

Technique for Propagation of Macadamia Nut Seedlings in Greenland Agroforestry Nursery at Gakoe in Kiambu County, Kenya

Technique definition

Propagation of macadamia nut seedlings through grafting of *Macadamia integrifolia* as scion onto *Macadamia tetraphylla* root stock

Purpose

To shorten time taken for flowering and fruit production as well as to increase productivity

Advantages

- Reduces time taken for tree to produce fruits.
- Increases productivity of tree.
- Allows for establishment of desired varieties.
- Induces dwarfing.

Disadvantages

- Needs skilled personnel.
- Produce few seedlings at a time since the process of grafting is time consuming.

Procedure

Preparation of root stock (*Macadamia tetraphylla*)

- Obtain clean *Macadamia tetraphylla* seed (nuts). The seed should be fresh, not more than 4 months old, well matured, and of high germination potential.
- Soak the seed in cold water for 12-24 hours to break dormancy through softening of the hard nut.
- Prepare a seed bed using river sand. The bed should be prepared in a tunnel.
- Sow directly in the seed bed or pots with soil and sand mixed at a ratio of 1:3.
- Sow seed with the white spot of seed facing down.
- Cover the tunnel with the transparent polythene sheet to create and maintain adequate temperature and moisture for the seed to germinate.
- Wait for 21 days for seeds to germinate while watering every 2 to 3 days.
- Open the tunnel and leave the seedlings under shade for 7 days to acclimatize and harden-up and continue watering.
- Remove the seedlings, which will form the root stock, to grow outside the tunnel for hardening off.

Grafting

- Allow the root stock to grow until the stem attains a diameter of 1-1.5 cm.
- Identify a reliable source of scion.
- Plan when to collect the scion and to graft.
- Collect scions from mature healthy *Macadamia integrifolia* trees.
- Select 1-1.5 cm thick scions from the end of the branches as it is softer and of a similar diameter to most root stocks.
- Cut off the top of the rootstock leaving a seedling of 20–40 cm above the potting mixture or soil.
- Make a clean V-cut down the centre of the stem of the root stock to about 2-3 cm deep
- Make a wedge cut on the base of the scion.

- Insert the wedge on the scion into the V-cut root stock and make sure they fit well.
- Tie the fitting parts together with a thin polythene stripe to ensure they are fastened together.
- Remove any buds below the union of root stock and scion.
- Cover the grafted seedling with the polythene tube to reduce water loss until bud sprouts
- Shoots will occur 3 weeks after grafting after which the polythene sheet can be gradually removed but seedling to remain under shade.
- Remove grafting polythene stripe from the graft union 4 months after grafting.

Dos

- Choose and cut scion only from mature trees.
- Use a sharp knife to make all the necessary cuts.
- Ensure the nuts are well soaked in water to reduce coat hardness before sowing.
- Ensure the stem thickness of the scion is not less than 1 cm in diameter.
- Ensure all the buds below the union of root stock and scion are removed.
- Cover the grafted plant well to reduce water loss.

Don'ts

- Avoid exposing the grafted seedlings to direct sunlight.
- Do not use blunt tools or unsterilized tools during grafting.
- Do not collect immature scions.

Way forward

- Be introduced to a more innovative way of propagation to enhance successful grafting.
- Treat the enterprise as a business by having a business plan.
- Work closely with the Ministry of Agriculture in order to get advice on; recommended varieties to propagate, agronomic practices, harvesting and post-harvest handling as well as marketing opportunities.



Mature macadamia tree



Wedge grafting technique



Grafted macadamia seedlings



Growing macadamia seedling in polythene tunnel



Macadamia grafts put in the sun to harden



Macadamia nuts on a tree

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