

SAPPA – GUIDELINES, CLASSIFICATION AND STANDARDS FOR PECAN NUT NURSERY TREES

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1. Objective

This guideline has the following objectives:

- To set guidelines for the root system, a classification according to size and general standards that are applicable to all nursery trees.
- To inform people who want to plant trees what to look out for when buying nursery trees.
- To serve as basis for the agreement between the nursery and the buyer.

Young trees often exhibit a low survival rate in the first year after planting. Poor management is the biggest contributor, but the quality of trees may also be the reason. Pecan nuts are a long-term investment and it is therefore critical to obtain trees that meet the minimum standards.

It is necessary to distinguish between dormant open root trees that are planted in July and August and container trees that can be planted at any time. The advantages and disadvantages of these two types will be dealt with separately. Most of the trees, which are commercially available in South Africa are open root trees. Because container trees can be planted throughout the year it is mostly used for domestic use and as replacement trees.

Definitions and Abbreviations

Commercial orchard: An orchard planted for the purpose of production and trade of pecan nuts

SAPPA: South African Pecan Nut Producers Association NPC

DAFF: Department of Agriculture, Forestry and Fisheries

2. Guidelines for the root system

2.1 Ratio of root to stem

The most important factor to determine the quality and ability of nursery trees to survive, is the root to stem ratio. Based on mass the ratio of roots to the stem, after both have been cut back for planting, should be at least 2:1. To achieve this the stem can be cut back four buds above the graft union.

2.2 Multiple tap roots

Multiple tap roots are not inferior to a single tap root and may even assist with the survival of the tree. It is however important that the planting hole is big enough to accommodate the roots.

2.3 Side roots

Side roots improve the ability of the tree to start growing sooner. With little or no side roots the tree has to use reserves to form side roots before proper above ground growth can start. Hair roots are not important as new hair roots are formed continuously. Side roots can be cut shorter to stimulate growth.

2.4 Unacceptable deviations of root systems

- **Cut off too short**

The tap root should be at least 500 mm long for small trees and longer for larger trees (Refer to table 3.1), it may not be cut shorter than this. The reserves of pecan trees are stored in the tap root, if it is cut shorter the tree will not have enough reserves for satisfactory growth after transplanting and may even die.

- **Damaged tap root**

Should the tap root be seriously damaged during the removal from the seed bed, it will be detrimental to the effectiveness of the root and will allow pathogens to enter the root. If the root has to be shortened sharp pruning scissors or knife has to be used and not a blunt object like a spade.

- **Goose neck**

A goose neck root is formed when a tree with a thin, soft root is planted and the root first grows upward and then turns down or the root grew in a circle in the nutshell. This can influence the production of the tree in later years and can alter sap flow and in serious cases trees may die.

- **Nematodes**

If trees show any deviation on the root system that indicate an infection of nematodes, it is not suitable to plant in orchards. The prevention of nematode infection in new orchards is very important.

3. Size classification for all pecan nut trees

- It is better to classify trees by stem thickness rather than length because the length of trees differ between production regions. It is also recommended that trees are cut back for better survival which makes length an unreliable measurement for classification of size.

Classification is done by stem thickness measured 20mm above the graft on new growth. The original graft cutting may not be included, only new growth above the graft union.

3.1 Size classification

TABLE 3.1 Size Classification

	Diameter of new growth 20 mm above the graft union (mm)	Minimum root length (mm)	Minimum container height (mm) (Container trees)
Small – Refer 3.2	6 to 8	500	550
Medium	>8 to 15	600	650
Large	>15 to 22	700	750
Extra Large	>22 to 30	800	850
Over Size	> 30	> 1000	

3.2 Small and Over Size

It is recommended that small trees are only traded when there is a **written** agreement between the buyer and nursery. Small trees need special care when they are transplanted.

Trees with a stem thickness of less than 6 mm (20 mm above the graft on new growth) are **not suitable for the market**.

Over size container trees are not recommended for commercial orchards.

Oversize open root trees must be removed with a minimum tap root of 1 meter. Such a big tree is difficult to transplant because the planting hole should be big enough. It is also difficult to package such a big tree and keep the roots moist. Oversize open root trees should be sold only upon specific **written** agreement.

When different sizes are not sold separately an indication should be given between the quantity ratio of small to medium and medium to large and extra large trees of each order.

4. Seedlings

Seedlings are not recommended for commercial orchards at all. If seedlings are sold it has to be specified **in writing** that the trees still have to be grafted after planting. If seedlings are not grafted it is not suitable for commercial production.

There is no colour code for seedlings. Colour codes indicate the different cultivars of the grafts union. Refer to the SAPPA website for the codes. <https://www.sappa.za.org/sappa-kleurkodes-vir-kultivars/>

5. Minimum standards for all pecan nut nursery trees

1. The diameter of the stem, measured on the new growth 20 mm above the graft union, must be at least 6 mm for small trees and more for bigger trees.
2. The new growth above the graft union of all trees must be at least 300 mm. Trees that do not meet this requirement **may not be sold**.
3. Root length must be at least 500 mm for small trees, and more for bigger trees.
4. A root to stem ratio of 2:1 based on mass must be achieved when the stem is cut four buds above the graft union.
5. Roots may not be twisted or knotted as this will constrain sap flow.
6. The graft union should not be higher than 1000 mm from the ground level.
7. Graft strips should be removed and trees may not be strangulated at the graft union. The wind could break such trees at the strangulated position.
8. The graft union should be well attached. This is especially important with small trees.
9. Each tree should be clearly marked with the standard cultivar colour code, using PVA paint. Refer to the SAPPA website for the codes. <https://www.sappa.za.org/sappa-kleurkodes-vir-kultivars/>
10. To ensure that trees can be planted at the right level, a thin white line should be painted at the root crown (where the root and stem comes together).
11. It is very important that trees are true to cultivar type to ensure no incorrect cultivars are distributed and that buyers get what they pay for.
12. Trees must be visibly free of any pests and diseases such as nematodes, aphids and scale.

6. Open root trees

6.1 Minimum standards for open root trees

- The packaging material must cover all the roots and be kept moist.
- The root crown may not protrude from the bag.
- Wood shavings and/or artificial moist releasers may be used.

6.2 Advantages of open root trees

- The price of open root trees are normally lower than that of container trees of the same size due to the lower input costs.
- The roots are visible and can therefore be inspected before planting.
- Open root trees are on average bigger than container trees.
- Transport is substantially easier and cheaper. Between 20 and 100 times more open root trees than container trees can be loaded onto a vehicle.
- Due to the availability of open root trees it is more suitable for large commercial orchards.
- Mechanical handling is possible and also preferable, especially in larger nurseries.

6.3 Disadvantages of open root trees

- Open root trees can only be planted when the trees are dormant during midwinter (July and August).
- The tap root may have been cut off too short.
- Trees that are stored too wet or too warm will bud early.
- The roots may dry out due to faulty packaging and/or handling during transport.
- The management after planting is important to prevent trees from dying back. Trees that die back and start growing under the graft union, shall be classified as seedlings and should be replaced or grafted.

7. Open root trees that are replanted in containers

- Open root trees that were recently replanted into containers shall not be sold as container trees.
- Open root trees must grow at least one growing season in the container to ensure sufficient side root development.
- Should recently replanted open root trees be sold it may only be done with a specific **written** agreement between the nursery and the buyer. Such trees have to be planted with special knowledge and management.

8. Container trees

8.1 Minimum standards for container trees

- The containers of container trees must be at least 550 mm high for small trees and higher for larger trees.
- The diameter of the containers should be at least 150 mm but preferably 200 mm.
- Trees in containers should be well established with sufficient side root development. Recently replanted trees should not be sold. Refer to point 7.
- The root crown (where the root and stem comes together) of container trees must be lower than ground level to ensure that the sun does not damage the tree after replanting.

- Containers trees should be at least 500 mm in height above soil level.
- If root clogging has taken place the container tree may not be replanted into a bigger container. If this happened the trees **may not be sold**.
- If containers do not meet the minimum requirements (3.1) the trees **may not be sold**.

8.2 Advantages of container trees

- Better survival rate after planting.
- Container trees can be replanted throughout the year and are not limited to a specific season.
- Minimal disturbance to the roots.
- Fertilizing can start directly after planting if hair roots remained intact.
- Minimal drying out of roots during transport.

8.3 Disadvantages of of container trees

- The roots of container trees cannot be inspected.
- If the tap root turns at the bottom of the container it has to be cut off above the turn
- Transporting container trees are very expensive due to the volume and weight of the containers.
- Limited numbers of container trees are commercially available.