PRUNING, FRUIT CULTURE & GRAFTING

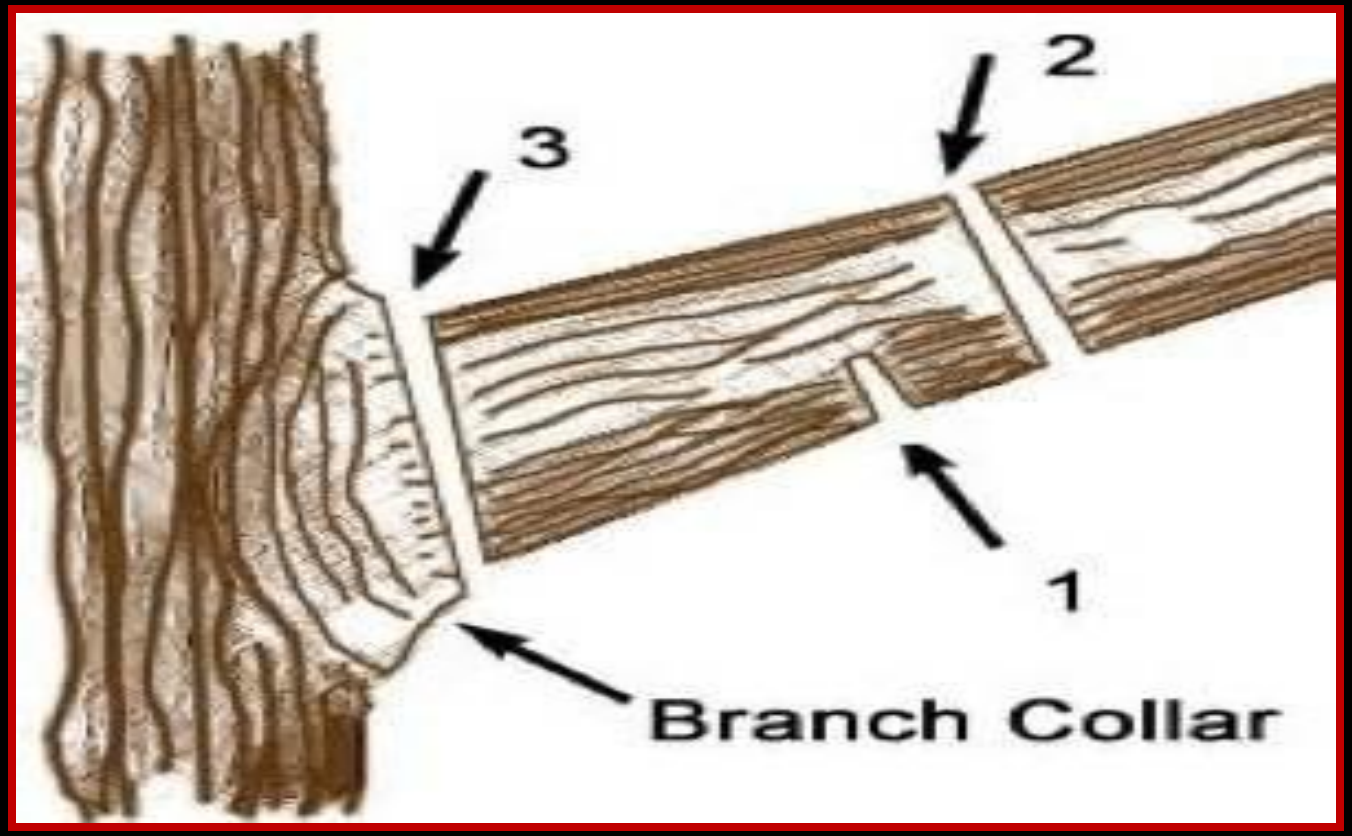
PRUNING

PRUNING OBJECTIVES

- REDUCING RISK FOR POTENTIAL TREE / BRANCH FAILURE
- PROVIDING CLEARANCE
- REDUCING SHADE AND WIND RESISTANCE
- MAINTAINING HEALTH
- INFLUENCING FLOWER OR FRUIT PRODUCTION
- IMPROVING A VIEW
- IMPROVING AESTHETICS

LIMB REMOVAL CRITERIA

- REMOVE DEAD AND DISEASED LIMBS
- REMOVE SUCKERS
  - WATER SPROUTS
  - BASIL SUCKERS
  - ROOT SUCKERS
- REMOVE COMPETITIVE LIMBS
- OPEN CROWN OF TREE


3
2
1
Branch Collar

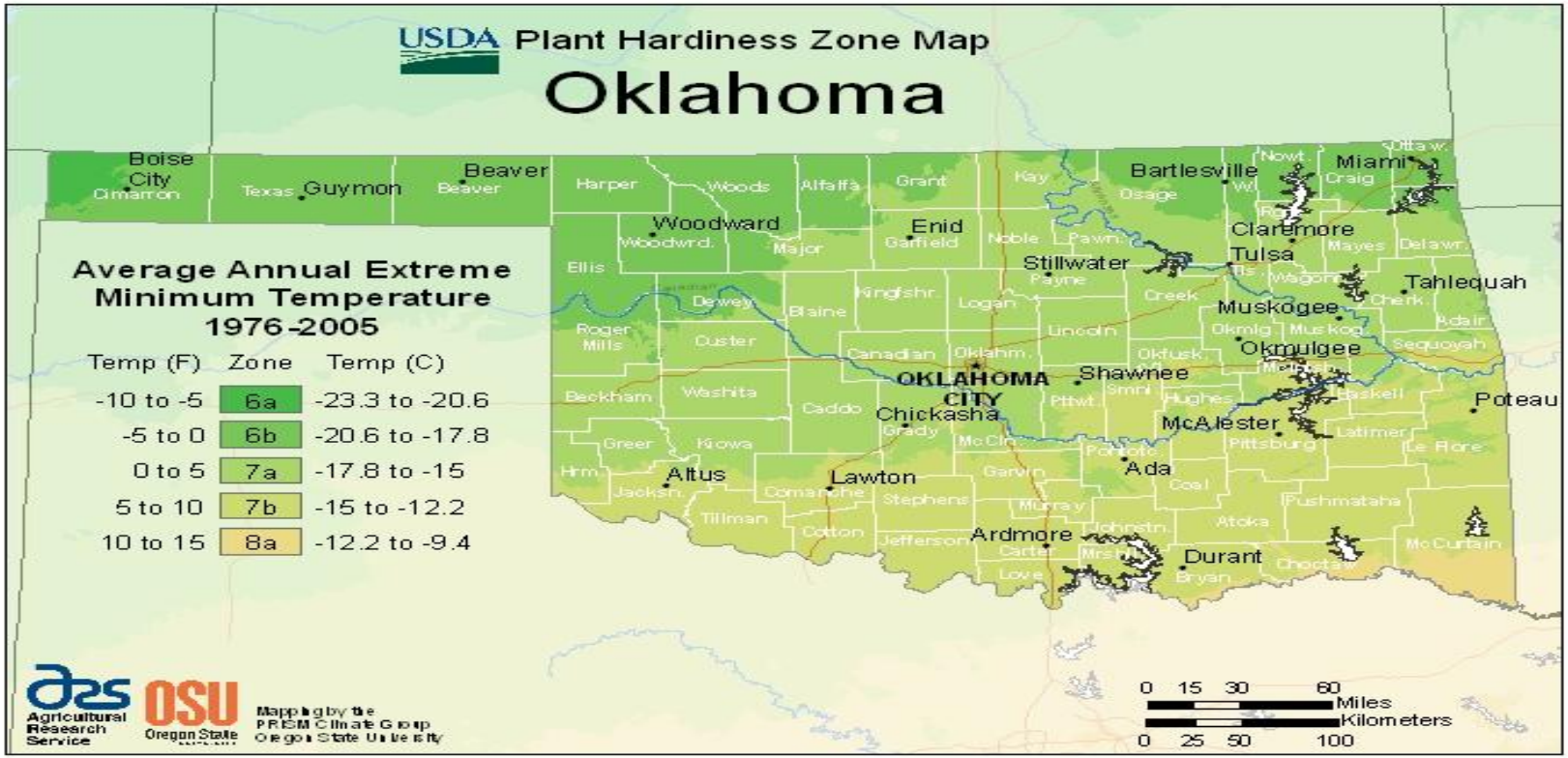
REASON TO REMOVE A TREE

- Not Structurally Sound Anymore
- Trimming Would Remove Over Half Of The Crown
- Removing All Damaged Limbs Would Result In Your Tree Being “Topped Out”

TRAINING TREES MAY BE SCARY


Before
Prune
After
Before Pruning
After Pruning

FRUIT CULTURE


USDA Plant Hardiness Zone Map
Oklahoma
Average Annual Extreme Minimum Temperature 1976-2005
Temp (F) Zone Temp (C)
-10 to -5 6a -23.3 to -20.6
-5 to 0 6b -20.6 to -17.8
0 to 5 7a -17.8 to -15
5 to 10 7b -15 to -12.2
10 to 15 8a -12.2 to -9.4
Boise City
Cimarron
Texas
Guymon
Beaver
Harper
Woods
Alfalfa
Grant
Kay
Woodward
Woodwrd.
Major
Enid
Garfield
Noble
Pawnee
Bartlesville
Osage
Nowata
Craig
Ottawa
Miami
Ellis
Dewey
Blaine
Kingfshr.
Logan
Payne
Stillwater
Creek
Claremore
Rogers
Mayes
Delawr.
Tulsa
Wagoner
Cherok.
Tahlequah
Muskogee
Adair
Roger Mills
Custer
Canadian
Oklahm.
Lincoln
Okmulgee
Okmlg.
Muskog.
Sequoyah
OKLAHOMA CITY
Okfusk.
Shawnee
Pottwt.
Seminole
Hughes
Haskell
Poteau
Beckham
Washita
Caddo
Chickasha
Grady
McAlester
Pittsburg
Latimer
Le Flore
Greer
Kiowa
McClain
Pontotoc
Ada
Hmn.
Altus
Lawton
Jackson
Comanche
Garvin
Coal
Stephens
Murray
Pushmataha
Tillman
Cotton
Jefferson
Ardmore
Carter
Johnston
Atoka
McCurtain
Durant
Choctaw
Love
Bryan
Agricultural Research Service
OSU
Oregon State University
Mapping by the PRISM Climate Group Oregon State University
0 15 30 60 Miles
0 25 50 100 Kilometers

Chilling hours for 2005-2006
32 - 45 degrees Fahrenheit

	Oct	Nov	Dec	30-Jan
Byars	17	165	449	703
Porter	28	179	455	699
Perkins	23	173	441	715

Dormancy in fruit has two separate stages: rest and quiescence.

Rest is a time when the chilling requirement is being accumulated and the buds will not grow.

Quiescence is the period of dormancy that peaches enter once their chilling requirement has been met. During this stage, buds will break and grow when

PLANTING SITE

- Know your planting site
- Soil characteristics
- Sun exposure and hours of light
- Temperature extremes
- Wind direction
- Water source

PLANTS REQUIREMENTS

- Best time to plant
- Time from planting to harvest
- Space requirement
- Disease tolerance
- pH requirement
- Sensitivities

FLOWER BIOLOGY CONSIDERATIONS

- Monoecious or dioecious
- Insect or wind pollinated or both?
- What types and numbers of pollinators present
- Pollen tube growth requirements (i.e. temperature)

- Weed
- Water

- Prune and Train
- Mulch

- Control Insects and Diseases

ESTABLISHMENT – TREE FRUITS

Bare-root, dormant plants

Plant after frost-free date in spring if actively growing, in late Feb or early March if dormant

Spacing:

Apples: 12 ft in row x 18 ft between rows (varies)

Pears: 16 ft x 25 ft

Peach/Nectarine: 18 ft x 24 ft (varies)

Cherry: 18 ft x 24 ft (varies)

CRITICAL POINTS FOR TREE FRUITS

Apple and Pear

Two or more varieties necessary for pollination

Many varieties are susceptible to fire blight

Cherry

Late frost often affect crop

Do not do well in areas with long, hot s

Peach/Nectarine

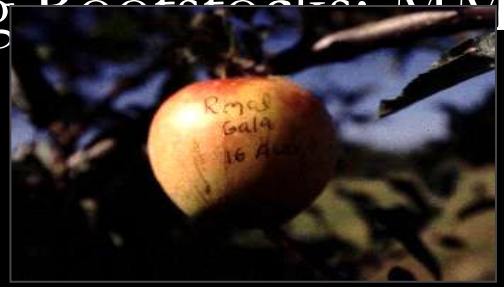
Late frosts often affect crop

VARIETIES – APPLE

Gala, Jonathan, Arkansas Black, Fuji, Enterprise, Delicious (marginal), etc.

Dwarfing Rootstocks: M9, M27

Semi-dwarfing Rootstocks: MM111, MM106



VARIETIES – CHERRY

Tart: Montmorency, Meteor, Northstar, Surefire, Danube, etc.

Sweet: Bing, Cavalier, Black Tartarian, Ranier, etc.

Rootstocks: MxM, Gisela

Tarts are self fertile, Sweet need 2 or more varieties

VARIETIES – PEAR

European: Bartlett, Bosc, Comice, D'Anjou, Moonglow, Harrow Delight, Maxine, Magness, Seckel, Warren

Oriental Hybrid: Kieffer, Orient

Asian: Chojuro, Shinko, Honsui, Shinseiki, 20th Century

Rootstocks: Old Home x Farmingdale, *P betulifolia*

VARIETIES – PEACHES/NECTARINES

Peach: Sentinel, Redhaven, Bounty, Nectar, Loring, Cresthaven, Flameprince, White County, White River, White Rock, etc.

Nectarines: Earliblaze, RedChief, Cavalier, Sunglo, Redglo, Arrington, Bradley, Westbrook, et

Rootstock: Halford, Lovell

Infects immature or mature fruit

Soft dry rot

Rapidly spreading on fruit (48 hrs)

Infected fruit sporulate profusely, shrivel = mummies


GREEN LIGHT
NEEM
CONCENTRATE
OMRI Listed
Listed by the Organic Materials Review Institute (OMRI) for use in organic production.
Insecticide, Fungicide, and Miticide. Use on Flowering Plants, Trees, Vegetables, Fruits, and Nuts.
ACTIVE INGREDIENT:
Clarified Hydrophobic Extract of Neem Oil 70%
INERT INGREDIENTS 30%
TOTAL 100%
KEEP OUT OF REACH OF CHILDREN
CAUTION See Side Panel For Additional Precautionary Statements.
Net Contents ONE PINT (474ml)
AMERICAN BRAND
Thuricide®
Concentrate
Controls: Gypsy Moth, Cankerworm, Tent Caterpillar, Cabbage Looper, Imported Cabbage Worm And Tomato Hornworm.
Mix 4 Teaspoons Per Gallon Of Water For Shade Trees And Ornamentals.
KEEP OUT OF REACH OF CHILDREN
CAUTION
See Side Panel For Additional Precautionary Statements
NET CONTENTS ONE PINT (16 Fl.Ozs.)


GREEN LIGHT
Use Up To Day of Harvest!
Incluye instrucciones en español
Fruit Tree Spray
Broad Spectrum Insecticide,
Fungicide, and Miticide
For Control of Insects,
Diseases, and Mites.
ACTIVE INGREDIENTS:
Pyrethrins 0.25%
Piperonyl Butoxide, Technical 2.50%
Clarified Hydrophobic Extract
of Neem Oil 70.00%
OTHER INGREDIENTS 27.25%
TOTAL 100.00%
KEEP OUT OF REACH OF CHILDREN
CAUTION See Booklet For Additional Precautionary Statements.
Net Contents 16 FL OZ (1 PT) 474 ml
MANTÉNGALO FUERA DEL ALCANCE
DE LOS NIÑOS
PRECAUCIÓN Vea en folleto las precauciones adicionales.
41016

CHICKASAW OR SAND PLUM
(PRUNUS ANGUSTIFOLIA MARSH)

Short, thickly branched shrub 1 to 3 m (3.3 to 9.8 ft) tall,

Or a small tree, height at maturity 4.3 to 7.6 m (14 to 25 ft)

Open- pollinated and early blooming, March-April,

ripe fruits small, 10-20 mm (¼ to 1/2in) in size, thin-skinned, red, orange-red, or yellow

fruiting in June-August. Some are edible fruits and others have bitter fruit

NATIVE PERSIMMON

(DIOSPYROS VIRGINIANA)

Flower: Species is usually dioecious

Fruit: A plum-like berry that is green before ripening, turning orange to black when ripe, 3/4 to 2 inches in diameter

The fruit is very astringent and mouth numbing when green, sweet and edible when ripe after a hard freeze; matures in mid to late fall.

Form: A small to medium sized tree to 60 feet

JUJUBE (ZIZYPHUS JUJUBE L.) HTTP://EDIS.IFAS.UFL.EDU/PDFFILES/MG/MG32900.PDF

Cultivated in China for more than 4000 yrs

Over 400 cvs. Ling, Lang

Don't require cross pollination but yields higher with it.

Flowers for several months-lemony smell

100 lbs fruit per year on well managed trees

Cold hardy survive below -10

30 years 40 to 50 ft tall

GRAPES

Approximately 50 species worldwide

Vitis rotundifolia -muscadine grape (Scuppernong)

***Vitis aestivalis* (Munson)- includes the Cynthiana grape or Norton grape.**

***Vitis labrusca*- fox grape**

***Vitis mustangensis*- mustang grape**

TRELLISING

STRAWBERRIES

GROWING STRAWBERRIES

ELDERBERRIES (*SAMBUCUS CANADENSIS*)

Mature height of 8 to 12 feet

1/4-inch purple-black berries

Rich source of iron and vitamin C

Partially self-fruited, cross-pollination increases yield

Fruit are produced on 1- to 3-year-old wood

Harvest the berries by removing the whole cluster

BLACKBERRIES
RUBUS L. SUBGENUS RUBUS


4 A-2241 T
A-228 T

PRIMOCANE FRUITING

Primocane terminates in flowers

Fruiting develops down the cane

Remaining buds develop flowers

ext year

Prime-Ark® Primocane-Fruiting Blackberries

Prime-Jan® Primocane-Fruiting Blackberry

Prime-Jan® Blackberry
(cultivar APF-8)

Prime-Jim® Primocane-Fruiting Blackberry

Prime-Jim® Blackberry
(cultivar APF-12)

BLUEBERRIES

CRITICAL POINTS FOR BLUEBERRIES

Matching of variety with location important for success

Soil pH must be below 6.0 to even think about planting blueberries

SOIL RECOMMENDATIONS - BLUEBERRIES

Well-drained, sandy loam preferred

pH of 4.8 – 5.2 is optimal, but will tolerate up to 6.0

Raised beds can improve water drainage

Blueberries cannot survive in high soil pH (> 6.0) unless greatly modified with organic matter

Difficult to change soil pH down

ESTABLISHMENT - BLUEBERRIES

Two-year-old nursery container grown plants

12 to 16 inches tall

Two or more varieties will improve fruit set

Plants 5 feet apart, rows 8-10 feet apart

Place ½ gallon of moist peat moss in hole before planting

Water immediately after planting

ESTABLISHMENT - BLUEBERRIES

Mulch to a depth of 5 to 6 inches with pine bark or other acidic mulch

Remove blooms first two years

Bird netting will likely be necessary

FERTILIZER RECOMMENDATIONS - BLUEBERRIES

Application rates should be based on initial soil test

Do not fertilize at planting, wait six weeks then again at 12 weeks

In second year on, fertilize at 6 week intervals starting at bloom

Do not place fertilizer at base of plant

Apply 60 to 80 lbs/acre of N per year (Ammonium sulfate best)

IRRIGATION REQUIREMENTS - BLUEBERRIES

Irrigation is essential for blueberries

Irrigation water should be acidic

2-3 inches per week

Drip irrigation best

Mulch will conserve moisture

PRUNING - BLUEBERRIES

Pruning is minimal for first five years

Remove only dead and diseased canes

Tip branches to maintain desired height

Thin out center to allow sunlight penetration and good air flow

Starting in 5th year, remove oldest cane from center of plant

Retain equal numbers of same aged canes

HARVEST -- BLUEBERRIES

Harvest in late spring/early summer of third year

Full production by 5th to 7th year

Harvest in morning and place fruit in shade/cool area

Fruit must be deep blue in color

GRAFTING: WHY AND HOW

GRAFTING TERMINOLOGY

- ROOT STOCK- THE PLANT THAT IS GOING TO BE GRAFTED.
- VARIETY MAY BE KNOWN OR UNKNOWN.
- SCION WOOD- THE CUTTING FROM A KNOWN VARIETY PLANT.
- CAMBIUM- THE GROWTH TISSUE OF A PLANT.
- LOCATED DIRECTLY UNDER BARK OF TREES.
- INNER STOCK- A KNOWN VARIETY SCION WOOD PLACED BETWEEN THE ROOT STALK AND THE DESIRABLE SCION WOOD.
- THIS IS USED TO CAUSE DWARFING.
- BUD- A SINGLE BUD USED TO GRAFT ON ROOT STALK INSTEAD OF SCION WOOD.
- BARK SLIPPING- WHEN BARK EASILY SEPARATES FROM THE WOOD OF THE STEM. (IN OKLAHOMA FROM AROUND APR.30-AUG.30)

WHAT IS GRAFTING?

GRAFTING DESCRIBES ANY OF A NUMBER OF TECHNIQUES IN WHICH A SECTION OF A STEM WITH LEAF BUDS IS INSERTED INTO THE STOCK OF A TREE. THE UPPER PART OF THE GRAFT(THE SCION) BECOMES THE TOP OF THE PLANT, THE LOWER PORTION(THE ROOTSTOCK) BECOMES THE ROOT SYSTEM OR PART OF THE TRUNK. ALTHOUGH GRAFTING USUALLY REFERS TO JOINING ONLY TWO PLANTS, IT MAY BE A COMBINATION OF SEVERAL. A THIRD PLANT ADDED BETWEEN TWO OTHERS BECOMES THE TRUNK OF A PORTION OF IT. THIS IS CALLED AN INTERSTOCK

WHY GRAFT?

MANY PLANTS DON'T PRODUCE WHAT IS EXPECTED FROM SEED.

A RED DELICIOUS APPLE SEED WILL PRODUCE AN APPLE TREE, BUT MAY NOT PRODUCE A RED DELICIOUS APPLE.

GRAFTING IS DONE TO GIVE THESE TREES AN IDENTITY, THEREFORE MAKING THEM SALEABLE.

SOME VARIETIES ROOTS ARE MORE TOLERANT TO MORE DIFFICULT GROWING CONDITIONS AND DISEASE RESISTANCE.

GRAFTING IS DONE TO PRESERVE THE VALUABLE ATTRIBUTES OF THE ROOTS YET PROVIDE A BETTER/MORE SUCCESSFUL PLANT.

GRAFTING MAY BE DONE TO REPAIR DAMAGED TREES.

PROVIDES SEVERAL DIFFERENT VARIETIES OF FRUIT ON ONE PLANT.

GRAFTING TECHNIQUES: WHIP, BENCH GRAFT

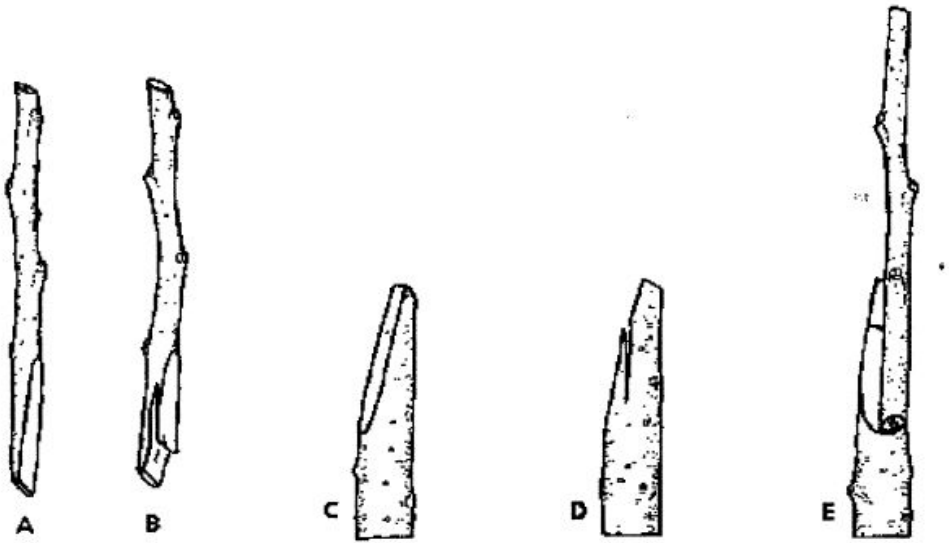


Figure 1. The Whip Graft is usually used for grafting root stocks and scions but can also be used for grafting small branches

GRAFTING TECHNIQUES: CLEFT GRAFT

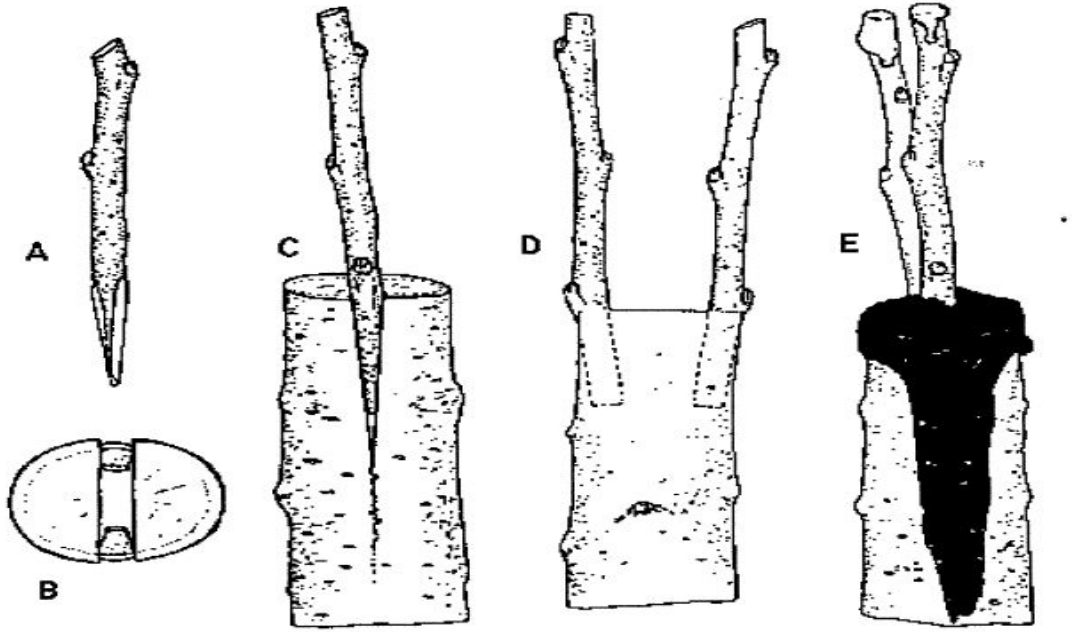
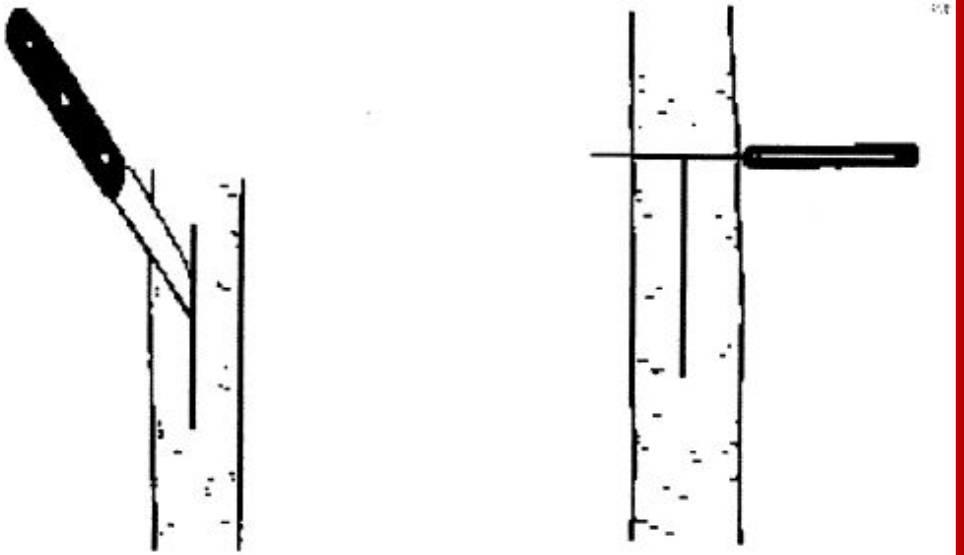


Figure 2. The cleft graft is the one to use on large branches.

GRAFTING TECHNIQUES: BUDDING STEP 1



Figures 7 and 8. Forming a "T" cut.

GRAFTING TECHNIQUES: BUDDING STEP 2

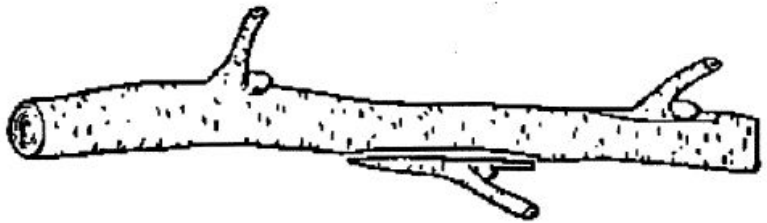
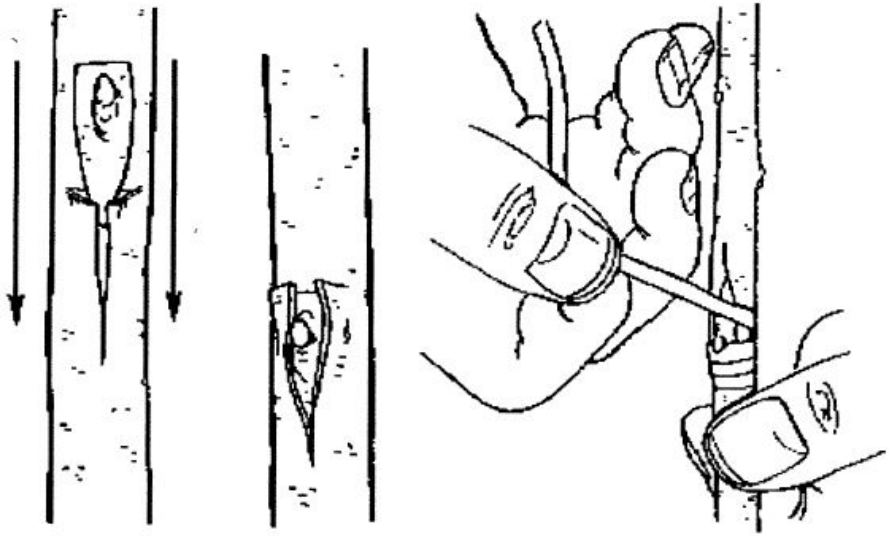


Figure 5. Budstick with leaf petiole attached. Note the method for removing the buds.

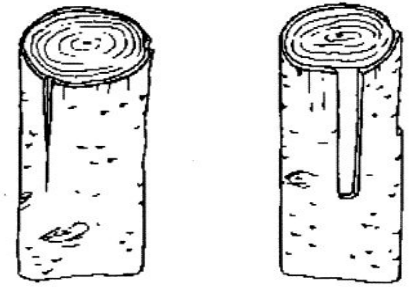
Figure 6. Bud with wood attached. Note the very straight cut.

GRAFTING TECHNIQUES: BUDDING STEP 3

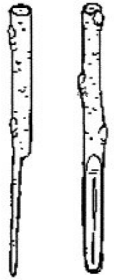


Figures 9 and 10. Slide the bud into the vertical slit until the top is even with or below the top cut. Wrap the bud tight with a budding rubber.

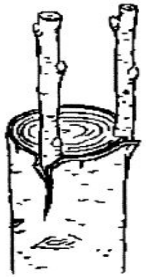
GRAFTING TECHNIQUES: BARK GRAFT

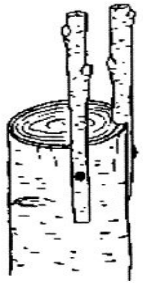


Stock may be prepared with a single cut (left) or a double cut.



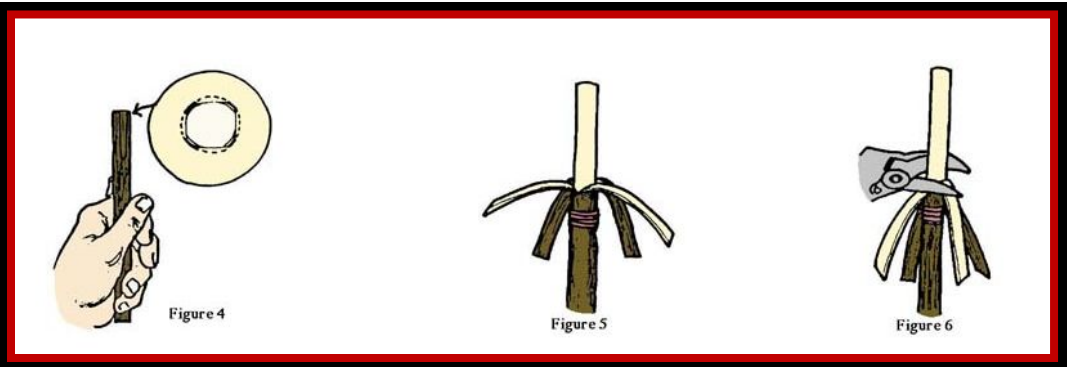
Scion cut forming a shoulder.

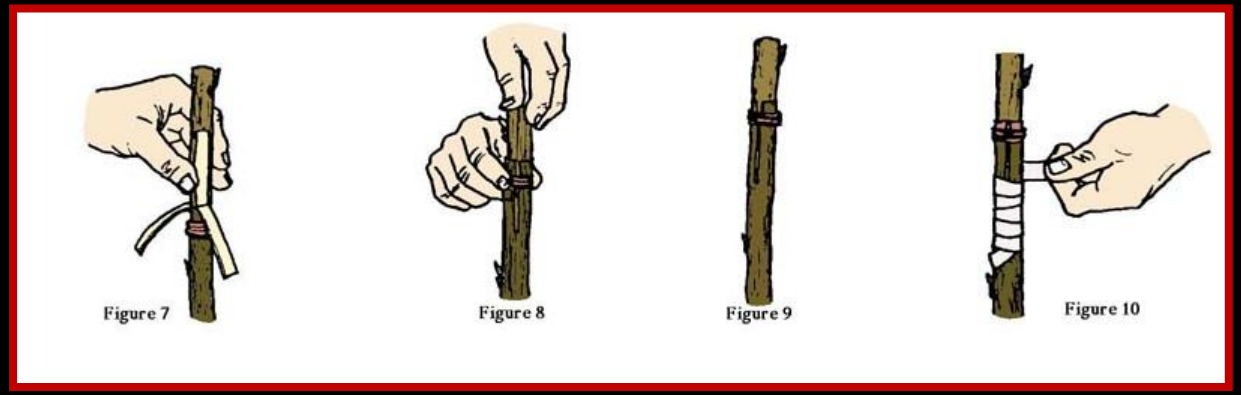




Inserting scion for single cut (left) and double cut techniques. Note the tight fit and the nails.

GRAFTING TECHNIQUES: FOUR FLAP METHOD





REASONS FOR GRAFT FAILURE

- ROOT STOCK AND SCION WOOD NOT COMPATABLE.
- CAMBIUMS DID NOT MEET PROPERLY.
- SCION WAS UPSIDE DOWN.
- GRAFTING WAS DONE AT THE WRONG TIME.
- SCION DRIED OUT.
- SCION NOT PROTECTED FROM THE SUN.
- SCION COLLECTED AT THE WRONG TIME.
- SCION WAS DISPLACED BY STORM, BIRDS, OTHER.
- GRAFT WAS ATTACKED BY INSECTS OR DISEASE.

QUESTIONS