Choosing apple varieties and rootstocks for your new orchard

Description:

With over 7500 known apple varieties in the world, how do we choose the right one for your orchard? Combine that with hundreds of rootstock selections and it can quickly become very confusing. Each cultivar and rootstock has very unique characteristics that need to be considered before planting a new orchard that could be in place for decades. Amy will help you understand apple cultivars and rootstocks that can be used in a 21st century orchard.

Instructor:
Amy Irish-Brown
MSU Extension Educator
Apple Tree Propagation

• Apple trees must be propagated vegetatively in order to preserve the variety.
• Seeds from apples are a recombination of genetic material and result in apples with traits not the same as the parents.

Grafting Basics

• Stock
• Scion
• Methods
• Tools

Tongue and Groove Grafting or Cleft Grafting

Chip Budding

T-budding

Tissue Propagation of Scions and Rootstocks
Rootstock Stool Beds

1957 Oregon Extension Service document "Propagating Clonal Rootstocks,"
2nd Year Stool Bed with 1st hilling

Photo credit: Steve Hoying
2\textsuperscript{nd} Year Stool Bed Summer Growth

Photo credit: Steve Hoying
Mature Stool Bed Ready for Harvest

Photo credit: Steve Hoying
Choosing Rootstock

• The rootstock on which a tree is propagated has enormous influence on the tree’s growth and fruiting habits.

• The rootstock determines the tree’s size, how one manages the tree and influences disease resistance.

• The success of a new tree depends primarily on having reliable, virus-free rootstock.
Rootstock manages tree size

Apple Rootstocks – Smallest to largest

- Malling 27 (M.27)
- Geneva 65 (G.65)
- Budagovskiy 9 (B.9 or Bud9)
- Malling 9 (M.9)
- MARK
- Geneva 16 (G.16)
- Geneva 41 (G.41)
  Budagovskiy 10 (Bud 10 or B.10)
- Ottawa 3 (O.3)
- Vineland 1 (V.1)
- Malling 26 (M.26)
- Geneva 214 (G.214)
- Geneva 935 (G.935)
- Geneva 11 (G.11)
- Geneva 202 (G.202)

- Geneva 210 (G.210)
- Geneva 890 (G.890)
- Geneva 969 (G.969)
- Pillnitzer Supporter 4 (Pi.80)
- Interstems
- Geneva 30 (G.30)
- Geneva 222 (G.222)
- Malling 7 (M.7)
- Malling-Merton 106 (MM.106)
- Malling 2 (Poland 18 (P.18)
- Malling-Merton 111 (MM.111)
- Budagovskiy 118 (B.118)
- Seedling
Selecting Apple Varieties for Commercial Production

• The driving force behind selecting varieties is high market value and high yields.
• Desirable variety traits for commercial production should be focused on:
  • Long shelf life / storability
  • Ease of production
  • Few pack-out problems – pests, disorders, rots, bruising, etc.
  • The harvest window is another aspect to consider when deciding on fruit varieties. Harvest is the single most demanding labor activity in orchards, so planting varieties that allow a broader harvest window, allows fewer laborers to pick over a longer period of time.
## Common Apples for Michigan Production

### Apples: Acres and percent of total by variety

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Percent</td>
<td>Acres</td>
<td>Percent</td>
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<tr>
<td>Cortland</td>
<td>470</td>
<td>1.1</td>
<td>420</td>
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<tr>
<td>Empire</td>
<td>2,490</td>
<td>5.9</td>
<td>2,080</td>
<td>5.6</td>
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<tr>
<td>Fuji (all seasons)</td>
<td>600</td>
<td>1.4</td>
<td>670</td>
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<td>Gala</td>
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<td>5.5</td>
<td>2,800</td>
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<td>0.7</td>
<td>260</td>
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<td>Golden Delicious</td>
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<td>12.2</td>
<td>4,600</td>
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<tr>
<td>Honeycrisp</td>
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<td>1.9</td>
<td>1,350</td>
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<tr>
<td>Idared</td>
<td>3,650</td>
<td>8.6</td>
<td>3,050</td>
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<tr>
<td>Jonagold</td>
<td>1,150</td>
<td>2.7</td>
<td>1,120</td>
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<tr>
<td>Jonathan</td>
<td>4,000</td>
<td>9.4</td>
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<tr>
<td>McIntosh</td>
<td>2,840</td>
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<tr>
<td>Mutsu</td>
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<td>1.4</td>
<td>520</td>
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<td>Northern Spy</td>
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<td>1,900</td>
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<tr>
<td>Paula Red</td>
<td>650</td>
<td>1.5</td>
<td>560</td>
<td>1.5</td>
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<tr>
<td>Red Delicious</td>
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<td>22.4</td>
<td>7,700</td>
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<tr>
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<tr>
<td>Sweetango</td>
<td>(1)</td>
<td>(1)</td>
<td>(1)</td>
<td>(1)</td>
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<tr>
<td>Other</td>
<td>2,180</td>
<td>5.1</td>
<td>1,840</td>
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<tr>
<td>Michigan</td>
<td>42,500</td>
<td>100</td>
<td>37,000</td>
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1 Not yet planted or included in other.
## Common Apples for Michigan Production

<table>
<thead>
<tr>
<th>Variety</th>
<th>Acres</th>
<th>Trees</th>
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<td>Blondie</td>
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<td>Crimson Crisp</td>
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<td>Empire</td>
<td>26</td>
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<td>Fuji</td>
<td>555</td>
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<td>Gala</td>
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<td>924,000</td>
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<td>Ginger Gold</td>
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<td>17,700</td>
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<td>Golden Delicious</td>
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<td>16,100</td>
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<tr>
<td>Honeycrisp</td>
<td>750</td>
<td>711,200</td>
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<td>Idared</td>
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<td>62,000</td>
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<td>Jonagold</td>
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<td>464,000</td>
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<tr>
<td>Jonathan</td>
<td>65</td>
<td>21,800</td>
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<tr>
<td>McIntosh</td>
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<td>149,100</td>
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<td>Paulared</td>
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<td>Pink Lady</td>
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<tr>
<td>Red Delicious</td>
<td>300</td>
<td>143,400</td>
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<td>Sweetango</td>
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<td>108,000</td>
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<tr>
<td>Zestar</td>
<td>29</td>
<td>16,600</td>
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<tr>
<td>Other</td>
<td>145</td>
<td>107,000</td>
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<tr>
<td><strong>Michigan</strong></td>
<td><strong>4,700</strong></td>
<td><strong>3,286,000</strong></td>
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*Michigan Fruit Inventory 2014-2015*
Paula Red

- One of the earliest to ripen.
- Available only into October. Pleasingly tart flavor and good aroma. Great in back-to-school lunches, or early season baking.
- Discovered in Sparta, Michigan!
Ginger Gold

• This sweet-spicy apple has a succulent texture and rich taste. A cross between the Golden Delicious and Albermarle Pippin, this early-season variety is best served fresh. Its mildly tart flavor definitely gets the Michigan autumn apple harvest off to an exciting start.
Gala

- Crisp snappy bite over a mellow sweetness. Michigan’s 3rd most popular apple for fresh eating or cooking.

- Gala has many strains available, medium sized, sweet, with some spicy characteristics tracing back to Cox’s Orange Pippen, good for fresh and for pies, medium shelf life, susceptible to fire blight, Fulford is somewhat larger, earlier, Imperial is older still popular variety, Many newer varieties are available that have more red skin color but otherwise not much better than Imperial.
McIntosh

- Classic large, round apple for eating out of hand!
- Ultra-juicy white flesh, lightly tart flavor and excellent fresh apple aroma. A perky addition to salads. Excellent in applesauce and cider. Also used in pies.
- McIntosh - many strains are available. Ruby Mac, Linda Mac, Miracle Mac are some of the newer strains with better skin color.

Available: Sept. 6
Golden Delicious

- A gingery-smooth, sweet taste treat lies under a thin skin. The most popular yellow apple, Goldens may be eaten fresh or cut up in salads.
- Professional’s choice for applesauce or cider, baking pies and other desserts.
Honeycrisp

• The apple industry darling right now.
• Sweet and crisp like none other.
• Combines unusual color and excellent sweet flavor with a great bite. Use it for fresh eating, fresh-cut slices or cut up in salads.
• Difficult to grow.
Empire

• Sweet and tart at the same time.
• Use for fresh-cut slices, candy and caramel apples. Also used in baking. Texture remains very firm, a good storing apple.
• Popular in Great Britain.
Jonathan

- Used for fresh eating, but mainly a cooking apple
- Medium size, sweet, but acidic, favorite for pie and applesauce
- Fire blight and powdery mildew susceptible, many varieties including the popular Jonee, Nured, and Ruby Jon
- Juicy flavor has a spicy tang that blends well with other apples. Michigan’s cooler climate produces superb Jonathans. Discovered in Woodstock, New York!
Red Delicious

- America’s most popular apple, known for the "five little bumps" on the bottom.
- Best for fresh eating and snacks. Full-flavored sweet taste, yellowish flesh and crisp texture. Discovered over 100 years ago in Iowa.
- Not recommended for cooking.
Jonagold

• Large fruited, dual purpose eating and cooking, sweet, juicy, somewhat tart, medium shelf life, medium fire blight susceptibility.

• Some of the older strains have a green skin background that may be considered unattractive. Some of the better coloring varieties are Jonagored, Rubinstar, and Crimson. However, ripening time and flavor of most Jonagolds are similar.
Fuji

- New to Michigan’s apple line-up, Fuji is Japan’s favorite apple for good reason! Fantastic sweet and tart flavor, with a low acid content. An incredibly good keeper, Fuji stays crisp for weeks and becomes better with storage.

- Early season Fuji - ripening approximately 1 month before standard Fuji – varieties include Rising Sun, Early Auvil, Daybreak, Nickell, Morning Mist. Not quite the quality of standard main season Fujis, but particularly useful in more northern areas with shorter growing seasons.

- Main season Fuji - firm, productive, older strains with greenish hint to the background when ripe.