Getting fruit trees off to a good start

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Getting fruit trees off to a good start

- Resources (Handout)
- Tree and Site considerations
- Planting tips
- Training systems & pruning
- General IPM considerations
## Fruit tree cold hardiness

<table>
<thead>
<tr>
<th>Time of year</th>
<th>Type of damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov &amp; Dec</td>
<td>Rapid temperature drop damages trees that have not hardened off for winter.</td>
</tr>
<tr>
<td>Jan &amp; Feb</td>
<td>Low temperature damage fruit buds, very low temperatures damage trees</td>
</tr>
<tr>
<td>Mar to Jun</td>
<td>Trees become more vulnerable as buds start to open</td>
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</tbody>
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Fruit types differ in the mid-winter hardiness of their flower buds

<table>
<thead>
<tr>
<th>Fruit type</th>
<th>Critical temp. (F) for flower injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>-30</td>
</tr>
<tr>
<td>Apricot, Pear, Concorde</td>
<td>-25</td>
</tr>
<tr>
<td>Blueberries</td>
<td>-25</td>
</tr>
<tr>
<td>Tart Cherry</td>
<td>-20</td>
</tr>
<tr>
<td>Raspberry</td>
<td>-17</td>
</tr>
<tr>
<td>Blackberry</td>
<td>-15</td>
</tr>
<tr>
<td>Plum, Sweet Cherry</td>
<td>-15</td>
</tr>
<tr>
<td>Peach and Nectarine</td>
<td>-13</td>
</tr>
<tr>
<td>European Grapes</td>
<td>-8 to -15</td>
</tr>
</tbody>
</table>
Fruit types with early bloom are at greatest risk for spring frost damage.

Bloom order:

- Bloom early
  - Apricot
  - Japanese Plum
  - European Plum
  - Peach/Nectarine
  - Sweet Cherry
  - Tart Cherry

- Bloom late
  - Pear
  - Apple
  - Conords
Choosing fruit varieties

- Look for varieties that are adapted for your growing area.
- If you plan to do minimal spraying, find varieties with better disease resistance. Be aware that the more resistant varieties may have lesser eating quality.
Choosing fruit varieties

Look for high chill (at least 500 chill hours) varieties for the Michigan climate.
Better fruit sites tend to be on hills where air is warmer on still nights.

cold air flows downhill
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

for most fruit:
Soil pH  best is 6.2 to 6.8, okay is 5.5 to 7.5.
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.
Tolerance to poorly drained soil

**Worst**
- peach/nectarine/apricot
- mahaleb cherry rootstock
- mazzard cherry rootstock
- concord grape
- apple/pear
- blueberry

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

Mound or berm should be approximately 6 inches high in the middle.

Drain tile to move water.
Anatomy of a nursery tree

Essentially all nursery trees are budded or grafted.

Scion

Rootstock

Graft union
Basic tree anatomy

Fruit trees are budded or grafted on rootstock

Chip bud

Bench graft

Photo credit: orangepippintrees.com
T-budded (left) versus bench grafted (center) versus knip boom nursery trees
Planting depth depends on the type of fruit tree

- apple & pear – plant so that graft union is above the soil

- peach, plum, apricot – plant so that graft union is at the soil line
Be careful, Plant trees at the right depth

Some nurseries will bud peaches like apples with a long shank.

Tree is planted too deep. Top roots are at least 8 inches below soil line.

Tree should be planted so that top roots are close to soil line.
Apple rootstock types make a big difference in tree size

- standard
- semi-dwarf
- dwarf
When to plant fruit trees

• For bare-root trees, spring is preferred, fall is 2nd choice. Frost may ‘heave’ fall-planted trees.

• For container-grown trees, can plant anytime, but prefer spring or fall
Tips on Planting Fruit Trees

- Keep roots from drying out, cut off damaged root tips
- Tamp the soil down around the roots gently while filling the hole. Water to settle the soil.
- Check over the next few days. Make sure that the graft union stays where it should be.

Soak bare root trees for several hours before planting
Tips on Planting Fruit Trees

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Apple trees planted too deep can develop scion rooting

This tree was planted too deep and the scion sent down roots, resulting in vigorous tree growth.
Reasons for pruning tree at time of planting

- Remove dead & undesirable limbs
- Reduce planting stress by reducing size of the top to match the root system
- Encourage limb development in the desired positions
“Whipping” newly planted tree

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

This is done if the original limbs are poor quality or too few.

- by whipping, the replacement limbs that grow will be approximately the same size.

Tree training techniques
Building good tree structure

Whip the tree at planting or leave stubs?
Notching above apple buds to encourage branch growth

Figure 2. Notching was performed with a hacksaw on 10 buds between 30 and 50 inches from the soil surface soon after planting. J.M. Clements photo.
Effect of notching above apple buds on branch growth

Figure 2. Notching was performed with a hack saw on 1.0 buds between 30 and 60 inches from the soil surface soon after planting. J.M. Clements photo.

Figure 4. Untreated tree after one season. W.P. Cowgill photo.

Figure 5. Notched tree after one season. W.P. Cowgill photo.
Whipped tree, use of clothespins to get good crotch angles

- Clamp clothespins on central leader over shoots when 4 to 5 inches long to flatten growth
- Remove clothespins in a few weeks when growth has lignified (hardened)
Trees should be trained so that branch angles are wide

Bark inclusions in narrow angle crotches weaken limb
Heading cut at time of planting

Head at chest height

Growth after 1st year

Note: growth is next to point of heading cut
Why heading tree limbs encourages lateral bud growth

- Auxin produced by the topmost bud inhibits the growth of lower buds.
- If apical bud is removed, lower buds begin to grow

Avoiding Problems Areas on Tree

Remove excess limbs on lower trunk as soon as possible
Stake apple trees growing on dwarfing rootstock

Fruit load tipped tree
Tree wraps, tree cages, & tree paint

cage + white latex paint

tree wraps

- 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
Latex paint does not protect against extreme low temperatures

Peach trunk splitting due to -19 F temperatures in 1994
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
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)
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
Effect of heading cut on growth

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

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

removal of whole limbs

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

Train so that limb diameters decrease:
King > Queen > Jack
Central leader apple

- Works well with apically dominant trees
Pyramid shape of Central Leader Tree
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
Central leader trees
Central leader apple with distinct layers
2\textsuperscript{nd} Growing Season

- Pruning central leader at the beginning of the 2nd growing season
Central Leader Peach
Open Center (vase) Method

• suited for peaches, Japanese plums
• helps to maintain good light penetration to maintain health of tree
Open center peach shortly after planting

- retained 3 limbs
Open center peach

– after pruning at start of 2nd growing season
Open Center Peach Tree
Open center peach before & after
Too many scaffolds on open central peach
European plum is more upright and is usually trained like a central leader apple. Japanese plum has a short central leader and more spreading shape.
Central leader
European pear

Central leader
upright Asian pear

Open center
Asian pear

Photo credit: University of Alabama
Sweet cherry
Central leader

Tart cherry
Open center
Thinning Fruit Crops

Thinning is important to:
* prevent tree damage
* encourage young tree development
* increase fruit size
* reduce biennial bearing
* remove poor quality fruit
Thinning Fruit Crops continued

- Thin after “June drop”
- Apples & pears ~ 5” apart
- Peaches ~ 8” apart
- Plums/Apricot may need to be thinned ~ 5” apart

Remove more fruit from young and early ripening trees

Small fruit may drop naturally
Minimum spray program for peaches

Peach leaf curl spray in November or early spring

Oriental fruit moth sprays to protect growing branch tips & fruit

Brown rot spray in bloom if warm and wet, and as the fruit start to color
Apple scab spray season

Figure 2. Egg laying scars caused by the plum curculio.

Figure 3. Codling moth larvae inside pear.
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