



Acknowledgement

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- Using a slicing movement cut the basal end of the scion into a wedge .
- Insert the scion into the rootstock, ensuring a tight fit. It is most important that the green rings of both scion and rootstock match perfectly.
- Firmly tie up the graft, using thin plastic strips.
- Cover the graft with a plastic bag or move the grafted plant into a greenhouse. Keep the newly grafted plants under shade. The graft should take within 4 to 6 weeks, by which time new leaves will be sprouting from the scion.
- Remove any shoots that might develop on the rootstock.
- After 6 to 8 weeks, remove the plastic cover and move the plant from the greenhouse into a shaded area. Gradual hardening off to full sunlight is important (do not immediately place the plants where they will be exposed to hot sun for hours).

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Production of marula (*Sclerocarya birrea*) seedlings



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Department:
Agriculture, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA

Common names: Marula, Maroela, UmGanu, Nkanyi, Morula, Mufula

Background

Marula fruit forms an integral part of the livelihood of rural people in Africa as a diet supplement, especially during periods of drought and food shortage. The marula trees grow naturally and are mostly found in the wild because of lack of technology for domestication.

Marula trees are raised from seeds but propagation (reproduction) can be achieved vegetatively through cuttings and grafting. Seed germination is generally at a low rate because of dormancy and therefore it should be broken to ensure good germination. It is reported that storing the seeds for one or more years may also increase the germination rate.

Vegetative propagation is an attractive option for marula production because farmers are more interested in female trees than male ones. It also allows farmers to select a tree with superior qualities. Vegetative propagation with cuttings has been successful.

Seed propagation

Fruit collection

Collect fresh, ripened fruit from the ground, which is normally pale, waxy yellow in colour. Avoid collecting fruit that is still pale green in colour.

Post-collection handling

The fruit should be processed and seeds dried immediately after collection. Carefully remove the skin and pulp from the seeds. Sun dry the seeds for about a month. The dried seeds should be stored in a ven-

tilated, shady room. It is recommended to expose the seeds to cold temperatures of lower than 10 °C to break dormancy.

Selection and prepreparation of seeds



There are two main types of seeds, the male and female. The female seeds have two opercula (lids), while the male seeds can either have one or three

lids. The female seeds are selected for seedling production. It is advisable to select large, healthy seeds that are without cracks and opened lids.

Marula seeds show strong dormancy and therefore they must be broken to ensure good germination. It is reported that without seed treatment, the germination may take as long as nine months. The hard endocarp (inner layer of the wall of a ripened ovary) forms a physical barrier to seed germination. The opercula should be removed to improve germination. Soak the seeds overnight in warm water to soften the lids. Use a sharp, small pocket knife to remove the lids.

Seedbed preparation

Prepare a seedbed rich in compost or manure. Use a loose, sandy mixture or vermiculate as substrate. Keep the soil moist, but not waterlogged.

Sowing seeds

Place the seeds in the seedbed or sow the seeds into the plastic bags or pots. It is recommended that seeds should be sown during the rainy season from October to December. Keep the soil moist, until germination takes place after 2 to 4 weeks.

The stem should reach knee height; however, by then the roots will start to tear some of the plastic bags before the small trees are transplanted into the field.

This will take 3 to 6 months, depending on the climate, substrate and watering regime.

Vegetative propagation

Cuttings

Cuttings are pieces of stem or shoot induced to grow their own roots and shoots. Cuttings are usually about 10 to 15 cm in diameter, 2 m in length and are planted at a depth of 1 m. Stem cuttings are usually most successful when taken from young seedlings. They can be used to produce cloned rootstocks (part of the root used as stock derived from vegetative reproduction) for later grafting. A leafy cutting from immature plants and mature plants can also be done through truncheons. It is suggested that these should be 10 cm in diameter and 2 m long, with the proximal 0,6 m inserted into the ground. The truncheon (short, thick branches) from a mature plant will generate trees of the same gender as the source plant. It is reported that if there is enough moisture, roots are usually readily produced from the buried butt ends. Where necessary, rooting hormone can be used to enhance rooting.

Grafting

Grafting can be carried out on established saplings (young trees with a slender trunk). The most commonly used technique is top-wedge grafting. It should be carried out immediately after dormancy breaks, using scion (shoot with buds) material from the tips of branches. Use sharp grafting knives to detach scions. Scion wood is best collected in cool conditions (late evening or early morning) to avoid temperature-induced moisture loss.

Use slightly thinner or slightly thicker scions. Healthy scions from superior mother trees must be selected. The scion has to be of the same diameter as the rootstock for optimal grafting.