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Mbarara Zonal Agricultural Research and Development Institute

Guidelines for grafting propagation techniques

Introduction

Grafting refers to propagating a plant from the parts of two parent plants: a rootstock and a scion. The scion, from a known good performing parent plant, attaches to a cut portion of stem from a root stock plant to form a graft union, which calluses over and allows the plant to grow normally.

Scion: The aerial part of a tree that will form the crown of the new plant. This part contains the dormant buds of the tree whose desired characteristics need to be multiplied.

Rootstock: The lower part of a plant, sometimes including part of the stem and some branches that will form the root system of the new plant. This part may also contain dormant buds which should not be allowed to develop in the new plant since they do not have the desired characteristics that need to be multiplied.

Reasons for grafting

- ❖ To obtain a tree which combines both the good characteristics of one tree and the rootstock of another e.g. yellow passion fruit is tolerant to collar rot while Kawanda hybrid is high yielding.
- ❖ Hastening the reproductive maturity.(Gestation period is reduced).
- ❖ Repair damaged parts of trees. (Bridge grafting, inarching).
- ❖ Perpetuating clones that cannot be readily maintained by cuttings, layers, division or other asexual methods.
- ❖ To change cultivars of established plants

Disadvantages of grafting:

- ❑ Requires skill
- ❑ Viruses can be transmitted to offspring(hence use healthy plants and disinfect grafting tool using Jik..

Requirements for successful grafting

- ✓ Rootstock and scion must be compatible (must be capable of uniting).
- ✓ The cut surfaces should be held together tightly by wrapping or tying.
- ✓ The grafting operation must be done at a time when the stock and scion are in proper physiological stage – scion buds are dormant
- ✓ Immediately after grafting operation is completed, all cut surfaces must be protected from desiccation by covering with tape or grafting wax.
  This is best done using a humid chamber (this is a chamber constructed in such a way so as to hold high humidity in the air, and reduces transpiration almost zero.

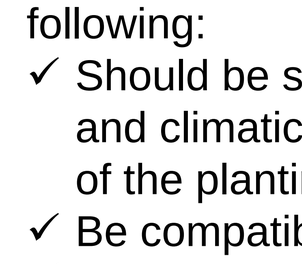
Rootstock selection

Majority of Rootstocks are raised from seed but can be propagated from cuttings and layering. It should meet the following:

- ✓ Should be suited to the soil and climatic characteristics of the planting site.
- ✓ Be compatible with scion
- ✓ Seed should be obtained from fruits of disease – free high quality trees.

-For mango, rootstocks used are for the local variety commonly known as Kagogwa while the yellow passion fruit variety is always used for passion fruit grafting. These rootstock are tolerant to soil borne diseases

1. Local (Kagogwa mango)
2. Yellow passion fruit



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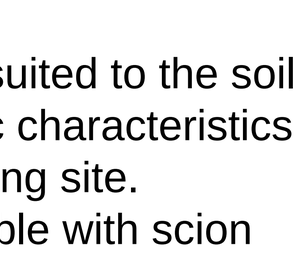

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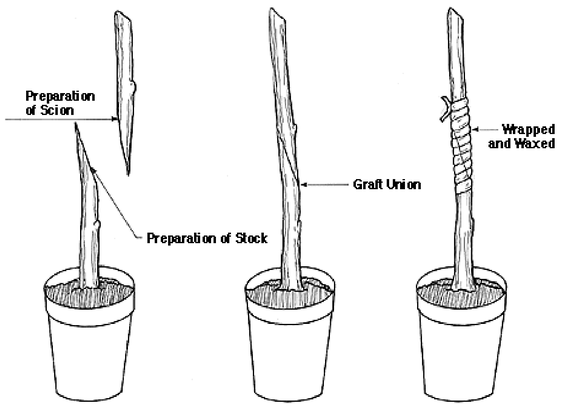
Scion selection:
In general, scions should be in phase of growth approaching a new flush, with buds swollen but not open. They should be from high quality and disease – free plants.

Method of grafting

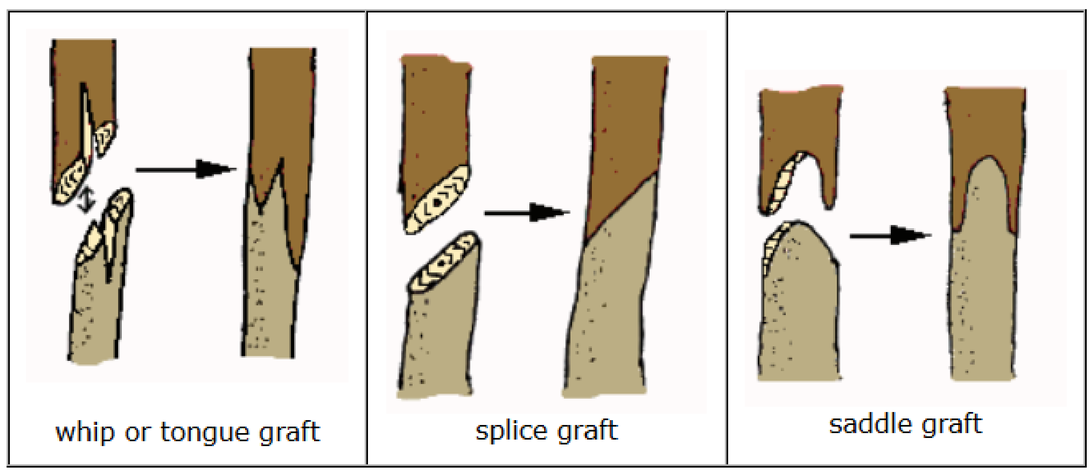
Splice grafting

Is useful particularly for grafting relatively small materials. It is most common in commercial nurseries that raise rootstocks from seeds for 6 months to one year. In this method, a simple slanting cut of the same length and angle is made on both the stock and scion. These are placed together and tied.
-Both the scion and the root stock must be of similar diameter.

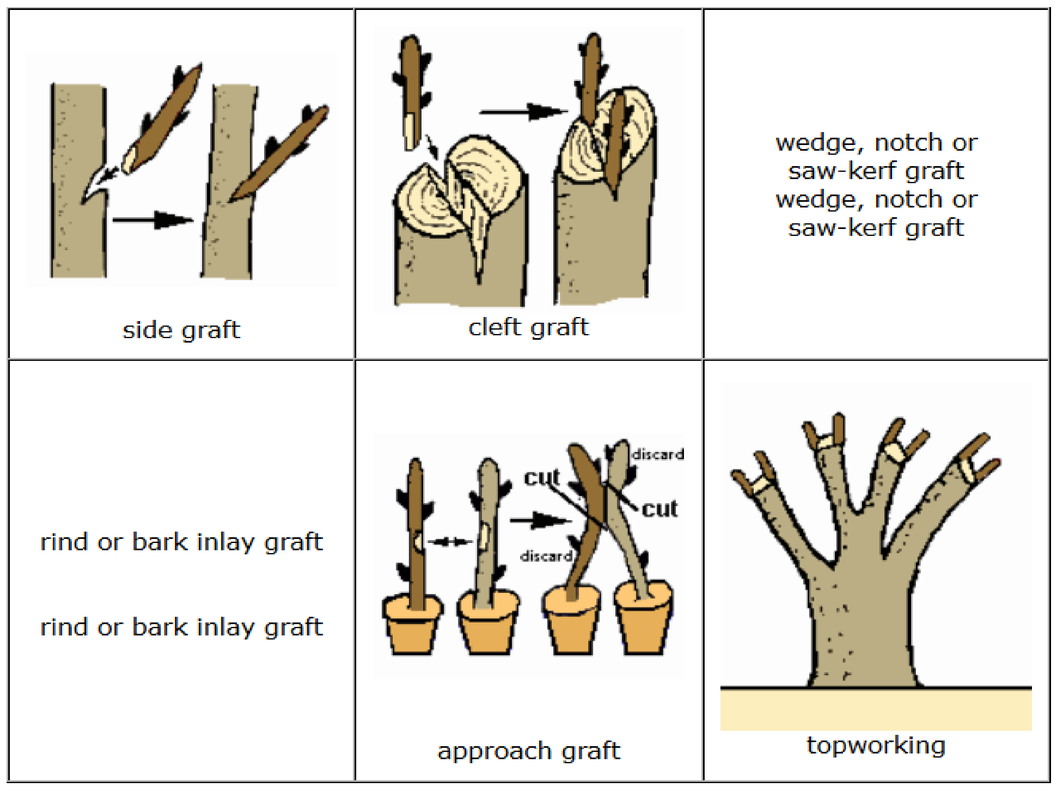


This simple method is usually applied to herbaceous materials that callus or "knit" easily, or it is used on plants with a stem diameter of 1/2 inch or less.
- Right from this stage, any growth below graft union is continuously removed to avoid competition with the scion

Types Used When Scion and Stock are Approximately Equal in Size



Types Used When Scion is Smaller than Stock



After grafting exercise, the clone is placed in the humid chamber to heal and produce new leaves. Right from this stage, any growth below the graft union is continuously pruned off.