

# Fresh Market Sweet Cherry Varieties for Eastern North America

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Only a minor component of sweet cherry production in Eastern North America has been for fresh markets, and the region's processing infrastructure and specialized processing markets will continue to drive the bulk of eastern cherry production. However, the increasing success of farm markets for local produce, the recognition of high value specialty market niches, and the proximity to many areas of high population in the Midwest and Northeast, bode well for many eastern growers interested in modest-scale fresh market sweet cherry production. The advent of hybrid clonal rootstocks that promote early returns, high productivity, and small tree stature may dramatically improve the economics for diversifying existing fruit-growing operations with fresh market sweet cherries. Also, some varieties have the potential for dual-purpose production, being suitable for fresh or processing markets, depending on cultural practices and/or annual production conditions.

New rootstocks such as the Gisela series (Gisela® 5, 6, or 12), Tabel® Edabriz, Weiroot 158, and others currently in regional research trials, can reduce the time to first commercial crop by half, which is a strong incentive for testing and adopting new varieties for diversified market opportunities. The ability to better control tree stature and tremendously improve labor efficiency on these rootstocks is a major consideration for both pick-your-own operations and even for commercial hand-harvest. Furthermore, it can reduce the cost for some previously unthinkable protective cropping options like installation of bird nets or rain covers.

The strong rootstock effect on productivity is a two-edged sword: for shy-bearing varieties, rootstock alone can make the difference between profit and loss. However, on very productive varieties (particularly many of the new self-fertile varieties), excessive crop loads can lead rapidly to poor fruit quality and even tree decline or death. Other good news/bad news situations have also been noted. In Michigan's disastrous spring of 2002, sweet cherry trees on Gisela rootstocks not only had much higher flower numbers per tree than on Mazzard or Mahaleb, but in some locations, significantly more of those flowers survived the widespread frost damage compared to other rootstocks. However, where conditions subsequently were brutal for flower infection by bacterial canker, those trees with higher flower numbers suffered proportionally higher infection sites as well.

As is often the case in life, new and exciting opportunities may also bring unforeseen additional challenges. While the exciting traits and cautionary caveats noted below are the culmination of our experiences to date, there is no doubt that much will yet be learned about these varieties as research trials and grower experimentation progress through the varying growing conditions of future seasons.

In this article, we will report our observations and data on sweet cherries for fresh market production, based on two decades of collaborative variety testing that has been supported by the Michigan Cherry Committee, Cornell University's Geneva Experiment Station, and Michigan State University's Northwest Horticultural Research Station. Some new varieties, for which we have limited expe-

Although sweet cherry production in Eastern North America is small, the advent of new improved sweet cherry varieties and clonal rootstocks that promote early returns may dramatically improve the economics for diversifying existing fruit-growing operations with fresh market sweet cherries.

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rience but which may have potential based on research from the fresh market cherry production regions of the Pacific Northwest, are also discussed to stimulate grower experimentation within their own orchard.

## Fresh Market Sweet Cherry Characteristics

Fresh market sweet cherries are expected to be visually attractive, generally with a glossy-skinned appearance and deep mahogany red color (or yellow skin with reddish blush, in the case of yellow-fleshed varieties like 'Rainier'). The flesh should be firm, juicy, and with an intense sweetness, often balanced by a palate-refreshing hint of acidity. Historically, bright red fruit or yellow fruit lacking a reddish blush have been shunned as an indication of insufficient ripeness and lack of flavor intensity. Eating properly tree-ripened sweet cherries is a delectable summer sensation that is rivaled by few other fruits, and accordingly, such fresh cherries often command handsome prices

and willing repeat purchases. Pick-your-own sweet cherry operations often have special notices or “hotlines” to alert their best customers when fresh sweet cherries will be at their peak.

For such prized fruit, potential defects like rain-induced fruit cracking are critical production issues. Fruits are most susceptible to cracking during the final three weeks of maturation and ripening. While specialized cultural practices, such as plastic row covers or calcium applications by overtree sprinklers, often can reduce the incidence of fruit cracking, varieties differ significantly in cracking susceptibility. Even when fruit are not visibly cracked following rainfall, microscopic cracks may develop that can greatly reduce fresh market shelf-life due to increased susceptibility to attack by fungal pathogens. Consequently, for Eastern North America, varieties with reduced cracking susceptibility provide an important trait for enhancing profits due to improved fruit quality and market supply consistency. The same benefits hold true for key varietal traits such as winter hardiness, spring frost sensitivity, spring frost avoidance by late bloom, and susceptibility to endemic diseases.

The varieties below are discussed in order of ripening, within each of the categories presented (red sweet cherries for commercial or experimental fresh market production, and yellow blush cherries for experimental fresh market production). It must be noted that relative bloom times, and subsequent ripening times, can vary quite significantly from year to year, depending on late winter and early spring temperatures.

### Commercial Fresh Market Red Sweet Cherries

**Cavalier™ (Rynbrandt cv.)** - Early ripening, high quality, firm, medium-sized dark red fruit. Low productivity on vigorous rootstocks, but a good match for precocious, productive, vigor-controlling clonal rootstocks. Bacterial canker tolerance and winter hardiness are both good, as is resistance to cracking. Self-infertile, in Pollen Group IV (S<sup>2</sup>S<sup>3</sup>), with an early bloom season; multiple pollenizers are recommended to boost productivity.

**Sam** - Early- to mid-season ripening, moderately large, very dark red to black fruit, with poor flavor until fully ripe and dark. The fruit are borne in relatively tight clusters, which favors brown rot incidence. Winter hardiness and resistance to bacterial canker, as well as fruit resistance to rain-cracking, are among the best.

Should only be grown for fresh market if fruit can ripen fully. Self-infertile, in Pollen Group XIII (S<sup>2</sup>S<sup>4</sup>), with a mid- to late-bloom season.

**Kristin** - Early- to mid-season ripening, moderately large, firm dark red, flavorful fruit. Winter hardiness is excellent, and fruit have moderate to good resistance to rain-cracking. Self-infertile, in Pollen Group III (S<sup>3</sup>S<sup>4</sup>), with a mid bloom season.

**Benton™ (Columbia)** - Fruit are dark mahogany red, firm, with large size, very good flavor, and a mid-season ripening time. Consumer taste panels in Washington state picked ‘Benton’ over ‘Bing’ in three of four years, and performance has been rated consistently high in trials in New York as well as Europe. Resistance to cracking is fairly good. Self-fertile, with a mid- to late-bloom season.

**Ulster** - Fruit are dark red, moderately large, with good quality and a mid-season ripening time. Winter hardiness is good, though fruit are moderately susceptible to rain-cracking. Self-infertile, in Pollen Group III (S<sup>3</sup>S<sup>4</sup>), with a mid bloom season.

**Sylvia** - Fruit are dark red, large and firm, with good flavor and a mid- to late-season ripening time. Bacterial canker tolerance is good, and the tree has a lower

vigor than normal, even on vigorous rootstocks. Tolerance to rain-cracking has varied widely, from excellent tolerance in some locations to excessive cracking on young trees at other locations. Self-infertile, in Pollen Group IX (S<sup>1</sup>S<sup>4</sup>), with a late bloom season.

**Attika® (Kordia)** - Fruit are large, very firm, heart-shaped and mahogany red with a very long stem, have excellent flavor, and a mid- to late-ripening time. Winter hardiness is good, with moderate to good tolerance of rain, but the flowers are more frost-sensitive than other varieties. Self-infertile, in Pollen Group VI (S<sup>3</sup>S<sup>6</sup>), with a mid- to late-bloom season.

**Regina** - Good quality, mahogany red fruit, having large size, good firmness, a mild flavor, and a late ripening time. Cold hardy and well-adapted to the growing conditions of Eastern North America, with good tolerance of rain and low susceptibility to cherry leaf spot. Productivity is low to moderate, making this a good candidate for matching to new clonal rootstocks that impart higher productivity. Self-infertile, in Pollen Group II (S<sup>1</sup>S<sup>3</sup>), with a late bloom season; multiple pollenizers are recommended to boost productivity.

**Sweetheart** - Very good quality, bright red, firm fruit having moderate to large size, good flavor, and very late ripening. A very grower-friendly tree, with a spreading tree form and precocious, heavy cropping on all rootstocks. Reports on winter hardiness and bacterial canker susceptibility have been variable, and fruit are moderately susceptible to cracking. Self-fertile, with an early- to mid-bloom season (though bloom date has varied widely in northwest Michigan).

**Hudson** - Good quality, mahogany red, firm fruit having moderate to large size, good flavor, and very late ripening. Very good winter hardiness and tolerance to bacterial canker, as well as good resistance to fruit cracking. Productivity is quite delayed, suggesting better potential with a clonal rootstock to impart precocity and productivity. Self-infertile, in Pollen Group IX (S<sup>1</sup>S<sup>4</sup>), with a late bloom season.

### Experimental Fresh Market Red Sweet Cherries

The varieties in this category are dominated by new varieties released from the Agriculture Canada breeding program at Summerland (British Columbia), the Washington State University breeding program at Prosser (Washington), and the Cornell University breeding program (Geneva) plus several older eastern varieties that may find renewed utilization if matched with the new clonal rootstocks like the Giselas. Many of the western variety releases exhibit remarkable fruit size and quality, but tree performance and survival under the harsher conditions typically found in Eastern North America has yet to be documented thoroughly enough for significant commercial plantings.

**Chelan**<sup>TM</sup> - Moderately good quality, dark mahogany red, firm fruit having moderate to large size and early season ripening. For best flavor, fruit must be allowed to ripen fully. Productivity is very good, resistance to cracking is fairly good, and trees are resistant to powdery mildew. Self-infertile, in Pollen Group V (S<sup>3</sup>S<sup>9</sup>), with an early bloom season.

**Index**<sup>TM</sup> - Good quality, mahogany red, firm fruit having large size, very good flavor, and an early- to mid-ripening time. Bacterial canker tolerance is similar to that of 'Ulster' and 'Kristin', and susceptibility to rain-induced fruit cracking is moderate. Self-fertile, with an early bloom season.

**Glacier**<sup>TM</sup> - Impressively large fruit size, dark mahogany red with very good flavor but less firmness than other fresh market varieties; ripens mid-season. 'Glacier' could be an outstanding fruit for local fresh markets and may be a good candidate for matching with precocious, size-controlling rootstocks. Moderately susceptible to rain-cracking. Self-fertile, with a mid- to late- bloom season.

**Nelson** - Fruit quality is moderately good (in terms of size and firmness) with very good flavor, ripening mid-season with the highest cracking resistance of any cherry tested thus far in Northwest Michigan. Trees exhibit low susceptibility to bacterial canker as well. Previous sources of 'Nelson' have been virus-infected, but when virus-free trees are available (virus elimination and certification currently underway), this variety is worthy of further test for fresh markets. Self-infertile, in Pollen Group XIII (S<sup>2</sup>S<sup>4</sup>), with a mid- to slightly-late-bloom season.

**BlackGold**<sup>TM</sup> - Fruit are moderately large, dark red and heart-shaped, ripen in mid-season, and moderately tolerant of rain. Cold hardy and well-adapted to the growing conditions of Eastern North America. Self-fertile, with mid- to late-bloom season.

**Schmidt** - Fruit quality is moderately good (in terms of size and firmness) with very good flavor, ripening mid-season with very good resistance to rain-induced fruit cracking. The traditional drawback with 'Schmidt' is low productivity, but the potential for matching with a new clonal rootstock to impart higher productivity is worthy of further test. Self-infertile, in Pollen Group XIII (S<sup>2</sup>S<sup>4</sup>), with a mid- to slightly-late-bloom season.

**Summit** - Impressively large, bright red, heart-shaped fruit size, with good flavor but less firmness than other fresh market varieties. Ripens mid-season, but often is picked earlier, especially by pick-your-own customers due to remarkable size. Moderately susceptible to rain-cracking, and tree winter-hardiness may be marginal in some years, but impressive fruit size is worth a trial. Self-infertile, in Pollen Group I (S<sup>1</sup>S<sup>2</sup>), with a mid- to late-bloom season.

**Selah**<sup>TM</sup> (**Liberty Bell**) - A dark red to mahogany, round fruit having impressively large fruit size, excellent flavor, and a mid- to late-season ripening time. Fruit are borne in loose clusters and have average susceptibility to rain-induced cracking. Superior size and cropping habit to 'Lapins' under western conditions, but little

performance data yet available in Eastern North America. Self-fertile, with an early- to mid-bloom season.

**Skeena**<sup>TM</sup> - A dark red to mahogany, impressively large and attractive high quality fruit, having good flavor and ripening in the mid- to late season. Superior to 'Lapins' for both fruit traits and tree growth (spreading and precocious) under western conditions, with moderate tolerance to rain, but little performance data yet available in Eastern North America. Self-fertile, with a mid-bloom season.

Not recommended for fresh market due to suspect fruit quality, rain-induced cracking, or tree adaptability: Bing, Brooks, Hartland, Hedelfingen, Lambert, Lapins, Royalton, Star, Valera, Van, Vic, Windsor.

### Experimental Fresh Market Blushed Yellow Cherries

This is a niche category for special markets, one for which discerning consumers are willing to pay extra for a premium cherry that is more difficult to grow well. This market was created by legendary fruit variety pioneer, Grady Auvil of Washington State, who began pruning and training his yellow-fleshed 'Rainier' cherries for the fresh market rather than for canning. By reducing his yields and improving light distribution through the canopy, he was able to consistently harvest very large, very firm fruit of very high sweetness (often 25° Brix or more), with an attractive red blush to the yellow skin. 'Rainier' has subsequently become the highest-priced fresh market variety, but it is also the most difficult to grow well, as the yellow flesh reveals every inadvertent bruise from wind, harvest, or packing as unattractive brown marks (which are usually present in mahogany-fleshed fruit, but not nearly as noticeable).

**Rainier** - Excellent quality fruit having the drawback of marginal adaptation for eastern growing conditions. In the Great Lakes, winter cold damage (particularly in young trees) and its associated disease problems, such as bacterial canker, can be a challenge for maintaining tree health, and in some orchards, 'Rainier' fruits have been noted to be particularly susceptible to *Alternaria* infection. The fruit ripen in mid-season and are low- to moderately-susceptible to rain-induced cracking. Self-infertile, in Pollen Group IX (S<sup>1</sup>S<sup>4</sup>), with an early- to mid-bloom season.

**Emperor Francis** - A very nice quality, firm fruit having the drawback of only medium size, yet perhaps the blush vari-

ety best adapted (thus far) to the growing conditions of Eastern North America. Good tree survival of cold winters and endemic diseases, with better resistance to fruit cracking than 'Rainier'. The fruit ripen mid-season, slightly after 'Rainier' and 'WhiteGold'. Self-infertile, in Pollen Group III (S<sup>3</sup>S<sup>4</sup>), with an early- to mid-bloom season.

**WhiteGold®** - A nice quality fruit of moderate to large size, ripening mid-season. Cold hardy and well-adapted to the growing conditions of Eastern North America, with a very low susceptibility to cherry leaf spot. Fruit are moderately tolerant of rain. Self-fertile, with a mid- to late-bloom season.

**Vega** - Very attractive fruit appearance, rivaling that of 'Rainier' and ripening about a week earlier, but having the drawbacks of higher susceptibility to rain-induced fruit cracking, rather low productivity, and reports of insufficient sweetness to offset its acidity (which is significantly higher than 'Rainier'). A potential candidate for growers interested in matching with size-controlling precocious rootstocks to increase productivity and provide external protection from rain-cracking. Self-infertile, in Pollen Group IV (S<sup>2</sup>S<sup>3</sup>), with an early bloom season.

**Stardust®** - Excellent fruit quality, with size, flavor, and firmness rivaling that of 'Rainier' but ripening significantly later. Limited reports in eastern North America suggest good winter hardiness and adaptability to Great Lakes conditions. Self-fertile, with a late bloom season.

Not recommended for fresh market due to fruit quality or adaptation: Gold, Napoleon (Royal Ann), Sue.

## Summary

The advent of new sweet cherry varieties having excellent fruit qualities and new rootstocks that confer important advantages for potential fresh market production are only two cornerstones for Eastern North American growers considering possible diversification of their orchard operations. Profitable production for fresh markets requires more intensive orchard management, a more thorough understanding of relationships between tree growth and reproduction, and a greater investment in hands-on labor. Such topics deserve further exposition in future articles.

For further information on sweet cherry varieties (including pollination charts), and periodic updates on cherry rootstocks and cultural practices, the fol-

lowing websites may be useful and/or provide additional relevant internet links: **Michigan State University** <[www.hrt.msu.edu/faculty/list\\_langg.htm](http://www.hrt.msu.edu/faculty/list_langg.htm)>, **MSU Northwest Horticultural Research Station** <[www.maes.msu.edu/nwmihort/](http://www.maes.msu.edu/nwmihort/)>, **Cornell University** <[www.nysaes.cornell.edu/hort/faculty/andersen/](http://www.nysaes.cornell.edu/hort/faculty/andersen/)>, **Washington State University** <[www.fruit.prosser.wsu.edu/chervar.htm](http://www.fruit.prosser.wsu.edu/chervar.htm)>, **Summerland Research Centre** <[http://res2.agr.ca/parc-crapac/english/2summerland/horticulture/kappel/variety\\_descriptions.htm](http://res2.agr.ca/parc-crapac/english/2summerland/horticulture/kappel/variety_descriptions.htm)>.

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