Orchard Site Selection

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Site Selection

Selecting a good site is the most important decision and will influence all other managerial decisions related to your orchard.
Outline

- Climate
- Topography
- Site History
- Soil Characteristics
- Resource Availability
- Market
Climate

- Climate considerations
  - Winter lows
  - Spring temperature and fluctuation
  - Length of growing season
  - Precipitation
  - Snow load

USDA Hardiness Map
Temperature

- Winter temperatures routinely below -35°F can kill trees and flower buds
- Late spring frosts
- Spring temperatures below 28°F can kill flower buds

Photos: Mark Longstroth
Wind

• Some wind is good to ensure proper air circulation

• Avoid excessively windy sites

• High winds can affect:
  • Tree shape, limb damage due to rubbing
  • Soil moisture
  • Spray drift
  • Pollination

• Wind breaks can be used to manage winds
Site Topography

- Ideal slope – 2-10%
- Acceptable – 10-20%
- Marginal – 20-40%
- Unsuitied – Greater than 40%

- Slope is important for:
  - Water infiltration/run-off
  - Erosion
  - Frost protection

- Apple orchards can be planted on slopes too steep for other crops if soil management strategies are used
Slope and Frost Protection

- The best frost protection technique is to choose the right site
Cold Air Drainage: Wind Breaks and Obstacles

Obstacles that slow or prevent the movement of cold air can be Good or Bad!
Slope Aspect

• South facing slopes
  • Experience greater winter temperature fluctuations
  • ‘South-west injury’- sunlight reflecting off of snow causes trunks to warm up and loose hardiness and ability to tolerate cold nights
• Can be managed with white paint
• Bloom earlier – greater risk for frost damage to flowers
Previous Crop

• Primary consideration is herbicide residual

• Corn fields - residual atrazine
  • Wait one year before planting

• Replanting an old orchard
  • Remove as many roots as possible
  • Prepare the soil using cover crops to improve organic matter
Soil Characteristics

• Must be well drained and aerated
  • Apple trees can not withstand extended periods of waterlogging
  • Poorly drained sites result in poorly (shallow) rooted trees
  • Consider subsoil
    • High clay content

• Testing for drainage
  • Dig 3-4’ hole in spring, evaluate amount of water standing and for how long
  • Evaluate color of soil – grey and orange
Soil Characteristics

- **Acidity**
  - Apples prefer pH of 5.8-6.8
  - Soil pH can be adjusted with lime or sulfur
    - pH adjustments MUST be done before planting
  - Amount that soil pH can be adjusted is influenced by soil composition
    - High clay content is more difficult to change pH
Soil Characteristics

• Fertility
  • Most WI soils have adequate Potassium, Phosphorous, and micronutrients
  • Avoid hilltops- tend to have poor soils due to erosion
  • Avoid overly fertile soils – too much vegetative growth at the expense of trees
  • Conduct soil test to determine if fertility amendments are needed
    • Amend soil BEFORE planting the trees!

• Organic matter content
  • Important for water holding capacity and nutrient release
<table>
<thead>
<tr>
<th>Soil Criteria</th>
<th>Well Suited</th>
<th>Suited</th>
<th>Marginal</th>
<th>Unsuited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth of soil above Consolidated bedrock</td>
<td>&gt; 100 cm</td>
<td>70-100 cm</td>
<td>50-70 cm</td>
<td>&lt; 50 cm</td>
</tr>
<tr>
<td>Depth of soil above compacted or cemented layer (B.D. * &gt; 1.6 g/cm³)</td>
<td>&gt; 90 cm</td>
<td>50-90 cm</td>
<td>40-50 cm</td>
<td>&lt; 40 cm</td>
</tr>
<tr>
<td>Excessive moisture (mottling)</td>
<td>None</td>
<td>Weak mottling Below 50 cm</td>
<td>Weak mottling within 50 cm</td>
<td>Strong mottling Within 50 cm</td>
</tr>
<tr>
<td>Lack of moisture</td>
<td>None</td>
<td>None</td>
<td>Severe</td>
<td>Very severe</td>
</tr>
<tr>
<td>Soil texture:** (uniform Throughout soil profile)</td>
<td>sl, l, sil</td>
<td>sl, l, sil</td>
<td>ls, cl</td>
<td>grls, s, silcl, c</td>
</tr>
<tr>
<td>Slope</td>
<td>&lt; 10%</td>
<td>10-20 %</td>
<td>20-40%</td>
<td>&gt; 40%</td>
</tr>
</tbody>
</table>

(Source: Dept. of Agr., Aquaculture and Fisheries, NB)
Regulations

- Zoning
  - Who are your neighbors?

- Environmental (irrigation, disposal, burning)

- Pesticide application

- Ag districts/Property taxes
Resource Availability

- Water
  - What are local regulations
    - Water withdrawal
    - Drilling well
    - Surface water regulations
  - Quality of water
    - pH, contaminants, algae
  - Capacity to meet demands

- Labor
  - Is there a labor force that can meet your needs
Market

• What is your intended market?

• How will they get to you or how will you get to them?

• Are there other apple orchards in your neighborhood?