



AVOCADO NURSERY AND SEEDLING PRODUCTION



Introduction

Farmers can establish their avocado orchards using own local seeds or can source seeds from their neighbors, but which give low yields. Through grafting technology, farmers are able to access improved avocado planting materials. Grafting has been identified as one of the most effective means of propagation of improved planting materials. It is a skill that can be acquired by almost everybody. It only requires practice to be able to perform and gain confidence. As agricultural production becomes increasingly commercialized and global food markets more competitive, farmers need to invest in improved avocado varieties for high yields and sustainable income

Avocado Informal Seed System

Majority of the farmers have no access to grafted seedlings or even registered nurseries and depend on informal seed system.

This system is characterized by the following:

1. Does not provide the quantities of the seed required
2. The seedlings produced using informal seed systems is usually of poor quality
3. The seedling quality is not assured
4. The farmer depends on trust that the variety is true to type.
5. No serious selection is carried out to choose the best mother plants for scion or rootstock
6. Most of the informal avocado seed system is run by untrained nursery operators
7. Informal seed system is known for mixed varieties

Avocado Formal Seed System

Formal avocado system has the following characteristics:

1. Registered by the relevant authorities (HCD, KEPHIS).

2. Subject to systematic inspection by KEPHIS
3. Been inspected and certified.
4. Produce quality planting materials.

Nursery Media Composition

There are various materials used to prepare soil and soilless media for field and container nurseries

Selecting a good growing medium is fundamental to good nursery management and is the foundation of a healthy root system

Soil

Soil - Compost Manure 1:3

Soil –Compost Manure -Sand 1:3:1

Vermiculite - Coco peat- Sand 1:2:1

Sand – Perlite – Compost Manure 1:1:2

Perlite – Coco peat – Sand 1:2:1



Soil and sand mixing for a soil compost sand media



Coco peat (dark), perlite, (brown) and lime (white) mixing for the perlite coco peat sand media

Nursery Site Selection

Factors to consider:

- Should be near source of adequate quality water.
- Should be well drained with access roads.
- Should be protected from animals/fenced, wind and other hazards.
- Should have access to the markets.
- Should have access to known mother plants.



Nursery Propagation

Rootstock

Avocado is preferably propagated by grafting onto rootstocks that are resistant to *Phytophthora* root rot and are tolerant to saline and calcareous soils. Select healthy, eggs-sized seeds and plant them in boxes or seedbeds with adequate drainage. Plant the seed with the broad side down. Immediately after germination (takes 3 to 4 weeks), transplant the seedlings into 9 Inch tins, pots or polythene bags. Water them until they attain a pencil -size thickness, at which stage they should be grafted.



Avocado seed



A stack of avocado seedling in a nursery

Grafting

The top wedge-grafting (cleft graft) method is recommended since it is the most successful of all methods. Grafting should be done at the point where the rootstock is soft and tender. The scion should be dormant at the time of grafting and should be of the same thickness as the stock. Wrap firmly with a polythene strap to exclude water from the graft union. Keep the grafted material under shade. Grafted seedlings come into bearing years earlier than ungrafted seedlings.

Grafted seedlings have the following advantages:

1. Come into bearing 3 years earlier than un-grafted ones
2. Tends to spread out as compared to un-grafted ones, which tend to grow upright
3. Tends to be shorter and thus easier to harvest or spray
4. Maintain the desirable characteristics of the mother plant e.g. fruit quality

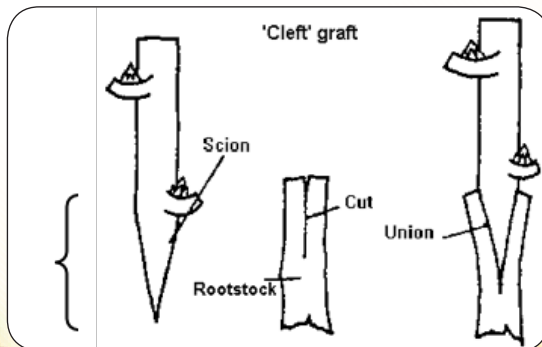


Well-formed fruits

Top Wedge or Cleft Grafting

Procedure

1. Make a 3 cm wedge cut into the scion (Figure 2a)
2. Make a 3 cm cut into the rootstock. Ensure that all cut surfaces are smooth.
3. Fit the scion and rootstock and align scion and rootstock cambium.
4. Tie and wrap the graft union with plastic wrap. A plastic bag may be used to cover the scion and graft to prevent desiccation.



Scion, left; rootstock, centre; scion and rootstock right

Nursery Inspection, Registration and Certification

- Certificates are issued only after Nurseries have been inspected by relevant authorities and passed for compliance.
- The process involves a systematic evaluation of the Nursery's compliance with the requirements for domestic and/ or international movement of nursery stock.
- These **evaluations/ inspections** are done on regular basis.
- Legislative Authority is the Plant protection Act.

Registration Process

Nursery Operator

Applies for Inspection, Registration, and Certification from horticultural crops directorate (HCD).

HCD - Inspects; Registers and Issues the Nursery License

KEPHIS- Inspects Issues an inspection report and a Nursery Certificate

Importance of Inspection and Certification

Nursery Certification process involves inspection, registration, licensing and issuance of certificates.

Why it is necessary?

- Helps prevent pest introductions into the country and between farms through planting materials
- Ensures compliance with HCD, GAP and other relevant standards
- Facilitates access to high-value local and export market



A nursery inspection session

Import Nursery Inspection

To import planting materials for nursery, an inspection must be carried out to ensure the following:

- Freedom from all regulated quarantine pests
- Practical freedom from non-regulated pests
- Materials must be grown using soilless media
- Materials must meet all the requirements of the importing country
- Importer must apply for and obtain the Phytosanitary certificate
- Importer must submit business registration documents and a Plant Import Permit



Non Compliance

- No certificates issued
- Nursery Stock Notice of Noncompliance issued
- Warranty of material treatment/ destruction signed
- Materials marked with no sale tags
- Big losses experienced

Reference:


(<http://www.plantwise.org/KnowledgeBank/CountryHome.aspx>)

www.kalro.org

Experts: Eliud Gatambia, Antony Nyaga ,J.K. Njuguna, (KALRO Kandara) and Dr. Lusike Wasilwa (KALRO sawarters),







Expert(s) Contact Details: eliudgatambia@yahoo.com, Lusike.
Wasilwa@kalro.org, Antony.Nyagah@kalro.org, John K. Njuguna
@kalro.org

Editors: Nyabundi K W., Mukundi K., Maina P., Wanyama H.N.,
Kibuci N.K.,

For Further Information

Director, KALRO HRI
director.hri@kalro.org

KALRO CALL CENTRE: 0111010100

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