

Grafting and budding

A step-by-step guide for small-scale farmers

What is grafting?

Grafting refers to a number of techniques in which a section of a stem with leaf bud/s (Scion(s)) is inserted into or joined to another stem (Rootstock) of the same species. Please note that grafting may also involve many scions being joined to one rootstock.

What is budding?

Budding refers to a number of techniques in which a **bud** or **buds** from a tree with desired traits is/are inserted into or joined to a rootstock of the same species.

Benefits of grafting and budding?

- ▶ Grafted or budded trees can produce fruits quicker. A tree grown from seed may take 8 to 10 years to fruit, but a grafted tree will only take 2-4 years.
- ▶ A tree grown from seed may not produce fruit the same as the tree the seed came from (mother tree). But a grafted or budded tree will be just as good as the tree from which the cutting (scion) came from.
- ▶ Grafting and budding can help build resistance of the tree to pest and diseases.
- ▶ Grafting and budding are good techniques to improve the resistance of a tree to drought and other environmental stress

While the growth rate of a grafted plant is faster than that of a budded one, budding has an advantage over grafting when there are insufficient scions i.e. a 25 cm scion can produce 8 to 10 buds.

Tools required for grafting and budding

The following are tools that one needs for grafting or budding:



(a) Parafilm; (b) surgical blade; (c) secateurs; (d) professional grafting tool (e) methylated spirit and cotton wool; (f) grafting knives



Promotion of agroforestry supported by:



Prepared by: Daniel M. Kalala

With support from



by decision of the German Bundestag

Step-by-step guide for grafting



Preparation of the scion: Using a sterilized pruning shear or knife, collect scions that are free from diseases or pest infestation. Scions should be 10 to 15cm long or the length of your palm. Remove all the leaves while making sure not to disturb the tip of the scion (shoot).



Joining the rootstock and the scion: The scion and the rootstock should be close in size. Split the rootstock down the middle using a knife or make a V-shape cut using the secateurs. Make a wedge at the lower end of the scion. Insert the scion into the rootstock ensuring good contact between the scion and rootstock.



Securing and protecting the scion: Secure the scion by tying around the joint with parafilm or plastic. Cover the seedling with a clear plastic from the top up to a few centimeters below the joint and tie. The plastic helps maintain moisture and optimum temperature.

Step-by-step guide for budding



Collection of buds and preparation of rootstock: Collect buds from the middle of the shoots. Buds at the base are too old and the ones at the tip are not mature enough. The rootstock to be budded should be pencil size. Remove all growth below the point where the bud will be placed.



Joining the bud(s) to the rootstock: Using a grafting knife or surgical blade, make an inverted T cut in the rootstock. Insert the bud by pushing it from the base of the cut upward ensuring that there is good contact between the cambium tissues.



Securing the bud: Using parafilm, tie above and below the bud to ensure that the bud is firmly held in place and prevent drying.

Other considerations for effective grafting and budding

Time for grafting

- ▶ Fruit trees may be grafted at different times of the year depending on the technique used.
- ▶ When it is cold, good results are obtained using a green house where the temperature and humidity are controlled.
- ▶ Best results are obtained during warm, humid weather.

Time for budding

It is possible to do budding all year round. However, for citrus the best time to bud in Zambia is from August to November and from March to April. It is not recommended to bud in the cold season (June to July).

Hygienic conditions during grafting and budding

To avoid contamination during the grafting and budding processes, ensure that your hands are washed with soap and possibly disinfected using hand sanitizer. All the tools to be used should also be disinfected using methylated spirit.



Temperature and irrigation management after budding and grafting: Immediately after grafting or budding, place the seedling under a shade. Irrigate at normal rate. Before transplanting start reducing the watering and introduce the seedlings to direct sunlight for 6-8 weeks to harden them.



Care after grafting and budding: Two weeks after grafting, remove the plastic cover if new shoots are seen. If not, and the scion is still green, remove the plastic when the shoots form. Normally, the parafilm used to secure the joint or bud comes off on its own, but if a plastic was used instead of parafilm, please remove after 3 months. If after two weeks, the scion is no longer green (turning brown), it means the grafting process was not successful.