Presentation Overview

• Orchard design and Infrastructure
• Site Preparation and Planting
• Early Care
• Pests
Orchard Design

• What are you growing and what are you growing for?
• What can you personally manage and sell?
• What equipment will you use?
• How will you harvest your fruit?
• Fencing, bird netting, frost protection?
• Where is your water and how will you irrigate?
Row Spacing

• Row Spacing
  • Consider mature height, row orientation and potential shading
• Slopes (12’-13’) vs flat ground (10’-11’)
• Size of equipment used for mowing, spraying and harvesting
• Row length 500’ max
In row spacing of plants

- Depends on plant + cultivar and/or rootstock
- Consider mature size of the plant

<table>
<thead>
<tr>
<th>Plant</th>
<th>Mature Heights</th>
<th>Planting Distances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grapes</td>
<td>5-20ft (depends on trellising)</td>
<td>3-8ft</td>
</tr>
<tr>
<td>Apple Trees on Ottawa 3 Rootstock</td>
<td>10-12ft</td>
<td>5-10ft</td>
</tr>
<tr>
<td>Apple Trees on Crabapple Rootstock</td>
<td>20-30ft</td>
<td>15-20ft</td>
</tr>
<tr>
<td>Plums</td>
<td>15-20ft</td>
<td>7-13ft</td>
</tr>
<tr>
<td>Currants</td>
<td>3.4ft</td>
<td>3.5ft</td>
</tr>
<tr>
<td>Sour Cherries</td>
<td>6-8ft</td>
<td>4-6ft</td>
</tr>
<tr>
<td>Saskatoons</td>
<td>5-12ft</td>
<td>3-6ft</td>
</tr>
<tr>
<td>Haskap</td>
<td>3-4ft</td>
<td>3-5ft</td>
</tr>
<tr>
<td>Pears</td>
<td>15-25ft</td>
<td>15-20ft</td>
</tr>
<tr>
<td>Strawberries</td>
<td>4-8&quot;</td>
<td>10-18&quot;</td>
</tr>
<tr>
<td>Raspberries</td>
<td>3-6ft</td>
<td>2-3ft</td>
</tr>
</tbody>
</table>

Source: http://www.fruit.usask.ca/growinginfo.html
Orchard Infrastructure

- Fencing
- Bird Netting
- Trellis
What are you Fencing For?

• Deer 6ft fence minimum
• Elk 8ft fence minimum
• Bear: electric fence rated to 0.7joules
Fencing Materials, Cost and Design

• Posts
  • **Pressure Treated** Wood Minimum 5”
  • Steel 2 7/8” or 3 ½”
• Panel fencing material strength varies
• A square is less expensive than a rectangle
• 16 foot opening for machinery to move in and out
• Costs will vary, but don’t cut corners!
Really, don’t cut corners!

- Use the right materials
  - 5” posts are 50% stronger than 4” posts
  - 1 ¾”-2” staples not 1” staples
- Be sure to install posts at least 1/3 their length deep
- Better to pound posts than auger
- Install anchors in undisturbed soil
Trellis

• Needs to support a lot of weight (especially for apples)
• Terrain, soil, fruit, irrigation, and climate will influence the strength of the system
• Build it strong from the start.
• Best Management Practices for Building Trellis Support Systems for High Density Ontario Apples

Bird Netting

• For soft fruits and berries
• Overhead crop netting for full orchard enclosure vs in row netting
• Snow
Orchard Equipment

- Tractor or ATV?
- Mower
- Sprayer or weeding equipment
- Spreader
- Pruning Equipment
- Harvest Equipment

Source: UVM, Tree Fruit Practical Guide For Organic Apple Production
Ready to plant? Protect your investment

Thank you Zach!
First Years: Prep, Planting, Care

• PREP: Weed control, Soil Assessment and Management
• Planting
• Care: Minimize stress
  • Weeds
  • Herbivores
  • Disease
  • Water/Nutrients
  • Prevent Fruiting

Thank you Zach!
Prioritize weed control

- Identify and address perennial weeds like quack grass, Canada thistle, bindweed, etc.
- Systemic herbicides effective and cheap. Organic will require frequent tillage and cover cropping
- Addressing early pays...

Thank you Zach!
Thank you Zach!
Early weed control is critical
Pre-plant soil and site prep

- Consider existing vegetation
- If you don’t have to till the entire area DON’T
- Soil structure: hard pan
- Opportunity to amend soils with immobile nutrients and organic matter
- Establish rows, alleys and set irrigation backbone

Thank you Zach!
Plants objectives

- Maximize growth-plant as soon as conditions allow in the spring
  - Fall planting risks cold injury
  - Plant early (before bud break of mature trees)
    - Roots grow once ground is thawed (soil temp >45) and before bud break
    - Early root growth results in improved first season growth
- Moisture
  - Cool, moist spring
  - Irrigation system (on-orchard and distribution system) must be ready

Thank you Zach!
Holding plants prior to planting

• Keep cool and moist
• Check that roots are moist, buds dormant, healthy, as ordered.

• Store:
  • Away from ethylene
  • 34-40 F
  • If extended storage (>few days)-Heal in trench

• Soak roots for 6-12 hours prior to planting

Thank you Zach!
Planting

• Hole
  • Slightly larger and deeper than roots
  • Avoid glazing, settling.

• Placement
  • Depends on plant

• Tamp down to remove air pockets

• Fill-loose, top soil if possible

• Create basin around tree to soak

• Water-in: removes air pockets

Thank you Zach!
Post-planting Care

• Maximize growth, minimize stress
  • Weeds
  • Vertebrates
  • Disease
  • Bloom removal
  • Resources: Nutrients/Water

• Cold injury
  • Sun scald
  • Hardening off-Encourage dormancy
Pests to know about

• Animals
• Insects
• Bacteria and Fungi
Rodent Control

• Alter Habitat
  • Reduce food and cover (vegetation/snow)
    • Remove vegetation around trunks
    • Mow or till
    • Avoid plants favored by gophers
  • Encourage predators
    • Cats, Snakes, Raptors, Foxes
• Protect Young Trees- tubes or paint
• Bait/Trapping
Birds 🎃 Berries
Insects and diseases

- More crop specific
- Management depends greatly on prevention and timing of controls
- Use IPM and keep in mind thresholds for damage
Pome Fruits: Apple, Pear, Saskatoons and Aronia

- Codling moth
- Aphids
- Thrips
- Pear sawfly
- Fire blight
- Scab
- Powdery Mildew
- Cedar/Juniper rusts
Dwarf Sour Cherry

• Pear sawfly/Cherry Slug
• Western Cherry Fruit Fly
• Spotted Wing Drosophila??
Currants

- Cane Borer
- Gooseberry Sawfly
- Currant aphid
- Thrips, spider mites
Grapes

• Leafhoppers
• Spider mites
• Powdery mildew
• Downy mildew
• Black rot
Haskaps

GREAT
JOB