Tissue culture rootstocks recommended when choosing the best apple rootstock for new plantings

Choosing the best apple rootstock for new orchard plantings is a critical decision that can significantly impact the health, growth, and productivity of your apple trees. Rootstocks serve as the foundation for the tree, influencing its size, vigour, yield and adaptability to various soil types and environmental conditions.

Choosing the ideal apple rootstock for new orchard plantings involves navigating the diverse options available, including those emerging from the Geneva-Cornell breeding programme and the use of tissue culture rootstocks for tree propagation. The introduction of new rootstocks from such programmes, coupled with advancements in tissue culture techniques, provides orchardists with innovative choices and propagation methods for establishing thriving apple orchards.

Currently, Hortgro funds rootstock evaluation trials in conjunction with Intellectual property (IP) licensees that empower growers with information to select the right rootstock for their situation. New rootstocks will be compared to a standard for their vigour class. For example, G.778 is the standard for vigorous rootstocks and M.9 is the standard for dwarfing rootstocks. The standard is the best representative of the vigour class and sets the bar for the performance of new rootstocks.

Sites for the evaluation of apple rootstocks are in the EGVV, the Koue Bokkeveld, and the Langkloof. New dwarfing-rootstock trials are also underway in the Highveld.

The availability of rootstocks through tissue culture propagation at Vitroplant SA has revolutionised nursery tree propagation and orchard establishment. Tissue culture enables the mass production of genetically identical, disease-free rootstocks, ensuring uniformity and reducing the risk of transmitting pathogen infections. This method allows for the rapid multiplication of rootstocks, meeting the demand for high-quality planting material while preserving the desirable traits of selected rootstocks.

When considering these advancements, orchardists must conduct a thorough assessment before selecting a rootstock. When choosing your rootstock, consider local conditions and evaluate your orchard site soil type, drainage, climate, and potential challenges like pests and diseases. Some rootstocks perform better in certain conditions, so choose those that thrive in your specific environment. While new rootstocks may offer appealing traits, compatibility with local conditions is important for success. Another crucial factor is the scion variety being used with the rootstock choice, the virus status and compatibility with the scion material. The Geneva rootstock varieties tend to be more sensitive to latent viruses and that could influence the performance and lifespan of planted trees.

Ultimately, there's no one-size-fits-all answer when selecting apple rootstocks. Orchard needs differ. So, aligning rootstock attributes with your orchard goals and environmental conditions is key.

By carefully evaluating these new rootstock options in conjunction with site-specific conditions and objectives, growers can select the right rootstock to establish thriving and resilient apple orchards for years to come.

Hortgro Science Rootstocks and Nursery Quality
https://www.hortgro-science.co.za/research-programme/rootstocks-nursery-tree-quality/

Fresh Quarterly
https://www.freshquarterly.co.za/publication/fresh-quarterly-issue-22-sep-2023/

VITRO plant SOUTH AFRICA
technologies for agricultural plants

For more information on rootstock choices, please contact Frederik Voigt at frederik@vitroplantsa.com. You may also visit www.vitroplantsa.com for the available range of crops and rootstocks.

HLB SAFE SYSTEM for citrus-tree production in nurseries

Worldwide, Huanglongbing is the most feared disease in the citrus industry. By Paul Fourie and the CRI Biosecurity Advisory Committee

Huanglongbing (HLB), or Asian Citrus Greening, is caused by the bacterium *Candidatus Liberibacter asiaticus*, which is mostly spread by the insect vector Asian Citrus Psyllid (ACP), *Diaphorina citri*. As a well-publicised example, HLB has destroyed >80% of the US Florida citrus industry, where growers did not strictly follow the best-practice control measures. There are no curative control measures, and the epidemic can only be effectively managed by a three-pronged approach: 1. Planting HLB-free trees, 2. Effective control of the insect vectors, and 3. Removal of infected trees. HLB control will fail if any of these three measures are not diligently implemented.

Preparing for the threat

Near SA, HLB and ACP have been reported in Mauritius, Reunion, and more recently in Kenya in East Africa. It is unlikely that HLB will be eradicated or contained in these countries, and it is expected that the disease will spread, following the natural range expansion of ACP along the east coast of Africa. Therefore, it is not a question of "if", but rather "when" ACP and thereafter HLB will arrive in SA.

To prepare for the dreaded incursion, the CRI Biosecurity Advisory Committee has developed an HLB/ACP Action Plan for SA. The plan was adopted by an HLB Steering Committee on which DALRRD and all relevant stakeholders are represented. In short, it specifies the required surveillance and control measures, and associated actions, once HLB or ACP has been detected. These measures are specific for different incursion scenarios, viz. incursion of ACP only, HLB only, or ACP and HLB.

Following detection, a quarantine zone will be demarcated, surrounding the positive find site. Mandatory control measures will be ordered (insect vector control and/or removal of infected trees), and movement of citrus propagation material will be prohibited. Thus, landowners, including nurseries, inside quarantine zones will not be allowed to move any citrus vegetative material or trees.

The need for HLB-free trees

Planting of HLB-free trees is one of the pillars of the three-pronged approach for effective HLB control. HLB-free trees can be produced in insect-secure nurseries, where trees are protected from insects vectoring the HLB bacterium. Most citrus trees in SA are not produced in insect-secure structures. To incentivise the expensive transition to insect-secure structures, and to promote industry readiness for HLB, the HLB Safe System for the production of citrus trees in nurseries was developed as part of the HLB/ACP Action Plan.

Qualifying nurseries must be certified by the Citrus Improvement Scheme (CIS), using CIS-approved propagation material exclusively. HLB Safe nurseries must preferably be located away from citrus orchards and must comply to specified infrastructural and operational requirements aimed at preventing HLB transmission to trees. Various levels of compliance are recognised, depending on the nursery's distance from citrus trees, which influence the risk assessment under the various incursion scenarios.

The Action Plan makes provision that HLB Safe nurseries in an ACP and/or HLB quarantine zone might officially be permitted to move citrus trees to pest-free areas.

First HLB Safe nursery in SA

Komati Fruit Nurseries outside Malalane (Fig. 1) is a purpose-built citrus nursery that follows specific guidelines for HLB Safe compliance. The nursery has capacity to produce around 150 000 citrus trees, all inside insect-secure structures that are >1km away from the nearest citrus orchards. Since November 2021 Komati Fruit Nurseries has been approved by CRI as a level 1 HLB Safe nursery.

To distinguish the HLB Safe compliant nurseries, CRI developed an HLB Safe™ certification trademark. HLB Safe nurseries can use the trademark on communications, and it will also be incorporated on the CIS Tree Certificate to indicate that the certified trees were produced in an HLB Safe nursery.

Komati Fruit Nurseries

The HLB/ACP Action Plan and HLB Safe System documents can be downloaded from the CRI website https://www.citrusres.com/public-downloads/ under the Biosecurity folder or can be requested directly from CRI Biosecurity Manager Paul Fourie at phf@cri.co.za.