

Growing Orchard Communities

COMMUNITY ORCHARD TOOLKIT



Bench Grafting Workshop Notes by Larch Maxey

This handout is designed to act as a reminder/support for those who have participated in a grafting workshop and is not a substitute for attending the workshop. For information on future grafting workshops contact Orchard Link.

What is grafting?

Humans have been grafting for approximately two thousand years (Mudge et al <https://www.hort.purdue.edu/newcrop/janick-papers/c09.pdf>). Our focus is on grafting fruit trees, but the principles apply to nut and many trees, as well as some other plants. All the apples, plums, pears, apricots, etc. ('top fruit') that you buy come from grafted trees. Grafting is a way of combining live material from one plant species to another, creating a new plant. The grafted plant will be a clone of the original plants, making its relevant parts genetically identical to the donor plants.

Why graft? We may graft for many reasons, including in order to:-

1. cheaply and quickly reproduce the variety you seek
2. control the tree's size, shape, disease resistance and adaptability to your climate, soil, etc.
3. assist with breeding (dwarf rootstocks mature in 2-3 years, rather than ungrafted trees which may take 5-10 years)
4. change the variety of an older tree (via 'top grafting')
5. grow more than one variety on the same tree ('family tree' good for small gardens)
6. participate in a miraculous, intimate process of alchemy!

Types of graft

There are many different types of graft, the main 3 we'll discuss are bench and cleft grafting (done in the dormant period with scions) and bud grafting. We'll focus on bench grafting as this is carried out in March/the end of the dormant period.

You will need:

Scions - prunings from last year's tree growth of the variety we wish to grow – cut when dormant and stored wrapped in a plastic bag in the (banana free) fridge/damp sand in the shade.

Rootstock – material bred and propagated for grafting to suit the scions we have, provide disease resistance, size, etc.

Tools:

1) A very sharp knife – grafting knives are ideal as these have blade with just one bevelled edge, rather than most knives which have a bevel on both sides of the blade – Budding knives have an extra section for budding and are available for around £10. Folding stanley knives also work (and allow to use a new blade for grafting ensuring a sharp edge), as do very sharp pocket knives. The key is to have a very sharp, clean edge.

2) Tape I recommend 'Parafilm' available from Martin Crawford and online, though electrical insulation tape also works, but needs removing once the graft has taken. Melted wax on papyrus also works and is the traditional method, but parafilm is the simplest.

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- 3) Label materials – I recommend plant labels, metal ties and pencil/permanent marker – it is so easy to lose labels/have them fade, etc. Clear, permanent labelling is key!
- 4) First aid kit - This is advised as there is some risk involved with the sharp knife
- 5) Plastic bags/buckets for keeping scions/rootstocks fresh before and after grafting

The grafting cut

A Trees' cambium layer – a 0.01-0.2mm thin green layer just below the bark is where the core of its living activity occurs, including the flow of sap. To graft we place the cambium layer from the rootstock into direct contact with the cambium layer of the scion. A range of cuts can achieve this, but we focused on the 'bench graft', a single, straight, angled cut through the rootstock and scion allowing us to tape them tightly together. Making straight and clean cuts is essential, so if we make a mistake we do the entire cut again to ensure one smooth cut. The angle of the cut needs to be close to the same on both pieces. The two parts must match well. Take time to practice the cuts – using practice material e.g. hazel/willow/spare scions.

Ideally the scion diameter matches the rootstock diameter so that on both sides of each the cambium layers can be matched. However, where this is not possible, e.g. as the rootstock is larger than the scion, then as long as one side has good contact cambium to cambium contact, the graft will 'take'.

It is essential that the scion is oriented in the same direction as the root stock as it won't grow upside down!

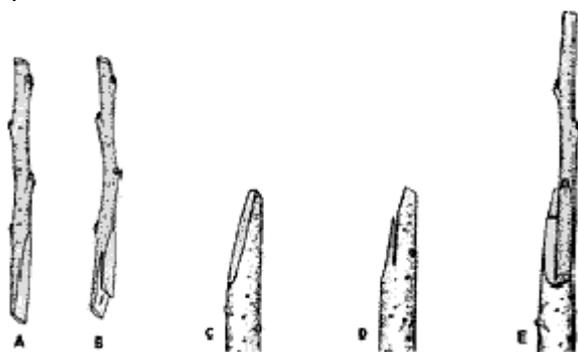


Fig 1 Scion (A and B), Root Stock (C and D) and completed graft (E) note this still need taping! Image courtesy of <http://www.extension.umn.edu/garden/yard-garden/fruit/grafting-and-budding-fruit-trees/>

Grafting resources - there is a lot of information available online e.g.:-

<https://www.hort.purdue.edu/newcrop/janick-papers/c09.pdf>

Missouri Extension - Grafting (excellent)

<http://extension.missouri.edu/xplor/agguides/hort/g06971.htm> CRFG elements of Grafting -

<http://www.kalron.com/kalstor/pub/crfg/grafting-basics.htm> Notes on Ancient Grafting by Arthur Stanley Pease (interesting ancient history) -

http://penelope.uchicago.edu/Thayer/E/Roman/Texts/secondary/journals/TAPA/64/Ancient_Grafting*.html Home Orchard Society by Todd Kennedy (basic info and compatibility chart) -

<http://www.homeorchardsociety.org/article/41/> Mr Citrus - Whip and Tongue graft (good pictures)

<http://members.fortunecity.com/pjsauber/WhipTongue.htm> Cass County Extension (good basic information) - <http://www.ext.nodak.edu/county/cass/horticulture/fruit/graft.htm>