

Growing tree fruits for the home garden

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Topics to be covered

- Site selection
- Botany
- Dormancy
- Propagation
- Varieties
- Pollination
- Flowering habit
- Rootstocks
- Fertilization
- Irrigation
- Fruit thinning
- Pruning
- Training
- Pest controls

Main problems home owners encounter growing tree fruits

- Deer and voles
- Insects
- Disease
- Pruning knowledge
- Choosing easy to grow fruits
- Packing trees too close together
- Storage and preservation



Site selection

- Plant Zone 7 or 8,
- Good for deciduous tree fruit
- Eight hours of sun
- Some elevation is a benefit -fights frost
- Microclimate effects
- Need a water source, at least in the beginning
- Well drained soil best

Site Selection-Soil

Tolerance to waterlogging:

- Pear- very tolerant
- Apple-tolerant
- Plum- somewhat tolerant
- Peach- sensitive
- Apricot- very sensitive
- Sweet cherry- very sensitive, sour or pie cherries less so

Site Preparation

The most common mistake gardeners make is to not begin soon enough to prepare the site adequately for planting fruit trees.



Soils for Tree Fruits

- Soil improvement needed?
- High organic matter
 - Amend with compost, etc.
- pH between 6.0 and 7.0
- Weed control!



Got deer?



Growing fruit trees

Dormancy
Propagation

All tree fruit plants are perennial

- Buds produced one year
- Fruit produced the following year
- Plant and buds must overwinter

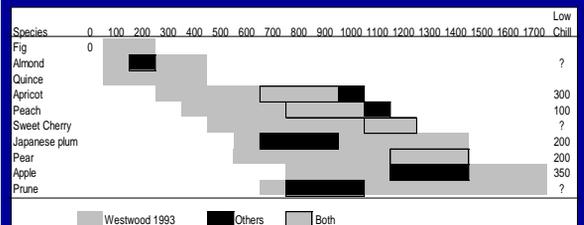


Dormancy

- *Dormancy is a condition of the buds.*
- *Accumulation of chilling hours is required to break bud dormancy. Hours <45 deg F*
- *Heat accumulation is also required to resume growth.*



Chilling Hours Required for Different Fruit Species



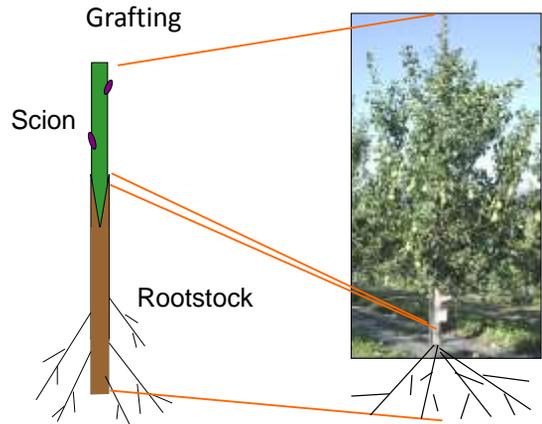
Satisfaction of chilling requirement is complex and not well understood.

Propagation= Reproduction or Multiplication

Most tree fruit and nut cultivars are clones, propagated vegetatively by grafting (or budding) or sometimes, cuttings.



- Vegetative (*Asexual*) propagation maintains the genetic identity of the plant.
- Trees are grafted because they are often difficult to root and/or they benefit from characteristics of the rootstock variety.



Growing tree fruits

Varieties

Tree Fruit & Nut Crops

Pome fruits

- Apples
- Pears
- Quince

Stone fruits

- Cherries
- Apricots
- Plums
- Peach

Other types

- Figs, persimmons, walnuts, hazelnuts



Choosing a Crop

- Hardiness
- Productivity
- Taste, appearance, texture, season
- Intended use
- Ease of culture
- Pollination requirements



Varieties best suited for home orchards

– Characteristics to look for....

- Apples
 - Scab resistant
 - Mildew resistant
 - Good flavor
 - Fruiting somewhat spread out
- Cherries
 - self-fertile
 - disease resistant
 - cracking resistant
 - flavor



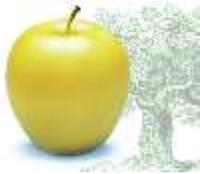
Scab-resistant apple varieties

- Early ripening-
 - Pristine
 - William’s Pride
 - Akane
- Mid-/ early late
 - Liberty
 - Chehalis
- Late
 - Goldrush

Leading Western Oregon Home Garden Varieties

- Akane
- Golden Delicious
- Granny Smith
- Gravenstein
- Gala
- Jonagold
- Pink Lady
- Braeburn
- Honeycrisp
- Liberty
- King
- Other heirlooms

Golden Delicious



Akane



Pink Lady



Liberty

Gravenstein



Braeburn



Gala



Fuji



Granny Smith



Jonagold



Standard pear varieties

Big four-

Bartlett (Summer*)

Bosc (Winter**)

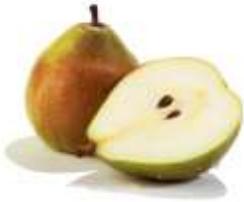
Comice (Winter**)

D'Anjou (Winter**)

*Summer- will ripen after harvest

**Winter- requires chilling to ripen normally (refrigerator or outside)

Comice



Yellow Bartlett



Bosc



D'Anjou



Peach Varieties

- Leaf curl resistant – no point in trying other varieties
- Frost
- Early Redhaven
- Charlotte
- Clayton
- Muir
- Krummel



Plum and Prune Varieties

- | | |
|----------------------|---------------------|
| • Plums- (Japanese) | • Prunes-(European) |
| • Beauty- red | • Italian- purple |
| • Santa Rosa- red | • Brooks - purple |
| • Satsuma- red | • French- blue |
| • Shiro- yellow | • Stanley- blue |
| • Methley- light red | • Moyer- purple |

Cherry Varieties

- Chelan
- Lapin – self fertile
- Bing
- Sweetheart – self fertile
- Stella - self fertile
- Rainier
- Royal Anne
- Any sour cherries



Other fruit trees

- Figs: Desert King
- Persimmons: Japanese types (need heat)
- Quince: Russian or Turkish types
- Olives: Still a work in progress



Growing tree fruit

Pollination

Fruit set requires:

- Flowers
- Pollination with compatible pollen
- Insects to move the pollen around
- Nuts are wind pollinated
- Fertilization



Pollination

Definitions:

Pollination = the transfer of pollen to the receptive part of the female flower.

Pollinator = the agent of pollen transfer (bees, flies, etc.).

Pollinizer = the source of the pollen.



Pollinizers

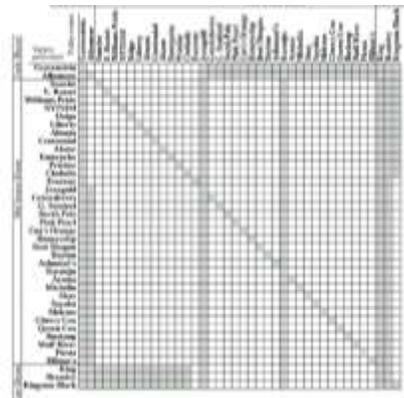
(triploid varieties are sterile)

- Apple
 - another variety
 - crabapple
- Peach
 - self-fertile (usually)
- Pear
 - Bartlett
- Cherry
 - self-fertile varieties
- Prune plum
 - 'Italian' benefits from another var.
- Oriental plum
 - another variety



Apple Pollinizer Chart

Pollen Source	Braeburn	Fuji	Gala	Golden Delicious	Granny Smith	Gravenstein	Liberty	Red McIntosh	Scarlet Sentinel	Spartan
Braeburn	X				X	X	X			
Fuji		X			X	X	X			
Gala			X		X	X	X			
Golden Delicious				X	X	X	X			
Granny Smith					X	X	X			
Gravenstein					X	X	X			
Liberty					X	X	X			
Red McIntosh					X	X	X			
Scarlet Sentinel					X	X	X	X		
Spartan					X	X	X	X	X	



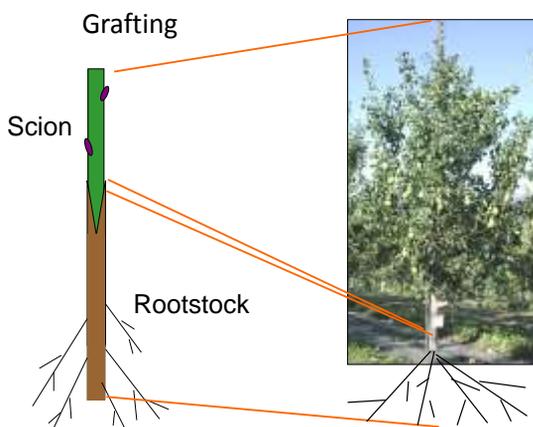
How do you control the size of fruit trees?

- Very hard pruning or
- Dwarfing rootstocks
 - genetically different root system
 - many dwarf rootstock trees have to have support
 - more later
 - variety is budded/grafted onto a rootstock

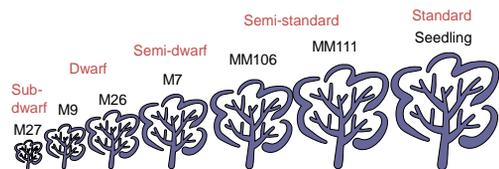
Vigor of the scion determines, in concert with the dwarfing rootstock, the ultimate tree height.

Why dwarf or “growth controlled” trees?

- Safer- little to no ladder work
 - pruning/training
 - harvesting
 - spraying
- Begin flowering earlier (precocious)
- Bear earlier
- More productive
- Less pruning



Apple Rootstocks



Apple spacing

- Extreme dwarf
 - 2 foot spacing
- Dwarf
 - 6-8 foot spacing
- Semi-dwarf
 - 15-20 ft spacing
- Standard
 - 18-30 ft. spacing

Good management practices

- Ground preparation
 - compost
 - weed free
 - raised bed if wet
- Hole for planting
 - not when wet
 - avoid glazing of edge (clay pot)

Planting



- ✓ Most deciduous fruit trees are planted bareroot and dormant (fall through early spring).
- ✓ Planting hole should be dug large enough to fit root system without bending roots – wide vs. deep
- ✓ Care must be taken not to glaze the sides of the planting hole – wait for soil to dry
- ✓ Broken or damaged roots should be trimmed off.

Planting



- ✓ Trees should be planted with graft union above soil line.
- ✓ Trunks should be painted with white interior latex paint (can be diluted with water 1:1).
- ✓ Water trees in (5 gals./ tree).
- ✓ Don't put fertilizer in hole or around tree base until 2nd yr.



Weed Management

- What is a weed to a tree?
 - Annual broadleaf weeds
 - Woody perennials
 - Grasses

Weeds compete for water and harbor voles.

51



Voles



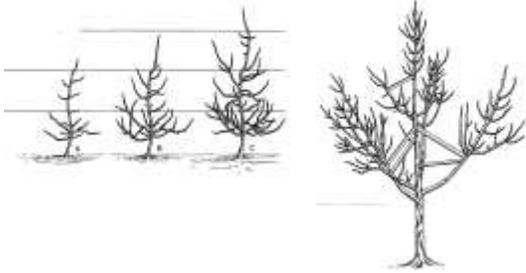
Pruning after planting

- Central leader training
- If not branched, head the tree at ~30"
- Allow 4-5 lateral branches to develop (not all from the same location on the trunk)

Training Systems – Central Leader



Central leader



Training & Pruning: Open Center or Vase



Growing tree fruits

Training: Creating a form or structure for the tree.

Pruning: Removing unwanted wood for better light penetration and renewal of fruiting wood.

Training dwarf fruit trees

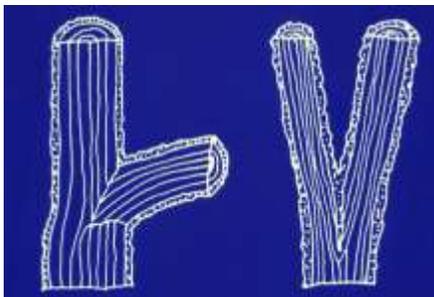
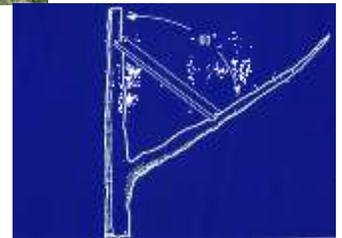
- Branch bending from vertical to more horizontal



Training Techniques

- Spreading
- Bending
- Trellising
- Tying

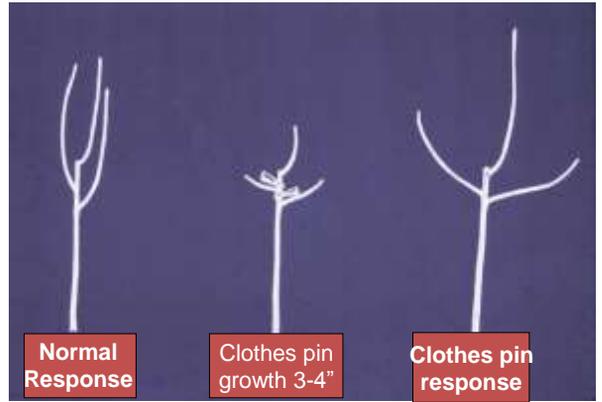
– All position limbs



Right—strong crotch

Wrong—weak crotch





Toothpicks

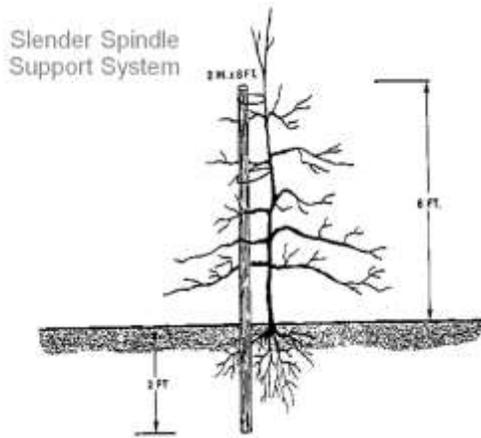


Support systems

- Prevents wind whipping
- Supports graft union
- Helps maintain central leader
- Critical for dwarf trees
 - *Place the stake about 2" from the tree, fasten the tree to the stake, use non-metallic fasteners*

Supports





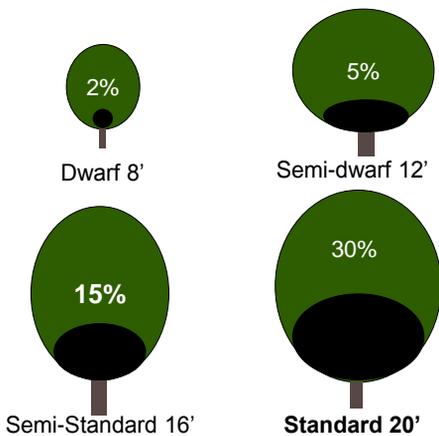
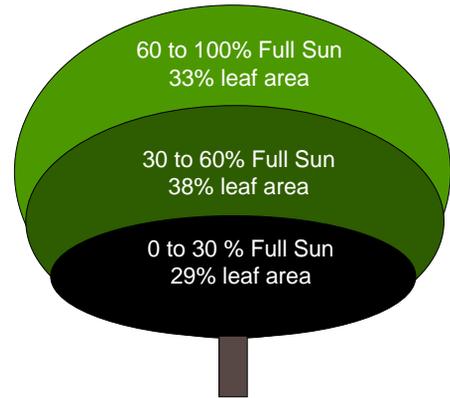
Pruning

Prune with a purpose:

- create access for thinning and harvesting fruit
- promote good spray penetration
- maintain and renew fruiting wood
- maintain growth or vigor in all parts of the tree.

Pruning should allow sunlight to enter and air to circulate throughout the tree canopy.

The Shade a Tree Casts on Itself is its own Worst Enemy



Shading by a single leaf

- Lowers light intensity to just 10% of leaves in full sunlight
- Reduces photosynthesis to 28% of leaves in full sunlight
- Limits the export of carbohydrates to fruits and spurs

Vertical Growth

- Very vegetatively vigorous
- Not fruitful



Horizontal growth

- Not vegetatively vigorous
- Very fruitful



When pruning you must know fruiting habits

- Fruit spurs need good light to form
- Trees that form their fruit on one-year old or new wood need a lot of new wood formation



Previous season's shoots

- Japanese plums
- Peaches
- Quince
- Hazelnuts



Previous season's spurs and shoots

- Apple (minor)
- Sour cherry
- Pear (minor)



Long-lived spurs

- Apples
- Pears
- Apricots
- Sweet cherry
- Sour cherry
- Plums



Fruit spur

Dormant



Suckers



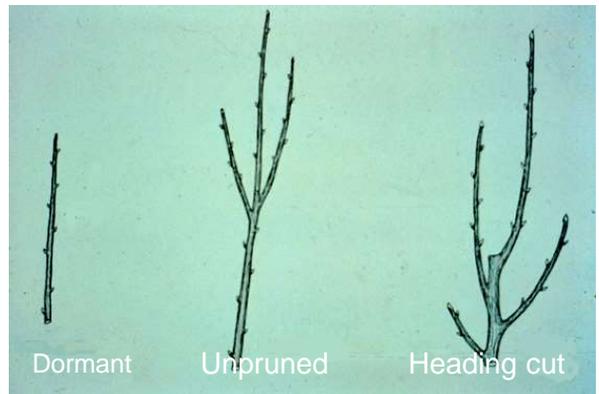
Water sprout



Pruning

- Heading back cuts
 - invigorating
 - lateral buds break
 - increases branching
- Thinning out cuts
 - branch collars
 - equal but opposite
 - stimulate apical shoot elongation
 - reduce branch number

**Heading cut
removes apical
dominance and
causes
branching**





When to prune?

- **Dormant season**
 - December through March
 - Summer pruning in late July
 - Vigorous apples
 - Stone fruits for disease issues

Pruning Procedure

- Remove water sprouts and suckers
- Remove broken and damaged branches
- Remove pendant branches
- Remove weaker of crossing branches
- Remove old complex spurs
- Evaluate often (step back)

Sky Test

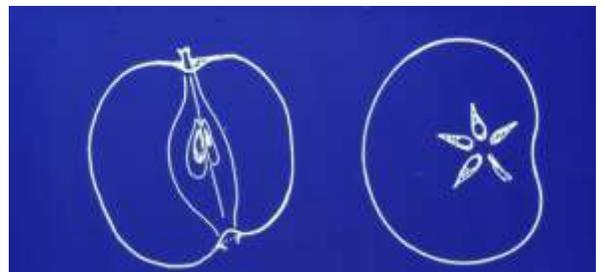
- Lay on your back with your head near the trunk
- Look up through the tree
- Can you see the sky clearly?
- If not, keep pruning 😊

Why do we thin fruit?

- Fruit size
 - apple, pear, peach, plum
- Return bloom
 - mostly in apple
- Prevent limb breakage
- Distance
 - at least 6" (fist with extended thumb)
 - < 25% of the crop in apple and peach

Thinning apples

- Hand test (1-2 fruit/cluster spaced 6" apart)
- Within 3 weeks of petal fall to get fruit size & return bloom response.



Seeds release hormones that cause cells to divide and expand. When seeds are only on one side lopsided fruit results.

Very incomplete pollination = fruit drop

Fruit Thinning



Growing tree fruits

Pests and control

Challenges

- Diseases
 - Scab
 - Anthracnose
 - Leaf curl
 - Bacterial canker
- Insect pests
 - Codling moth
 - Apple maggot
 - SWD
 - Cherry fruit fly
 - Borers
- Vertebrate pests
 - Voles
 - Deer

Diseases

Apple scab: Resistance or lime sulfur after bloom.
A wet weather disease



Apple anthracnose

- Girdled bark with rough appearance
- Fall fungicides and pruning



Apple anthracnose



Apple mildew

- Summer disease
- Resistance
- Fungicides



Bitter pit

- Disorder of calcium
- Cultural management: lime, irrigation, pruning



Codling Moth – Apple and Pear Pest



Apple Maggot

A fly of recent introduction.

Damage= lots of small holes and dimpled fruit



Apple maggot control

- Emerges in late June
- Difficult to control
- More common on later apples
- Botanicals, Surround, traps, spinosad



Pest control

- Sanitation, sanitation, sanitation!!!!
 - Remove all fruit before winter
 - Cut out cankers/dead wood
 - If bad scab year, rake up leaves and compost
 - Prune for good air movement

Western Cherry Fruit Fly – Cherry Pest



Control: Ignore or spinosad in mid-June through harvest.

Peach Pest Control

- Peach leaf curl
 - 3 dormant copper or lime-sulfur sprays
 - Nov, Jan or Feb, pre bud break
- Coryneum blight- fall copper
- Bacterial canker- fall copper
- Brown rot- pre bud break sulfur and mid summer to harvest

Bacterial canker of stone fruits



Coryneum (shothole) blight

Copper in fall and spring or other fungicides
Good air circulation



Peach leaf curl

- Winter copper
- Resistance!!



Shot hole borer

- Often a problem on stressed trees
- Stone fruits and others
- Difficult to prevent – whitewash?



Use Resistant Varieties



Final Thoughts

- Remember to build in low maintenance through careful variety selection and proper pruning techniques. Plant trees that will grow to the height that you need and are as pest and disease resistant as possible.