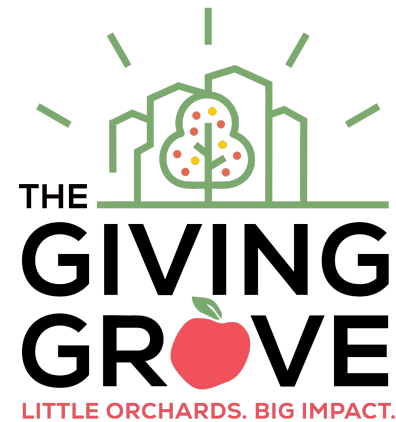


Fruit Propagation



This is part of a series on growing fruit!

Fruit Tree Selection

Fruit Tree Pruning

Growing Grapes

Small Fruits and Berries

Holistic Spray Program

Orchard Companions

Fruit Propagating

Slides will be available on the resources tab of our website

The screenshot shows a web browser at the URL theunitygardens.org/classes.html. The website header includes the Unity Gardens logo and a navigation menu with links for Home, About Us, Gardens, Events, Get Involved, Classes, Store, and Unity Projects. A shopping cart icon with a '0' is visible in the top right. The main content area features a large heading 'UNITY GARDENS CLASSES' followed by a paragraph: 'Unity Gardens Classes are free and open to anyone. Classes normally last 60 to 90 min. We host most classes at our Welcome Center on 3701 Prast Boulevard, but also in other spaces in the area. Watch here. Powerpoints and handouts from class are under the resources tab.' Below this text are two green buttons: 'CLICK HERE FOR OUR YOUTUBE CHANNEL WITH RECORDINGS OF CLASSES' and 'CLICK HERE FOR THE RESOURCES PAGE'. At the bottom, there are two colored boxes: a light green box for 'Fruit Classes 2024' and a light blue box for 'Winter Library Classes 2024'. The green box lists the location as the Unity Gardens Welcome Center at 3701 Prast Blvd, Wednesdays, and notes that classes are free and open to the public, with slides available on Zoom. The blue box lists the location as libraries throughout St. Joseph County, also free and open to the public, with specific dates and times for Tuesday, April 9th and Wednesday, May 29th.

theunitygardens.org/classes.html

Unity Gardens

Home About Us Gardens Events Get Involved **Classes** Store Unity Projects

UNITY GARDENS CLASSES

Unity Gardens Classes are free and open to anyone. Classes normally last 60 to 90 min. We host most classes at our Welcome Center on 3701 Prast Boulevard, but also in other spaces in the area. Watch here. Powerpoints and handouts from class are under the resources tab.

[CLICK HERE FOR OUR YOUTUBE CHANNEL WITH RECORDINGS OF CLASSES](#)

[CLICK HERE FOR THE RESOURCES PAGE](#)

Fruit Classes 2024
At the Unity Gardens Welcome Center
3701 Prast Blvd
Wednesdays
Classes are free and open to the public
These will be available on Zoom during the class time!

Wednesday, 4/3 @6pm - Holistic Spray Program

Winter Library Classes 2024
Hosted at libraries throughout St. Joseph County
Classes are free and open to the public

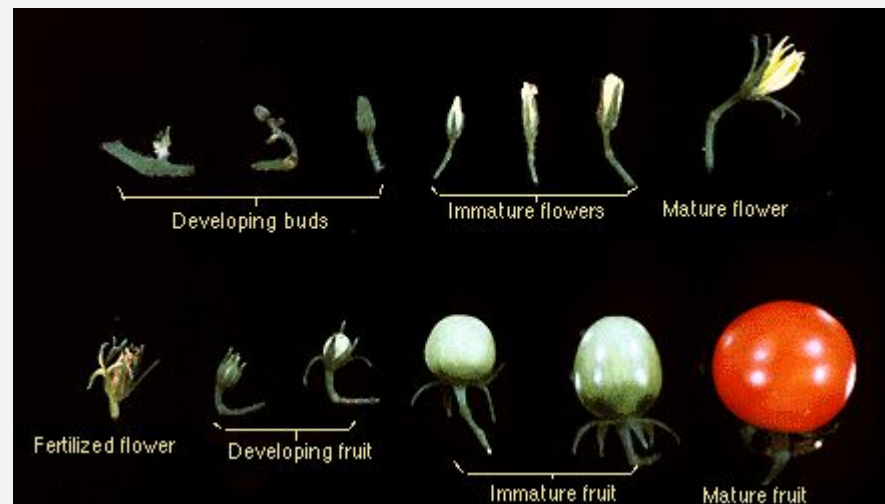
Tuesday, April 9th, 4-5pm
LaSalle Branch Library
Seed Flings (for kids age 6-12)

Wednesday, May 29th, 5-6pm

What is propagation?

What is propagation?

- process of creating new plants
- two types
 - sexual (from the reproductive parts of the plant - seed, flowers, fruit)
 - creates a genetically different plant
 - asexual (from the vegetative parts of the plant - stems, roots, leaves)
 - creates a genetically identical plant (clone)



Asexual Propagation

cutting - rooting a severed piece of parent plant

layering - rooting a part of the parent and then severing it

budding/grafting - joining two plant parts of different varieties

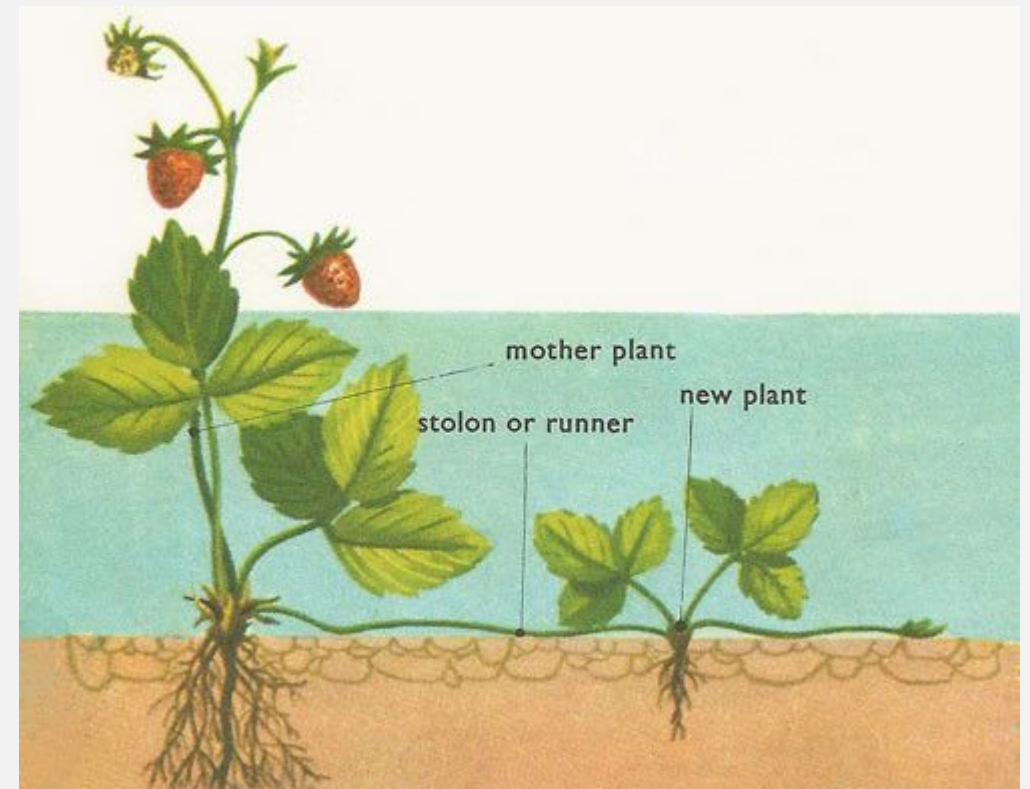
<https://extension.umaine.edu/gardening/manual/propagation/plant-propagation/>



Strawberry Propagation

Strawberries = layering

- can grow strawberries from seed but it takes multiple years
- much easier to propagate through layering
- separate from mother plant only when it's developed its own roots
- pick off blossoms/fruit on new plants
- <https://www.youtube.com/watch?v=e4bNv747Vw>

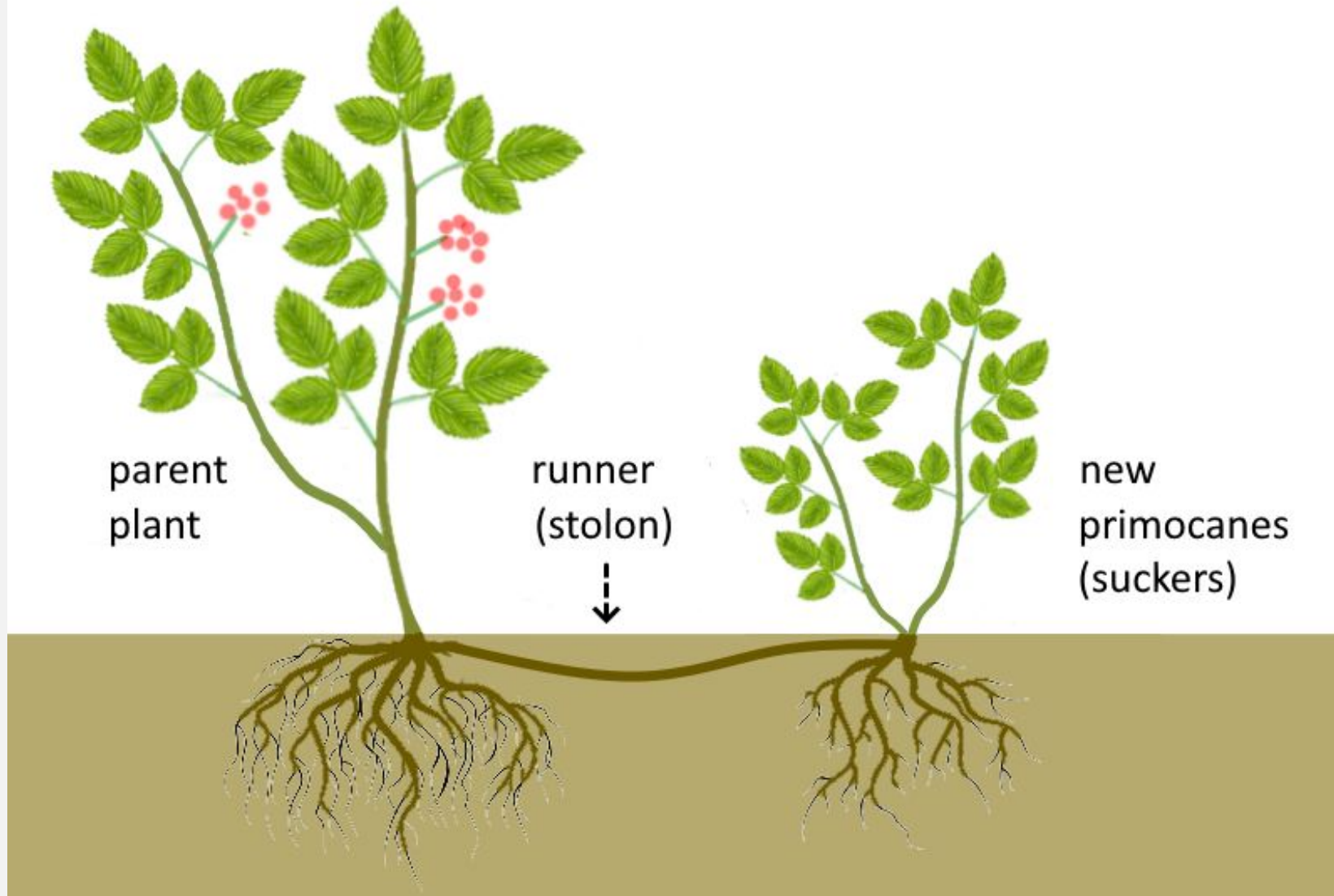


<https://www.youtube.com/watch?v=O3cEljuKJ64>



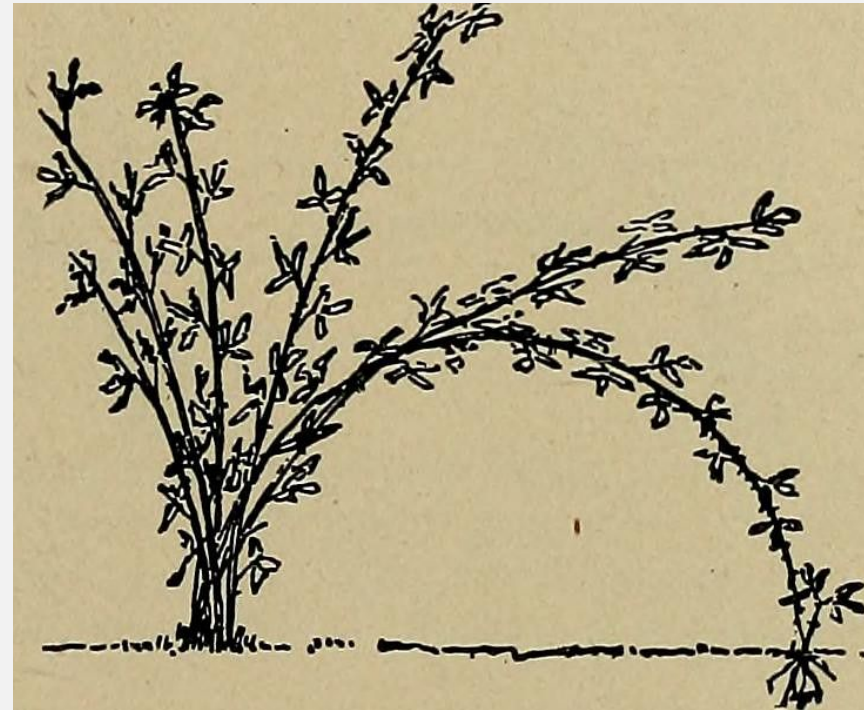
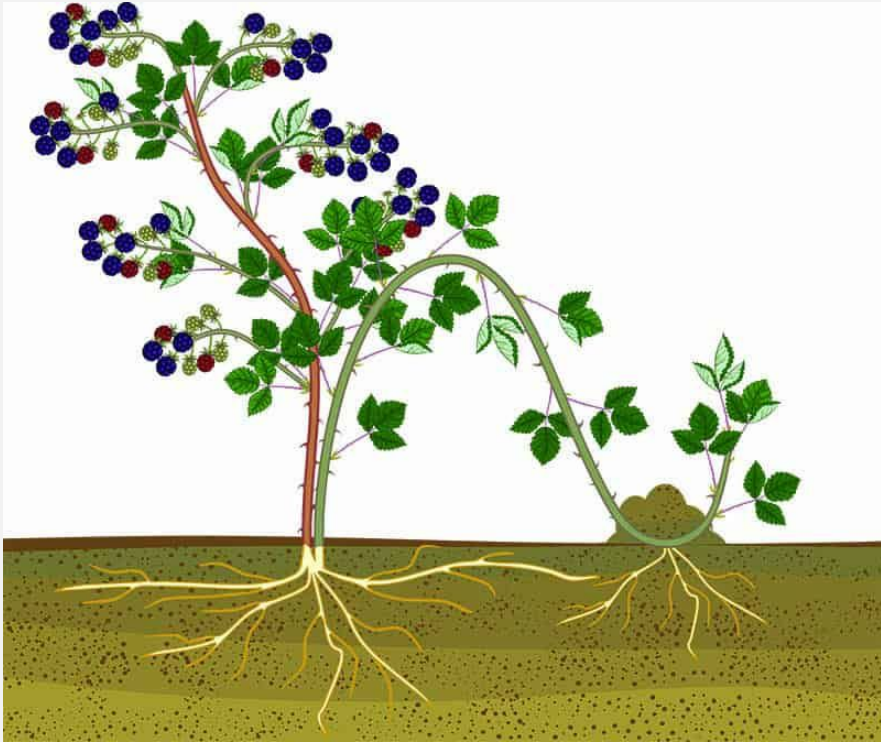
Layering on Brambles

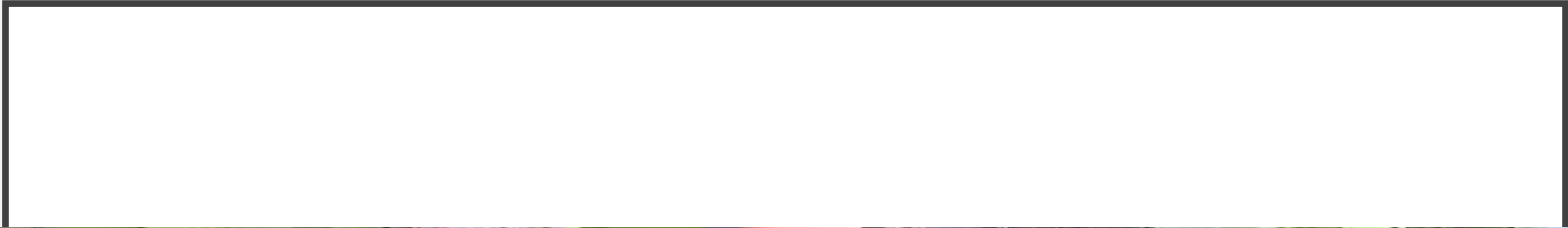
Raspberries Spreading from Runners



(all the same principles apply)

the other layering method





Can also utilize cuttings

this works for brambles &
gooseberries



Tree Propagation

Why can't I plant from seed?

- seeding is a result of sexual propagation which means the child is not genetically identical to the parent
- this is especially true of things like apples that cross-pollinate with other varieties
- to reliably get a plant with the same characteristics, you need to graft!
- seeding also takes a long, long time to reach maturity

Grafting

Grafting Parts

a grafted tree has two parts: scionwood or budwood and the rootstock

the section they join is called the graft union

not all rootstocks and scions are compatible



Compatibility

Apples - different varieties of apple trees (*Malus domestica*) and crabapples (*Malus sylvestris*)

Cherries - sweet cherries (*prunus avium*) and sour cherries (*prunus cerasus*)

peaches (*prunus persica*) - other peaches and almonds (*prunus dulcis*)

pears - european and asian pears are usually compatible (*pyrus communis* and *pyrus pyrifolia/pyrus ussuriensis*), sometimes quince (*cydonia oblonga*)

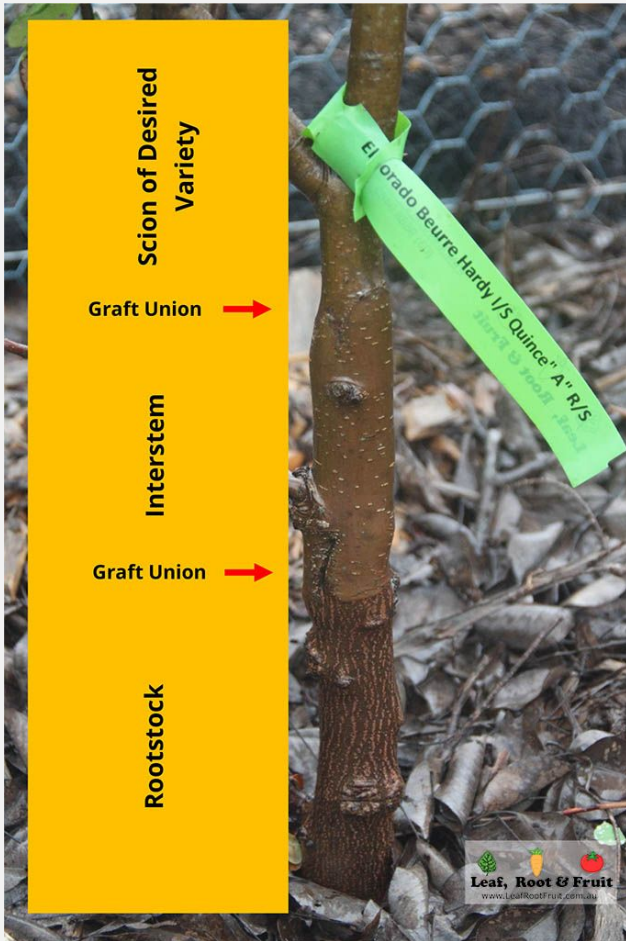
plums - all types of plums are usually compatible (*prunus domestica*, *prunus salicina*, *prunus americana*). sometimes apricots

North American Scion Exchange has more info on compatibility

<https://www.facebook.com/groups/scionexchange/>

Interstem Grafting

- essentially inserting another rootstock above the first to adjust some of the compatibility or final features
- for compatibility, height, or disease resistance
- (so a semi-dwarf rootstock with a dwarfing interstem will limit height)
- (a non compatible rootstock with a compatible interstem will allow for compatible grafting)
- 2 yr process



Scions

How to Choose a Scion

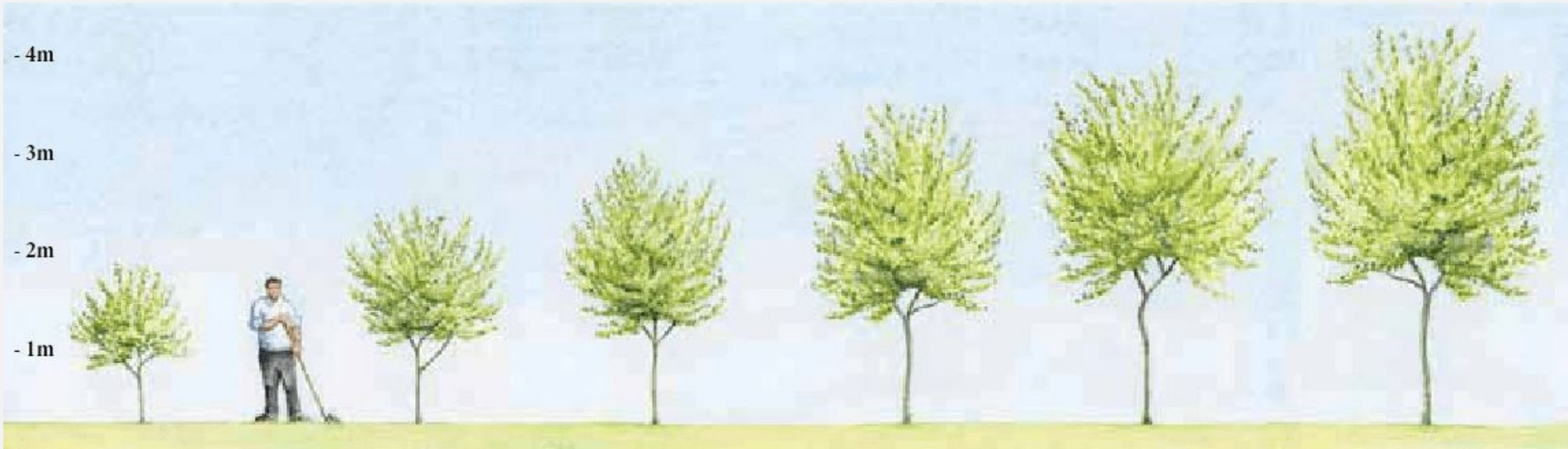
- plant hardiness
- chill hours
- use
- taste
- harvest time
- bloom time
- pollination requirement
- disease resistance
- vigor
- precocity

Rootstocks

How to Choose Rootstock

- eventual size of tree
- resistance to pests
- resistance to disease
- suitability for specific soil types
- weather tolerance

Rootstocks



Very Dwarf		Dwarf		Semi Dwarf		Medium		Semi Vigorous		Vigorous		Very Vigorous	
Fruit	Rootstock	Fruit	Rootstock	Fruit	Rootstock	Fruit	Rootstock	Fruit	Rootstock	Fruit	Rootstock	Fruit	Rootstock
Apple	M27	Apple	M9	Apple	M26	Apple	M116	Apple	MM106	Apple	MM111	Apple	M25
		Pear	Quince C	Apricot	Torinel			Pear	Quince A	Pear	Pyrodwarf	Pear	Pyrus communis
		Cherry	Gisela 5	Plum	Pixy, VVA-1			Plum	St Julien A			Pear	Pyrus Kirchensaller
				Gage	Pixy, VVA-1			Gage	St Julien A			Cherry	F.12.1
				Damson	Pixy, VVA-1			Cherry	Colt			Plum	Brompton

Considerations in rootstock

Dwarf	Semi-dwarf	Full size
<ul style="list-style-type: none">● Most expensive● Needs support● Smallest (8-10ft)● Good for kids, maintenance, and small spaces● shortest lifespan (15-20 yrs)● will benefit the least from holistic care● smallest harvest● bears fruit earliest	<ul style="list-style-type: none">● In the middle● Supported/freestanding● Medium (14-22ft)● Good for maintenance and easy harvest● shorter lifespan (40-50 yrs)● bears fruit next	<ul style="list-style-type: none">● Cheapest● Freestanding● Full sized (25+ft)● Will produce the most, at cost of harder maintenance and harvest● longest lifespan (50+ yrs)● bears fruit latest

Disease/Pest Resistance

Apple - resistance to fire blight, crown rot, root rot, apple scab, and woolly aphids

Peach - resistance to bacterial canker

Pear - resistance to fire blight

Cherry - resistance to crown gall, bacterial canker

(Rootstocks are also usually clones!)

- rootstocks are often produced by vegetative propagation to ensure genetically identical plants
- (rootstocks grown from seed may not have the same characteristics as the parent plant)

Getting into It

Collecting scionwood

- needs to be collected during dormancy
- once the buds start swelling, they are more vulnerable and need more nourishment from mother tree
- collect “first year wood” (can identify from last year’s growth ring)
- should be about a pencil thick ($\frac{1}{4}$ - $\frac{3}{8}$ inch in diameter)
- new growth is usually more flexible



Identifying

<https://ecommons.cornell.edu/serve/api/core/bitstreams/317dc529-3265-4f8c-87a2-473c2e3e790b/content>



Why New Wood?

- older branches are harder to cut clean
- vegetative buds on old growth are less vigorous

Why can't I find good scionwood?

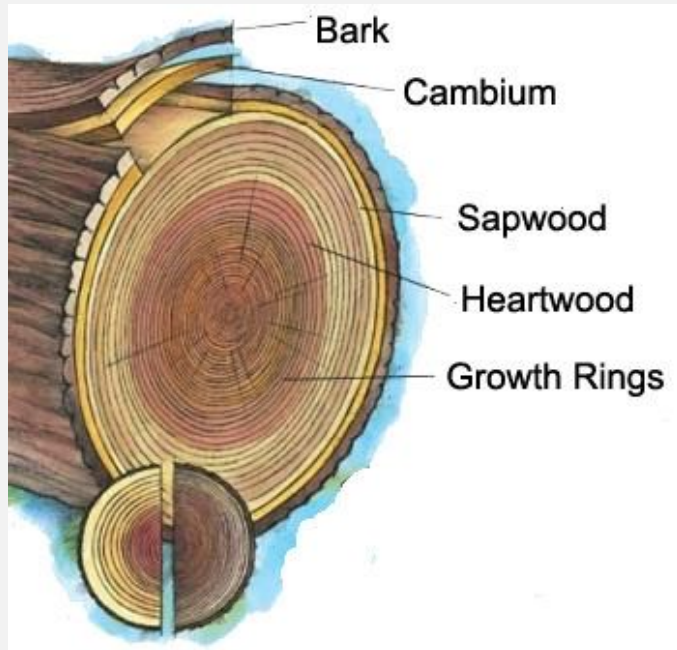
- your tree is unhealthy and not growing a ton
- you pruned off too much recently
- you haven't pruned in a while

Collecting Scion Wood

- only cut when the weather is above 1 degree F
- sterilize pruners before and after
- label your scions
- wrap in damp newspaper, seal in plastic bag and store in cold area around 32 degrees F (if storing in fridge, be aware of ethylene)
- can also dip the cut end of your scion in wax
- make sure they don't dry out or get too wet
- can store rootstock in a bucket with damp sawdust



Science of grafting



vascular cambium - layer of living tissue under the bark of the tree made up of undifferentiated cells

- generally evolve into xylem (bringing water/nutrients up) or phloem (brings sugars down)
- also heal wounds on trees by forming a callus

primary growth on trees in elongation of branches/roots

second growth on trees is making stems/roots thicker

- when grafting, line up cambiums and they work to heal the wound together



bark slippage

- only necessary for some types of grafting (bark grafting and t-budding, maybe more?)
- can only do this at a certain point in the year and it varies from variety to variety
- test by making a cut along the length of the branch and try to pull back the bark
- even easier on a well-hydrated tree
- only a short period where it's possible to do bark slippage

timing

early spring, bud swell (cambial cell division)

later spring, buds open (cambial cell division, bark slippage)

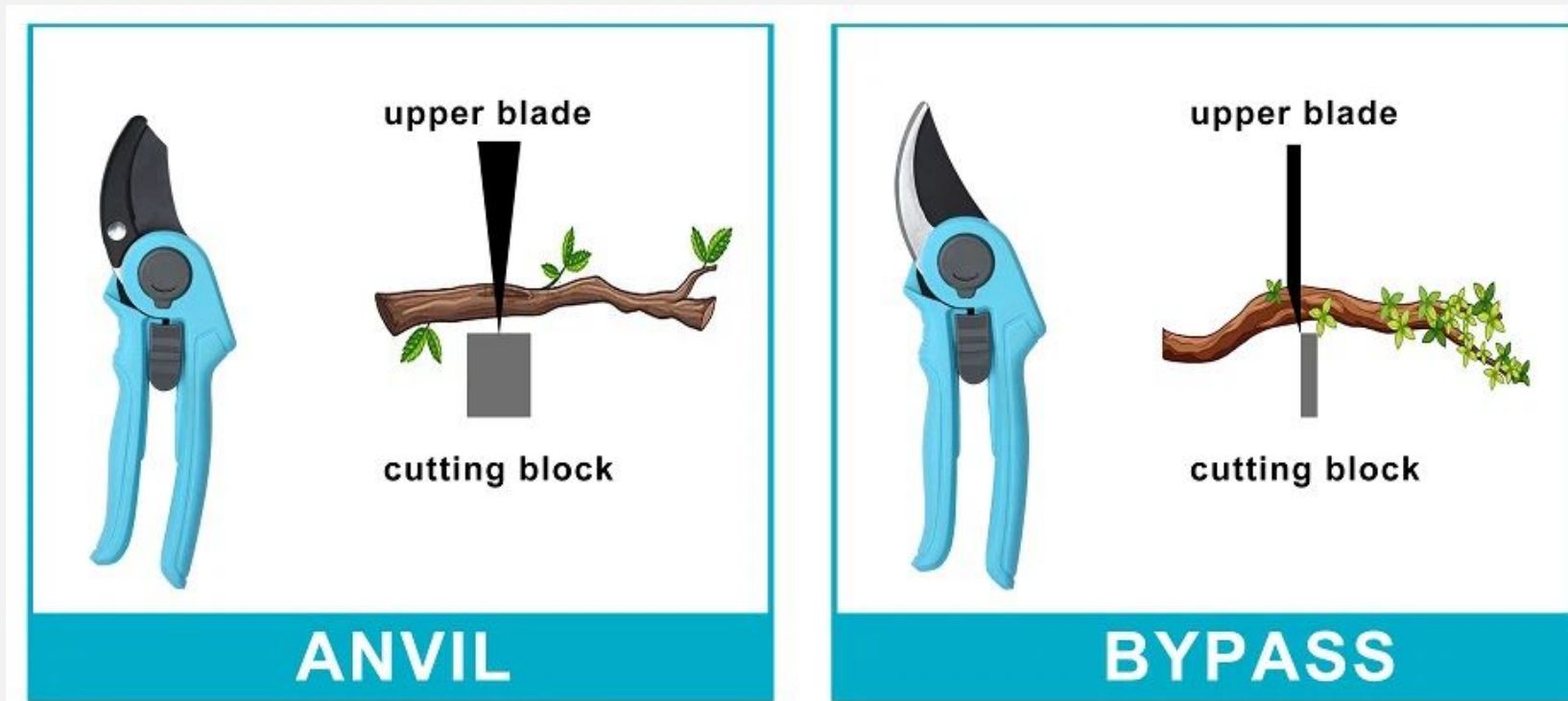
early summer (cambial cell division)

summer grafting is harder because of heat stress and minimal cell division

full blooms is when grafting is coming to an end

tools

- pruners (sharp & sanitized) (bypass instead of anvil)
- grafting knife
- grafting tape or some sealant (wax, electric tape, etc)



fundamental grafting cut

makes a smooth, angled cut that is about one inch long

no jagged edges

practice on scrapwood first

use a sharp and clean knife



Types of grafting

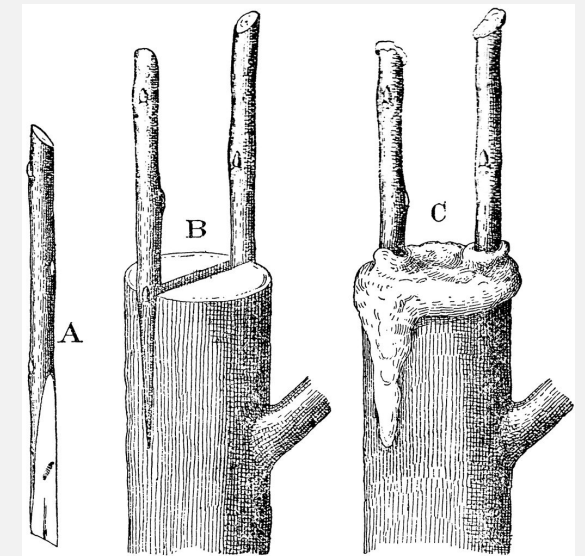
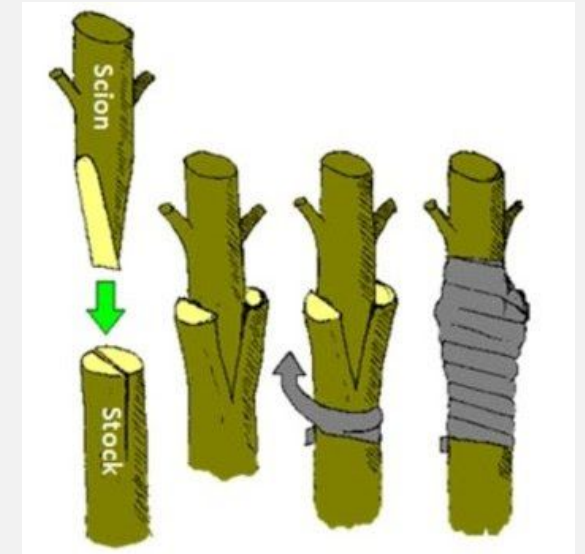
cleft grafting

on established trees or roostocks, works on branches that are 1-2 in thick

no bark slippage required

match up cambiums

if diameters don't match up, can graft two scions



Modified Cleft Graft

- cut at edge of rootstock should be same diameter as the scion
- great for when diameter of rootstock and scion are different

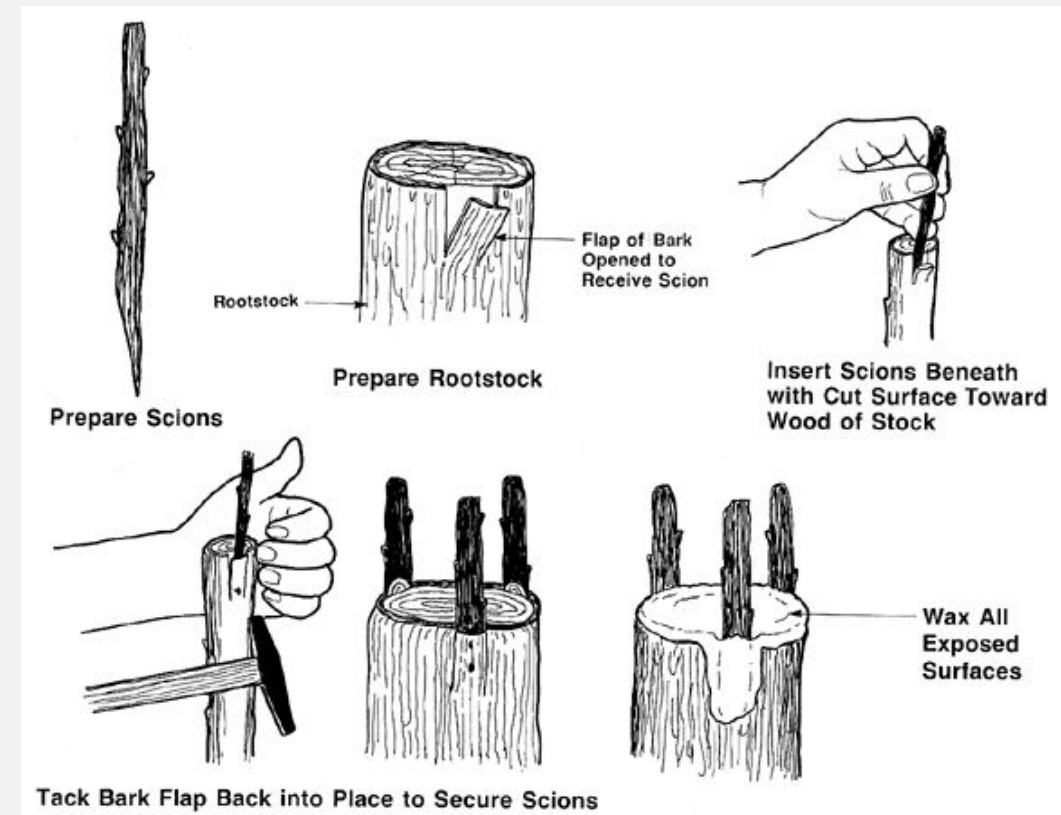


bark grafting

on established trees, graft onto branches that are more than 2 in thick

bark slippage required

long cut into branch interior, shallow cut on exterior

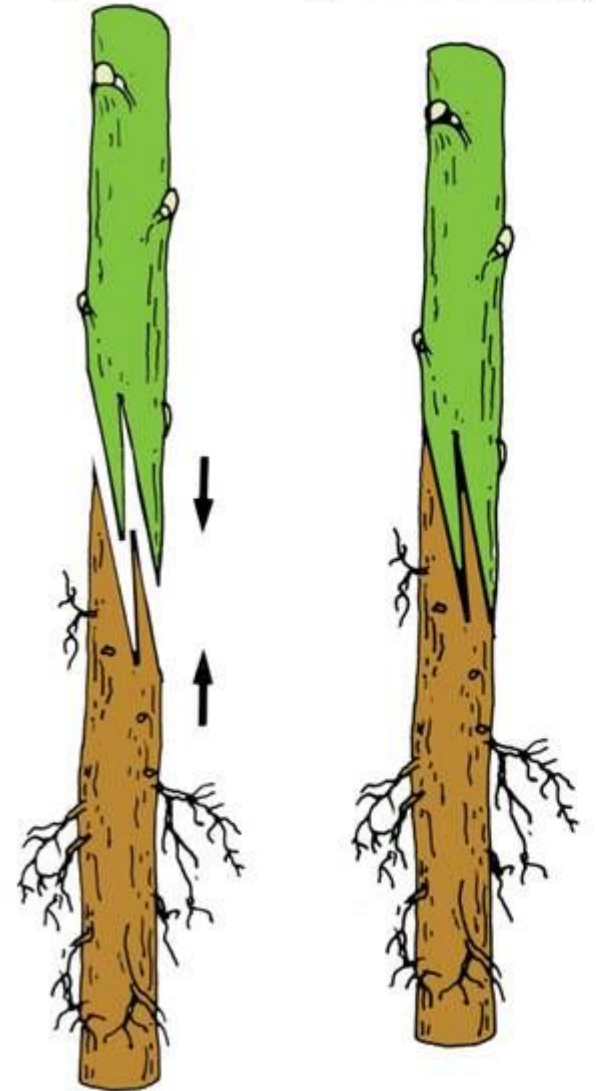


whip and tongue grafting



on roostocks, can be used on
established trees, but host tree and
scion must match in diameter
no bark slippage required
making parallel cuts on scion and
rootstock to ensure a snug fit
very high success rate!

The stock and scion are slipped
together, the tongues interlocking.



side grafting

can be used when scion and rootstock are different diameters

make sure to make cuts the same length and match up cambiums

can use the same technique as whip n tongue to ensure a good connection



where to cut on rootstock

- don't cut too low into your rootstock, your graft union needs to stay above soil level
- (grafting cuts should be about 6 in above roots)

sealing your graft

need to seal your graft so it doesn't dry out and cause failure

options: tape, glue, wax

keep in mind whether it's biodegradable or if you'll have to remove it

tape is the easiest to use (Buddy Tape or parafilm grafting tape)

Lac Balsam is easier to seal tip of scion than tape



Why Do Grafts Fail?

I. Bad Contact with Cambium

- this is usually either caused by bad cuts, or improper positioning
- can be solved by
 - practicing your cuts
 - using sharp knives
 - extra pressure when sealing
- easier to line up cambiums when they have the same diameter
 - with different diameters, line up at the edge
 - or utilize a different grafting technique



2. Bad Scion Selection

- utilize 1 yr old healthy wood
- if the scion is dried out or diseased, the graft will fail
- can check by scraping the bark above the cut, if you reveal brown wood, it may be dried out
- choose scions with leaf buds instead of flower buds
- utilize dormant scions



3. Bad Graft Protection

- oxidation will kill the cells in the cambium
- need to seal the graft union properly to keep air out
- you also need to seal the graft soon after making your cuts into the scion wood/rootstock
- water will also cause rot if it enters the graft region
- skin oil contact with grafting cuts may also cause the region to dry out

4. Compatibility

- scion and rootstock need to be compatible for the graft to be successful!
- both in species and in vigor

Set your Graft Up for Success

prune excessive new growth

- graft union is weak
- remove growth below graft union
- label your grafts
- monitor your grafts
- remove extra grafts

Resources

<https://www.youtube.com/@JSacadura/videos>

Fruit Tree Grafting for Everyone by Susan Poizner