100 Years of Fruit Crops Breeding

Vision
Horticultural Research Center
Commitment
Achievements
Past to Future
Minnesota, A Place for Fruits?

“I would not live in Minnesota because you can’t grow apples there.” - Horace Greeley, 1860
The varieties of fruits that were introduced into this country by the original settlers, while they often proved of value for a few years, have generally been superseded by better kinds that have originated in the section in which they are grown. That portion of the United States known as the central Northwest... (has) had more difficulty in getting varieties of fruits suitable to their conditions than any other portion of this country. This has been due to their cold winters and especially to an occasional extremely cold winter in which the ground is bare of snow. The climate... is generally drier in the summer and not as well adapted to the fruits of western Europe as portion of the United States lying east or on the west coast.

– Prof Samuel B. Green, The Minnesota Horticulturist, April 1908
19th Century Successes Spur Interest in Fruit Breeding

Louis Suelter, German immigrant in Carver County, MN introduced ‘Beta’ grape in 1870 from a cross of V. riparia (white) x ‘Concord’

Peter Gideon, of Excelsior, introduces the Wealthy apple in 1868
Vision

• High quality fruit, thriving in a continental climate

• “There is a large field for the plant breeder to work in. We need hardier cherries and better keeping varieties of plums for the market, we need long keeping varieties of apples and many other fruits. How are we going to get these? Only through the patient and hardworking plant breeder.”
  – Charles Haralson, The Minnesota Horticulturist, Nov. 1908
Research Site:
Establishment of The University of Minnesota Fruit Breeding Farm in 1908

Fruit breeding plots of Prof. Samuel Green at the University Farm in St. Paul in 1908. Now the site of the University of Minnesota St. Paul Campus

By the establishment of the fruit breeding farm at Zumbra Heights, we have found opportunity for the expansion of our fruit breeding interests which were formerly grouped together in a congested way at the University Farm

• Charles Haralson, The Minnesota Horticulturist, Nov. 1908

Legislative act establishing what is now the University of Minnesota Horticultural Research Center

An Act Providing a Fruit Breeding Farm for the University of the State of Minnesota.

Be it enacted by the Legislature of the State of Minnesota:
$16,000 Appropriated for Fruit Breeding Farm.

Section 1. There is hereby appropriated out of money in the State Treasury not otherwise appropriated, the sum of sixteen thousand dollars ($16,000), or as much thereof as may be necessary, for the purchase of a Fruit Breeding Farm for the State University by the Board of Regents of the State University as hereinafter provided.
$2,000 Annually Appropriated.

Section 2. There is hereby annually appropriated out of money in the State Treasury, not otherwise appropriated, the sum of two thousand dollars ($2,000) for the care and management of said fruit breeding farm.
Regents to Select a Fruit Farm.

Section 3. As soon as may be after the passage of this act, the Board of Regents of the State University shall select a fruit farm which shall meet with the approval of the executive board of the Minnesota State Horticultural Society as being well adapted for fruit breeding purposes.
Visitors Committee.

Section 4. The executive board of the Minnesota State Horticultural Society is hereby required to appoint a committee of two suitable persons to visit said fruit breeding farm, at least once in each year, to examine the fruit breeding work being done there, and to report on the progress of such work to the Minnesota State Horticultural Society and Board of Regents of the State University, together with such recommendations for the future conduct of said farm as may seem to them best. This act shall take effect and be in force on and after its passage.

Approved April 23, 1907.
“To get the best results in fruit breeding a large number of varieties of all fruits adapted to this region should be planted as soon as possible at our (new) fruit farm.”

• Charles Haralson, The Minnesota Horticulturist, Nov. 1908
Commitment to Fruit Breeding: 100+ Years Continuous Scientific Staffing

1908: 100 Years at the Horticultural Research Center

- Peter Gideon 1878-1889
- Samuel Green 1888-1908
- Charles Haralson 1908-1923
- M.J. Dorsey 1908-1921
- W. H. Alderman 1919-1953
- A.N. Wilcox 1923-1963
- T.S. Weir 1946-1965
- M.J. Dorsey 1908-1921
- W. H. Alderman 1919-1953

- “Science may accelerate natural cycles to some extent, but breeding, selecting, and testing new fruits is not a job for the impatient.”
  – W.H. Alderman, 1957, in *Fruit Varieties Developed at the University of Minnesota Fruit Breeding Farm*

- Jim Luby 1982-present
- David Bedford 1979-present
- Peter Hemstad 1984-present
- Patrick Pierquet 1975-1980
- Cecil Stushnoff 1967-1980

From The Minnesota Horticulturist, 1909
# 100 Years of Hardy Fruit Introductions from the University of Minnesota

<table>
<thead>
<tr>
<th>Fruit</th>
<th>1908-1957</th>
<th>1958-2008</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>Apple</td>
<td>13</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>Blueberry</td>
<td></td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Cherry</td>
<td>3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Cherry-plum</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Currant</td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Gooseberry</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Grape</td>
<td>4</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Pear</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Plum</td>
<td>20</td>
<td>2</td>
<td>22</td>
</tr>
<tr>
<td>Raspberry</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Strawberry</td>
<td>10</td>
<td>6</td>
<td>16</td>
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<tr>
<td>Ornamentals</td>
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<td></td>
<td></td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>64</strong></td>
<td><strong>40</strong></td>
<td><strong>104</strong></td>
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</tbody>
</table>
Prominent Achievements from 1908-1957

Haralson apple, 1922
Beacon apple, 1936
Red Lake currant, 1933
Latham raspberry, 1920
Prominent Achievements from 1957-2008

• Regional and World Class Apples

Regent
Honeygold
Sweet Sixteen
Keepsake
Honeycrisp
Zestar!®
SnowSweet®

Honeycrisp
Zestar!TM
Prominent Achievements from 1957-2008

• A New Northern Wine Industry

Frontenac        Frontenac gris
La Crescent
Marquette
League Crescent
Prominent Achievements from 1957-2008

- Hardy Blueberries for Plantation and Garden
  
  Northblue
  Northcountry
  Northsky
  St. Cloud
  Chippewa
  Polaris
  Superior
Prominent Achievements from 1957-2008

- High quality strawberries for Zone 3-4 from the University of Minnesota-USDA Cooperative Breeding Program

Winona™

Mesabi™

Itasca™
The Future of Hardy Fruit Breeding at the University of Minnesota

- Facilities - the Outdoor Laboratory
The Future of Hardy Fruit Breeding at the University of Minnesota

- Germplasm – Cultivated, Wild, Worldwide

“To get the best results in fruit breeding, a large number of varieties of all fruits adapted to this region should be planted as soon as possible at our (new) fruit farm.”
  – Charles Haralson, The Minnesota Horticulturist, Nov. 1908

Native half-high blueberries in the Adironcacks of Northern New York

Wild grape, *Vitis* riparia, from Manitoba

Wild apple, *Malus sieversii*, from Tien Shan Mts in Kazakhstan

Hardy kiwifruit, *Actinidia kolomikta*, from NE China

Fall bearing (primocane fruiting) blackberries from Arkansas
The Future of Hardy Fruit Breeding at the University of Minnesota

• Technology – Forcepts to Genomics

• “The Mendelian Theory of the transmission of characteristics occupied much time and attention, but those presenting papers on this subject differed so much in their views in regard to it that the discussion lacked interest and point. There was a very general feeling that too much time was put on this, a subject of relatively little importance for a meeting of this kind.”

  – Prof. Samuel Green, delegate from the University of Minnesota to the 1908 American Breeders' Assn meeting in Washington, D.C. As reported in the Minnesota Horticulturist, Jan. 1908
• “Horticulture is an art of endless possibilities and changes, and no person of experience in such matters ever feels that he knows it all.”
  – Prof. Samuel B. Green, President’s address to the Minnesota State Horticultural Society, The Minnesota Horticulturist, January 1908