB and commercial citrus germplasm is that adequate tolerance or resistance does not exist. However, he described other similar incidents of "Escape Trees" that they had discovered in their trial sites. As a result of understandable pressure from the farming community for answers to this devastating disease, the UF/CREC Citrus Improvement has undertaken a massive natural HLB screening for potentially tolerant/resistant scions and rootstocks and some field observations suggest that HLB incidence is less common in some citrus cultivars when grown on specific rootstocks. Since then UF CREC has been testing these under controlled conditions, to confirm their tolerance to HLB.

On a recent overseas visit, I met with Prof Gmitter again where we discussed the possibility of importing some of these rootstocks that show potential. My argument was that SA needs to trial the rootstock now for commercial viability and also to satisfy the criteria discussed above, i.e. production, resistance to soil borne pathogens and abiotic stresses such as high PH, salinity,

drought etc. In this way we can screen varieties that meet the requirements for commercial production before HLB arrives in SA, even while their ability/potential for HLB resistance/tolerance is being determined.



Jon Roberts

Thankfully, Prof Gmitter was open to my suggestion and from there I made contact with CRI's Paul Cronjé. CRI's Cultivar and Rootstock Research Committee agreed to prioritise the screening of these rootstocks under SA conditions. Under the leadership of Paul Cronjé, CRI and UF CREC reached agreement in 2019. We are happy to hear that CRI have received import permits for the first rootstocks and the first batch of seed will arrive early this year. The first trees budded with Midnight will be planted out in 2021. We will await the results of these trials with interest in the coming years. ❀



mating process of the wild moths, thus eradicating the pest.

The two main operational functions in the orchards serviced by X-SIT are the releasing of sterile moths and the weekly monitoring of both sterile and wild moths captured in the traps. Releases are mostly done by helicopter, but some areas – mostly those under nets – require manual releases which are done by hand and facilitated by using quadbikes for transportation.

Monitoring was also always conducted by quadbike, which added up to 17 monitors. These would require transport by a bakkie-and-trailer configuration to specific areas from where it would be safe to operate the quadbikes, which cannot drive freely on main roads. The movement of quadbikes between farms connected by public roads had always been a logistical challenge. Therefore, it was decided to roll out a plan to replace the quadbikes used

for monitoring with motorcycles. The roll-out started with citrus orchards not covered by nets.

Monitors are in the process of high-level training to facilitate obtaining their licenses, and will be receiving accredited professional driving training, specific to rough terrain. The motorcycles are fully licensed and road legal for use on all national roads in SA. The motorcycles are also specifically designed for low speed farm related operations and the maximum traveling speed on open roads is mechanically limited.

We are very pleased to identify and mitigate risks and reduce complexity in the monitoring process, as well as to provide high quality training and skills development. This will ensure that the services we provide can be more effective and efficient and most importantly, conducted in a safe and responsible manner. ❀