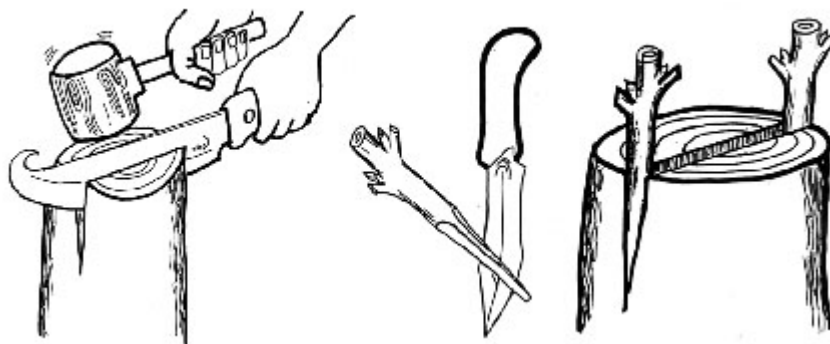


## >> Cleft Grafting




### Application:

Cleft grafting is usually performed several to many feet up from ground level, in an established tree. As such, it is a topworking or highworking



technique. It is used to change over (rework) an established fruit (scion) variety to a new (more desirable) variety, or to obtain multiple varieties on a single tree, or to insert a pollinizer branch for self incompatible trees like apple. Cleft grafting is used for grafting one or more smaller diameter scions (5 to 10 mm) onto a larger stock (5 cm or greater).

### Timing:

Cleft grafting is performed in the early spring just as the stock plant is beginning to become active (bud swelling, etc.). On the other hand, it is preferable to use scion wood that more or less fully dormant (phenologically several weeks "behind" the stock). This may be accomplished by collecting scion wood several weeks or more earlier, during the winter, and storing under refrigeration, in slightly moist cloth or other medium. This differential phenological activity between stock and scion allows vigorous callusing from the stock and later stages of graft union formation at the point of stock/scion union, but the relative dormancy of the scion delays leafing out and hence minimizes scion water stress. This is critical before vascular continuity is established, i.e. before new xylem forms across the graft union to facilitate water transport from stock to scion.

### How to Cleft Graft:

Cleft grafting is usually performed in the landscape or orchard on well established trees (including full grown).

Branches, well up in the canopy of the tree, are cut back with a saw at a point

where they are one to several inches in diameter, for insertion of the scion(s). Often several branches on a single tree are cleft grafted as shown. Cleft grafts are often placed several to many feet above ground level.



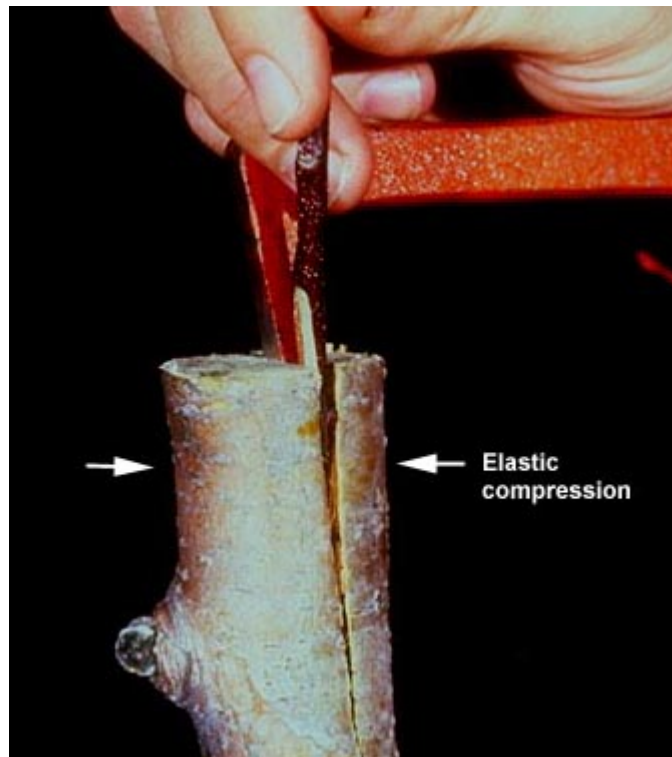
Chisel end of the cleft grafting tool is centered and struck with a hammer to split the stock.



Base of scion is cut to a V-shaped wedge for insertion into the stock



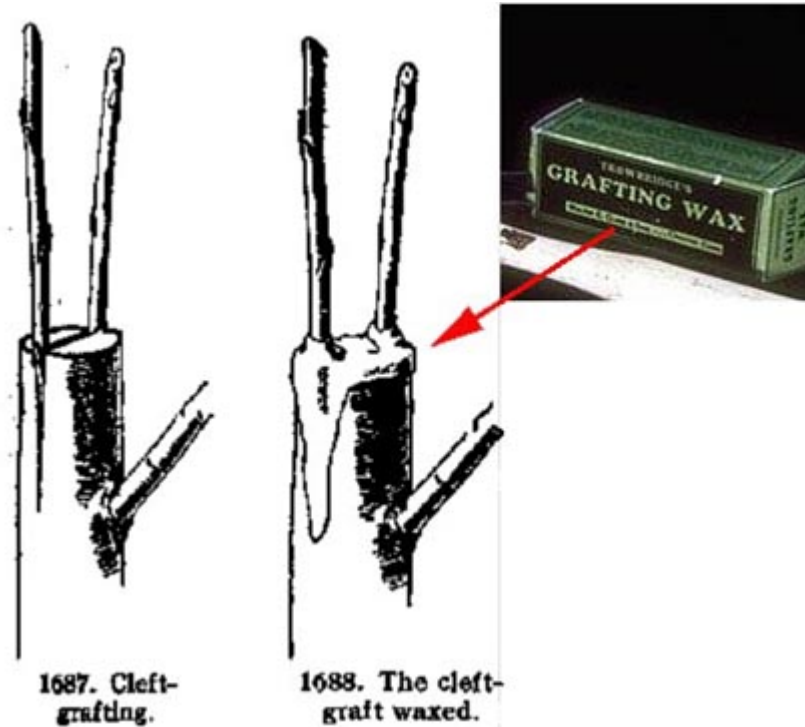
The spreader end of the tool is used to pry open the split in the stock while inserting the scion. The carpentry itself generates pressure, so tying is not necessary.



Two scions, 2 to 4 nodes long, inserted at edges of stock (not centered) to assure cambial alignment.



Melted grafting wax is used to seal cuts from moisture loss and pathogen entry. Distal ends of scions should be waxed as well. After graft union formation, the weaker-growing of the two scions is removed (pruned back). Images 1687 and 1688 are from LH Bailey, 1928, Standard Cyclopedia of Horticulture, Macmillin.



Alternative cleft grafting tool used in Kenya.



## Additional Information:

**Source:** Univ. of Missouri Outreach & Extension

**Title:** Agricultural publication G6971, Grafting, 1995

**URL:** <http://muextension.missouri.edu/xplor/agguides/hort/g06971.htm>

**Comments:** Description of cleft grafting about 1/2 of the way down the page; includes audio clip

**Source:** Cornell Univ. Hort 400 Plant Propagation Web Page

**Title:** Propagation of Interstem Apple Nursery Stock by Grafting and Budding at a Commercial Nursery in New York State, Part 6.

**URL:** <http://www.cals.cornell.edu/dept/flori/hort400/apple/apple6.html>

**Comments:** Slides 18 and 19 of this autotutorial describe the use of cleft grafting for changing over from an older to a newer apple variety on donor trees, from which scions are collected for field budding. There is a link to the first page of the autotutorial at the bottom of the page.

**Source:** Texas A&M University, Research and Extension Resource/Aggie Horticulture

**Title:** Cleft Grafting

**URL:** <http://extension-horticulture.tamu.edu/propagation/cleftgrafting/cleftgrafting.html>

**Comments:**

**Source:** University of Minnesota Extension Service, College of Agricultural, Food, and Environmental Sciences  
**Title:** GRAFTING AND BUDDING FRUIT TREES, by Leonard B. Hertz, Former Extension Horticulturist  
**URL:** <http://www.extension.umn.edu/Documents/D/G/Other/DG0532c.html#cleft>  
**Comments:**

**Source:** University of Minnesota Extension Service, College of Agricultural, Food, and Environmental Sciences  
**Title:** Orchard Grafting Methods, by Ken Wilson, Former Extension Horticulturist  
**URL:** <http://www.gov.on.ca/OMAFRA/english/crops/facts/98-005.htm#Cleft Graft>  
**Comments:** Adapted from "Orchard Grafting Methods", October 1977 by B.J.E. Teskey (Retired), Department of Horticultural Science, University of Guelph

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