

PRACTICAL GUIDELINE FOR THE HANDLING OF POTTED NURSERY TREES FROM TRANSPORT TO ESTABLISHMENT

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Transport and Reception

- Confirm in advance with the nursery when the trees will be delivered or need to be picked up.
- If trees are not transported in bins, ensure that the freestanding trees are upright and fastened.
- Ensure that the potting mix is moist before the trees get loaded for transport.
- Trees should preferably not be transported on hot days, but if no alternative exists, it should be done early in the morning or late in the afternoon. Long distance transport should take place overnight. Also, trees must not come into contact with the canopy or roof of the vehicle and not be transported under a tarp during a hot day as the upper part of the trees can be damaged by the heat if the vehicle is in the sun for a long time.
- Potted trees that are planted in autumn can be transported with intact leaves and should not stand in direct wind as it will cause dehydration.
- Avoid potential damage to the buds, bud union or leaves by rather handling the pot and not the trunk of the tree. Containers such as the Ellepot™ are best handled at the base.
- Ensure that there is a suitable area to unload the trees.
- Trees should preferably be passed on from the delivery vehicles, rather than being dropped off on their root systems.
- Make sure that the correct trees are received.
- Identify and remove all infested/diseased/physically damaged trees.
- If the trees are not going to be planted immediately, ensure that it is stored in a cool and partially shaded area. Trees should preferably be stored off the ground, for example in pallet bins or on pallets.
- If the trees are stored temporarily, check the moisture level of the growing medium daily and ensure that it's adequately moist. Be careful to not over-irrigate the containers.

Orchard Preparation

See *Practical guideline for the handling of bare rooted nursery trees from lifting to planting* for recommendations.

Planting time

Potted nursery trees can be planted any time of the year, although it is not advisable to plant in the extreme heat of summer. It is recommended that potted trees be planted in late autumn/ early winter so that the trees can establish and develop a decent root system through the winter before taking off in spring. However, if additional chill needs to accumulate before planting, cold storage might be required.

Planting in late autumn/ early winter

- Growth cessation and defoliation
 - Growth cessation of potted nursery trees should preferably take place in early autumn, before planting, (naturally or induced by, for example, reducing water and nitrogen) to ensure that the trees are planted in the dormancy induction phase where:
 - Terminal and lateral buds develop;
 - Reserves build up;
 - Trees harden off in preparation for winter and the entrance into endodormancy.
 - Trees are planted with intact leaves and should therefore be handled with great care during the planting process to minimize stress.
 - If potted trees are to be defoliated prior to transport or to facilitate cold storage, defoliation should be delayed for as long as possible, preferably 6-7 weeks after terminal growth cessation, to ensure that adequate reserves build up for re-growth in spring. A shorter period between growth cessation and defoliation can result in significantly weaker growth after planting and greater sensitivity to cold- and rest breaking damage. It can also result in re-growth following defoliation which would be very detrimental to tree quality.
- Planting process
 - Make planting holes immediately before planting and avoid flattened walls (pot effect) as it will restrict root growth and cause water accumulation and the resultant drowning of the roots.
 - Monitor potted plants often before planting and ensure that the potting mix is moist just prior to planting.

Observations thus far indicate no noteworthy differences in the

performance of trees planted with or without their potting mix. It is, however, recommended to gently loosen the outer root ball, especially in case of big differences in potting medium and soil texture. Note that removing the potting medium can damage the root system thereby creating entry points for pathogens. Removing the potting medium while trees still have leaves may cause dehydration.

- Pot bound roots seldom occur in plastic containers with no air pruning, but should be removed if present.
- Insert a shovel full of soil into the planting hole and spread the loosened roots on it.
- Fill the rest of the planting hole with soil and water simultaneously to ensure that good contact between the roots and the soil is maintained. A 20 L container as well as a water cart must always be on hand.
- Plant the trees with their graft unions approximately 10 cm above the soil/mulch. An exception may be with example M.9 or other dwarfing interstems where the grower might want or do not care if the interstems root.
- After planting, most of the tree roots will still be in the containerized area for the first couple of weeks. It is thus very important to monitor the moisture level of the potting medium of randomly selected trees and irrigate the containers accordingly until the tree roots have penetrated the surrounding soil.

Planting in late winter/ early spring

- Growth cessation and defoliation
 - See *Practical guideline for the handling of bare rooted nursery trees from lifting to planting* for recommendations.
- Storage in cold room (Optional)
 - Ensure that the trees are clearly tagged.
 - If trees are stacked in bins during storage, don't stack more than two layers per bin. More layers will hinder optimal moisture management during storage.
 - Store trees for approximately 6-8 weeks before planting.
 - Ensure that the pot medium is always kept moist.
 - Ensure that the temperature and relative humidity of the cold room do not deviate from the best management practice.
 - Preferably store between 2 and 4 °C to ensure that enough positive cold units accumulate.
 - Under no circumstances should trees be stored together with fruit at

- 0.5 °C as no effective chilling will accumulate.
- Ensure that the optimum high humidity is maintained in the cold room
 - as close to 100% as possible.
- The main aim of cold storage is to accumulate chill. Although cold storage can also serve as temporary storage while the orchard is prepared for planting, trees should under no circumstances sprout while in the cold room and therefore the trees should not be stored for too long. White roots are very brittle and easily damaged during planting, while etiolated shoots that develop in cold rooms are extremely sun sensitive.
- Planting process
 - It is crucial that the trees do not sprout before planting.
 - See *Planting process of Planting in late autumn/ early winter* above.

Establishment

- Ensure that all trees, especially tall trees, are supported/ fastened after planting as fastened trees will grow faster and invest less (of the initially very limited) energy in supportive wood formation. Fastening of trees also prevent potential girdling that can take place in rocky soils due to movement in the wind.
- Consult your technical advisor on the appropriate rest breaking treatments for the young trees.
- Ensure that the drippers/micro-sprinklers are placed optimally (over the root zone) so that the root systems are always kept moist. Preferably, position the dripper spikes in the containers.
- Consult your technical advisor/soil scientist on the optimal irrigation level and scheduling for the orchard.
- Fertilisation:
 - Ensure that the fertiliser/manure is not applied directly against the bark as it can result in toxicity, trunk burn and even girdling.
 - Consult your fertiliser expert regarding an optimal fertilisation program.
- Weed management and pest- and disease control:
 - Consult your crop protection specialist to perform the best management practice.
 - Ensure that the tree trunks are protected against herbicides.

This guideline was compiled from previous articles published in the *Fresh Quarterly*¹ and *South African Fruit Journal*², a guideline drafted by Angelique Pretorius (Technical Manager, Kromco), and with input from Shaun Biggs (Ellepot® SA), F Ungerer and N Kapp and the "Quick Start" Planting and Care Instructions from Sierra Gold Nurseries³.

¹ Bestbier, G. 2020. Get a handle on new trees. *Fresh Quarterly*, December, pp. 10-11. Mouton, A. 2020. To pot or not. *Fresh Quarterly*, December, pp. 12-13.

² Steyn, W. and Theron, K. 2015. What are the physical characteristics of a good nursery tree? *SAFJ*, October/November, pp. 63-65.

Theron, K. and Steyn, W. 2015. What are the physiological characteristics of a good nursery tree? *SAFJ*, December/January, pp. 64-67.

Steyn, W., Theron, K. and Ungerer, F. 2016. Nursery trees: When is it not the nurseryman's fault? *SAFJ*, June/July, pp. 66-69.

³ <https://www.sierragoldtrees.com>

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