

Technique for Propagation of *Melia volkensii* through Grafting for Seed Orchard Development

Introduction

Melia volkensii is one of the flagship tree species identified for domestication and rehabilitation of drylands of Kenya. The selection of the species is based on its fast growth, drought tolerance, multiple uses and production of high quality timber that is termite resistant. Due to these characteristics the species has been over-exploited both from the wild and on farmlands. To conserve the tree species urgent measures that will provide adequate propagation materials are required.

Technique definition

- Multiplication of *Melia volkensii* through grafting.
- Breeding of a plant specimen by natural processes from the parent stock.

Purpose

- Shorten tree fruiting period.
- Establish a seed source of superior germplasm.
- Develop superior germplasm of *M. volkensii* through propagation of species with desirable properties.
- Domestication of an indigenous tree species for timber plantation development.

Advantages

- Fast growth rate.
- Higher survival rate.
- Quality seed production.
- Useful in rehabilitation of degraded lands.
- Serves as a source of income.

Disadvantages

- Labour intensive.
- Needs skilled labour.
- Seed and scion loose viability fast.
- The process is expensive.
- Requires highly regulated temperature and moisture conditions.

Procedure for vegetative propagation

Propagation of rootstock

- Identify mother trees with desired traits (height, good branching, straight-bole, health).
- Collect only mature fruits (yellowish with brownish patches).
- De-pulping the fruit using a pestle and mortar.
- Wash the nuts and sun-dry.

- Crack the nut using a sharp knife inclined to a makeshift wooden board.
- Extract the seeds from the cracked nut.
- Nip the sharp tip of the seed as a way of pre-treatment.
- Soak the seed in cold water for at least 12 hours.
- Prepare sowing beds using sterilized sand.
- Sand sterilization may be by chemical method or by baking.
- Sow the seed and cover with transparent polythene sheet to generate and maintain high temperatures.
- Ensure that moisture is always constant.
- Wait for 7 days to expect germination and emergence.
- Remove the polythene sheet but maintain shade.
- Prick out the young seedling into polythene bags which are under a shade.
- Take seedlings out of the shade for hardening.

Procedure for grafting

- Identify candidate plus trees from the wild or farms. The selected trees should be larger in height and diameter, have straight stem and free from insect pests and diseases.
- Collect scions from mature, healthy plants with known traits.
- The scion should be same diameter with the root stock for compatibility purposes.
- Grafting should be done within 2 days of scion collection.
- Grafting should be done during the dry months to reduce possibility of fungal attack.
- The scions are grafted onto the seedlings raised from seed.
- When seedlings reach 30 cm (1 ft) in height they can be planted out.
- Dig planting holes before the onset of the rains at a spacing of 6 m x 6 m. Planting holes should measure 45 cm in depth, 45 cm width and 45 cm length.
- Mix the top soil from the planting hole with charcoal dust and put back into the hole.
- Plant seedlings during the rainy season.

Dos





- Use a sharp knife for all cutting.
- Clean or sterilize the knife after every graft.
- Graft during the dry season.
- Ideal temperature and moisture must be maintained after seed sowing to enhance germination.
- Use sterilized sand for sowing root stock to avoid fungal attack.
- Collect mature fruits from healthy parents for the root stock.
- Harden off seedlings before out planting.
- Maintain seed orchard through activities such as disease control to ensure adequate and quality seed production.

Don'ts

- Do not use unsterilized sand for seed sowing.
- Do not use blunt and contaminated knives.
- Do not plant out seedlings without hardening them.
- Do not collect immature seed.
- Do not pick seed from the ground if it is for progeny trials.

Conclusion

Follow the prescribed procedure to ensure high sustained success.

 <p>Candidate Plus Tree with straight stem</p>	 <p>Processing Melia seeds</p>
 <p>Melia seedling in a nursery</p>	 <p>Fruiting Melia orchard trees</p>

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