Backyard Orchards: Growing Fruit Trees at Home

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Topics

Site selection & modification
Soil and planting
Common pests
Maintenance care
Pruning concepts

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Stone fruit are more prone than pome fruit to damage due to mid winter low temperatures

	Fruit type	Typical mid winter temperatures (F) sufficient to kill flower buds
Pome fruit	Apple	-30
	Pear	-30
Stone fruit	Apricot	-25
	Tart cherry	-20
	Plum	-15
	Sweet cherry	-15
	Peach & nectarine	-13

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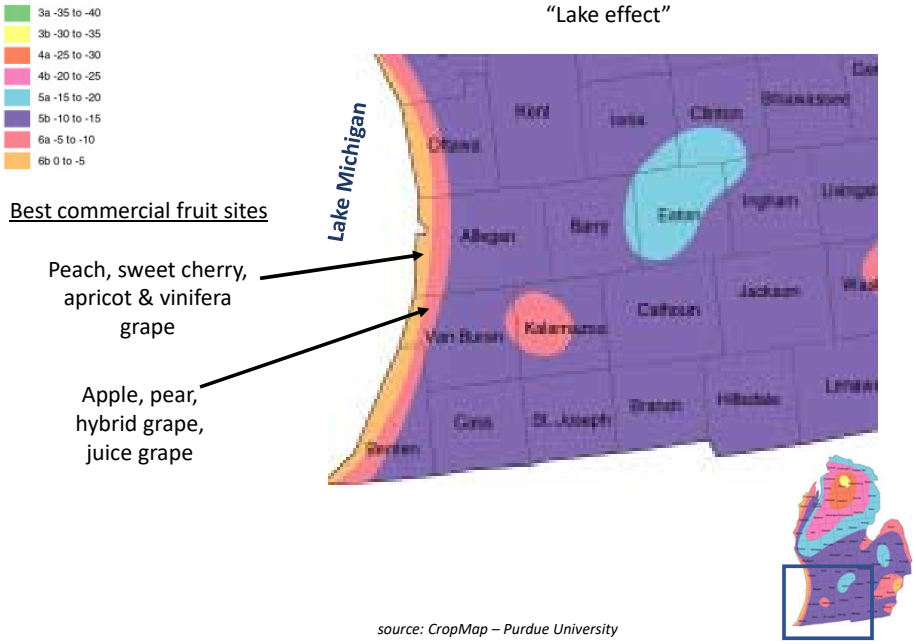
Michigan Hardiness Zones and Typical Winter Low Temperatures in SW Michigan



source: CropMap – Purdue University

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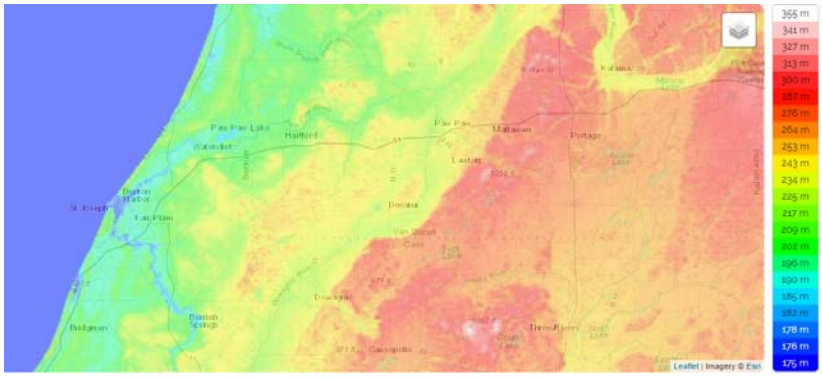
Elevated sites tend to be warmer on still nights because cold air moves downhill

Areas close to Lake Michigan have relatively low elevation



Benton Harbor, Berrien County, Michigan, United States of America (42.11671 -86.45419)

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Site selection for fruit

Sunlight requirements

- fruit needs approximately 60% full sun--all day is best

Soil requirements

- sandy loam to clay loam
- good water drainage
- soil pH 6.2 to 6.8 is best

Exceptions:

Blueberries and cranberries require pH below 5.5 and perform best at pH between 4.5 and 5,

tart cherries are somewhat intolerant of low pH.

Planning the home fruit planting

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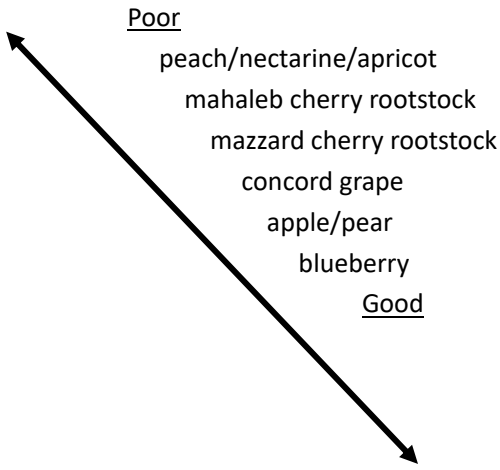
Chose your fruit tree and site carefully

Tolerance to poorly drained soil



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Site Modification

Build a mound or berm where wet soil is a problem. Also consider tiling for water drainage

The mound or berm should be approximately 6 inches above normal ground height after settling

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When choosing varieties, consider when they ripen

Apple variety	Typical southwest Michigan harvest	Days from bud opening to harvest
Macs	Sept 8	146
Gala	Sept 10	148
Honeycrisp	Sept 13	159
Red Delicious	Oct 1	169
Golden Delicious	Oct 3	171
Fuji	Oct 15	183

Traverse City averages 150 frost-free days

Benton Harbor averages 170 frost-free days

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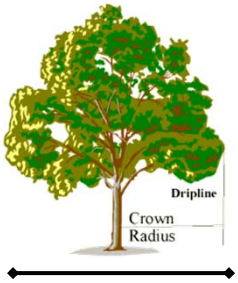
Fertilizing Fruit Plants

Typical rates of nitrogen for semi dwarf trees is approximately 100 lb of actual nitrogen per acre. The drip zone gets bigger each year so the amount per tree goes up as well.

Some sites with rich soil may need little or no nitrogen



Apply fertilizer to drip zone area of tree

Apply nitrogen in spring, perhaps half in March/April,

Apply 2nd half just after bloom.

9

What does 100 lb actual N per acre mean for a small tree?

Area = 12.5 sq feet

1 cup fertilizer is approximately ½ lb

Type of fertilizer	Cups fertilizer per tree	Actual N per acre, if entire orchard floor is treated	Fertilizer per acre, if entire orchard floor is treated	Amount fertilizer per young tree for 100 lb actual N per acre
10-10-10	1 cup	174 lb	1,740 lb	0.57 cup = 9.12 tbs
34-0-0	1 cup	592 lb	1,740 lb	0.16 cup = 2.56 tbs

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Trees planted closer together need less fertilizer when mature

Tree spacing	Trees/acre
40 X 40 ft	40 trees
26 X 26 ft	84 trees
22 X 16 ft	132 trees
20 X 14 ft	173 trees
14 X 4 ft	778 trees
14 X 2	1,556 trees
10 X 1	4,356 trees

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General timing for disease and insect management for apple

Protect leaves & stems

Protect fruit

Thinking about strategies

- Can lose about 15% of foliage and not affect fruit production
- Pests that attack the fruit are of bigger concern than foliage feeders.
- Easier to control pests / pathogens when the pest population is small
- Pests / pathogens tend to be active at certain times of year
- Treatments are only partially effective
- The fruit don't have to be perfect

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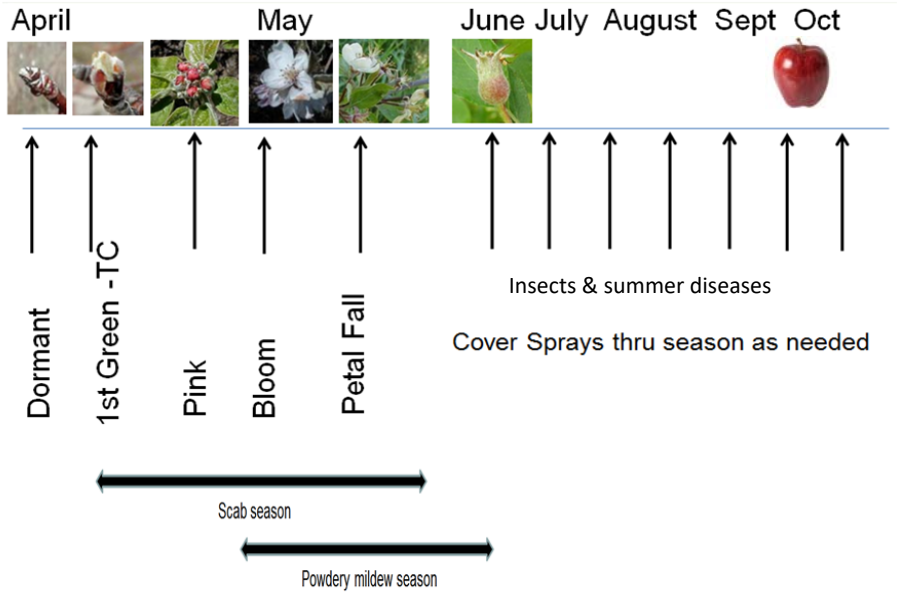
General timing for disease and insect management for apple



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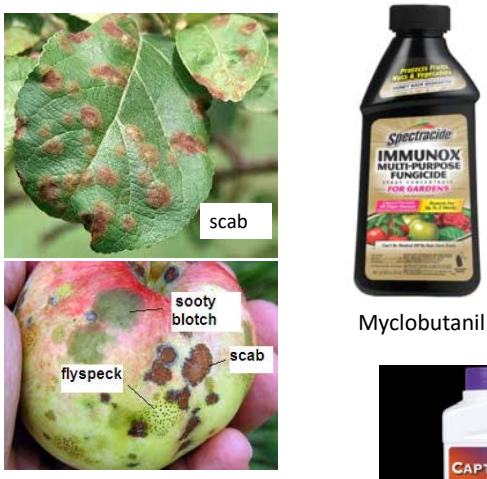

Myclobutanil

Sulfur★

Copper★

Captan

Mancozeb

★ Organic (depends on product)

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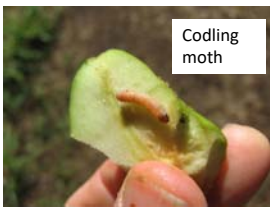

Imidan

★ Organic (depends on product)

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Tree Fruit Culture

- Pollination
- Rootstock & tree characteristics
- Planting tips
- General pruning strategies
- Pruning systems

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Pollination requirements types

<u>Self pollinizing – generally does not need a partner</u>

Peach, nectarine, apricot, tart cherry, grape, raspberry, strawberry, blueberry

<u>Not self pollinizing -- generally needs compatible partner</u>

Apples, pear, sweet cherry, plum, nut crops

Both types generally need pollinators (bees or insects or wind (nuts) to move pollen

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European plum pollination

Can be relied upon to pollinate this variety.
Suggested good pollinizer for this variety.
Partially self-fruitful, but we not be recommend solid planting.
Should not be to pollinate this variety.

EUROPEAN PLUM

Pollen Source Variety	Variety Pollinated: Earliblue	Mount Royal	Castleton	NY66.609.6	Stanley	Polly	NY 58.900.9	Twilight	Italian	Demaris	Shropshire Damson	Victory	Green Gage	Vision	Empress	President
Earliblue	●															
Mount Royal		●														
Castleton			●	★	★				★	★						
NY66.609.6			★	●	★				★	★						
Stanley				★	✦				★					★	★	
Polly	★	★	★	★	★	●	★	★	★	★	★	★	★	★	★	★
NY 58.900.9				★			●									
Twilight								●								
Italian			★	★	★				●	●				★	★	★
Demaris			★	★					●	●						
Shropshire Damson											●					
Victory												●				
Green Gage													●			
Vision					★				★					●	★	★
Empress					★				★					★	●	★
President									★					★	★	●

From older Hilltop Nurseries catalog

Nurseries & universities are sources of information about pollination

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Appreciating tree anatomy, growth, and fruiting helps in understanding tree training

Non-spur type e.g. Rome

- Bears fruit on tip of branches
- Tends to have droopy limbs

Spur type e.g. Red Delicious

- Bears fruit on short branches called spurs
- Tends to have upright branches

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Closer view of spur type growth habit

Red Delicious apple

Bartlett pear

Spurs may grow less than an inch per year

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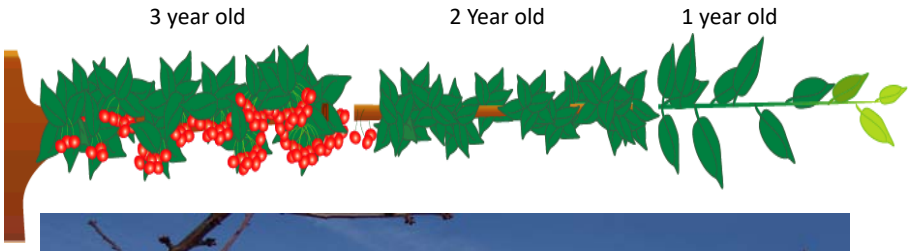
Cherries generally develop fruit on spurs of 3+ year old branch sections



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Peaches develop flowers and fruit on last years growth, so heading cuts will be needed to keep new shoots coming.

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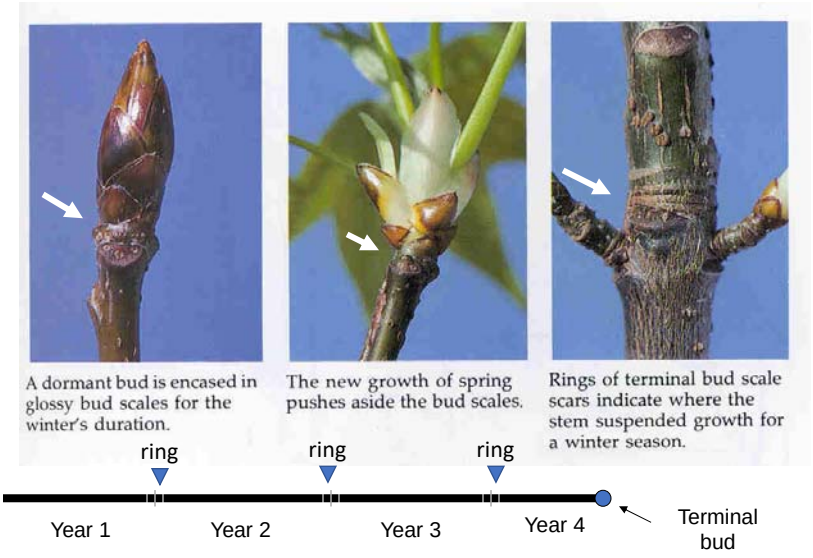
Rings on branches are from bud scale scars and show where terminal bud growth resumed in spring



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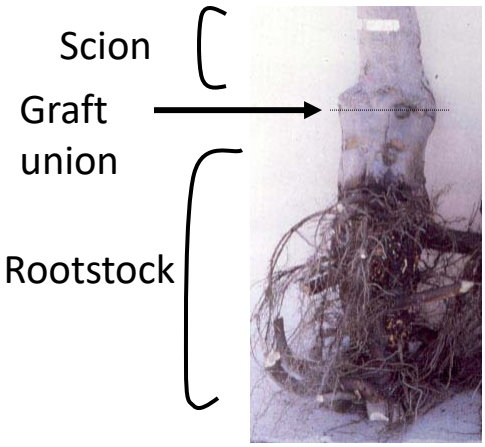
Characteristics of Scion and Rootstock



Scion: chosen for yielding, fruit characteristics

Rootstock: chosen for tree size control, support, disease resistance, adaptation to soil conditions

Most fruit trees are formed by grafting scion onto rootstock

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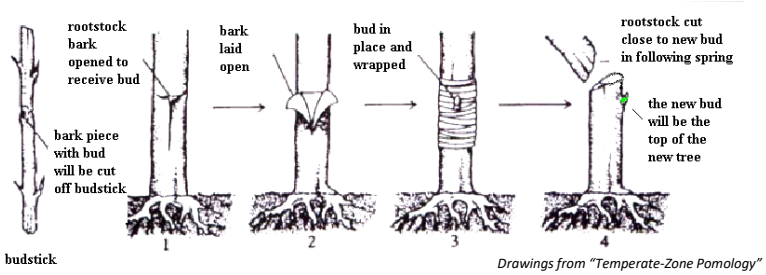
Tree Propagation by T-budding



Drawings from "Temperate-Zone Pomology"

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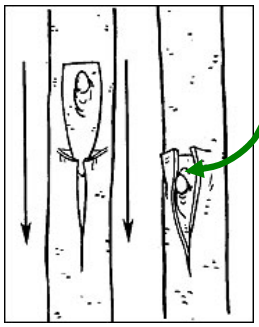
It is important to know if the nursery tree is a budded or grafted tree

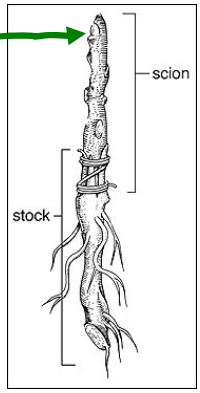
Scion started with branch piece

Scion started with single bud

Where growth starts



T-bud



Bench graft

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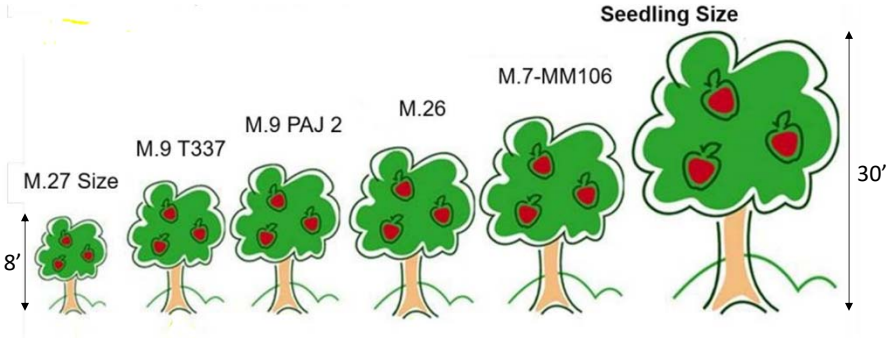
Mature apple tree size is controlled by rootstock



Requires staking

Staking not needed

Graphic adapted from Cornell University image

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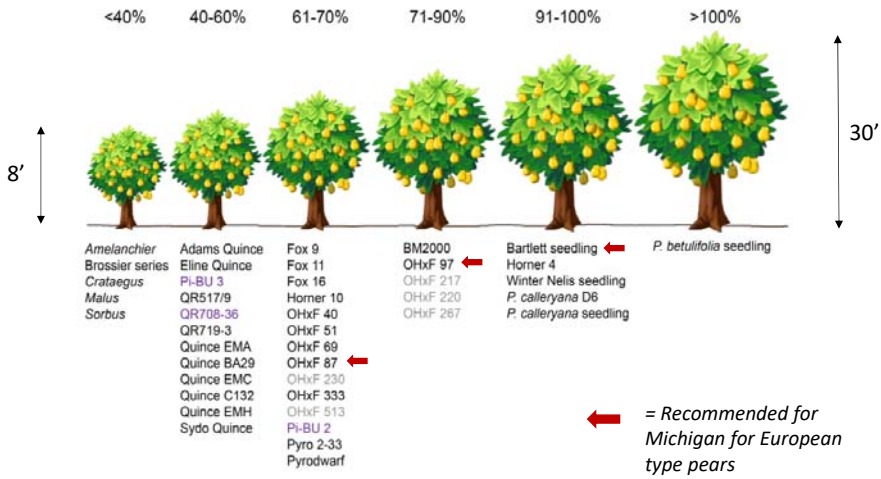
Mature pear tree size is controlled by rootstock



Graphic adapted from Washington State University

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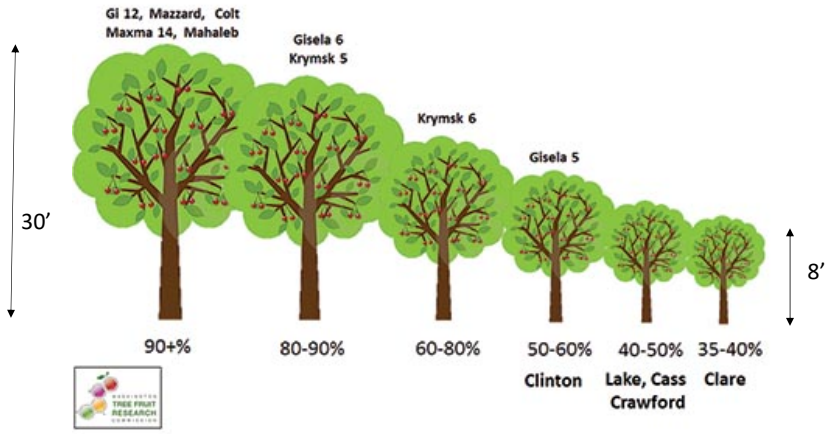
Mature cherry tree size is controlled by rootstock



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Factors influencing Fruit Tree Size

- **Variety type**
- **Rootstock**
- **Growing conditions (sandy, loamy, clay)**

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When to plant fruit trees

For bare-root trees,
spring is preferred,
fall is 2nd choice.

For balled or container-grown trees anytime, but prefer spring or fall.

Credit: Shelbourne Nursery

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Tips on Planting Fruit Trees

1. Keep roots from drying out, cut off damaged root tips. Don't wrap roots around in hole.
2. Tamp the soil down around the roots gently while filling the hole. Water to settle the soil.
3. Check over the next few days. Make sure that the graft union is above the soil line for apples and pears

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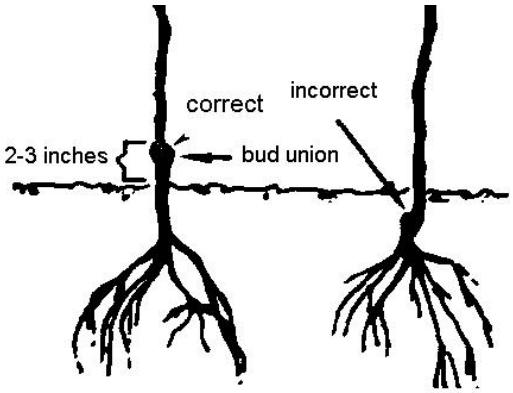
Planting Depth for Apples and Pears



Note: with cherry, peach, and plum, plant so that the bud union is close to the soil line.

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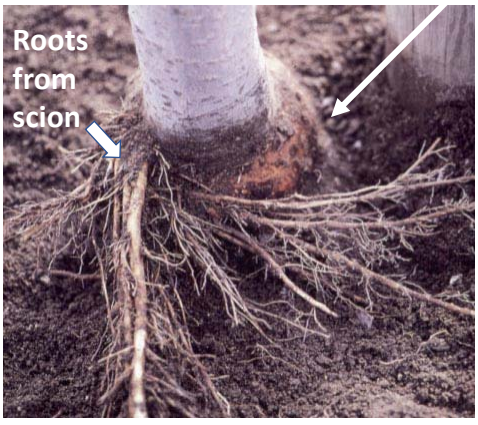
Scion Rooting



This tree was planted too deep and the scion sent down roots, resulting in vigorous tree growth

Top of graft union

scion

rootstock

Soil line should be here

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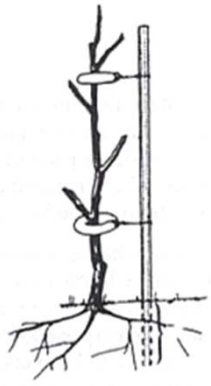
Stake apple trees growing on dwarfing rootstock



Fruit load tipped tree

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Tree wraps, tree cages, & tree paint

tree wraps

cage + white latex paint

Hardware cloth vole guard.
Photo: Alan T. Eaton.

- plastic tree wraps and cages help prevent rodent feeding.
- white latex paint and wraps reduce trunk damage due to rapid temperature fluctuations due to sunlight in mid winter.
- remove tree wraps in summer to avoid disease & insect problems. Cages can stay on year-round

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Latex paint does not protect against extreme low temperatures

Peach trunk splitting due to -19 F temperatures in 1994

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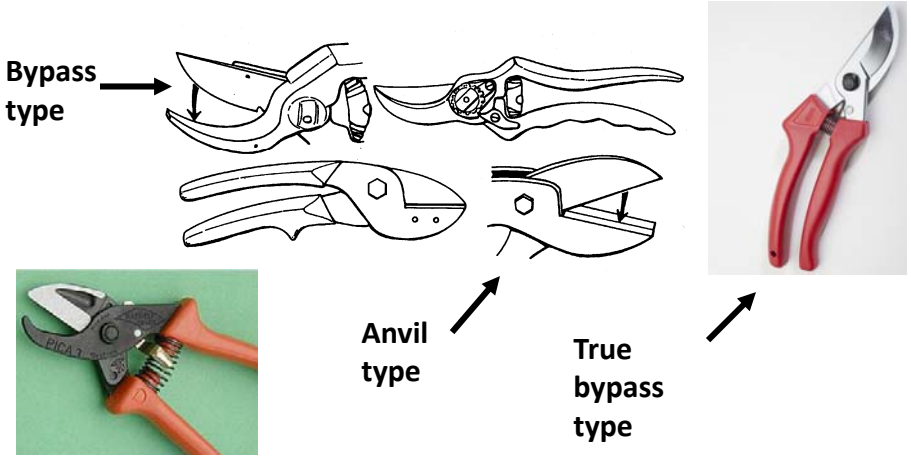
Pruning Tools

- Bypass shears allow the limbs to be cut cleanly.
- Anvil shears crush the limb at the cutting point and can cause (slightly) more disease problems



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Pruning Objectives

For Young Tree

- Shape tree
- Reduce crop to promote growth and prevent limb breakage

For Older Tree

- Remove dead, diseased, broken limbs & other undesirable growth
- Increase penetration of sunlight and spray applications, increase air movement
- Shape tree and control tree height
- Thin crop

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When to Prune

- Best time to prune is during dormant season, in February, March, and April
- Older, larger trees especially apples and pears can be done in February
- Younger trees, especially peaches, plums, and apricots should be pruned closer to bloom (late March to April)

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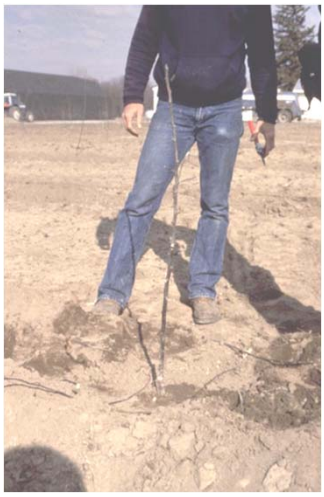
"Whipping" newly planted tree

- a tree is whipped by removing all limbs at time of planting so that the tree looks like a whip

Why?
- the limbs may have been poor quality or too few.
- by whipping, the limbs that eventually will be approximately the same size.



Tree training techniques

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Whipping severity depends on tree quality

Leave longer stubs if planting larger diameter trees to increase chances of getting growth.

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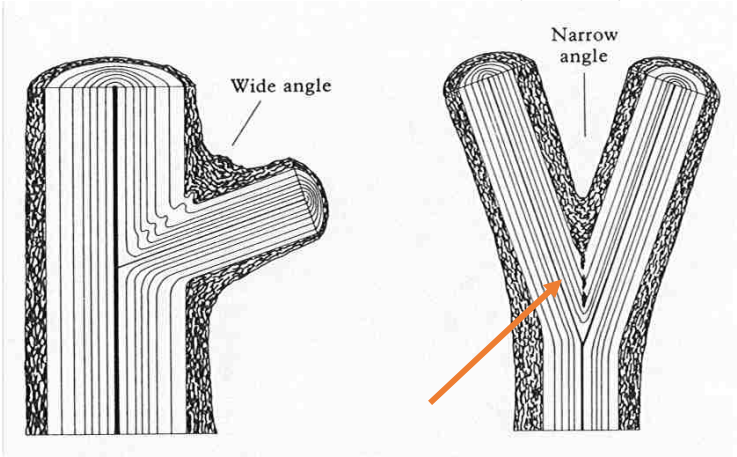
Trees should be trained so that branch angles are wide

Co-dominant (same size) branches



Bark inclusions in narrow angle crotches weaken limb

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Clothes pins to train wide angle branches

- Clamp clothes pins on central leader above shoots when 4 to 5 inches long to flatten growth
- Remove clothes pins in a few weeks when growth has lignified (hardened)

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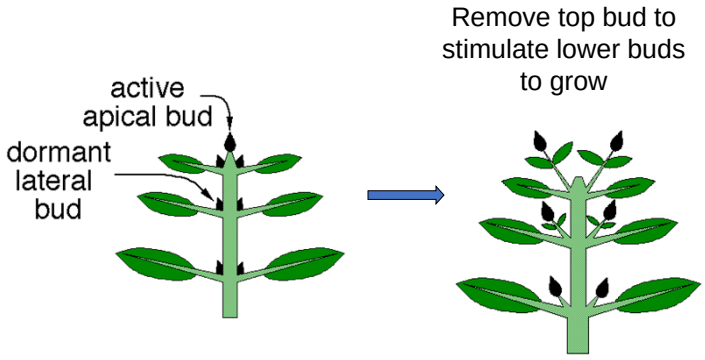
Tree training concepts

Apical dominance and tree training

Growing buds produce auxin, a growth hormone. Auxin moves downward from active buds, inhibiting the growth of lower buds.



Koning, Ross E. 1994. *Plant Physiology Website.*

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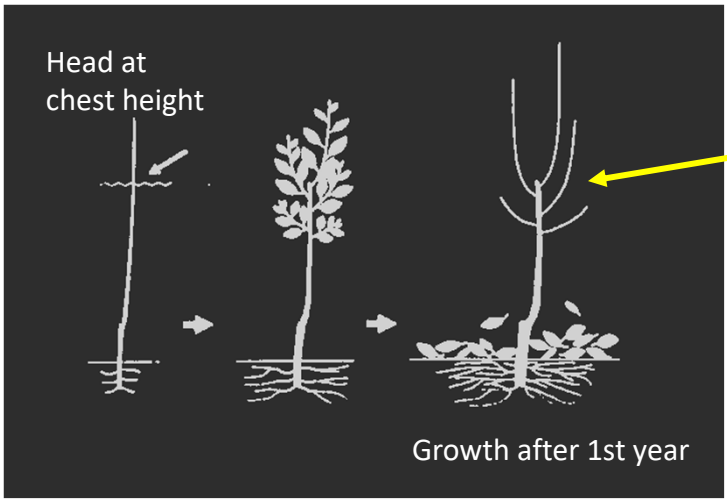
Heading cut at time of planting



Note: growth is next to point of heading cut

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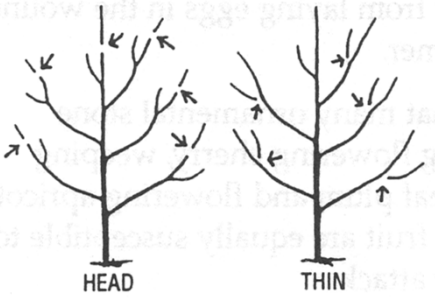
Heading Cuts and Thinning Cuts

Heading cut -- only the end of the shoot or branch is removed

Thinning cut -- the entire limb or shoot is removed



Pruning basics

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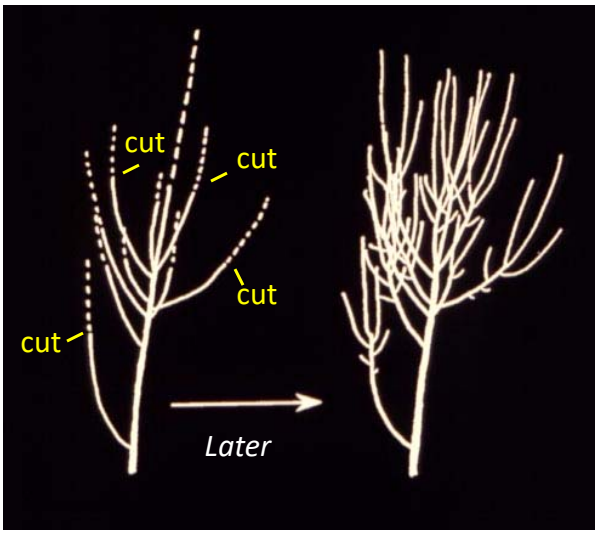
Effect of heading cut on growth



- stimulates growth at point of cut
- may increase shading within tree

Pruning basics

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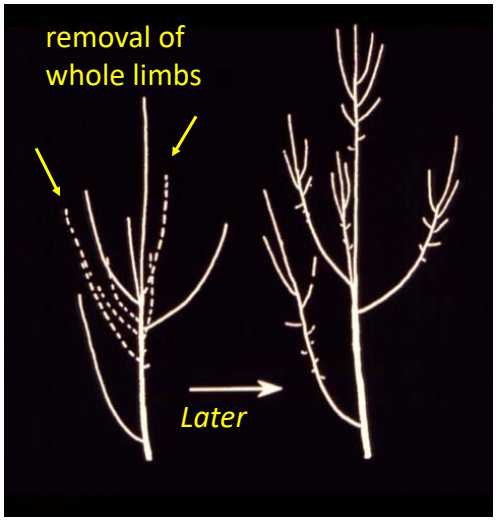
Effect of thinning cut on growth



- general rather than local stimulation of growth
- increases light penetration into interior of tree

Pruning basics

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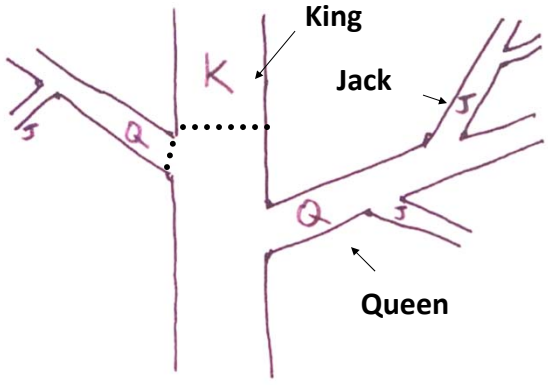
Hierarchy (e.g., who is the boss) concept of tree training



Train so that limb diameters decrease: King > Queen > Jack

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- Works well with apically dominant trees

Central leader apple

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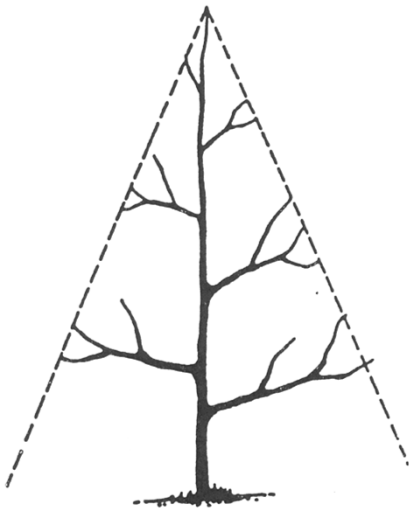
Pyramid shape of Central Leader Tree



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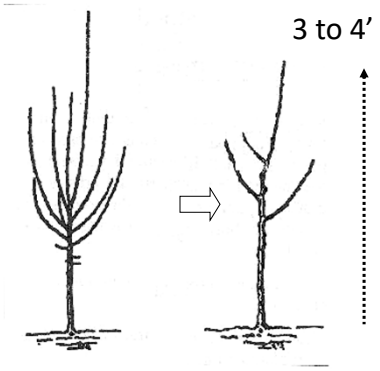
Training Central Leader Tree

- At planting time head central leader to 3 1/2 to 4 feet above the ground
- If 3 to 4 desirable branches are available, head these back by 1/3 to 1/2, otherwise "whip" the tree



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Pruning central leader at the beginning of the 2nd growing season

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Central leader trees

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Open Center (vase) Method

- suited for peaches, Japanese plums
- helps to maintain good light penetration to maintain health of tree

after pruning at start of 2nd growing season

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Open Center Peach Tree

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Open center peach before & after

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Too many scaffolds on open central peach

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Apple
- Upright growth
- Many limbs close togetherr

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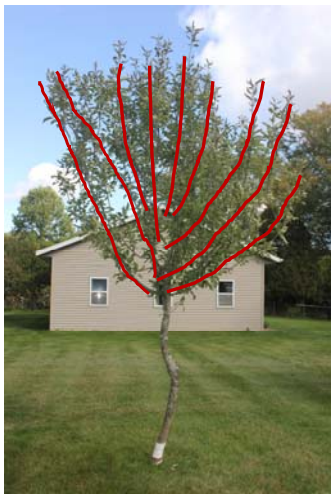

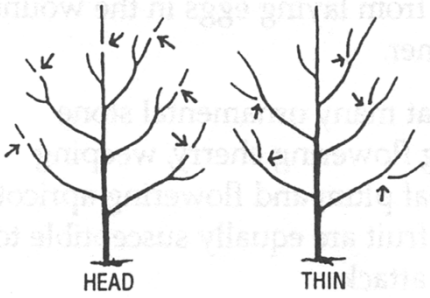

Do thinning cuts to get more light into tree

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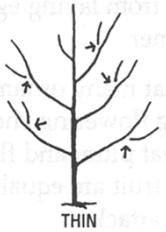

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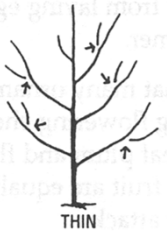

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Neglected apple - before cut

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Neglected apple #2 - after cut

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Dwarf Sweet Cherry

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Dwarf Sweet Cherry

Blind wood – branches with no growth

Do heading cuts to stimulate more vigorous growth. Will take several years to see benefit

Caused by abundant flowering of lateral buds on 1 year old wood

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Best wishes for a productive and safe season!

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