Growing Tree Fruits Successfully  
Part 1
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Presentation Topics
- Soil
- Site
- Irrigation
- Selection
- IPM
- Pruning/Thinning

FERTILITY
PEST MANAGEMENT
IPM
PESTICIDE SAFETY
FROST PROTECTION
MARKET – FRUIT QUANTITY AND QUALITY

APRICOTS
APPLES
CHERRIES
PEACHES NECTARINES
PEARS/ASIAN Pears
POMEGRANATES
OTHERS

SOILS
- When planting an orchard, look for deep, well drained river soils.
- Good soil grows the best tree fruits.

- Most Master Gardeners have BAD soil and still grow tree fruits.
- BEST: well drained soils
- REALITY: Poor soils.
- ° Raised beds, 12-18 inches deep with dwarf and semi dwarf trees.
Get to Know Your SOIL

- 80% of Tree Problems is the Soil
  - Planted to Deep, looks like a telephone pole. Graft union.
  - Compacted Soil, lack of vigor
  - Excessive Mulch, 2” to 4” maximum
  - Excessive Moisture, Poor Drainage
  - Interface, two soil types meet
  - Raise in Grade, collects water

ID Your Soil – Research It

- To identify the type of soil you have, go online at http://www.or.nrcs.usda.gov/soils.html
  - Look up your property, write down the codes, look up codes on the website

Where to Send Your Soil off for Testing of nutrients?

- A List of Analytical Labs Serving Oregon:
  - OSU Extension Publication EM8677

Three of the Closest Testing Soil Labs

- Analytical Lab, 361 W 5th, Eugene, OR 97401  1-541-485-8404
- Agri-Check, PO Box 1350, Umatilla, OR 97882  1-800-537-1129

Site Considerations

- Why are site conditions so important?
  - Spacing Recommendations
  - Sunlight Requirements
  - Micro-Climates??? High vs low

Site Selection-Soil

- Tolerance To Waterlogging (wet soil)
  - Pear- very tolerant
  - Apple-tolerant (except M26, MM106)
  - Plum- tolerant
  - Peach- sensitive
  - Apricot- very sensitive
  - Cherry- very sensitive
Microclimates
- Variations in elevations
- Structures near your orchard site
- Surrounding trees, forests, fields and water ways?
- Know your directional exposure
  - Sun, Wind, Rain and Frost Pockets

Selections
- Select TREE FRUITS to site conditions
- Select DISEASE resistant varieties
- Select VARIETIES with maintenance requirements in mind
- SIZE of trees
- How much FRUIT wanted?

Cold Air Goes to the Bottom of a Slope

Frost Pockets & Warm Spots
You Can Stop the Air Flow

You Can Divert the Cold Air Flow

IRRIGATION

Dig in the soils and grab soil. How should it feel?

Water availability

- Water fairly available
- Most important to irrigate when???
- July and August = because???
- Gravelly soils, need more water.
- 2 rivers and 9 reservoirs
Yearly Temps

- What were the temperatures in 2014?
- When did people start to irrigate?

Best method to Irrigate?
**Irrigation**
- Establish an irrigation system
- Water will reach all trees
- Summer watering
  - New trees water weekly
  - Established trees monthly

**Irrigation Check**
- Do a test run of irrigation system
- At the drip line of the tree
- Dig with a shovel 8 inches deep
- Or with a soil probe
- Grab soil
  - It should be Moist
  - But not Wet

You will soon learn your soil!

**Planting and Painting**
- Trees planted with graft union above soil line.
- Trunks painted with white exterior latex paint (can be diluted with water 1:1).
- Water trees in.
- Prune off top at desired height to encourage branching.
- Don’t put fertilizer in hole or around tree base until 2nd yr.
- Can use a light compost.

**Prepare the Site**
- Weeds and Rocks
- Amendment the Soil
  - Add Organic Matter
  - Recommendations from soil test
  - Best to do this 4 to 6 months in advance of planting date
- Decide how you are going manage the soil and orchard.

**Planting**
- When should trees be planted?
  - (winter or spring)
- Dig the Hole
  - Two to Three times as wide as the root ball
  - As deep as the root ball
- Leave a small mound of dirt in the hole
- Spread roots out uniformly over mound
- Plant with graft union 2”-3” above ground
- Back fill hole Native Soil and Mulch
Planting continued

- Water deeply once a week first year
- Remove any plastic or metal labels
  - Record variety and rootstock
- Dwarf trees should be staked
- Wrap trunk with flexible mouse guard (optional)
- Paint trunk with white latex paint (optional)
  Or white lime.

Trunk Wraps and Painting

- Why paint trunk?
  - Summer
  - Winter
  - WHICH CRITTER

When paint?

Space Recommendations

- Distance Between Fruit Trees
  - Standard Apple   20 feet.
  - Dwarf Apple      3-6 feet.
  - Standard Pear    9 ft..
  - Semi-Dwarf Pear  9-12 ft..
  - Plum              8-11 ft.
  - Sweet Cherry     10-15 ft.
How much fruit do you REALLY eat?
- A mature apple tree will Produce?
  - Standard 20 boxes
  - Semi-Dwarf 6 to 10 boxes
  - Dwarf 3 to 6 boxes
- One box/bushel is equal to 42 pounds

Spacing between Trees
- Dwarf: 3-6 ft. tall
- Semi-dwarf: 6-10 ft. tall
- Standard: 18-25 ft. and taller if not pruned
EASY answer: The height is the distance between trees.

What size of tree is best?
- Depends on space
- What will the tree be used for?
- Do you have deer?
- Use of ladders
- Differences between standard, Semi-Dwarf, and Dwarf trees

Sunlight Requirements
- Ideal 8 to 10 hours
- Minimum of 6 to 8
  - For optimum growth
  - Blossom and Pollination
  - Fruit Set and Production

CRITTERS – Above ground
- Deer/ sheep/ horses/cows/ elk
- Rabbits/hare
- Raccoons
- Possums and skunks
- BELOW GROUND
- Voles – field mice
- Gopher and moles
Our favorite FRIENDS/FOES?

Sheep, Cow, Deer, Bird, Raccoon or Horse Damage

CONTROLS
- Dogs
- Caging
- Plant a small pasture area next to the orchard
- Grow tall trees = ladders

Meadow Mouse (Vole)

Pocket Gopher

Solutions
- Fence 8-12 foot tall or double fencing 2ft tall and 4 foot tall, two foot apart.
- Motion sprinkler
- Rotten eggs, smelly soap, blood meal
These need replacing every two weeks minimum

- (CAN’T IRRIGATE DURING THIS TIME _________ WHY ?
- Irish spring soap bar
- Blood meal in small cloth baggies
- Brut cologne

Duck or chicken eggs left out in the hot sun for 2 weeks and then break along the tree line.
- Dogs in the area of the trees.

Fertilization-pH

- Young trees should grow 15-18 inches
- Older trees should grow 12-15 inches
- pH of 6-7 good, lime every third year. If below 6, add 80 pounds/1000 sq. feet. Many orchard soils are acidic which means?

Evaluate fertilizer needs

- PYRAMID EFFECT OF NUTRIENTS
- pH or adding lime or sulfur
- Primary - N-P-K
- Macros or Secondary - Cal, Mag., sulfur
- Micros – or small amounts – B boron, Cu copper; Fe iron; Cl or chloride; Mn manganese; Zn – zinc. How much do plants need?

Fertilization

- Apply nitrogen fertilizer during growing season. (April). Is it used this year or next?
- Early season application will promote growth in current season.
- Aug-Sep application will be stored in buds for flowers-fruit for next yr. But what happens to growth?.

<table>
<thead>
<tr>
<th>Growth or yield (percent of maximum)</th>
<th>Deficiency zone</th>
<th>Adequate zone</th>
<th>Toxic zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Critical concentration</td>
<td>luxury consumption</td>
<td>No</td>
</tr>
<tr>
<td>0</td>
<td>Concentration of nutrient in soil</td>
<td></td>
<td></td>
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</tbody>
</table>
Can Compost be my only Fertilizer?

- Compost – 2N-2P-2K
- 1st number = 2% N
- 2nd number = 2% P
- 3rd number = 2% K

Fertilizers

- What’s in them?
- Organic
- Chemical/Conventional

Fertilizers

- What’s the numbers mean?
- 16N 16P 16K
- 2N 0P OK 6S ammonium sulfate
- Various other fertilizers

Fertilization

- Excess N encourages vegetative growth, bitter pit and lessens disease resistance.
- See Fertilizer Guide (FG 66): Home Fruit, Vegetable, and Ornamental Gardens
- “Salt and pepper” fertilizer granules underneath the drip line of the fruit tree with synthetic or organic materials.
- Proper growth – 12-15 inches per year

How do I Know if I need to add Fertilizer?

- Soil Test
- Monitor Plant Growth
  - Look at new growth per year

Send Your Soil off for Testing

- pH: Tree Fruits prefer a pH 6.5 to 6.8
- P (phosphorus), K (potassium), Ca (calcium), Mg (magnesium)
- Test for B (boron) every 10 years
- Organic Matter in the soil
- Soil texture: Clay, Silt and Sand
- Salt content
Rootstocks

<table>
<thead>
<tr>
<th>Rootstock</th>
<th>Height</th>
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<tbody>
<tr>
<td>MM111</td>
<td>Sub-dwarf</td>
</tr>
<tr>
<td>MM106</td>
<td>Semi-dwarf</td>
</tr>
<tr>
<td>M27</td>
<td>Dwarf</td>
</tr>
<tr>
<td>M26</td>
<td>Semi-standard</td>
</tr>
<tr>
<td>M7</td>
<td>Standard</td>
</tr>
<tr>
<td>Bud 9</td>
<td>Seedling</td>
</tr>
<tr>
<td>G.60</td>
<td>Semi-dwarf</td>
</tr>
<tr>
<td>G.30</td>
<td>Dwarf</td>
</tr>
</tbody>
</table>
| Supporter 4 | Standard Apple Trees

30’ x 30’ = 1 Standard Apple Trees

Or 30’ x 30’ = 4 Semi-Dwarf Apple Trees
Or 30’ x 30’ = 9 Dwarf Apple Trees

60’ x 30’ = 2 Standard Apple Trees

Or 60’ x 30’ = 4 Semi-Dwarf Apple Trees and 9 Dwarf Apple Trees

4 Semi-Dwarf Trees
9 Dwarf Trees
Why plant semi dwarf or dwarf rootstocks?

Advantages???
Dis-advantages???

MARKET/Purpose
- Fruit quantity
- Fruit quality
- Market demand
- Meeting demands AND changing as needed

- What do growers do if growing the wrong varieties or wrong crop?
- Test or demo plots – answers some of these questions
To sell the fruit

- Must be fresh.
- Must look nice - quality
- Must have ENOUGH fruit - quantity

Market research

- What is popular?
- Are growers growing ALL of the new varieties?
- Take advantage of the growing climate – good sun, good water, good soil.
- What are you going to do with the fruit when ALL tree produce fruit?
- Start thinning coop or Association.

Options:

- They pick
- You picks and sell off the farm
- Sell at local farmers market
- Sell to local stores and/or markets
- Clean, refrigerate and ship in quantity

OTHER IMPORTANT ORCHARD MANAGEMENT TECHNIQUES

THINNING – why?
Thin 4 out of 5.
The biggest bloom is called the **** bloom?

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

Why do you thin fruit
- To stop biennial production

Thinning
- Thin Fruit around May 15-June 15
- Thin according to the size of apple wanted
- Thinning ensures
  - good fruit size
  - protects the branches from breakage
  - helps prevent alternate bearing

When to thin
- When fruit is the size of a quarter
- You can then blossoms
  - If you had a year of bad pollination it will set you back
ODDITIES

Water Core – cause?
Bitter Pit – cause?

What is this and its use?

MOSS Issues?

Chimera – is two different tissues on one plant. Like a red apple on a golden delicious tree.
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

Pruning
- Minimum – prune each year
- Keep the trees low, preferred
- Depends on the rootstock and variety
- Most trees are multiple leader branched
  - tip-bearers, avoid heading cuts
  - spur-bearers, leave spurs
  - review HINTS: leave one sucker, hand prune in June, due root sucker control

Pruning classes
- List date and locations for 2015

Training & Pruning
For compact trees:
- Use dwarfing rootstocks.
- Select spur type cultivars.
- Select genetic dwarfs (very short internodes).
- Minimize dormant pruning.
- Train to favor more horizontal growth.
- Water and fertilize in moderation.
Vase Shape

Why hardest to prune?

Pruning – how old?

Discussion:
- How far above the ground do we prune the new tree top off at?
- When?
Pruning Basics
- Why Prune Trees?
- Tree anatomy and branch parts
- Pruning Cuts
- Pruning Tools

Why Prune?
- To maintain the health
- To increase air flow and light
- To improve natural form
- To control size
- To increase fruit production

When to Prune?
- Best when trees are dormant
  - November – March
  - Best - February
  - July 15 – August 15
  - Or when you need to do it!

Anatomy of a Tree
Parts of the Branch

Types of Tree Forms

Central Leader  Modified Central Leader  Vase or Multiple Leader

Training for Proper Crotch Angle

Thinning Cuts

- Branches are removed entirely at their origin

Heading Cuts

- Removes the end of branches
- Encouraging the buds on the branch to grow

Thinning vs. Heading
Pruning Tools
- Hand Pruners
- Long-handled Loppers
- Hand-saw
- Orchard Ladder

Hand Pruners
- Bypass Blades, not anvil type
- Cuts up to 1/2” in diameter

Long-handled Loppers
- Bypass Blades, not anvil type
- 12” to 18” handles or extendable
- Up to 1 1/2” in diameter

Hand-Saws
- 6” to 16” Blade
- Cut on Pull or Push and Pull

Three Legged Ladder (optional)

PLANT PROBLEM CONTROLS
- Organic VS Conventional VS IPM
- Choices that you get to make!
**IPM**

- **Integrated pest management.**
- **Meaning** – using all available research and resources, in an effort to control problems, solve issues, keep ecological balances and produce good, sellable fruit.

**STEP ONE**

- **Determine the problem**
- **Determine what can be done.** Sometimes – nothing.
- **Understand the ecology of the orchard** – Wenatchee, reduced sprays by 60%.

**NEXT SLIDE SET**