Bulletin No. 253 - Cherries of Utah

Fancis M. Coe
Lambert: The leading Utah cherry

Utah Agricultural Experiment Station
UTAH STATE AGRICULTURAL COLLEGE
Logan, Utah
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| Centennial                                                    | Schmidt (Black Orb) |
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SUMMARY AND CONCLUSIONS

1. This publication is intended to serve as a record of cherry varieties grown in Utah, together with a progress report on the new varieties under test by the Utah Station. While special emphasis has been given to varieties of commercial importance or possibilities, those of historical or pomological interest have also been included, and technical descriptions of fruit and trees as they grow in Utah are given.

2. Utah ranks fourth among the sweet cherry growing states in number of trees, having 224,280 cherry trees in 1930, half of which were non-bearing. In the younger plantings Lambert predominates, although substantial numbers of Bing and Napoleon have also been planted. Montmorency is the only sour cherry planted to any extent in recent years.

3. Napoleon, Bing, Lambert, and Black Tartarian led the sweet cherries in the test orchard in spread and height after five years' growth, while Early Richmond and Dyehouse excelled in vigor of growth among the sour cherries. Reine Hortense was the most vigorous of the Duke trees tested.

4. Black Tartarian, Napoleon, Centennial, Schmidt (Black Orb), Chapman, Early Burbank, and Early Purple were injured the most by the unusually early and severe winter of 1932-33 when -18° F. occurred on December 12 and 13, at Farmington. Windsor, Lambert, Yellow Spanish, Major Francis, Abundance, and Seneca were injured the least among sweet cherries. Royal Duke and Reine Hortense were injured most of the Dukes, while of the sour varieties Chase and Suda appeared to suffer most.

5. Because of its greater hardiness of tree and the large size, attractive color, firmness, and quality of its fruits, Lambert appears to be the best variety for commercial shipping, although Bing is also desirable for the same purpose on the warmer lands and Napoleon in similar locations for canning.

6. Of the minor varieties, Windsor appears to be the most generally valuable for pollination, although Black Tartarian is also useful where early cherries are wanted. Schmidt (Black Orb) and Yellow Spanish also appear to have value as pollinizers.

7. Seneca appears to be the best of the extra early varieties, ripening two weeks before Tartarian. Major Francis appears worthy of testing because it appears to be hardier than Tartarian. Deacon and Elkhorn are new main crop varieties also worthy of trial as pollinizers.

8. Black Republican, Early Purple, Black Spanish, Black Eagle, and Governor Wood do not appear worthy of further cultivation in Utah.

9. Of the new varieties under test, Chapman, Burbank, Abundance, Giant (California type), and Gold do not appear worthy of further trial by Utah growers.

10. Of the sour cherries, Montmorency appears to be the best for commercial canning, with Montmorency, Early Richmond or Dyehouse, and Wragg for limited local market planting and for home use. Chase and Suda do not appear to be promising. Of the Duke cherries, Royal Duke appears to be useful for local market in early locations and for home planting. Reine Hortense, Late Duke, Knudson, and Sixteen-To-One do not appear to have commercial value, but may be useful to provide variety in home plantings.
In the production of cherries, as with all fruit plants, growers are dealing with clonal varieties which are individuals, and as such differ from each other in their characteristics. Since these characteristics vitally affect the value of each variety and returns from its culture, the importance of complete information on these characteristics for a given region is evident.

All varieties now grown, unfortunately, have faults or fail to reach the ideal in one or more important characters. They may lack size, productivity, hardiness, or quality. They may lack vigor or be susceptible to diseases and insects. They may ripen at an undesirable time, have the wrong color of skin or flesh, or be soft and bruise badly in handling. They may be intersterile, as is the case with the leading commercial varieties of cherries, and require special pollinizers.

Some of these faults can be remedied by cultural methods, such as pruning, fertilization, spraying, etc., but many of them cannot be changed by the husbandman, and even those varieties having remedial faults are objectionable because of the increased costs of production entailed.

**IMPORTANCE OF VARIETY TESTING**

The hope of the cherry industry lies in the introduction of new varieties which will come nearer the ideal and have fewer and less serious faults than varieties now grown. New varieties come from three sources: (1) the selection of desirable chance seedlings, (2) the breeding of new varieties, and (3) the discovery of bud sports (mutations) which occur in orchards.

In former days, breeding, selection, and testing of promising new varieties was largely in the hands of amateurs who rendered great service to the growing fruit industry. Early orchards were really variety test orchards, comprising dozens of varieties. The rule in recent years, however, has been to standardize on a few varieties which have proved best.

**Acknowledgments:** The writer wishes to gratefully acknowledge the assistance of the following: Director P. V. Cardon and former Director William Peterson of the Utah Agricultural Experiment Station for assistance in initiating and carrying on the work; Doctor A. L. Wilson, for assistance and suggestions on the work at Farmington; Mr. Arthur Manning, foreman of the Davis Experimental Farm, for assistance and supervision; Dr. A. L. Stark and T. A. Merrill for planting and caring for the test orchard at Farmington; and Mr. R. K. Gerber, for assistance with field and photographic work.

The manuscript was read by the following persons, whose helpful criticism and suggestions are acknowledged with thanks: Dr. U. P. Hedrick, Director of the New York Agricultural Experiment Station, and Messrs. Richard Wellington, G. H. Howe, and Olav Eins of the same institution.

The generous cooperation of the following nurserymen in donating trees to start the test orchards is acknowledged: Porter-Walton Company, Utah Nursery, Salt Lake; Smith Brothers, Centerville; C. L. Smith, Clearfield; E. Howes, Roy; C. L. Moore, Ogden; Milton Nursery, Milton, Oregon; Stark Brothers, Louisiana, Missouri.

1Contribution from Department of Horticulture, Utah Agricultural Experiment Station.

2Assistant Horticulturist.

*Horticultural varieties propagated vegetatively are called "clones." Since all trees of a variety are propagated from one individual in the beginning, the variety may be considered as an individual.


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and to experiment, if at all, in a small way. The commercial grower can no longer afford to test the hundreds of new varieties of fruits which are offered for trial. Such testing of promising new varieties has become, therefore, a primary and continuing obligation of the experiment stations to the fruit industry.

The experiment stations, however, can test new varieties under one or at most a few locations and conditions; hence, private testing of the more promising varieties, as revealed by their performance in the Station tests, is necessary to determine their value under the varying soil, climatic, locational and cultural conditions prevailing throughout the region served. This testing should be done conservatively on the part of the individual grower, since the vast majority of new varieties, no matter how alluring their praise elsewhere, fail to succeed under specific conditions and requirements.

Only varieties thoroughly tested under similar conditions should be planted extensively for commercial purposes.

PURPOSES OF THIS PUBLICATION

In connection with the testing of promising new varieties and the recording and evaluating of their characteristics, which is the main purpose and occasion for this publication, it is desirable to record for comparison both of fruit growers and pomological workers elsewhere the characteristics also of varieties now growing in Utah orchards, including those which are being discarded. By this means the cumulative experience of growers who have been testing varieties under a wide range of conditions can be preserved, and the question which inevitably recurs as to why certain older varieties are no longer grown can be answered without the expense of a retrial.

To provide such a record of cherry varieties, old and new, under Utah conditions which will be readily available to all is the major purpose of this publication. Because of the short time they have been under test, the information on new varieties is in the nature of a progress report, subject to modification as additional crops are observed and additional varieties are fruited.

BOTANY OF THE CHERRY

The sweet cherry has been commonly considered by pomologists and botanists to be *Prunus avium*, the sour cherry *Prunus cerasus*, and the Duke varieties to be hybrids between the sweet and sour cherries. Crane (1927), however, has produced evidence from genetic and breeding studies to prove that both sweet and sour cherries as well as Dukes are hybrid in origin between the two species. He has raised seedlings with characters of *P. avium* from selfed sour cherries and seedling with *P. cerasus* characters from crosses between sweet varieties. Of 30 varieties of domestic origin examined, nearly all gave evidence of hybrid origin. He also states that sour cherries possess additional elements, probably derived from *P. fruticosa*, the dwarf cherry of Europe.
POMOLOGICAL CLASSIFICATION OF THE CHERRY

Sweet cherries are divided for convenience into two general groups. The cherries of the soft-fleshed group are variously referred to as "Heart" cherries or by the French term "Guigne," or English "Gean." These cherries may be either white-fleshed or purple-fleshed, Black Tartarian and Governor Wood being typical Heart cherries. The firm-fleshed varieties such as Bing, Lambert, Napoleon, or Windsor, are called "Bigarreau" cherries. The term "Bigarreau," according to Hedrick (1915), originally had reference to the diverse colors of the fruits.

Sour cherries are divided into two major groups: (1) The "Amarelles" which include the light-juiced varieties, such as Montinor Emcy and (2) the "Morellos" which include the colored-juiced sorts, of which English Morello is the type variety.

HISTORY OF CHERRIES IN UTAH

When the first hardy "Mormon" pioneers crossed the plains in 1847 under the leadership of Brigham Young bound for "Deseret," as the new colony which is now the State of Utah was then known, they brought with them in their handcarts and prairie schooners seeds of fruit trees as well as seeds of grains, flowers, and vegetables. Shortly after, scions and in some cases trees of the grafted varieties then grown in the East and Central West were sent for or brought here by later settlers. These were added to by emigrants from Europe and by returning missionaries who brought back varieties with them. Names of many varieties were lost, and several are now grown under local names.

These fruit trees for the most part thrived in the virgin soils of the Salt Lake and Utah Valleys, irrigated by water diverted from mountain streams. Small nurseries were established to supply the demand for home orchards in town and country.

Later, with the coming of the transcontinental railroad and the development of refrigerated cars, Utah leaders saw possibilities of the irrigated valleys of Utah being covered with flourishing and profitable orchards. Unfortunately, this vision has not yet been realized, and following the horticultural boom of 1900 to 1910, which harmed the industry through the indiscriminate expansion of orchards of unsuitable varieties often poorly located, a period of depression set in from 1910 to 1925 during which time few orchards were planted.

In the cherry orchards planted during the boom period, seven varieties of sweet cherries predominated: Napoleon, Windsor, Schmidt (Black Orb), Lambert, Bing, Black Tartarian, and Black Republican. There were occasional plantings of Centennial and Royal Duke. There were also planted a few trees of Governor Wood, Yellow Spanish, Lewelling, Early Purple (locally called Early Black), Knudson, Sixteen-To-One, Reine Hortense, Montmorency and Early Richmond. On the whole both sour and Duke cherries were neglected during this period. From 1925 to 1930, the relatively high prices of cherries again resulted in heavy new plantings.

PRESENT STATUS OF THE UTAH CHERRY INDUSTRY

Among the western states where sweet cherries predominate, according to the census of 1930 Utah ranks fourth in the total number of
cherry trees. Of a total of 224,280 cherry trees in Utah, 114,230 were listed as non-bearing trees and 110,050 as bearing trees. This heavy proportion of young trees indicates the growing importance of cherry culture in Utah. In value, the cherry crop is exceeded only by the apple crop, the average production of 3366 tons of cherries for the three-year period, 1930-32, being valued at $343,333.\textsuperscript{4} Production, price, and value of Utah cherry crops for the 11-year-period, 1924-34, are given in Table 1.

<table>
<thead>
<tr>
<th>Year</th>
<th>Tons</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1924</td>
<td>3800</td>
<td>$380,000</td>
</tr>
<tr>
<td>1925</td>
<td>5500</td>
<td>770,000</td>
</tr>
<tr>
<td>1926</td>
<td>5300</td>
<td>636,000</td>
</tr>
<tr>
<td>1927</td>
<td>3800</td>
<td>570,000</td>
</tr>
<tr>
<td>1928</td>
<td>4600</td>
<td>690,000</td>
</tr>
<tr>
<td>1929</td>
<td>3200</td>
<td>432,000</td>
</tr>
<tr>
<td>1930</td>
<td>3500</td>
<td>455,000</td>
</tr>
<tr>
<td>1931</td>
<td>2400</td>
<td>324,000</td>
</tr>
<tr>
<td>1932</td>
<td>4200</td>
<td>252,000</td>
</tr>
<tr>
<td>1933</td>
<td>3078</td>
<td>200,000</td>
</tr>
<tr>
<td>1934</td>
<td>3850</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>3929</td>
<td>$470,900</td>
</tr>
</tbody>
</table>

\textsuperscript{4}Data furnished by Frank Andrews, Federal Agricultural Statistician, Bureau of Agricultural Economics, U. S. Department of Agriculture, Salt Lake City.

**Cherry Districts of Utah**

Commercial culture of sweet cherries is confined to more or less clearly defined areas comprising "benchlands" along the western slope of the Wasatch Mountains in Salt Lake and Utah Valleys and in the irrigated lands of Washington County in southwestern Utah. Boxelder County on the north leads in number of cherry trees, followed by Weber, Davis, Utah, Salt Lake, Washington, and Cache Counties in the order named. The number of bearing and non-bearing cherry trees in each county is given in Table 2. In the U. S. Census Report, numbers of sweet and sour varieties were not segregated; hence, the census figures shed no light on their relative importance in Utah.

<table>
<thead>
<tr>
<th>County</th>
<th>Total</th>
<th>Bearing</th>
<th>Non-bearing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boxelder</td>
<td>60,266</td>
<td>28,358</td>
<td>31,908</td>
</tr>
<tr>
<td>Weber</td>
<td>47,222</td>
<td>20,587</td>
<td>26,635</td>
</tr>
<tr>
<td>Davis</td>
<td>47,108</td>
<td>24,389</td>
<td>22,719</td>
</tr>
<tr>
<td>Utah</td>
<td>40,907</td>
<td>21,028</td>
<td>19,879</td>
</tr>
<tr>
<td>Salt Lake</td>
<td>11,308</td>
<td>8,263</td>
<td>3,045</td>
</tr>
<tr>
<td>Washington</td>
<td>9,359</td>
<td>2,668</td>
<td>6,691</td>
</tr>
<tr>
<td>Cache</td>
<td>2,219</td>
<td>915</td>
<td>1,304</td>
</tr>
<tr>
<td>All Others</td>
<td>5,891</td>
<td>3,842</td>
<td>2,049</td>
</tr>
<tr>
<td>STATE</td>
<td>224,280</td>
<td>110,050</td>
<td>114,230</td>
</tr>
</tbody>
</table>

\textsuperscript{4}Data furnished by Frank Andrews, Federal Agricultural Statistician, Bureau of Agricultural Economics, U. S. Department of Agriculture, Salt Lake City.
Sour cherries are grown commercially mainly in the same districts as the sweet varieties, although they are sufficiently hardy to permit their culture in frost-free locations in most of the state with altitudes below 6000 feet.

Relative Importance of Cherry Varieties

Results of a survey by Andrews in 1927 to determine the relative importance of different cherry varieties in Utah are summarized in Table 3. While this survey covered only 80 orchards, comprising approximately 10 per cent of the trees in the state, it shows the relative importance of the varieties and indicates the changes that are taking place in the varietal makeup of Utah orchards as a result of new plantings since 1923.

Table 3. Relative importance of cherry varieties in Utah orchards, 1927

<table>
<thead>
<tr>
<th>Variety</th>
<th>Bearing Trees</th>
<th>Non-bearing Trees</th>
<th>Total Trees</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sweet Varieties</strong> (84.9 per cent of total trees)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Napoleon</td>
<td>25.3</td>
<td>13.2</td>
<td>20.8</td>
</tr>
<tr>
<td>Lambert</td>
<td>18.4</td>
<td>55.9</td>
<td>32.4</td>
</tr>
<tr>
<td>Windsor</td>
<td>14.2</td>
<td>0.4</td>
<td>9.1</td>
</tr>
<tr>
<td>Bing</td>
<td>13.7</td>
<td>27.3</td>
<td>18.8</td>
</tr>
<tr>
<td>Black Tartarian</td>
<td>10.4</td>
<td>0.6</td>
<td>6.8</td>
</tr>
<tr>
<td>Schmidt (Black Orb)</td>
<td>7.6</td>
<td>0.6</td>
<td>5.0</td>
</tr>
<tr>
<td>Black Republican</td>
<td>5.4</td>
<td>0.5</td>
<td>3.6</td>
</tr>
<tr>
<td>Early Purple</td>
<td>2.6</td>
<td>0.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Governor Wood</td>
<td>1.4</td>
<td>0.0</td>
<td>0.9</td>
</tr>
<tr>
<td>Centennial</td>
<td>0.3</td>
<td>0.0</td>
<td>0.2</td>
</tr>
<tr>
<td>Yellow Spanish</td>
<td>0.2</td>
<td>0.0</td>
<td>0.1</td>
</tr>
<tr>
<td>Other Sweet Varieties</td>
<td>0.3</td>
<td>1.4</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Sour and Duke Varieties</strong> (14.4 per cent of total trees)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Royal Duke and May Duke</td>
<td>51.8</td>
<td>0.0</td>
<td>27.3</td>
</tr>
<tr>
<td>Early Richmond</td>
<td>23.6</td>
<td>0.7</td>
<td>12.7</td>
</tr>
<tr>
<td>Montmorency</td>
<td>14.7</td>
<td>97.4</td>
<td>53.8</td>
</tr>
<tr>
<td>Knudson</td>
<td>6.4</td>
<td>1.2</td>
<td>3.9</td>
</tr>
<tr>
<td>Reine Hortense</td>
<td>1.5</td>
<td>0.6</td>
<td>1.1</td>
</tr>
<tr>
<td>Other Sour or Duke</td>
<td>2.0</td>
<td>0.0</td>
<td>1.1</td>
</tr>
</tbody>
</table>

1Data from survey by Frank Andrews, Federal Agricultural Statistician, Bureau of Agricultural Economics, U.S. Department of Agriculture, Salt Lake City, covering 10 per cent of total cherry trees in Utah. Published as mimeograph, entitled “Varieties of Utah Cherries,” March 29, 1927.

2Includes Lewelling and Black Oregon.

3Early Purple is known locally as “Early Black.”

4While part of these were reported as May Duke, it is thought they were Royal Duke.

In regard to sweet varieties, three facts stand out: (1) The Lambert has become the dominant variety; (2) the Napoleon has fallen from the position of leading variety to a poor third in the newer plantings; and (3) practically no other variety besides these two and Bing have been planted since 1923. This decline of the Napoleon variety will be further emphasized by the light plantings of this variety since 1928 as well as the greater winter injury suffered by this variety in 1932-33.

6For the proportion of pollinizers in Utah orchards, pollination requirements, and pollinating varieties, the reader is referred to Utah Agricultural Experiment Station Bul. 245, entitled “Cherry Pollination Studies in Utah.” 1934. By F. M. Coe.
In 1927 there were relatively few sour cherry orchards as such, the Royal Duke trees being planted largely with sweet varieties. Since most of the sour cherry orchards have been planted since 1923, the sour cherry variety situation is more accurately portrayed by the figures on non-bearing trees in 1927, which show the striking predominance of the Montmorency variety, which made up 97.4 per cent of the non-bearing trees at that time.

EARLY CHERRY VARIETY TESTS IN UTAH

The testing of fruit varieties was one of the first lines of work started following the establishment of the Utah Agricultural Experiment Station in 1889. This work was initiated and carried on for seven years by Professor E. S. Richman, the first Horticulturist of the College. Richman planted 25 varieties of cherries at the College in the year 1890, as well as over 300 varieties of other fruits. This test orchard, which was continued and developed by his successors, covered much of the ground now occupied by the main campus of the College. It was removed in 1917 to make way for the construction of buildings and the quadrangle.

Richman (1892), in Bulletin No. 18, reported the following cherry varieties under test at Logan: Abesse, Belle de Montreal, Black Eagle, Carnation, Double Natte, Belle de Choisey, Bessarabian, Black Tartarian, Brusseler Braune, Ostheim, Early Richmond, George Glass, Griotte du Nord, King's Amarelle, Lieb, Montmorency Large, 24 Orel, 27 Orel, Rockport, Spate Amarelle, Vilna Sweet, Early Purple, Galopin, Griotte Precoce, Koeper, Late Duke, Lutovka, 23 Orel, 26 Orel, Red Muscatel, Sklanka, and Shadow Amarelle.

In Bulletin No. 25, Richman (1893) reported as follows: "Several varieties of cherries fruited this year but only two—Early Richmond and Montmorency Large—bore more than a few specimens. They are both early cherries and quite sour; they have made a fine growth and are apparently well adapted to the location. The Montmorency Large produced double the amount of fruit the Early Richmond did."

In the Utah Station Annual Report for 1894, Richman recommended the planting of sour cherries such as Montmorency Large and Early Richmond where the sweet cherry does not thrive. In 1896, he stated that Montmorency Large holds its old place as the heaviest yielder of the sour cherries and is the most profitable variety so far grown. He described briefly the following: Spate Amarelle, Sklanka, Griotte Precoce, Susse Fruhweichsel, and Red Muscatel. He also stated that sweet cherries continued to do well on the Experiment Station Farm, the Black Tartarian being the most promising. This variety winterkilled in the lower portions of Cache Valley and therefore could be recommended only for favored locations.

Sears (1897) states that cherries were included in a test orchard planted on the farm of W. H. Rowe of Corinne, Utah. No further mention of this test appears in later reports.

Hedrick (1899), later the chief author of the monumental work, "The Cherries of New York," discussed the status and possibilities of sour cherries in Utah at that time and presented yields for 1898 and 1899 and

*Spelling of the varietal names has been changed to conform to that used in Hedrick's "The Cherries of New York."
brief descriptions of 23 varieties under test. Lack of interest in this fruit which was not grown commercially at that time, he stated, was due to the popular conception that sour cherries were no hardier than sweet cherries as well as to unproductiveness of many dooryard trees. Showing the extreme contrast between varieties in regard to productiveness, he says:

"Year in and out some of the trees on the Station grounds are loaded to the earth with cherries; while others scarcely bear at all, even if they bloom." Sour cherries brought a high price for those days ($1 for 18 pounds) and met with a strong demand.

Montmorency, Double Natte, Ostheim, and Brusseler Braune were cited as having "done best in this and past years." Average yields per tree for trees in their eighth, ninth, and tenth years from 1898 to 1900, are given in Table 4.

Table 4. Yields of various varieties of sour and Duke cherries for the 3-year period, 1898-1900 (eighth, ninth, and tenth years) ¹

<table>
<thead>
<tr>
<th>Rank</th>
<th>Variety</th>
<th>No. Trees</th>
<th>Total Yield</th>
<th>Average Yield per Tree per Year (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Double Natte</td>
<td>2</td>
<td>240</td>
<td>80</td>
</tr>
<tr>
<td>2</td>
<td>Ostheim</td>
<td>2</td>
<td>187</td>
<td>61</td>
</tr>
<tr>
<td>3</td>
<td>King's Amarelle</td>
<td>2</td>
<td>150</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>Sklanka</td>
<td>2</td>
<td>137</td>
<td>46</td>
</tr>
<tr>
<td>5</td>
<td>Shadow Amarelle</td>
<td>1</td>
<td>75</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>Early Richmond</td>
<td>1</td>
<td>70</td>
<td>23</td>
</tr>
<tr>
<td>7</td>
<td>Bessarabian</td>
<td>3</td>
<td>61</td>
<td>20</td>
</tr>
<tr>
<td>8</td>
<td>27 Orel</td>
<td>1</td>
<td>56</td>
<td>19</td>
</tr>
<tr>
<td>9</td>
<td>Spate Amarelle</td>
<td>2</td>
<td>47</td>
<td>16</td>
</tr>
<tr>
<td>10</td>
<td>Susse Fruhweichsel</td>
<td>2</td>
<td>43</td>
<td>14</td>
</tr>
<tr>
<td>11</td>
<td>Carnation</td>
<td>2</td>
<td>41</td>
<td>13</td>
</tr>
<tr>
<td>12</td>
<td>Lutovka</td>
<td>1</td>
<td>41</td>
<td>13</td>
</tr>
<tr>
<td>13</td>
<td>Belle de Choisay</td>
<td>1</td>
<td>40</td>
<td>13</td>
</tr>
<tr>
<td>14</td>
<td>23 Orel</td>
<td>1</td>
<td>33</td>
<td>11</td>
</tr>
<tr>
<td>15</td>
<td>Cerise de Ostheim</td>
<td>1</td>
<td>32</td>
<td>11</td>
</tr>
<tr>
<td>16</td>
<td>Griotte du Nord</td>
<td>1</td>
<td>24</td>
<td>8</td>
</tr>
<tr>
<td>17</td>
<td>Orel 24</td>
<td>1</td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>18</td>
<td>Griotte Precce</td>
<td>2</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>19</td>
<td>Galopin</td>
<td>2</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>20</td>
<td>Brusseler Braune</td>
<td>1</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>21</td>
<td>Abbesse</td>
<td>1</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>22</td>
<td>Late Duke</td>
<td>1</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

¹Compiled from Utah Station records made by U. P. Hedrick (Horticulturist) and William Peterson (Assistant Station Horticulturist at this time). The low yields of many varieties were caused by poor soil and poaching. No tree-measurement records were made. Records are not available on this planting after 1900.

While not specifically recommending any certain varieties, Hedrick's descriptions commend the following varieties: Ostheim, Double Natte, Brusseler Braune, Montmorency, Sklanka, Shadow Amarelle, Spate Amarelle, Lutovka (24 Orel), and Early Richmond. Of these the Montmorency is the only variety commonly grown in Utah today, although Early Richmond is occasionally found.
Unfortunately, no further reports were made on the cherry varieties tested at Logan, or on other fruits tested in the Station orchards. These plantings were said to have been removed in 1908 and in 1917, although a few unidentified trees still survive.

**VARIETY TEST ORCHARD**

In 1928, a new variety testing project was initiated by the writer and test plantings were made on the upper part of the Davis Experimental Farm, between Farmington and Kaysville. The site, while too low to be typical of the best sweet cherry lands of Utah, is representative of many of the lower lying orchards. The soil is a fertile and, in most places, deep alluvial stony loam. Streaks of gravel occur at a depth of 12 to 18 inches under part of the sweet cherry orchard, all of which is well-drained.

The 1928 plantings included both a variety and strain test. Twelve varieties of sweet cherries were planted: Lambert, Bing, Napoleon, Black Tartarian, Giant (California type), Chapman, Early Purple, Windsor, Burbank, Black Republican, Black Oregon, and Centennial. Trees of Napoleon, Bing, Lambert, and Black Tartarian were secured for strain tests from a number of sources, both local and outside the state. Since 1928, the following varieties have been added, bringing the total to 27: Victor, Gold, Long-Stem Waterhouse, Seneca, Lyons, Abundance, Deacon, Elkhorn, Schmidt, Yellow Glass, Big K, Giant (New York), Carnival, Major Francis, and Yellow Spanish.

Six sour varieties planted in 1928 were Montmorency, Early Richmond, Dyehouse, Chase, Wragg, and Suda. Montmorency trees from seven sources were planted in a strain test, including Montmorency Stark, Montmorency Monarch, Montmorency King, and Montmorency Sweet. Later, English Morello and Stockton Morello were added.

The following Duke varieties were planted: Royal Duke, Reine Hortense, Late Duke, and Knudson.

At Logan, Montmorency, English Morello, May Duke, Late Duke, Lambert, Bing, Schmidt, Tartarian, Windsor, Napoleon, and Deacon are being or have been recently grown.

The test plantings at Farmington were set out on a double filler system with sweet cherry trees 15 feet apart, the permanent trees to be 30 feet apart. The sour cherries were planted 12.5 feet apart in rows 13 feet apart. The temporary fillers in the sour and Duke trees were removed in 1932, the trees being weighed as an index to varietal vigor.

The test orchards have been kept cultivated during the growing season, cover crops of winter vetch being grown three seasons.

The trees were trained to the modified-leader system the first four years, little pruning having been done in 1932 and 1933. The sweet cherries were headed back in June from the second to the fourth years to secure branching, in addition to the dormant thinning out and heading incident to modified-leader training. The trees have made a vigorous growth, it being necessary in 1932 to suppress the leader branches.

Following severe winter injury to the sweet cherries in December, 1932, the trees were not pruned during the dormant season, but dead and dying branches were pruned out the following summer. In the spring of 1934, dead trees and branches were removed, and the permanent trees
were given a rather severe thinning out and heading back to reduce the crop, stimulate wood growth, and aid recovery. These trees also had all dead bark removed and were treated with several wound protective paints. The fillers, which likewise had set a heavy load of blossom buds as a result of growth being checked by winter injury, were neither pruned nor treated except for pruning away dead branches and low branches which interfered with cultivation.

In December, 1932, the lower branches interfering with cultivation in the sour and Duke cherries were removed and the permanent trees of each variety pruned by the "long" system, the semi-permanent trees being left unpruned as checks. In December, 1933, the trees were similarly long-pruned, with the weak fruiting branches headed back as well as thinned out.

**HARDINESS OF CHERRY VARIETIES**

Owing to its location on lower land, winter injury has been more severe in the Station planting than in orchards well located on upper benchland; hence, it is felt that varieties which are sufficiently hardy on the Station grounds should succeed in warmer locations.

The winter of 1932-33 was extremely injurious to sweet cherries, many young orchards almost to bearing age being killed out or severely damaged. Following a period of unseasonably warm weather in early December, on December 12 the temperature dropped to $-18^\circ$ F. Minimum temperatures for other stations in the fruit districts of northern Utah are given in Table 5.

<table>
<thead>
<tr>
<th>Weather Station</th>
<th>Minimum Temperatures</th>
<th>Date (Dec., 1932)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brigham City</td>
<td>-20</td>
<td>13</td>
</tr>
<tr>
<td>Elberta</td>
<td>-21</td>
<td>13</td>
</tr>
<tr>
<td>Farmington</td>
<td>-16</td>
<td>12</td>
</tr>
<tr>
<td>Ogden</td>
<td>-20</td>
<td>12</td>
</tr>
<tr>
<td>Provo</td>
<td>-24</td>
<td>13</td>
</tr>
<tr>
<td>Salt Lake City</td>
<td>-8</td>
<td>12</td>
</tr>
<tr>
<td>Salt Lake Airport</td>
<td>-21</td>
<td>13</td>
</tr>
<tr>
<td>Santedaquin</td>
<td>-15</td>
<td>13</td>
</tr>
<tr>
<td>Spanish Fork</td>
<td>-12</td>
<td>13</td>
</tr>
<tr>
<td>Mean</td>
<td>-17.5 $\pm$ 1.39</td>
<td></td>
</tr>
</tbody>
</table>

1Data from CLIMATOLOGICAL DATA: Utah Section; U. S. Dept. of Agr., Weather Bureau, 34:12-48.

Injury varied from outright killing to the ground to black-hearting, with reduced vigor as the outward result. Napoleon and Tartarian varieties were most severely damaged, with Lambert and Windsor showing the least damage, and with Bing being intermediate. In the older orchards, Napoleon, Black Tartarian, Schmidt, and Centennial appeared to suffer most, while Lambert, Windsor, and Yellow Spanish appeared to suffer the least. The relative injury to different varieties in the Station orchard is summarized in Table 6.
Table 6. Hardiness of cherry varieties as indicated by condition following test winter of 1932-33

<table>
<thead>
<tr>
<th>Variety</th>
<th>Extent and Type of Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sweet Varieties</strong></td>
<td></td>
</tr>
<tr>
<td>Abundance</td>
<td>Moderate injury to 4-year-old trees</td>
</tr>
<tr>
<td>Black Republican</td>
<td>Slight injury</td>
</tr>
<tr>
<td>Black Tartarian</td>
<td>Severe injury, trees half to entirely killed</td>
</tr>
<tr>
<td>Bing</td>
<td>Moderate black-hearting, some sunscald, reduced crop</td>
</tr>
<tr>
<td>Burbank</td>
<td>Severe injury, half of trees total loss</td>
</tr>
<tr>
<td>Centennial</td>
<td>Severe injury to old bearing trees</td>
</tr>
<tr>
<td>Chapman</td>
<td>Severely injured, 3 out of 4 trees killed outright; remaining tree half killed</td>
</tr>
<tr>
<td>Early Purple</td>
<td>Severely injured, many branches killed</td>
</tr>
<tr>
<td>Giant (California)</td>
<td>Slightly blackhearted</td>
</tr>
<tr>
<td>Lambert</td>
<td>Considerable blackhearting; reduced vigor and crop</td>
</tr>
<tr>
<td>Lyons</td>
<td>Young trees killed to ground</td>
</tr>
<tr>
<td>Napoleon</td>
<td>Severe injury to both old and young trees; branch killing, sunscald, black-hearting</td>
</tr>
<tr>
<td>Schmidt (Black Orb)</td>
<td>Severe injury to old trees</td>
</tr>
<tr>
<td>Seneca</td>
<td>Moderate black-hearting; some branch killing and black-hearting; appears to be as hardy as Lambert</td>
</tr>
<tr>
<td>Victor</td>
<td>Severe injury to young trees</td>
</tr>
<tr>
<td>Windsor</td>
<td>Slight injury in old trees; bore moderate crop; young trees moderately black-hearted</td>
</tr>
<tr>
<td>Yellow Spanish</td>
<td>Slight injury; bore moderate crop</td>
</tr>
<tr>
<td><strong>Sour and Duke Varieties</strong></td>
<td></td>
</tr>
<tr>
<td>Chase</td>
<td>No apparent injury</td>
</tr>
<tr>
<td>Dyehouse</td>
<td>No apparent injury</td>
</tr>
<tr>
<td>Early Richmond</td>
<td>No apparent injury</td>
</tr>
<tr>
<td>Late Duke</td>
<td>No injury at Farmington; considerably injured at Logan</td>
</tr>
<tr>
<td>Royal Duke</td>
<td>Moderate injury—black-heart and sunscald</td>
</tr>
<tr>
<td>Montmorency</td>
<td>No apparent injury</td>
</tr>
<tr>
<td>Reine Hortense</td>
<td>Black-hearted; reduced vigor; buds killed</td>
</tr>
<tr>
<td>Suda</td>
<td>Slightly black-hearted; reduced vigor</td>
</tr>
<tr>
<td>Wragg</td>
<td>No apparent injury</td>
</tr>
</tbody>
</table>

**COMPARATIVE VALUE OF CHERRY VARIETIES IN UTAH**

The Choice of Sweet Cherry Varieties

The effects of the test winter of 1932-33 emphasize the importance of winter injury as a major factor in Utah cherry culture and the necessity of minimizing such injury by choosing only the hardiest varieties and by confining plantings to warm benchlands with superior air drainage. Sweet cherries should no longer be planted on the lower lying, colder lands in Utah.

While none of the commercial varieties entirely escaped injury, Lambert demonstrated marked superiority over the other popular commercial varieties. For this reason, Lambert should continue to be the dominant variety for shipping purposes. Bing, while not as severely injured as Napoleon or Tartarian, has a past record of susceptibility to sunscald injury, particularly on the lower lands. For this reason, Bing plantings should be confined to the warmest locations.

No varieties have yet been fruited in the Station orchard which appear to be superior or even equal to Lambert and Bing as shipping
cherries. The fruits of Schmidt (Black Orb) and Elkhorn (Black Oxheart)\(^7\) are acceptable, but Schmidt has proved disappointingly unproductive under most conditions where tried in Utah orchards; Elkhorn (Black Oxheart) has not been widely tested and old trees of this variety at Centerville are not in the best of condition.

Napoleon, the major white canning variety, has not been as popular in recent years as it once was because of low prices paid by cannerymen; it was also badly damaged in both young and old trees in the winter of 1932-33, but because it has a long record of profitableness on account of its vigor and productivity, its continued culture is justified. In ordinary winters when buds and trees are damaged by low temperatures in January, or long-continued cold, as in 1931, Napoleon has suffered less damage than Bing or Lambert and has produced crops in the North Ogden and Brigham districts when Bing and Lambert failed.

There is no variety in sight to replace Napoleon for canning purposes. Centennial has proved to be too tender in bud and tree and smaller fruited than its parent variety, Napoleon. The fruit of Abundance appears to be too small in size. Yellow Spanish, because of its apparently greater hardiness, justifies wide trial as a substitute, but the slightly smaller size of its fruits and its greater softness and tendency to bruise in handling are disadvantages. Since there is no substitute which can be recommended at this time, it would seem wise to continue planting Napoleon for canning purposes in order to diversify production and avoid complete dependence on markets for shipping cherries. New plantings, however, should be confined to well-protected upland locations and damage to young trees should be minimized by careful management to insure proper maturity of the trees before entering the winter season. Late irrigation and cultivation should be avoided. Fall cover crops such as oats, barley, vetch, and cover crops of weeds are helpful in checking late growth and in increasing maturity. Injury to old Napoleon trees can be minimized by avoiding weakening through overproduction, and defoliation by the cherry slug, which may be easily controlled by spraying. Overproduction may be prevented by pruning\(^8\) and by cultural practices designed to increase vigor.

Black Tartarian, which was severely damaged by the test winter, has been planted recently principally as a pollinizer, although it is also desirable in a limited way in early locations as an early market cherry. Because of its susceptibility to winter injury and consequent shorter life and smaller production, it should be replaced as a pollinizer by Windsor and other varieties.

When desired for market purposes, Black Tartarian should be planted only on warm upland locations. It should continue to be of value for home-orchard purposes. Major Francis, a large black early cherry of Tartarian type which has been grown for over a score of years at Brigham, is suggested for trial with a view to its replacing Tartarian because of its apparently greater hardiness.

Because of its superior hardiness and productivity, Windsor has in many cases exceeded the more popular Bing, Lambert, and Napoleon in

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\(^7\)This variety, grown locally by R. Barber of Centerville under the name "Black Oxheart," has been tentatively identified as Elkhorn, as it appears to coincide with the description of that variety given by Hedrick (1915). Positive identification must await comparison with Elkhorn from a verified source grown under the same conditions.

\(^8\)For a fuller discussion of this problem, see Utah Station Bulletin 245.
profitableness, in spite of its smaller size and lower price. Because of its smaller size, lighter flesh, and lesser degree of firmness, Windsor is not desired as a shipping cherry. For local market and nearby truck hauls, where the trade desires a less expensive black cherry, the Windsor should continue to be profitable. It could also replace Bing to advantage as a home-orchard cherry in all but choice cherry districts.

Value of New Varieties of Sweet Cherries

Of the new varieties of sweet cherries under test which have fruited, Seneca, Elkhorn, and Deacon appear to have value. Seneca, while quite small, appears to be the best variety to precede Black Tartarian, being superior in size, earliness, and hardiness to Early Purple, which is now grown in a limited way for this purpose, and to Chapman and Burbank. Its value, however, appears limited to home use and local market on a small scale. It also has value as a pollinizer. Deacon, although it has not fruited here, is favorably reported as a Bing type cherry from Washington and British Columbia, where it is said to exceed Bing in hardiness and productivity. Because of its smaller size and lesser firmness, however, it is not likely to be valuable as a shipping cherry but appears to merit trial mainly as a pollinizer and for local market purposes.

Elkhorn (Black Oxheart), because of its large size, dark color, and firmness, and its reputed characteristic of hanging late on the tree in good condition, appears to warrant wide testing both for commercial and pollinating purposes. While grown in a protected location at Centerville for more than half a century, it is not known to have been tested elsewhere.

The trees planted and fruited as Giant, which were obtained from a California source, bore fruit of such small size as to be worthless. Trees of this variety from New York have not yet fruited.

There appears to be no place in future plantings for Black Republican, Lewelling, Early Purple, Black Spanish, Black Eagle, Centennial, and Governor Wood which are now found in Utah orchards. Reasons for discarding these varieties are lack of hardiness in the case of Centennial and small size in the other varieties.

The strain test showed no tangible differences between the various strains of the commercial varieties tested, except in the case of one strain each of Black Tartarian and Bing. The Black Tartarian from the Milton Nursery, Milton, Oregon, differed from the ordinary type of Tartarian by having a wider-spreading growth habit and in sustaining less winter injury. It has not been tested long enough to determine its value. Bing from a California nursery produced fruit markedly creased or "doubled" and less desirable than the standard type of Bing, although it appeared likely that this creasing was a rootstock or cultural effect, as creased Bings were noted on other trees.

Comparative Value of Sour Cherry Varieties

None of the other sour varieties tested for canning purposes appears equal in value to Montmorency, the standard sour cherry variety in Utah. For local market and home use, however, there appears to be a place for

*See Utah Station Bulletin 245.
Dyehouse or Early Richmond, and English Morello or Wragg, to give greater variety and to extend the marketing season. Early Richmond and Dyehouse, while inferior to Montmorency in size, precede that variety by two weeks in season. English Morello and Wragg, which are similar if not identical, extend the season by a month, and because of their dark-colored juice and high acidity make possible a superior variety of culinary cherry products. Chase, a new Morello variety, while productive, appears to be much more dwarf than Wragg and not well adapted to the soil in the test orchard. It has the additional disadvantage of being self-unfruitful and, according to Wellington, recent commercial tests in New York show it less valuable than English Morello. Suda, another Morello, appeared to be less vigorous and hardy than Wragg and hence less valuable than that variety, which it closely resembles.

The strain test of Montmorency has so far yielded no marked differences in the various strains under test. Montmorency Sweet, however, so closely resembles Early Richmond and Dyehouse as to be indistinguishable from them. While this variety is sweeter than Montmorency at the time the latter is ripe, it is no more so than Dyehouse and Early Richmond; like those varieties, the fruit is much smaller than that of Montmorency.

Value of the Duke Varieties

In regard to the Duke cherries, Royal Duke, locally called May Duke, is the only one which appears to have commercial possibilities. Because of its large size and superior quality, the fruit of Royal Duke is preferred to that of Montmorency by discriminating consumers. Its earliness is another advantage, especially in early locations where it could be marketed before Montmorency is offered on the market. The trees are not as hardy, long-lived, and reliably productive as Montmorency, however; hence, a higher price for the fruit is needed to make it equally profitable. For home use, however, the variety is excellent. Reine Hortense, Late Duke, Knudson, and Sixteen-To-One do not appear to have commercial possibilities because of shy bearing, lack of hardiness, and ripening over a long season; they are useful, however, to add variety to the home-orchard planting.

In preparing the following descriptions and evaluations of varieties, both observations of behavior in the Station plantings and in commercial orchards of Utah have been taken into consideration. In the case of the newer varieties, it should be understood that the opinions set forth are in the nature of a progress report, subject to change as the varieties become older and additional data and observations are made. Several of the varieties which have not fruited, or have not fruited enough for a thorough test, are noted briefly for completeness. Technical descriptions of trees and fruit are given as far as possible as a record of how the variety appears in Utah under the conditions of the test orchard or in commercial orchards.
DISCUSSION AND DESCRIPTIONS OF SWEET CHERRY VARIETIES

Abundance

Abundance is a new variety under test in the Station orchard, having fruited but two years. The fruit is of the Napoleon type, light-fleshed, firm, and blushed. The fruit ripens late. Unfortunately, the fruit as it has grown in the test orchard is only small to medium in size, too small for the variety to have value in Utah. In 1933, the fruit was extremely small, partly due to winter injury. The fruit was larger in 1934.

Fig. 1—Abundance: A new late cherry of the Napoleon type originated by Luther Burbank. The fruit appears too small in Utah for the variety to have value, although the trees are hardy, vigorous, and productive.
but still much smaller than Napoleon. The trees appear to be vigorous, productive, and fairly hardy. The stones are undesirably large.

According to Hedrick (1915), Abundance is a seedling of Napoleon originating with Luther Burbank. The trees in the test were received from the New York Fruit Testing Association in 1929.

Tree vigorous, upright, hardy in wood and bud; productive; bark reddish-brown, smooth on upper surfaces, roughened and gray on under surfaces; lenticels numerous, large, conspicuous; leaves oblong, ovate or obovate, folded, crenulate, coarsely and irregularly serrate, rounded at base, pointed at apex.

Fruit late, ripe July 10 to 15, small, ± to ± inch in diameter; ovate, compressed; cavity abrupt, suture a distinct line; apex rounded with russet dot; color amber, with mottled red blush; dots small, russet, numerous; stem short, ± to 1 inch in length; skin thin, tough, separates readily from flesh; flesh amber yellow, with light-colored juice, firm, meaty, moderately juicy, veinous; quality fair to good; stone clinging, small (± by ± by ± inch), smooth, oval, compressed, but plumper than most.

**Bing**

From the standpoint of fruit characters, Bing is almost the ideal for a commercial shipping cherry. The fruit is extremely large, round, firm, glossy purplish-black in color when ripe and has excellent quality, both for eating out of hand and as a home-canned fruit. It ripens early and its size and quality command a substantial premium over all varieties, except Lambert and Schmidt (Black Orb), on the markets and make it a prime favorite with shippers. Unfortunately, the trees are somewhat tender to cold and only moderately vigorous, productive, and healthy. While preferred by some Utah growers, especially those with warm protected upland sites where this variety has been most successful, it has been outranked in the newer plantings by Lambert, which has a harder tree. The fruit, however, is superior to Lambert in color and in adherence of stem. Bing should continue to be one of the major shipping and local market cherries until replaced by a harder and more vigorous variety with equally good fruit. Its culture, however, should be confined to the warmer upland sites.

Bing was grown from seed of Black Republican by Seth Lewelling of Milwaukee, Oregon, in 1875, and was named after a Chinese workman. It is a leading shipping variety in California and other Pacific Coast states. Short Stem Bing is an excellent strain of Bing occurring in the orchard of Enoch Randall of North Ogden. Careful comparison of fruit of this strain in 1933 showed no consistent differences between Short Stem Bing and other Bings.

Tree large, vigorous, moderately hardy in wood and bud, productive, spreading, crotches usually wide-angled, strong; bark reddish-brown, smooth with grey scarfskin; lenticels scattering, large, conspicuous; leaves oblong oval, sometimes ovate or obovate, coarsely crenate, dark green.

Fruit early mid-season; large to very large, ± to 1½ inches in diameter; round or oblate-cordate, compressed, somewhat irregular; cavity deep, regular, medium width; suture a line; apex rounded, with large russet depressed dot in center; color dark red to reddish or purplish
black; dots small, numerous, russet, obscure; stem long, slender, 1 to $1\frac{1}{2}$ inches long, adhering well to fruit; skin moderately thick, tough, adhering to the flesh; flesh red, firm, meaty, sweet, rich; juice dark, scant; quality very good; stone semi-cling to almost free, large ($\frac{7}{16}$ inch long, $\frac{1}{4}$ inch wide, and $\frac{3}{4}$ inch thick), oval, blunt, smooth.

Fig. 2—Bing: Next to Lambert, Bing is the leading shipping cherry, being preferred because of its large, firm, handsome fruits of excellent dessert quality. While productive, the trees are somewhat lacking in hardiness of buds and wood.
Black Heart and Black Eagle

These two old cherry varieties, of Tartarian type and season, are now seldom found in Utah cherry orchards. Black Heart was reported from Boxelder, Salt Lake, and Utah Counties in the cherry survey by Andrews in 1927. The late W. O. Knudson of Brigham City, who had a fine old Black Heart tree, considered Black Heart and Black Eagle, as grown in Utah, to be identical, the variety being locally known by the name Black Heart. Hedrick (1915), however, lists them as separate varieties. Knudson's original tree was bought as Black Eagle in Omaha and brought over the pioneer trail by wagon in 1862. The original tree was removed in 1925. The fruit is small, soft, glossy black, and about the same season as Tartarian, or a few days later. There is no place for these two old varieties in Utah pomology, as Black Tartarian and Major Francis ripen in this season and are larger fruited.

Fig. 3—Black Eagle: An old soft early variety of Tartarian type which is passing from cultivation. In Utah this variety is confused with Black Heart.
Black Republican, Lewelling

Found in quite a few of the older Utah orchards, the Black Republican and Lewelling are no longer planted, and growers find it difficult to dispose of these cherries profitably because of the small size of the fruit. The fruit is late in ripening and is usually sweet and rich in quality, although often its flavor is bitter. The trees are generally vigorous and productive, and where soil and moisture conditions are favorable they reach large size.

Fig. 4—Black Republican: Formerly widely planted for pollination purposes, the small size and inferior quality of this variety make it undesirable for planting in Utah.
Lewelling, as grown in a number of Utah orchards, is similar to the typical Black Republican in most characteristics but is distinct from it in shape of fruit, being more ovate or tapering than Republican, which, as grown in Utah, is blunter, shorter, and less tapering. There is no question but that the two varieties grown in Utah under these names are distinct, although possibly they should be considered as strains of Black Republican, in spite of their differences being as distinctive as those between some varieties. The differences in shape may be readily seen by comparing Figures 4 and 5. Schuster (1925) noted the existence of different strains within the Black Republican variety. The origin of the type grown in Utah as Lewelling is not known. It is of interest in this

Fig. 5—Lewelling: A variety closely resembling Black Republican which differs mainly in shape of fruits. It has no value for Utah planting.
connection that the late W. O. Knudson of Brigham City, Utah, had a Lewelling tree direct from the originator, Seth Lewelling of Milwaukee, Oregon, which produced fruit of the typical Black Republican type. Hedrick (1915) states that "the consensus of opinion is that both names apply to a single cherry," basing this conclusion on the literature.

Black Republican is thought to have resulted from a cross between Napoleon and Black Tartarian. Black Republican is one of the parents of Bing, which was also originated by Seth Lewelling.

Tree vigorous, upright-spreading, productive, fairly hardy, bark reddish-brown, smooth; lenticels large, scattering, conspicuous, wide; leaves ovate, rather broad, tapering to a point, bluntly serrate.

Fruit small to medium size (3/4 x 1/4 inch), late in season; shape roundish-cordate, short, blunt; firm in texture, color purplish-black, flesh purple when matured, breaking, meaty, rich, sweet, with a characteristic flavor; often bitter, quality generally good. Lewelling: Similar to Republican, except that it appears to be slightly earlier, smaller, more conic; the suture is more ridged and the apex, which is bluntly pointed, ends in a slightly depressed dot. The stones are similar, being semi-clingstone, small, and smooth.

Fig. 6—Black Spanish: A small-fruited, firm-fleshed cherry occasionally found in Utah orchards. The variety resembles that called Lewelling in Utah and is worthless for planting.
Black Spanish

Black Spanish, as grown by the late J. C. Knudson of Brigham City, does not appear to be the same variety as that described by Hedrick (1915), being small, ovate, with a large stone and deep cavity. This variety resembles that grown as Lewelling and may be identical with it, differences being due to environment. The trees were smaller than those of Tartarian in the same orchard and appeared to lack vigor. The variety does not appear to have value in Utah.

Tree small for a sweet cherry, upright, fairly hardy, bark mostly covered with grey, lenticels numerous, large, prominent, pointed at ends; leaves broadly ovate or obovate, base acute, coarsely serrate; glands prominent, brown, ovate or reniform.

Fruit small (1/4 inch), late season, ovate, cavity deep, abrupt; slightly lipped and ridged along suture; stem moderately long, slender, skin dull, dots small, numerous, large, roughening skin at base; medium size russet dot at apex; color deep purple, almost black; skin medium, tough; flesh deep purple, clinging, meaty, firm, clinging to stone, rich, sweet, mild flavor; stone large, long, ovate, bluntly pointed.

Black Tartarian

Black Tartarian is the favorite early cherry of the United States. In eastern states, Tartarian is a popular dooryard tree; it is also important commercially. In California it is an important early shipping variety. In Utah it is found mostly in the older plantings but has been planted to a limited extent in recent years as a pollinizer for the commercial varieties. In early locations, fruit of this variety brings satisfactory prices for early sales on the nearby city markets; later fruit, however, is shipped or sold to truckers at a substantial discount under the price paid for Bing and Lambert. In seasons of low prices, the fruit is often unharvested. This lack of demand for Black Tartarian is caused by its softness and unsuitability for home-canning. Because of smaller size and less attractive appearance, the demand for Tartarians for eating out of hand largely disappears when the more popular Bings appear on the markets. For these reasons, the Black Tartarian has been profitable only in the warmer, earlier locations.

Tartarian trees, while vigorous, productive, and long-lived under favorable conditions, appear to lack somewhat in hardiness of wood and bud in all but the most favorable cherry locations in Utah and to suffer more from winter-killing of buds and sunscald injury to the trunks than do several other varieties with which it must compete. The test winter of 1932-33 was especially injurious to Tartarians, many trees over twenty years of age as well as young trees being killed outright. The Black Tartarian may be easily distinguished in the orchard by its upright, much-branched habit of growth. The fruit is easily recognized by its earliness, softness, heart-shape, and its glossy, purplish-black color.

Because of these disadvantages of limited demand and lack of hardiness, Tartarian is not considered as valuable as Windsor for general use as a pollinizer for the commercial varieties. In early, warm locations, however, it should continue to be profitable for early market purposes and for pollination. In the warmer valleys it should also continue to be
a favorite dooryard and home-orchard variety, where it competes with the strawberry for the honor of being the first fruit of the season.

That Black Tartarians are not all alike and that there are a number of distinct strains within the variety have been noted by Philp (1925), Schuster (1925), Crane (1927), Kinman (1930), and other workers. In

Fig. 7—Black Tartarian: This strain is the most commonly grown strain in Utah and to distinguish it from other types has been called the “Normal Strain.” While widely used in recent years for pollination, it appears to be less valuable than Windsor and several other varieties for this purpose. It is still desirable in warm early locations for a local market and home dessert cherry.
studies of strains of this variety in Utah orchards made in connection with pollination studies,\textsuperscript{10} at least five different and apparently distinct strains of types of Black Tartarians were found. To distinguish the dominant type, which is grown practically to the exclusion of all others in Utah orchards, this type is referred to as the "Normal Strain." This strain corresponds closely with the description given for the variety in Hedrick's "Cherries of New York" and is thought to be the original strain or type of the variety. While the origin of the others is largely unknown, it is believed that they originated either as seedlings, unwittingly propagated because of their close resemblance to the parent variety, or as sports, a number of which have been reported by Drain (1933) and by the writer. The characters of the Normal Strain Tartarian will be given in detail, followed by the differences observed in the other types.

According to Hedrick (1915), Black Tartarian was first introduced into England from Circassia, Russia, under the name of Ronald's Large Black Heart. It was first introduced into North America by William Prince, of Flushing, Long Island, early in the nineteenth century. It soon became popular and is today perhaps the most widely disseminated cherry variety in the world.

Tree vigorous, fairly large, characteristically upright while young, later becoming spreading; much branched and densely headed, crotches usually narrow and crowded, weak; fairly hardy, although severely injured by the early freeze of 1932-33; moderately productive, buds fairly hardy; bark reddish-brown, smooth, lenticels large, fairly numerous, conspicuous, raised, sharply pointed at ends, wide; leaves large, long, lanceolate to narrowly oblong-ovate, often crenulate and folded, margins coarsely serrate; petioles long, glands 2-4, usually on petiole below attachment to leaf.

Fruit ripens early (from June 10 to 20), but hangs in good condition for some time, medium size to above medium, usually about \( \frac{3}{4} \) inch in diameter, but occasionally up to 1 inch; long-cordate, compressed, ventral surface flattened, ribbed, irregular; cavity medium depth and width, flaring; suture a line, indistinct; apex pointed with depressed russet dot; color purplish-black; dots numerous, small, indistinct; stem slender, 1\% inches long, adherent to fruit; skin thin, separating readily from the flesh; flesh red to purplish-red, with abundant dark-colored juice, rather soft, crisp, meaty, highly flavored, sweet and rich when fully ripe; quality excellent; stone free, ovate, smooth, slightly oblique, \( \frac{3}{4} \) inch long, slightly compressed.

Other Tartarian Strains or Types\textsuperscript{11}

Late Tartarian (No. 18).—This strain, which was found only in an old orchard on the property of the Woods Cross Canning Company at Clearfield, resembled the Normal Strain closely, except that the fruit was ten days to two weeks later in ripening, was larger and more scattering, and the trees more upright and comparatively unproductive. There were four separate trees of the strain, proving it to be a budded variety. The source of the trees is not known. A number of Normal Strain Tartarian trees, growing alternately in the same row, made possible a close comparison of the two strains under the same conditions. The heavy loads of fruit borne by the Normal Strain trees formed a marked contrast with


\textsuperscript{11}Illustrations of the other Tartarian strains described may be found on pages 36-41 of Utah Station Bulletin 245.
the scattered crop of the Late Strain. The fruits of the latter were also noticeably more ridged and had a slightly protruding or "hooked" apex. The stones were longer and more pointed than those of the Normal Strain. Because of unproductiveness, greater competition with Bing and Lambert in the markets, with its later season, this strain appears to have no value.

**Duncan Strain.**—This strain, which has larger, firmer, and more oblate fruits as well as a more spreading growth habit, was called to the writer's attention by Messrs. C. H. Smith and George Earle of Centerville. Three trees of this variety about 25 years of age were growing in the orchard of Walter Duncan of Centerville. Young bearing trees of the Normal Strain Tartarian were growing close by in the same orchard. The fruits of the Duncan Strain are distinguished by their larger size and larger, rougher stones. The trees have not been productive in this location, the buds appearing to be more tender to cold and the blossoms to spring frost than those of the Normal Strain. Following the cold winter of 1932-33, one of the trees which was badly sunscalded on the south side and black-hearted bore a heavy crop of fruit which failed to reach marketable size; two other trees in the north row were in good condition and bore a limited quantity of good fruit. While this strain was propagated and distributed in a limited way by C. H. Smith it is not now being propagated; it does not appear to have value.

**Milton.**—This strain of cherry is distinguished from the Normal Strain by its radically different growth habit, the young trees being low-headed and spreading like a Bing tree, instead of being narrow and upright like the other Tartarian trees in the variety test orchard of the Station at Farmington, all of which, with one exception, appear to be of the Normal Strain in spite of coming from divergent sources. The Milton Strain was secured from the Milton Nurseries of Milton, Oregon. This strain was damaged little by the severe winter of 1932-33, which killed outright or severely damaged practically all the Normal Strain trees in the same block of orchard, indicating superior hardiness. The fruit is similar to, and equal in every way, to the Normal Strain Tartarian. Because of its indicated greater hardiness and superior tree characters, this strain appears to be worthy of trial in a limited way to determine if it should replace the common strain Tartarian. It has not been given special trial to determine its pollinizing value.

**Burbank**

An extra early variety of the Early Purple type, Burbank, like its parent, Early Purple, and Chapman, which it resembles closely, does not appear to be vigorous, hardy and productive in the Station orchard. Although said to be earlier than Early Purple, heretofore the standard but not popular extra early cherry in Utah, it appears to ripen at about the same time or a few days later. The trees suffered considerably from the severe weather in December, 1932. The fruit lacks a week of being as early as Seneca and appears to be inferior to it in size and quality under the conditions of the test orchard. Burbank is not considered promising either for further testing or for use in Utah.

According to Wickson (1912), this variety was originated by Luther Burbank and sold in 1903 to a group of growers at Vacaville, California. No technical description of the variety was made.
Centennial

Centennial is a firm white-fleshed cherry of the Napoleon type originating in California from that variety. It has been given a rather wide trial in Utah orchards, and nowhere is it considered a commercial success, except perhaps in a limited way for local market. It may, how-

Fig. 8—Centennial: Although a beautiful and delicious cherry at its best, Centennial does not appear to be sufficiently hardy, long-lived, and productive for general cultivation in Utah, although it may be worth growing for home use and local market in warm locations where a sweeter white canning cherry than Napoleon is desired. It has some pollinizing value.
ever, have a place as a home-orchard fruit in warmer localities because of the sweetness and high quality of its fruits, which exceed its parent Napoleon in sweetness and crispness. To offset these advantages, however, the fruit is somewhat smaller, and is less attractively shaped and colored, being more mottled than the Napoleon. The main faults which bar it, however, lie in the tree, which appears to be tenderer to cold in wood and bud and consequently shorter-lived and less productive. The variety also appears to be preferred as food by grasshoppers. The fruit has been canned commercially with Napoleons, but is not as well liked by canners. The tree has some value as a pollinator, but has not proved as valuable in experiments as Windsor for this purpose.

Centennial, according to Hedrick (1915), is a seedling of Napoleon grown by Henry Chapman, of Napa, California. It was introduced by Leonard Coates of that city in 1885. It was introduced into Utah by David M. Moore, of Ogden, who secured his stock direct from the introducer.

Tree medium to large, open-topped, spreading, vigorous while young, becoming weaker with age, crotches wide-angled; bark dark reddish-brown, smooth; lenticels large, relatively few, wide; leaves large, oblong-ovate, coarsely serrate, moderately vigorous and productive; somewhat tender and subject to winter injury; has been shorter-lived in Utah than Lambert and Windsor.

Fruit medium to large (1 x 7/8 inch); shape roundish-oblate-cordate; color amber-yellow, mottled and washed with carmine; stem short to medium (1 to 1 ¼ inch), moderately thick; cavity flaring; suture distinct; apex sunken; skin waxy, moderately thick and tough; flesh amber, firm, meaty, breaking, juicy, extremely sweet when well-ripened; stone medium size, clings to flesh, smooth, roundish-oval, compressed.

**Chapman**

Chapman is an extra early cherry of the Early Purple type, grown to some extent in early districts of California where it is said to be the earliest variety shipped which brings high prices. In the Station orchard, the trees have been neither vigorous nor productive and have lacked hardiness, the severe winter of 1932-33 killing three out of four trees and seriously injuring the fourth. The fruit ripens at approximately the same time as Early Purple and is too small to be of much value. Because Seneca appears to be earlier and better in tree and fruit characters than Chapman, the latter is not considered promising or worthy of further trial in Utah.

According to Hedrick (1915), Chapman originated with W. H. Chapman of Napa, California, supposedly from a seed of Black Tartarian, and is said to be larger than that variety, although this does not appear to be true in Utah.

**Craighead Early**

A local early variety originated by William Craighead, of Brigham City, the originator of the Poorman gooseberry. It is found only in that locality. The fruit ripens a week before Black Tartarian and is very firm, but the trees are unproductive. This variety has no value and is described here only to complete the record of Utah cherries. It might have some value in breeding firm-fleshed, early cherries.
Trees are medium-sized, leaves long, lanceolate, curled, resemble Early Purple. Noted only in the orchard of J. C. Knudson at Brigham City.

Fruit above medium in size (\(\frac{4}{8}\) x \(\frac{3}{4}\)\)); round, compressed, nearly flat on ventral side; halves unequal; cavity broad, shallow; stem short to long; color dark red to black; dots numerous, often lines, submerged; skin smooth, waxy, glossy, thick, moderately tough; flesh deep red, meaty, fairly firm, veinous, softer about pit, juicy, subacid, flavor mild; quality fair to good; pit semi-free, round oval, blunt, compressed, medium-sized.

**Deacon**

Deacon is a moderately large and moderately firm black cherry which has been grown in a limited way in eastern Washington for many years and has recently come into prominence as a pollinizer for Bing, Lambert, and Napoleon because of greater value of its fruit than the Black Republican or Tartarian formerly used for this purpose. Experimental tests in Washington and British Columbia have proved its value as a pollinizer. While this variety is not known to have been fruitied in Utah, at least under this name, reports of the variety from the Northwest and inspection of a sample of the fruit make it appear promising as a pollinizer, but not sufficiently large or firm to be of value as a shipping cherry. It is said also to be hardier than Bing and Lambert. Because of its promise as a pollinizer, the opinions of authorities in other states who are familiar with the variety are summarized here:

Fig. 9—**Deacon**: A new variety from Washington which is being used in recent years in that section as a pollinizer. It should be given a trial in Utah for this purpose, as it may be more valuable for its fruit than varieties now used. It is not promising as a main crop commercial variety as the fruit is inferior in size and firmness to Bing and Lambert. This sample was sent to the writer by the Columbia and Okanagan Nursery of Wenatchee, Washington.
Palmer (1929) reported the Deacon to be an excellent pollinizer for Bing and Lambert and to be superior in market value to Black Tartarian and Black Republican. Britton (1930, 1931), continuing this work, reports Deacon also satisfactory for Napoleon.

Palmer describes Deacon as follows: "In every case the owner speaks very highly of the qualities of this particular cherry. The trees produce heavy crops and are ready to harvest just after Bing and before Lambert. The fruit resembles both of the varieties mentioned and may be marketed as Lambert. It is more sprightly in flavor than Bing and when once tried for canning is apparently the choice of all. The fruits are usually smaller than Bing, due to the very heavy set. The limited tests made so far on its shipping qualities indicate that it has given complete satisfaction to the trade."

According to Bregger (1931), Deacon is smaller than Bing, except where trees are not loaded, and it is slightly earlier in season. "Shape is broadly ovate. Fruit is broadly heart-shaped, slightly angular, with a deep cavity and a roundish or slightly depressed apex. Its typical color when ripe is a very dark red, almost black, with dots quite small and inconspicuous. The stem of Deacon Cherry is slightly more slender and longer than that of Bing. The flesh is less firm and less coarse than the Bing and is of a dark red color with red juice, in contrast to the Bing which has darker and more purplish juice. In flavor, the Deacon is slightly more acid than the Bing, but is sprightly sweet and of exceptionally good quality. The pit of the Deacon Cherry is semi-free and of an ovate shape, slightly larger and more elongate than that of the Bing. The leaves are distinctly different so the varieties can be distinguished in the nursery. The oldest trees having reached an age of twenty-five years, Bregger assumes that the variety has no undesirable tree characters.

Deacon, according to Bregger, was originated by a Mr. Murray, a nurseryman and fruit breeder of Olympia, Washington. It was introduced in a small way one year by J. P. Littooy of Wenatchee, Washington, at the suggestion of Professor Van Holderbecke, former Washington State Commissioner of Horticulture. It was reintroduced in 1905 by Stark Brothers Nurseries, of Louisiana, Missouri, under the name of Black Tartarian Improved, with Deacon and Mezel as synonyms. They report that Deacon was formerly grown locally in Missouri. In view of the distinct origins given for Deacon and Mezel it is doubtful if they are the same.

The description given below was made from a sample of Deacon fruit sent the writer from Washington in 1933 through the courtesy of the Columbia and Okanagan Nursery of Wenatchee (Fig. 9). A sample of Bing was enclosed for the comparisons noted. No tree description is available.

Fruit moderately large (\(\frac{7}{8}\times\frac{3}{8}\) inch), roundish to oblate cordate, sides compressed, cavity narrow, irregularly rounded, abrupt; suture indistinct somewhat darker line, apex rounded with medium-sized russet round or elliptical dot set flush with surface; dots numerous, large, prominent, more numerous and larger at apex, depressed, giving a roughened appearance to skin; stem rather thick, \(\frac{1}{3}\) to \(\frac{1}{2}\) inches long; color deep reddish-purple to almost black when well-matured, resembles Bing; skin moderately thick and tough, peels readily from flesh; flesh translucent with a dark red tinge, veinous, meaty, juicy, moderately tender, sweet, rich, quality good. Firm enough for shipping; stone semi-cling, medium to large, tan-colored, stained with red, round ovate; smooth, ventral suture prominently bulged.

Compared to Bing, which it somewhat resembles, it is slightly smaller, less firm, although not soft, more cordate and less round in shape; stem is half an inch longer and thicker, being 2 inches long compared to 1 1/2 inches for Bing; flesh is more tender, lighter colored, and
not as breaking as Bing. Stones are smaller, not as long and not as yellow in color or as much stained as Bing.

Early Purple

Quite frequently found in Utah cherry orchards where it is known by growers as Early Black, Early Purple opens the cherry season in Utah. At their best, the fruits resemble Tartarians, being slightly smaller in size; usually, however, the trees have been weakened by winter injury or from lack of care and the fruits are quite small. The birds are especially fond of these early ripening cherries, and isolated trees are kept stripped of fruit as or before it ripens. Supplies find their way to market in small quantities, where they are not popular because of their small size and soft flesh. In the Station orchard, the trees have been fairly vigorous and of upright habit; they were damaged severely, however, by the test winter of 1932-33. The few fruits borne have been mostly taken by the birds. The variety appears also to be inferior to Seneca in size, quality, and earliness, being a week or more later; hence, it should probably be replaced by that variety where an extra early variety is desired.

Early Purple is an old variety, being mentioned, according to Hedrick (1915), by Ray in 1688, its previous history being unknown. Elliot (1854) states that it was introduced into the eastern United States from England and into the central-western states from Germany under the name "German May Duke." In Utah, it was mentioned by Richman (1892) as being grown in the test orchard at Logan. It was reported by Knudson (1915) as being grown by him at Brigham City. According to Andrews (1927), 2.6 per cent of the bearing trees surveyed in Utah were of that variety, included in the returns as Early Black.

Early Rivers

A new variety of the Black Tartarian type, Early Rivers is said by Howe (1932) to exceed that variety in earliness and firmness, ripening a week to 10 days earlier than Tartarian, just after Seneca. The tree is said to be healthy, hardy, and productive. It has not been tested under Utah conditions, but is included here as a variety which appears to be worth testing. Early Rivers originated in England, where it is a popular early variety.

Elkhorn (Black Oxheart)

The variety described here and in Bulletin 245 of this Station as Elkhorn, has been grown by R. Barber of Centerville, Utah, under the name of Black Oxheart, being obtained as such about 1888 from the Geneva Nursery, Geneva, New York. Since Black Heart is a synonym for Elkhorn and the variety closely follows the description given by Hedrick (1915), it has been tentatively identified as Elkhorn, although the local performance of the variety as given by Mr. Barber makes it appear more promising than would be inferred from the statements of Hedrick, who says the variety is not worth planting. Positive identification, however, must await comparison locally with fruit borne by trees introduced from verified sources.

As grown in the orchard of Mr. Barber (the variety has not been fruited in the Station orchard), the fruits are the equal of Bing or Lam-
bert as a commercial cherry, being extremely large, dark purple, firm, meaty, purple-fleshed, and of equally good quality, being sweet and of good flavor. In 1934, the fruit was large and ripened with Schmidt (Black Orb) or a few days before Bing. According to Mr. Barber, in average seasons the fruits hang in good condition on the trees ten days longer than that of Lambert, although this was not the case in 1933 and 1934. In these years the crops were light on the old trees probably the result of winter injury in 1932-33 since the bloom was scattering in the spring of 1933. On young trees, however, the fruit was well-clustered and of grand size, and the best fruit packed eleven across a

Fig. 10—Elkhorn: Grown for many years by R. Barber of Centerville under the name Black Oxheart, this large, firm-fruited black cherry appears to be worthy of testing in a limited way by growers as a pollinizer. The fruits are the equal of Bing and Lambert in size, firmness, and quality.
case. The fruit, while resembling Bing in shape, is duller and has more prominent dots, which are often sunken about the apex.

The old trees are quite large, several measuring 30 feet across the tops and over 2 feet through the trunks, even though the orchard was closely planted, crowded, and irrigated with only one furrow on each side of the tree row. The older trees, however, were only in fair condition, having some dead and many weak branches, apparently from winter injury and canker.

According to Hedrick (1915), Elkhorn is supposed to have been raised by John Tradescant, gardener to Charles I of England, under the name Tradescant's Black Heart. It was first mentioned in America by William Prince (1832), who states that it was first propagated by his father from a tree growing in a hotel garden in Maryland, where it was called Elkhorn by the proprietor. Prince said that it was one of the largest black cherries he had ever seen, and quite solid. Wickson (1912) says: "It is large, heart-shaped; deep, glossy black; very solid and firm; dark purple, moderately juicy." Thomas (1897) says the flesh is "solid, firm, not juicy, with a high, fine flavor, bitter before fully ripe." Hedrick (1915), while praising the variety for its large size, firm flesh, late ripening, rich flavor, and for hanging on the tree long after maturity, says it has served its day and fails in competition with other firm-fleshed varieties because (1) it bears fruit of variable size which diminishes as the trees get older and (2) in being only moderately productive.

As the only planting which is now fruiting in Utah is located in a protected location, it should be widely tested for hardiness and productivity under Utah conditions elsewhere before it can be recommended here. Its fruit characters are good enough, however, to make it worth trying in a limited way, particularly as a pollinizer, as the fruit exceeds in value any other variety tested or observed, except perhaps Schmidt (Black Orb), which has proved unproductive and somewhat lacking in quality. Where it is used as a pollinizer, alternate pollinating trees should be Windsor, since Elkhorn has not been thoroughly tested as a pollinizer for Lambert and Napoleon, although it gave a good set on Bing.

The variety grows in Mr. Barber's orchard as follows:

Tree large, spreading, open-topped; vigorous while young; productive, moderately hardy; wide-angled crotches; bark brown, mostly covered with grey scarfskin; roughened; lenticels numerous, large, conspicuous; leaves large, ovate, coarsely serrate; glands often large, reniform, dark-colored.

Fruit large (1 to 1½ inches) roundish oval to slightly obtuse, shouldered, compressed, cavity large, deep, wide, flaring; obscurely ribbed, often swelled along suture; suture a thin line ending in a large russet dot; apex slightly depressed. Dots small, numerous, larger and more conspicuous at base, sometimes giving a pitted appearance. Stem long, medium thickness. Skin medium, tough; flesh very firm, meaty, crisp; flavor sweet, mild, rich; quality very good. Stone large, oblong, ovate, bluntly pointed. Ventral suture broad, short groove in center. Color straw, surface somewhat rough.

**Emperor Francis**

A new variety of the Napoleon type, Emperor Francis exceeds that standard canning variety in size, color, and quality of fruit, according to Howe (1933), who rates it as a better variety than Napoleon in New
York. It is slightly earlier than Napoleon and darker in color. The tree is said to be hardy and productive. Emperor Francis, as the name implies, probably originated in Austria. The variety is not known to have been fruited in Utah, but appears well worth testing. It is intersterile with Bing, Lambert and Napoleon and should not be used as a pollinizer for those varieties.

Giant (California Type)

This variety, which was originated by Luther Burbank in 1900 and introduced in 1914, reputed to be a large black shipping cherry, has proved to be too small as it grows in the Station orchard to be of value in Utah. It is possible, however, that the variety tested may not be the true Giant reported favorably by Howe (1930) in New York, as Britton (1930) in British Columbia reported fruiting three separate varieties under the name Giant. One of these, which was large, resembled Bing and was thought to be a strain of that variety, as it failed to pollinize Bing, Lambert, and Napoleon. The other two were not promising, one being small and the other soft. In New York, the variety is commended for its large, vigorous, productive trees, and fruit of splendid quality which is large and attractively colored. The trees which have borne fruit in the test orchard are from a California source and may not be the same as that grown in New York. According to Philp (1930), there are two types of the variety propagated in California, one of which resembled Bing and the other Lambert. He states that Giant is considered by some growers to be superior to Lambert. As the variety is said to be confused with these two by California nurserymen,12 these two types may be those varieties instead of Giant. The Giant grown in the test orchard appears to be a distinct variety, differing in being more oblate and compressed than either Bing or Lambert. The trees appear to be hardy, standing the extreme winter of 1932-33 as well as Lambert. They lack vigor, which may be due to the Mazzard stock as trees of all varieties tested on this stock are smaller than those on Mahaleb in the test orchard. The fruit, however, fails to reach the large size claimed for this variety. This particular type of Giant does not appear to be promising enough for further testing by growers, although the New York type which has been planted but not yet fruited in the Station orchard may be better.

Tree small and appears to lack vigor and healthiness under conditions in test orchard, although this may be due to Mazzard stocks and winter injury; upright growing like Lambert; bark brown, nearly covered with grey scarfskin, lenticels scattering, oval, rather numerous; crotches tend to be narrow and weak; leaves oblong ovate, pointed, coarsely serrate.

Fruit ripens with Lambert late midseason, medium size, 7/8 inch in diameter; round to oblate, compressed; cavity deep and flaring; suture a line, indistinct; apex round, depressed dot at point; color reddish-black; dots numerous, small, russet, obscure; stem slender, 1¼ inches long, adherent to the flesh; skin moderately thick, tough, adhering to the pulp; juice scant, dark; flesh red, firm, meaty, sweet, rich, pleasantly flavored, good quality; stone semi-clinging, medium size, round, oblique, somewhat flattened, blunt, smooth.

12 Richard Wellington in correspondence with writer (1930), quotes F. W. Anderson, formerly connected with bud selection work in California, as stating that California nurserymen had propagated Bings as Giants.
The following description was made from a sample of the New York type Giant sent the writer by G. H. Howe of the New York Agricultural Experiment Station at Geneva, in 1930, which was said by him to be smaller than usual:

Fruit medium to large (.8 to 1 inch long x .7 to .8 inch broad x .6 to .7 inch thick). Shape roundish-cordate to oblate-cordate, markedly compressed, often depressed dorsally and ventrally. Color deep purple to almost black; very firm; cavity shallow, wide; apex with marked depression, compressed, often deeply cracked; stem long, slender, separates readily from fruit; suture, a black line, often in shallow depression; dots numerous, small, russet, submerged; flesh firm, veinous, deep purple to wine red away from pit, veined fibers lighter; stone above medium size, compressed, roundish, flanges shallow, smooth.

Fig. 11—Governor Wood: Formerly grown as an early dessert cherry, Governor Wood is too small and soft to have value in Utah. This variety is passing from cultivation.
Gold

Gold is a widely advertised new yellow-fruited variety. While it has not been fruited in the Station orchard long enough to judge its value finally, it does not appear promising as a commercial cherry in Utah because of the small size and softness of its fruits. The lack of a red blush also makes it less attractive than the fruit of Napoleon. The stone appears large for the size of the fruit. The fruit is translucent and bruises easily. The tree, however, is vigorous and appears to be hardier than average, being but little damaged by the severe winter of 1932-33.

According to the introducers, Stark Brothers Nursery of Louisiana, Missouri, the variety originated with S. J. Thomas of Richardson County, Nebraska.

Governor Wood

Governor Wood is a small, early, soft-fleshed white cherry found in some of the older cherry orchards of Utah and occasionally as dooryard trees. The fruit is sweet and delicious and ripens with Black Tartarian. Because of their small size and soft flesh, they are often not picked for market but are left for children and birds. In recent years many of the trees have been removed. This variety appears to have no value in Utah.

Governor Wood originated in 1842 with Professor J. P. Kirtland at Cleveland, Ohio. The variety was not grown in the Station orchard.

Fruit early, usually small to medium in size, % to \( \frac{3}{4} \) inch in diameter; roundish-cordate, compressed; cavity medium depth, wide, flaring; suture distinct; apex rounded; color yellow with light red blush; dots small, numerous, light russet; stem slender, 1% to 1\( \frac{3}{4} \) inches long, adherent; skin thin, tender, separating from flesh; flesh creamy white, colorless juice, tender, sweet; quality very good; stone large, 1\( \frac{3}{4} \) inch long and broad, \( \frac{3}{8} \) inch thick, clinging, round-ovate, blunt, smooth, light colored, broad and prominent ventral suture.

Lambert

Lambert (cover cut) is easily the leading cherry in Utah orchards. While it has attained this position principally because of its large, firm, red-fleshed fruits of high quality and attractive appearance, it is also esteemed because of its hardiness and productivity, although in the latter respect it is exceeded by several other varieties, notably the Napoleon. Fortunately for Utah cherry growers, it withstood the unusually severe and prematurely early cold of 1932-33 better than most commercial varieties, although some young plantings were injured so badly as to cause their removal. The tree characters are generally considered by Utah growers as being superior to Bing, the other leading black shipping cherry. However, the trees are not as vigorous and productive as those of the Napoleon, nor do the buds appear to be as hardy, although the trees stood the test winter referred to better than did those of Napoleon. The late ripening of the variety is also an advantage in Utah, which is one of the latest cherry shipping districts. The variety also blooms late, which aids in escaping frost.

As the merits of the variety are generally better known than its shortcomings, the following faults should also be noted: (1) The ease
with which it loosens from the stem when mature; (2) its mahogany red color, often mottled when ripe, which is not as attractive a color as the dark purplish-red of the Bing or the purplish-black of the Schmidt (Black Orb) at shipping maturity; (3) the tendency to crack when exposed to heavy or long-continued rains, a condition which seldom appears to affect Utah cherries, but occasionally does, as it did in the Station orchard in 1934; (4) the upright growth habit of the trees, which tend to make tall, narrow trees unless carefully trained; (5) the habit of forming long barren branches devoid of fruiting spurs except toward the ends; and (6) its failure to hang in good condition on the trees for more than a few days when shipping maturity is reached. While this seems like a long list of disadvantages, the advantages of large size, dark color, firmness, good quality, and hardiness of tree make it the best of the thoroughly tested shipping varieties, a place it appears likely to hold for some time to come.

According to Hedrick (1915), Lambert originated as a seedling under a Napoleon tree planted by Henderson Lewelling about 1848 in the orchard of J. H. Lambert of Milwaukee, Oregon. This seedling, supposed to have been a cross between Napoleon and Black Heart, was grafted to May Duke; about 1880, however, the top died, and the seedling was allowed to form a top and fruit. It was introduced in 1895. According to N. H. Barker of North Ogden, Utah, John Packham of Pleasant View introduced the first Lambert tree into Utah, growing it on what is now the Potter place about 25 to 30 years ago. He was so impressed with the variety that he had David M. Moore, nurseryman of Ogden, bud 140 trees, which were planted near the lime kiln in North Ogden. All recent writers on cherry varieties speak well of Lambert, although it is criticized in the East because it cracks badly from the rains. It has become a leading variety in all the Pacific Coast states, where most of the commercial sweet cherries are grown.

The technical description of the variety as it grows in Utah follows:

Tree medium in size, fairly hardy in tree, but average in bud hardiness; fairly vigorous, upright-spreading, crotches often narrow; open-topped; bark reddish-brown, numerous lenticels giving a grayish appearance; branches often barren of spurs on lower portions; productive; leaves moderately large, oblong-oval to obovate, finely serrate.

Fruit ripens late midseason; size large, ¾ to 1 inch or larger in diameter, roundish-cordate, compressed; cavity deep, flaring; suture a line, indistinct; apex pointed, with depressed russet dot; color mahogany red to reddish-black, sometimes mottled in shade; dots numerous, small, russet, obscure; stem long, slender, 1 to 1½ inches long, separates readily from fruit; skin thin, tough, adhering to flesh; flesh dark red, firm, meaty, rich, sweet, pleasantly flavored; juice dark, scant; quality good to very good; stone clinging, large, ovate, flat, blunt, smooth, ½ inch long by ⅛ inch broad.

**Lyons**

Lyons is a new early cherry which was received from the New York Fruit Testing Association in 1930 but which has not fruited as yet. It is considered one of the best extra early market cherries by Howe (1934) of the New York Experiment Station who states that it is large, dark red, moderately firm-fleshed, with large, productive trees. In the test orchard at Farmington, the young trees were severely injured by the
winter of 1932-33, so the hardiness of the variety under Utah conditions is in doubt.

Lyons originated as a chance seedling near Lyons, France, in 1822, where it has been grown for over a hundred years. It was only recently introduced to this country.

**Major Francis**

Major Francis is an early variety of the Black Tartarian type and season grown in the orchard of J. C. Knudson of Brigham City which

![Fig. 12—Major Francis: A variety of the Black Tartarian type, Major Francis appears to be hardier in tree and larger in fruit than that standard early variety and should be given trial in a limited way to compare with it. The fruit is quite soft but of good dessert quality. It is a tested pollinizer.](image-url)
appears to be hardier in tree and bud and more productive than Black Tartarian. In 1933 it ripened a few days before that variety but appeared even softer, so that it would not be suitable for distant hauling. The trees bore a heavy crop in 1933 while Lambert and Bing adjacent to it bore only lightly, and Napoleon was severely injured. The fruit is larger than that of Black Tartarian when not overloaded and is more pointed. The trees are more spreading than those of Tartarian. It was found to be a satisfactory pollinizer in Oregon. Because of its earliness, hardiness, size, and productivity, it appears to be worth trying as a pollinizer in early locations, or for early local market where a cherry of Tartarian type is desired.

According to Hedrick (1915), Major Francis originated at Oswego, Oregon, about 1865, and was named in honor of Major Francis of Portland. In the Northwest the fruit is said to be of good quality, sought by the birds; tree very large, vigorous, upright, productive; fruit large, heart-shaped, dark red, flesh deeply stained with red, juicy, sweet; too tender for long shipment; season early. The variety grows at Brigham City as follows:

Tree medium-sized, vigorous, hardy (hardier than Napoleon and Tartarian), round-topped, spreading, productive, dense, branches largely wide-angled; bark smooth, purplish brown; lenticels large, numerous, long, broadly lanceolate, grey with brown cork-like protruding centers; leaves oblong-ovate, partly folded, crenulate, margins serrate, petiole unusually long, glands round, variable in location and colors.

Fruit medium to large when well-grown, ¾ to ¾ inch, roundish, conic, pointed with light dot at apex; pedicel long, slender, cavity acute; no suture or sometimes a line; color deep reddish purple to black, dots numerous, submerged, inconspicuous; skin smooth, waxy, thin and tender; flesh tender, light red, veinous, juicy, melting; flavor sprightly; quality good; stone above medium, freestone, ¾ x ¾ inch, ovate, smooth, light tan color.

Napoleon (Royal Ann)

Formerly the most popular cherry in Utah and still the leading cherry for commercial canning, Napoleon in recent years has not been popular with planters because of low prices. Its importance was further reduced by the greater damage it suffered from winter injury in December, 1932, although up to that time in the seven years during which the writer has observed the variety in Utah, it has appeared to be hardier in wood and bud than the black cherries, Bing and Lambert, which are replacing it in the growers' esteem. In 1930, Napoleon produced a crop in the territory north of Ogden when Bing and Lambert failed, apparently because of winter-killing of buds. Comparing the three varieties further, Napoleon easily has the more vigorous and productive trees. Even at the discount in price of 2 to 3 cents a pound suffered by Napoleon fruit in normal times under that of Bing or Lambert, many growers claim the white canning cherries to be the more profitable because of heavier, more regular bearing.

Napoleon occupies its important position, not only as the leading canning cherry in Utah but also as the dominant canning and maraschino cherry of California and the Northwest, not only because of its excellent tree characters and productiveness but because it is one of the largest
and most beautiful of fruits. In Utah, the cherries take on an attractive red blush, often nearly covering the fruits. The fruits are also excellent in quality when well-ripened, being more sprightly than Bing and Lambert, but sweet and rich when mature. Although a firm-fleshed cherry,

![Image of cherries](image_url)

Fig. 13—**Napoleon**: Until a few years ago the most important Utah cherry, low prices paid for canning cherries and winter injury to the trees in recent years have reduced its importance. Napoleon is still the best white canning cherry, and its vigor and productiveness are said to make it cheaper to grow than the large black shipping cherries.

the variety is not desired for shipping because it discolors and is lacking in appearance when shipped to market or hauled long distances. While preferred by canners and used almost exclusively for packing the canned "Royal Ann" cherries of commerce, many home-canners, in Utah at least, prefer the large black cherries for bottling at home. On the local markets, this variety has brought substantial discounts under the Bing and Lambert fruit, although heavy plantings of the latter varieties and revival of the canning demand may eventually eliminate this disparity.
As discussed under the choice of varieties for planting in Utah, it is probably advisable to continue the growing of canning cherries as a measure of diversification, and the Napoleon, even though badly injured in 1932-33, appears to be still the best variety for this purpose.

While two strains of Napoleons were distinguished on the grounds of Paul Smith at Centerville, the differences noted between them were not as great as the differences in fruit between different orchards; hence, these strains could not be identified with certainty in the different orchards. The strain which was thought to be the commoner in Utah bore fruit of lighter color and of longer shape; it was also somewhat more solid and freestone. Since these strains appear to exist in Utah, and many strains have been noted by workers in other states, it is advisable that nurserymen and growers be alert to select and propagate strains which are superior in hardiness, other tree characters, and fruit characters. The occurrence of different strains of Napoleon explains the assertion often made by growers that the Napoleon and Royal Ann are different varieties.

Napoleon is of unknown origin. It was thought, according to Hedrick (1915), to have first been mentioned in the literature under a different name in 1667. It was named Royal Ann by Seth Lewelling who introduced it on the Pacific Coast, as the label had been lost in transporting it across the plains. It is still known as Royal Ann on the Pacific Coast.

Tree very large, vigorous, exceeding most varieties in size and vigor, very productive, buds hardy for a sweet cherry, tree fairly hardy but susceptible to early cold before well matured; branches usually wide angled, with strong crotches; bark reddish-brown often covered with grey scarfskin; lenticels large, prominent, scattering; leaves large, long, oblong-ovate or obovate, tapering to sharp point, finely serrate, semi-folded, dark green.

Fruit ripens early mid-season; large, $\frac{3}{4}$ to 1 inch, usually over $\frac{1}{2}$ inch in diameter; oblong-cordate, compressed; cavity deep, wide, flaring; suture a distinct line; apex pointed; color yellow, washed and mottled with varying shades of red where exposed to sun; dots numerous, small, russet; stem slender, $1\frac{3}{4}$ to $1\frac{1}{4}$ inches long, adherent to fruit; skin thin, tough, adheres to flesh; flesh white with yellowish tinge, meaty, tender, discolors badly when bruised, subacid early in season, becoming sweet and fairly rich when fully ripe; juice colorless; quality good to very good; stone semi-clinging, long ovate to ovate, flattened, blunt, smooth, $\frac{1}{6}$ inch long, $\frac{1}{6}$ inch wide and $\frac{1}{4}$ inch thick.

Schmidt (Black Orb, Schmidt Bigarreau)

This variety, because of its large handsome fruits, was widely planted in Utah from 1900 to 1910 and more sparingly up to 1920. Little propagation has been done by Utah nurserymen in recent years. The reason for its rapid decline in popularity was its failure to produce even reasonably well. The trees are outstanding for vigor of growth, size, and luxuriance of foliage, but only in isolated cases have they produced well over a series of years. A good crop is set in occasional years, but during most seasons, either through bud-killing or excessive dropping of small fruits, the set of fruit is scattering and the yield disappointing. This is true even with good care and when surrounded by pollinizing
varieties. Trees of moderate or weak vigor appear to be better croppers than vigorous trees.

According to Hedrick (1913, 1915), Schmidt is productive in New York, while Philp" states it is unproductive in California. Garcia and Fite (1932) state that Schmidt is medium in production in New Mexico.

Schmidt appears to be somewhat tender in bud, which may be one reason for its failure to bear well, although it often blooms heavily and fails to set well even when surrounded by pollinizers. Other characters are nearly ideal. The fruit is large, glossy black, firm, meaty, ripens early and ships well. The quality is good, although not considered as tasty in flavor as Bing. The fruit compares well with Bing in size, color, and firmness and is a few days earlier than Bing. The trees are large and vigorous where given good soil and ample moisture, although they have a tendency to die back to the trunks and then start to grow like a young tree again. Just why they do this is not definitely known, although winter injury is the probable cause.

According to Hedrick (1915), Schmidt originated about 1841 with Herr Schmidt, Casekow, Prussia. This variety, which was introduced into Utah about 40 years ago from France by Seymour B. Young, was originally disseminated under the name "Young's Large Black." It was later renamed "Black Orb" by Charles H. Smith, nurseryman of Centerville, and widely advertised by him. In 1930 specimens were sent to the New York Experiment Station and pronounced identical with Schmidt Bigarreau by Wellington, Philp, and others. In 1933, a tree of Schmidt from a Michigan source bore fruit identical with Orb in every respect, further confirming its identification as Schmidt.

Schmidt was mentioned by Wickson (1912) as a newly introduced German cherry, the largest of all the black Bigarreau cherries. Hedrick (1913) praises the variety for its size, stating that in this important character it is unsurpassed by any other black cherry in New York, being attractive in shape and color, with crisp, firm, juicy flesh, and a sweet, rich, delicious flavor as well as its vigorous healthy, and productive tree. Fite and Garcia (1932) agree with Hedrick's description for New Mexico conditions, but state that while the fruit is good in quality the flavor "is almost too strong with the cherry or bark flavor when eaten fresh, but a beautiful cherry of very good quality when canned." The tree is said to be large, upright, and medium in vigor and production. Ellenwood and Shoemaker (1933) state that in Ohio some growers have found the tree to be comparatively short-lived, although trees in the Station orchard twenty years old are still thrifty. They describe the fruit as large and excellent in quality and appearance, subject to cracking and as ripening with Lambert, slightly later than Bing.

Tree vigorous, large, upright-spreading; bark purplish-brown, often covered with scarfskin; lenticels large, numerous, prominent, brown, giving tree characteristic striped, rough appearance; not productive; buds and blossoms tender, trees susceptible to die-back; leaves very large, oblong-ovate, finely serrate.

Fruit large (1 x 3/8 inch long), roundish cordate, flattened on ventral side with slight swelling along suture. Stem long (1 1/4 to 1 5/8"

"Correspondence with author, 1930.
14Correspondence with the author, 1930. For further information on this point see "Chinese Apricot and Black Orb Cherry Identified as Old Varieties." By F. M. Coe. In BETTER FRUIT, 27:12 (1933).
inches), moderately slender; cavity deep, flaring; suture a black line; color deep red to purplish-black—darker than Bing; dots numerous, small, submerged, lighter color than skin, inconspicuous; apex bluntly pointed, dot small, dark; skin thick, tough, flesh wine red, firm, breaking, veined;

Fig. 14—Schmidt (Black Orb): Known only in Utah as Black Orb, this large, black, firm-fleshed shipping cherry has been identified as Schmidt, an old European variety widely grown in the east. Unfortunately, the variety has proved to be generally unproductive and for that reason not worth growing as a commercial variety. It is an excellent pollinizer. A productive strain is reported from New York.
meaty rather than juicy; flavor sweet and rich, but with slightly "off" flavor; quality not as good as Bing and Lambert; stone clinging, above medium in size, obliquely ovate (⅜ x ⅝ inch), shouldered.

**Seneca**

Seneca is the earliest cherry to ripen in the Station test orchard, ripening from two to three weeks before Black Tartarian and nearly a week before Early Purple (one of the parents of the new variety), heretofore the earliest Utah cherry. In addition to being earlier than Early Purple, it is also larger, more attractive in appearance, and has better tree characters. It also appears to be superior to the other two extra early varieties in the test, Burbank and Chapman. While on the grounds of the New York Experiment Station at Geneva, New York, where this interesting new cherry originated, the fruits are said to be as large as Black Tartarian, in Utah they have been smaller in the three years they have fruited. In 1933, Seneca ripened in the orchard of W. W. Wicher of Centerville (an early location) on June 10, while in 1934 (a very early season) they ripened in the Station orchard (a late location) on May 20 on Mazzard stocks and a week before on Morello stocks.

The fruits, while small, are an attractive glossy black color and closely resemble Black Tartarian. In quality they are of the best for a heart cherry, being soft in texture like their parent. Tree characters appear to be satisfactory, the trees being vigorous and apparently as hardy or harder than Bing and Lambert, although they suffered considerably from the severe winter of 1932-33. The trees have an upright, open habit, with wide-angled crotches and distinctively shaped leaves. Five-year-old trees in Mr. Wicher's orchard in 1933 were 12 to 14 feet high, with a spread of 16 feet.

While apparently undesirably small, Seneca should have some value in early locations as an extra early market cherry; high prices, however, should not be expected because of the competition of superior California Bings on the local markets at this time. It should also be useful as a pollinizer in such early locations, as tests at the New York Station have proved its value for this purpose. Its greatest value, however, would seem to be for home use, since it ripens when few other local fruits are available.

Seneca originated as a cross between Early Purple and an unknown red sweet cherry, the cross being made in 1910, according to Howe (1934). Nine years later the seedling tree bore fruit, which attracted attention as the earliest ripening cherry known. It was introduced about 1922.

Tree very vigorous, tall-growing but spreading with wide-angled crotches, hardy, productive, precocious, bark light colored, mottled and roughened, with grey scarfskin; lenticels large, conspicuous; leaves narrow, ovate or obovate, crenulate, folded, coarsely serrate.

Fruit ripens very early, small to medium in size, ⅜ x ⅝ x ⅜ inch; somewhat truncate, cordate, compressed; cavity regular, moderately deep and flaring; suture indistinct; apex bluntly rounded. Color dark red to almost black, with some red mottling evident; stem 1¼ to 1½ inches, separating readily from the fruit; skin thin, tender, separating from flesh; flesh dark red, juicy, soft, slightly stringy; flavor sweet with some
sprightliness, rich, quality excellent; stone free, small, oval, $\frac{3}{8} \times \frac{1}{4} \times \frac{7}{8}$ inch, compressed.

**Victor**

Victor is a new cherry of Napoleon type which has not fruited as yet in the Station orchard. This variety is praised by both the New York and Ohio Experiment Stations. At the Geneva (New York) Station it is said to ripen earlier than the Napoleon; the cherries are said to be large, firm-fleshed, light-colored, and of excellent quality. The tree is said to be large, vigorous, and productive. Ellenwood and Shoemaker (1933) of the Ohio Station describe it as pinkish-yellow, with firm flesh, and ripening slightly later than Governor Wood; it is said to be worthy of more extensive trial. Victor originated in 1916 at the Vineland, Ontario (Canada) Horticultural Experiment Station.

**Windsor**

Formerly a popular variety, Windsor has not been propagated or planted to any appreciable extent in Utah orchards during the past decade for the reason that shippers have not liked it because of its generally smaller size, softer flesh than the standard Bing and Lambert, and its light-colored flesh. On local markets this variety has brought low prices compared to the larger black varieties. On the other hand, Windsor has proved hardier in bud and tree than those varieties, and because of its heavier and more regular production is said by some growers to exceed them in profitableness in spite of a discount in price of 2 to 3 cents per pound. There has been a tendency, also, to lower the public esteem of this variety by harvesting it when the skin is a red color and the flesh almost white and decidedly tart and poor in quality. Some growers have increased their returns from the Windsor variety by pruning, fertilization, cultivation, and irrigation to make it mature late, and by delaying harvest until cherries are scarce on the market.

During some seasons Windsors are purchased by the canneries and pitted and packed for pie fruit. For this purpose they are picked somewhat immature. With the recurring surplus of Montmorency cherries, however, the demand for Windsor for this purpose will likely be short-lived. The cherries are used in the main as a lower-priced black cherry for home-canning, for which purpose they are quite satisfactory when well-matured. The principal place of this variety in Utah appears to be as a pollinizer for the larger-fruited Bing, Lambert, and Napoleon, for which purpose it appears to be the most valuable of the thoroughly tested varieties. It should also be used more widely as a home-orchard cherry in the colder districts where sweet cherries of maximum hardiness are desirable. It is doubtful if it should be planted as a main-crop variety, as it has not been profitable during years of low prices and severe competition.

Occasionally trees of Windsor are found which produce cherries as large as Bings. While it is possible that these are distinct and superior strains of the variety, it is more probable that their increased size is due to environmental factors which favor a light set of fruit and good

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tree vigor. Because of the possibility of such variants being distinct strains which would propagate true, nurserymen and growers should be alert to note and test such large-fruited types.

Windsor originated, according to Hedrick (1915), in the latter half of the nineteenth century on the farm of James Dougall of Windsor,
Ontario, Canada, and was propagated in 1881. Windsor was introduced into Utah by David M. Moore of Ogden, Utah, who secured trees of the variety from Ellwanger and Barry, of Rochester, New York. It was recommended for Utah by Wright (1901) and occupied a prominent place in orchards planted from 1900 to 1912. In the east, Windsor is a standard sweet cherry, Hedrick stating that it is the standard late cherry and one of the most profitable of the hard-fleshed cherries grown in New York. In that state it is said to be one of the hardiest of sweet cherries, usually fruitful and comparatively free from damage by robins. It is also commended in Ohio, where Ellenwood and Shoemaker (1933) state that it is highly productive, has a good tree habit, comparatively long picking season, is hardy, and is free from cracking. In Ontario, Canada (1914), it is said to be very hardy and productive, adapted farther north than most Bigarreau cherries and the best of the late black cherries. In 1926, Windsor was again referred to as the most valuable variety in Ontario. In Michigan, according to Motts et al. (1933), Windsor is the most important sweet variety, making up 38.2 per cent of the trees, with Schmidt in second place.

Tree of medium size and vigor, spreading, crotches wide-angled; hardy, very productive; bark reddish-brown, on older branches covered with grey scarfskin; lenticels scattered, small, oval. Leaves medium size, oblong, oval, coarsely serrate.

Fruit ripens late, although often picked for canning and shipping before fully ripe in mid-season; usually medium, sometimes large, ¾ inch to 1 inch in diameter, sometimes smaller; round to round-ovate, compressed; cavity deep, wide, flaring; suture a line; apex rounded, with medium sized russet dot slightly depressed; color red becoming purplish-black when fully ripe; dots numerous, small, russet, obscure; stem slender, 1 to 1½ inches, adherent to pulp, separating readily when fully ripe; flesh amber to light red early in season, becoming purple when fully ripe; juice reddish, flesh tender, meaty, crisp, juicy, subacid becoming sweet when fully ripe, pleasant, sprightly flavor; quality fair to very good, depending on maturity; stone semi-free, small, ovate, blunt, smooth, ventral surface protruding at base.

Yellow Spanish

Because of its superior tree characters, Yellow Spanish may have a place in Utah as a pollinizer of the white-fleshed canning type, or for home use in the colder districts where sweet cherries may be grown. The trees are larger and hardier than those of Napoleon, being probably the largest and most vigorous of any sweet cherry, and bear regularly and abundantly. On the farm of A. S. Williams of Brigham City one tree bore 475 pounds of cherries several years ago when other varieties had a light crop, bringing 8 cents per pound, a total of $35 worth of fruit. He reports that his Yellow Spanish trees have not missed a crop in 17 years. Following the severe winter of 1932-33 which severely damaged his Napoleon trees, the Yellow Spanish trees were in fairly good condition.

In fruit characters, the Napoleon is the larger and firmer, although Yellow Spanish is sweeter and better in quality. It is, however, smaller, slightly softer, and bruises more readily. The fruit appears to be acceptable for canning and would probably be preferred for home canning by consumers who prefer a sweeter white cherry than Napoleon.

Yellow Spanish is probably the oldest known variety of sweet cherry
still in cultivation, according to Hedrick (1915). It is thought by some pomologists to be a variety described by Pliny, the Roman historian, in the first century of the Christian Era. It was described by Parkinson in 1629. Yellow Spanish was introduced into America by Prince, early American nurseryman of Long Island, in 1802. Long a standard variety in the United States, it has largely been replaced in recent years by

Fig. 16—Yellow Spanish: While inferior in size and firmness to Napoleon, which it resembles, Yellow Spanish has better tree characters than that standard canning variety, being more vigorous and hardy. Yellow Spanish is a good pollinizer and may be used where a white canning cherry is desired. Its greater sweetness and hardiness also make it an excellent home cherry.
the larger-fruited Napoleon, although it is still (1934) recommended in New York for home and local use. In eastern New York, according to Tukey (1929), it is still the leading white-fleshed sweet variety and is the equal of Napoleon, all points considered.

Tree very vigorous, usually large, spreading, hardy, productive; bark reddish-brown, with grey scarfskin; lenticels long, elliptical, rather broad; leaves oblong-ovate, crenulate, partly folded; margins irregularly and coarsely serrate; petioles long, with prominent glands.

Fruit midseason, above medium in size, but slightly smaller than Napoleon; roundish-ovate, compressed; cavity deep, wide, flaring; suture a line; color amber yellow, with mottled blush; dots numerous, russet, obscure; stem long, 1 1/2 inches; skin moderately thin, tough, separates readily from the flesh; flesh ivory, moderately tender, meaty, sweet; quality very good; stone free, ovate, somewhat compressed, smooth, ridged along ventral suture.
SOUR CHERRY VARIETIES

Chase

A late ripening dark-juiced cherry of the Morello type, Chase does not seem to be well adapted to the soil conditions in the Station orchard, although Wragg seems to be at home and Early Richmond grows lustily under the same conditions. The trees of Chase are dwarfer even than the other varieties of the Morello type and the leaves tend to be mottled and chlorotic, usually a sign of winter injury. The fruits, on the other hand, are of good size and quality, compare favorably with those of any other Morello, and are milder than most. As the trees do not seem to do as well as those of Wragg, Chase does not appear to be promising to replace that variety in Utah. Chase may be distinguished from Wragg by its more cordate shape and lighter colored flesh and stone. Further

Fig. 17—Chase: A new variety of the Morello type originating in New York, Chase did not appear to be well adapted to the conditions in the test orchard at Farmington and does not appear to be as desirable in Utah as Wragg.
testing on upland soils may show the variety to be more promising under those conditions.

Chase was first introduced by Lewis Chase of Rochester, New York, under the name Riga, the name of the town where he found the variety, according to Hedrick (1923). It was later renamed Chase and widely disseminated by the New York Fruit Testing Association. The trees in the test orchard are from the Washington Nursery of Toppenish, Washington. Based upon recent commercial tests in New York, Chase has been found to be less valuable than English Morello. Wellington and associates (1934) found it to be practically self-unfruitful in New York.

Tree small, dwarfish, lacking in vigor, productive, branches drooping, like English Morello; unhealthy, does not seem well adapted to soil of test orchard, showing some chlorosis; bark brown, cracked and roughened; lenticels large, raised, cleft; leaves obovate, lanceolate to broadly ovate, usually folded, margins crenate, pointed; petiole short, glandular.

Fruit medium to small in size for a sour cherry, $\frac{5}{8}$ to $\frac{3}{4}$ inch in diameter; stem short, exstipulate; shape cordate, slightly compressed; cavity round, abrupt, furrowed and lipped at suture; suture a barely distinguishable line; apex rounded with slightly depressed elliptical tan dot; color dark wine red to deep purple, almost black when very ripe; skin thin, tough; dots small, numerous, depressed, giving surface of skin a dull appearance; flesh firm for a sour cherry, translucent, light red, veinous, melting, acid unless very ripe; conspicuous light veins near skin; juice pink, lighter than Wragg or Suda; quality poor for dessert; good as a sweetened, cooked product. Stone small, $\frac{3}{8} \times \frac{1}{8}$ inch, ovate, somewhat compressed, light brown, smooth, slightly stained with red.

Dyehouse

Dyehouse, as grown in the Station orchard, appears so similar to Early Richmond, the standard early light-fleshed sour cherry, as to make it possible that the trees are the same variety. About the only differences noted between the two are that the fruit on the Dyehouse appears to be a few days to a week earlier and the trees are larger and more vigorous, although both these differences may be due to soil or rootstock variations. The fruit and leaf characters are strikingly similar. As far as can be seen at this time, there is little difference between the value of the two varieties, although Dyehouse appears a shade the better.

According to Hedrick (1915), the variety was raised by a Mr. Dyehouse of Lincoln County, Kentucky, about eighty years ago. He states that Dyehouse is smaller, earlier, has a brighter, clearer color, greater opaqueness, and more highly colored juice than Early Richmond. He also considers it less productive and more particular as to its environment.

Tree very vigorous, being the largest sour cherry tree in the test orchard; upright-spreading, hardy, productive; more open-topped and spreading than Montmorency; crotches generally strong and wide-angled; bark brown and grey, roughened and cracked; lenticels long, narrow, numerous, raised; leaves obovate to oblong-ovate, folded, finely serrate, pointed, dark green.

Fruit ripens very early, the earliest sour cherry to ripen; small, $\frac{3}{4}$ inch in diameter; round to round oblate, slightly compressed; cavity abrupt and regular; suture not visible; apex flattened, with depressed dot; color medium to dark red; dots numerous, small, obscure; stem moder-
ately slender, 1\(\frac{1}{2}\) to 1\(\frac{1}{2}\) inches long, adhering to the stone; skin thin, slightly tough, separating only fairly well from the pulp; flesh pale yellow, somewhat stringy, tender, melting, sprightly; becoming milder and sweeter with greater maturity; quality good; stone smooth, slightly clinging to flesh, round to ovate, \(\frac{1}{2}\) inch long, clinging to stem.

Fig. 18—Dyehouse: This variety appears to be almost identical with Early Richmond. It should be useful in early locations to precede Montmorency for local market and home use, although too small to compete with it for commercial canning. The young trees on the Station grounds are larger and more vigorous than Montmorency, and the fruit, which is smaller, ripens two to three weeks earlier.

**Early Richmond**

Early Richmond, although the standard early sour cherry, is little grown in Utah, Montmorency being the only variety of the sour type widely grown. Because of its earliness, preceding as it does the Montmorency by two or three weeks in season and its large, healthy, productive trees, Early Richmond or Dyehouse should be grown more widely as early market sour cherries or for home use. Probably the principal hindrance to a greater use of the variety is the low esteem in which sour cherries are held by the consumers of Utah fruit, the demand for sour cherries for home consumption being only a small fraction of the demand for sweet cherries. Being unable to compete with the larger-fruited Montmorency, the Early Richmond type cherries are necessarily restricted to home and early market demand. They should be planted for market
only on a very limited scale, and then only in early locations where they will be off before fruit of Montmorency is ripe.

Early Richmond is the popular Kentish cherry of the English. It is a very old variety, its origin being unknown, although it is thought to have originated on the continent. The name Early Richmond by which it is known in this country arose because William Prince, who described the variety in 1832, secured the variety from Richmond, Virginia. Hedrick (1915) praises the variety for its excellent tree characters. He notes also that before the development of commercial canning of cherries, the fruits of Early Richmond were used in making dried cherries, making a delicious sweetmeat—a hint to housewives and sour-cherry growers who have difficulty in marketing their product.

Tree quite hardy, unusually vigorous, sharing with Dyehouse the distinction of being the largest and most vigorous of the sour cherries in the test, upright spreading, strong-shouldered, branches mostly forming wide-angled, strong crotches; more spreading and open-topped than Montmorency, very productive, commencing to bear earlier than Montmorency; bark brown and gray, roughened and cracked; lenticels long, narrow, numerous, raised; leaves obovate to oblong-ovate, folded, finely serrate, pointed, dark green.

Fruit very early, two to three weeks before Montmorency; small, \( \frac{3}{4} \) inch in diameter; round to round oblate, compressed only slightly; cavity approaching abrupt, regular; suture a line, indistinct; apex flattened with depressed dot; color dark red; dots numerous, small, obscure; stem moderately slender, 1 to 1\( \frac{1}{4} \) inches long, adhering to the fruit; skin thin, slightly tough, separating from the pulp; flesh pale yellow, stringy, tender, melting, sprightly, becoming mild at maturity; quality of fruit good; stone smooth, slightly oblique, round to ovate, \( \frac{3}{4} \) inch long; free.

English Morello

Although English Morello is the standard late, red-juiced sour cherry, it has been little grown in Utah in recent years, being found only occasionally in older sour cherry plantings, where it has a reputation of producing undesirably small fruit. That this defect is largely due to the habit of the variety of setting too heavy crops when unpruned is shown by a comparison of the pruned and unpruned trees of Wragg, which is considered by many pomologists to be identical with English Morello, in the Station orchard. Trees pruned rather heavily bore large fruit, much of it larger than that of Montmorency, which does not reach the large size in Utah that it does in more humid climates. The unpruned trees, on the other hand, were overloaded and the fruit was undesirably small. With regular pruning to prevent over-bearing and keep the trees vigorous, it would seem possible to produce good crops of large fruit with this variety.

Since no trees of English Morello were included in the variety test for comparison and the consensus of authoritative opinion favors the conclusion that English Morello and Wragg are identical, or at least that the trees of both varieties sent out by many nurseries are identical, the discussion and description given under Wragg will suffice for both varieties.

According to Hedrick (1915), the true origin of the English Morello is obscured in antiquity, many varieties described by early European pomologists having been thought to be this variety.
Montmorency

Montmorency, the standard commercial sour cherry, is so well-known that a description is necessary only for completeness and for purposes of comparison. The characteristics which have given it its predominance in commercial sour-cherry orchards of Utah are its large size for a sour cherry, productiveness, hardiness, vigor, and quality as a canned or cold-packed product for bakery, hotel, or restaurant use as well as for by-products uses. This is the cherry which fills the demand for "Red-Pitted Sour Cherries," the standard article of trade in the pie-cherry line. While excelled in vigor, productiveness (at least while young), and strength of tree by the Early Richmond and Dyehouse varieties, fruits of the latter are too small; for this reason, they are not liked by canneries, whose pitting machines are designed to handle Montmorency fruit. The trees

Fig. 19—Montmorency: This sour variety is grown almost exclusively in Utah for commercial canning, home use, and local market. Its popularity is due primarily to its being the largest fruited of the light-fleshed sour varieties, although inferior to some others in size of tree, precocity, and quality. Montmorency does not attain the large size in the dry atmosphere of Utah that it does in more humid regions.
of Morellos are too dwarfed; the cherries require more sugar in processing; the red coloring matter reacts with ordinary tin plated cans so that lacquered cans must be used. They are also too small as usually grown without regular pruning. Royal Duke, while bearing superior fruit, is not as productive, hardy, and long-lived as Montmorency. Other sour and Duke varieties which equal or surpass Montmorency in fruit characters are unproductive, ripen over a long season (as most of the Dukes), or have other faults in the trees which eliminate them as commercial varieties. This leaves the field clear to Montmorency as the best commercial sour cherry of the Amarelle, or light-juiced, type. In Utah the Montmorency tends to overbear and seldom reaches the size it attains in more humid districts. A variety of this type, with larger fruit, and more vigorous, strong and precocious trees is needed to replace Montmorency.

Although Montmorency trees were secured from four different nurseries in the Middle West, Pacific Coast, and Utah (four supposedly different strains being secured from one nursery), all of the strains were indistinguishable, with one exception—Sweet Montmorency. This variety, which was received from Stark Brothers Nursery of Louisiana, Missouri, was smaller-fruited, earlier, had a more vigorous tree than the other Montmorency trees, and appeared to be similar to if not identical with, Early Richmond.

The other strains, including Montmorency Monarch, Montmorency Stark, and Montmorency King did not appear to differ from each other or from the Montmorency trees obtained from the Milton Nursery of Milton, Oregon or from the Porter-Walton Nursery of Salt Lake City. They appeared to be the standard Montmorency Ordinaire, which is considered to be the best variety of the type for commercial use. None of the strains appeared to be Large Montmorency or Short-Stem Montmorency, both of which are said by Hedrick (1915) to be less productive or larger-fruited.

Montmorency, according to Hedrick (1915), originated several centuries ago in the Montmorency Valley of France. It has been confused with the Large and Short-Stem Montmorencies and is now grown under several different names, often being offered as Large Montmorency. Hedrick (1915) states that the existence of distinct strains of the variety is doubtful, in spite of the many supposedly different strains which have been named. Observations of the "strains" of Montmorency in this test to date tend to verify this conclusion.

Tree medium in size and vigor, round-topped, dense, upright spreading, with tendency toward narrow, weak crotches, productive, hardy, bears fairly young; bark purplish brown with grey scarfskin, cracked and roughened; lenticels large, long, narrow, often forming horizontal lines across branches; leaves obovate, long, narrow, sharply pointed, dark green, semi-folded, often crenulate, margins finely serrate.

Fruit ripens in mid-season, about July 15 to 25, medium to above medium size for a sour cherry, mostly 5/8 to 3/4 inch in diameter; round to roundish-oblate; slightly compressed; cavity abrupt, medium to small, shallow; suture a line, often indistinct; color light cherry-red to dark red when fully ripe; dots small, numerous, inconspicuous; stem moderately thick, long, 1 3/4 to 2 inches, adheres well to fruit; skin thin, tender, separates readily from flesh; flesh yellow to amber, juicy with light colored, abundant juice, tender, melting, sour to sprightly subacid when fully ripe; quality very good for culinary purposes, too acid for dessert.
use; stone cling to semi-cling, small (3/8 x 3/8 x 1/4 inch), light-colored, round ovate, pointed, smooth.

Suda

Suda, or Suda Hardy as it is called by its introducers, Stark Brothers of Louisiana, Missouri, is a cherry of the English Morello type which so closely resembles that variety and Wragg as to be hardly distinguishable. On the Station grounds the variety does not appear to be as healthy, vigorous, and hardy as Wragg. Aside from these differences, which may be due to variation in rootstocks or soil between the trees, the varieties appeared to be identical. Since the Wragg trees were better under the conditions in the test orchard, it would seem advisable to use Wragg instead of Suda where a variety of English Morello type is desired in Utah.

Suda originated, according to Hedrick (1915), about 1880 with a Captain Suda, of Louisiana, Missouri. Hedrick notes that trees of Suda are more upright than those of English Morello and the fruits longer stemmed. He ranks it less desirable in New York than the older variety. Aside from the tree differences noted, the description of Wragg which follows the discussion of that variety also applies to Suda.

Wragg

Wragg is considered by several eminent authorities to be identical with the English Morello. Hedrick (1915) quotes Colonel G. B. Brackett, Pomologist of the U. S. Department of Agriculture, as being unable to find distinguishing differences between the two as grown on the grounds of the originator, J. Wragg, of Waukee, Iowa, where the variety originated as a sprout from another tree.

In the test orchard at Farmington, Wragg was the best of the Morello type cherries in the test, which included Chase and Suda, although English Morello trees of the same age were not available for direct comparison. Because of its late season, high quality for culinary uses to which pie cherries are adapted, precocity, and productivity, Wragg deserves a place in local market and home orchards in Utah. The trees, although small and dwarfish, are hardy and productive, bearing almost as soon as they are established in the orchard and loading heavily every year. In fact, the tendency of the variety to overbear and lose vigor is its major fault, trees of weak vigor often setting more fruit than they can mature to desirable size. This tendency, however, can be corrected by rather severe annual pruning. Trees in the Station orchard given such pruning bore fruit exceeding Montmorency in size.

Although not well-known to Utah consumers, the fruit of Wragg has been well liked where tried, the pies, jellies, and preserves made from it exceeding Montmorency in richness of flavor. They also have an attractive deep purplish color. The fruit is too acid to eat out of hand, except when allowed to hang on the trees long after it is well-colored, and even then it is acceptable only to acid-tolerant appetites. The lateness of the variety is a major advantage, as it furnishes pie-cherry fruit for market after Montmorency is gone. The fruit where well-grown makes an attractive appearance and handles well, being firmer than Montmorency. Because of the small size of the trees, the variety would probably not yield as well as Montmorency when plantings are mature. Wragg is not
desired by commercial canners, although it would seem that its higher color and richer flavor would merit further trial for this purpose for a special trade. As a dooryard tree, the Wragg has special merit. The tree is particularly ornamental in flower and fruit, while the small size and drooping habit enable it to fit in well as a lawn or garden tree. Wragg should be more widely grown in Utah to prolong the season and to add variety for home use and local market. Where planted in orchards, less space is required for the trees than for other sour-cherry varieties, and the trees make excellent fillers because of their small size and heavy production while young.

Tree small, dwarfish, moderately vigorous when pruned annually to prevent overbearing, but otherwise loses its vigor quickly; extremely

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**Fig. 20—Wragg:** Considered by many pomologists to be identical with English Morello. Wragg appears to be the best of the Morello type cherries fruited in the test orchard. Its late season, precocity, phenomenal productiveness for the size of the trees, and the high quality and attractive color of culinary products made from its fruit make it a useful addition to the home and local market orchard. The trees should be given annual pruning to keep them from overbearing, losing vigor, and producing unsalably small fruit.
productive and precocious; hardy; branches usually wide-angled, forming strong crotches, drooping in habit; bark dark brown, with grey scarfskin, cracked and roughened, lenticels numerous, small, raised and cleft in center, short; leaves oblong-ovate, broad for a cherry leaf, coarsely serrate, seldom folded or crenulate, mucronate, dark green.

Fruit late in season, variable in size, usually small to medium size (% to % inch in diameter), although surpassing Montmorency on vigorous branches; shape round-cordate, larger fruits rounder, smaller fruits more cordate; stem adherent, 1 ½ inches long, slender, often stipulate; cavity shallow, round flaring; suture a barely distinguishable thin line; apex roundish with depressed tan-colored dot; color mahogany red to deep purple; dots small, numerous; skin thin, tender, free; flesh wine-colored, firm for a sour cherry, melting, veined, juicy, very acid unless quite mature when it becomes sprightly subacid; juice wine red in color; quality excellent for cooking but too acid for dessert purposes; stone small to medium (%x inch), almost free, oblong-ovate, bluntly pointed, plump, smooth, tan-colored, stained with red.

DUKE CHERRY VARIETIES

Late Duke, Knudson, Sixteen-To-One

These three Duke varieties are so similar that it was thought advisable to discuss them together; indeed, it is possible that they may be identical, although the origin of the Knudson, said to be a local seedling, would preclude its being identical with the Late Duke. All are large-fruited, semi-sour Duke cherries of excellent quality which ripen late over a long season, having ripe and green fruits on the tree at the same time, as shown in Figures 21 and 22. Knudson and Sixteen-To-One are old Utah varieties which have passed out of cultivation to such an extent that the writer was unable to find trees of the Sixteen-To-One for comparison, all the trees of this type being called Knudson by their owners, although they corresponded more closely to the descriptions of Sixteen-To-One than to that of Knudson, as given by local authorities. Neither of these varieties is mentioned in the literature as being grown outside of Utah. Late Duke, on the other hand, is an old and well-known Duke variety widely grown to prolong the season for Duke cherries; in Utah, however, it is a new variety, not being found by the writer outside the Station orchard.

Late Duke. The trees of this variety in the test orchard are too young to determine its value under local conditions. In view of the probability that it is identical with Knudson or Sixteen-To-One, both of which failed because of lack of hardiness and other tree characters, Late Duke cannot be said to be promising as a market variety. Its late ripening, long season, and large, high-quality and attractive fruits make it promising, however, as a home-orchard variety to furnish fruit for pies or for eating out of hand. Because of its habit of ripening gradually, however, the birds make serious inroads on the crop, more so than with Royal Duke or other varieties which ripen more uniformly. A variety which bears fruit so large and handsome should not be lost to Utah pomology; hence, it is hoped that those who appreciate the unusual and superior in fruits will continue to grow this variety in their gardens. In other states, authors who describe the variety commend its tree characters. Hedrick (1915) states that it is vigorous, hardy, and productive. He suggests
planting it in a cool, partly shaded location, such as north of a building, to provide delicious cherries in August. Late Duke is an old variety, being described by Prince in 1832. It is probably of European origin. The

Fig. 21—Knudson: The fruit shown was taken from trees grown as Knudson but which conform to the descriptions of Sixteen-To-One. Both varieties have been grown only in Utah under these names and have passed from cultivation. It is likely that one or both are identical with Late Duke, which is similar.

tree description was made from young trees. The fruit description given under Knudson and Sixteen-To-One applies also to this variety.

Tree vigorous, upright-spreading, more spreading than Royal Duke, not productive, uneven in ripening, hardy; bark mostly grey, lenticels broad, raised, conspicuous; branches mostly wide-angled and strong-shouldered; leaves unusually large for a Duke, broadly obovate or ovate, pointed, rugose, dark green, margins coarsely crenate.
Knudson, Sixteen-To-One. Knudson is said to have originated from a tree in Brigham City, on the home place of the late W. O. Knudson, who informed the writer in 1933 that the original Knudson tree was a seedling. The tree is not now alive. He stated that Knudson is a large tree, while the Sixteen-To-One is a small tree with much dieback. The fruits are somewhat similar, with the exception that the fruit of Knudson ripens uniformly on the branches, certain branches on the trees ripening their fruit much later, while with the Sixteen-To-One the fruits on all the branches are variable in ripening. Some of the fruits of the latter variety were said to ripen as late as October, although the author was unable to verify this interesting statement. J. A. Tingey of Brigham City

Fig. 22—Knudson: A: A normal branch ripening its fruit in mid-season, with some variation in maturity; B: A branch from the same tree containing all late-ripening fruits. This variation may indicate a mutation or "sport." Such sports of the May Duke have been propagated and named as later-ripening types of the variety.
stated that he did not consider Knudson identical with Sixteen-To-One, as the former is round in shape like Royal Duke.

Charles H. Smith, veteran nurseryman of Centerville, stated to the writer that the Sixteen-To-One cherry was given its unusual name by Arthur Van Meter, nurseryman of Roy, Utah, during the famous free silver campaign of William Jennings Bryan in 1896. It was introduced from a 40-year-old budded tree located at East Bountiful, possibly the Late Duke. The fruit was extremely late in season, quite sour, unusually large for a cherry of this type, had light red juice, a red blush like Reine Hortense, and a large stone. The fruit was roundish-cordate in shape. The tree was rather tender and susceptible to winter injury, which probably caused the dieback of branches characteristic of the trees now known as Knudson. The limbs varied in season of ripening. Smith, like Knudson, stated that the Knudson was a better tree than the Sixteen-To-One and ripened its fruit more uniformly.

One block of old trees, growing in the orchard of Will Peters at Perry, said to be Knudson but which corresponded to the description of Sixteen-To-One, was observed for several seasons. These trees were removed in 1933, being in poor condition from dieback at that time. The trees were small to medium in size and were branched low. The fruit resembled that of Late Duke. It was irregular in ripening, large, much deeper, duller red than Montmorency, with a mottled appearance; it was not a bright cherry-red like Montmorency. Where overloaded and weak in vigor, the fruit was small, about the size of Montmorency. When bottled, the color faded out of the fruit, although the product was of good flavor. At the time when most of the fruit was ripe all the trees had one to several branches which had mostly small, green cherries. The balance of the branches, about 80 to 90 per cent, bore mostly ripe cherries.

Two trees were located in this orchard which had all late-ripening branches. Another tree was noted which had all early-ripening branches except one large branch on which all fruit was green and late. These early- and late-ripening branches were propagated to determine if the differences in time of ripening would propagate true. The late-ripening branches seemed less vigorous, sparser foliaged, and the fruit was more scattered, suggesting an injured condition or pathological cause for the variation. The most likely explanation of this peculiar behavior, however, is that the late-ripening branches are mutations (sports) such as were reported by Kinman (1930) and Drain (1932). Similar dimorphism in Duke cherries is reported by Einset (1933). The late-ripening trees may have been propagated from late-ripening branches. In this connection, Thomas (1885) notes that two late-ripening sports of May Duke, called Holman's Duke and Late May Duke, have been propagated from late-ripening branches of May Duke.

Comparison of fruits from this planting with those borne by a Late Duke tree in the Station orchard showed them to be so similar as to warrant considering them identical, although final identification must await further observation of the young Late Duke trees. So far, they have not shown any inclination to dieback in the tops, although suffering considerable injury at Logan in the winter of 1932-33.

Hedrick (1915) quotes a letter from the Utah Station as stating that Knudson was discovered by William O. Knudson of Brigham City, Utah,
in 1896, stating further: "Although similar to Late Duke, further testing may prove it distinct; tree bears early, hardy; fruit medium to large, bright scarlet; ripens over a long period; used for pies and canning." The author of the letter was not stated.

The description was made from a large tree in the orchard of J. C. Knudson at Brigham, which appears to be typical of the variety grown under the name Knudson. In 1934 it had a spread of 27 feet but was in poor condition from winter-injury.

Tree moderately large and vigorous for a Duke, spreading, rather tender and susceptible to winter injury and dieback; productive, uneven ripening, bark dark purplish-brown, rough, lenticels large, prominent, numerous, lancelolate with brown crack along center; leaves thick, broadly ovate to obovate, acute at base, tapering to a point, often partly folded, coarsely and bluntly serrate; glands ovate or reniform, dished, usually on leaf margins, often glandless.

Fruit late in season, ripening gradually over a long period beginning about two weeks after Royal Duke; large (¾ to 1 inch), round cordate, somewhat compressed; cavity wide; shallow suture; color mottled dark red; stem slender, long; flesh amber, juicy, tender, mild for a sour cherry, sprightly, refreshing; stone clinging, rather large, ovate, compressed, light colored, with surface which feels rough to the tongue.

Reine Hortense

Two types or strains of this variety which appear to be distinct have been observed. The Reine Hortense trees growing on the Station grounds are large, vigorous, unproductive, and late in season. The other type is represented by trees which bear fruit which appears to be identical but which ripens three weeks earlier in the orchard of Will Peters of Perry, Utah. These trees appeared to be quite productive and ripened their fruit with Black Tartarian and ahead of Royal Duke. In both instances the trees suffered considerably from winter injury in 1932-33, more than that suffered by Royal Duke. The early type appears to have considerable promise as an early pie cherry for home use or local market because of its large size, quality, and earliness. Where it is known to consumers it meets with a good demand, although soft and difficult to handle if allowed to become fully ripe. When fully matured, it is mild, refreshing, and good to eat out of hand. Half dried it is delicious. The cherries are long oval shape, with a long, slender stem. They are an attractive bright cherry red. The trees have a reputation for tenderness and short life, which calls for the choicest of locations, and probably will restrict the variety to home use or to limited market trade. This early type was also found in the orchard of Sherman McGerry of Spanish Fork.

The late type of Reine Hortense as grown in the Station orchard at Farmington differs from the early strain in being more oval, where the early type is somewhat larger and more conic. The stems of the late type are shorter than the early type, being 1¼ to 1½ inches, while those of the early type ranged from 1½ to 2 inches. Another distinguishing feature is the lipped cavity at the termination of the suture line, which is a distinct dark line in a lighter background. The early form is not lipped and has an indistinct suture, barely distinguishable. Both forms appear to ripen over a long season. The early type appears to be somewhat softer and has juicier flesh. Both are freestone, with large, oblong ovate, pointed, straw-colored stones, differing only slightly in their
markings. In view of the marked variation in time of ripening of the fruits and the statement of Thomas (1885) that similar late ripening variations of the May Duke had been propagated, it appears likely that the late type may be a late strain of the Reine Hortense which originated through propagating from a late-ripening branch of the variety. Further observations and testing will be necessary to determine the relationships and value of the two types. Because of lack of productivity and the scattering habit of ripening, the late strain does not appear promising for any purpose at this time. The tree description is of the late type, while the fruit description is of the early type.

Fig. 23—Reine Hortense: A light-fleshed Duke cherry. There appears to be a late-ripening strain (such as grown in the test orchard) and an early-ripening strain, the latter being more productive. The late type, although the trees are vigorous and ornamental, is too unproductive to have value. The early type may have value for home use and local market because of the high quality of the fruits, which may be used, like Napoleon, for maraschino making.
According to Hedrick (1915), the variety was originated by M. La Rose of Neuilly-sur-Seine, Seine, early in the nineteenth century. The cherry is described by Hedrick as ripening in mid-season; the trees are only medium in size and productivity. In regard to strains, Hedrick says: "The theory that Reine Hortense comes true to seed and therefore has several strains has been discredited." Whether this applies to strains arising by mutation is not stated.

Tree (late type) large, very vigorous, unproductive, moderately hardy, upright-spreading, branches strong-shouldered; bark brown, mostly covered with grey scarfskin; lenticels prominent, scattered, large, brown, raised; leaves large, oblong-ovate to obovate, finely serrate, long sharp point, dark green, single long stipule at leaf attachment. A beautiful tree.

Fruit (early type) early, ripening with Black Tartarian and Schmidt (Orb). Size medium to large (%\text{x}\text{3}/4\text{a}), shape round-ovate, stem long, slender; color bright cherry red; skin thin, tender; flesh juicy, soft, melting, amber-colored, veined, free from pit, flavor sprightly subacid to mild when quite ripe, about the same acidity as Royal Duke; quality very good for pie cherry, somewhat too acid for dessert; stone elliptical, light-colored, smooth, above medium size.

Royal Duke, May Duke

These two similar Duke varieties appear to be confused in Utah, as elsewhere (Thomas, 1885). Although called May Duke in Utah, the writer is convinced by comparison with descriptions of the two varieties given by Hedrick (1915) and by personal observation of the trees growing at the New York Agricultural Experiment Station, Geneva, New York, that the variety commonly grown in Utah under this name is really the Royal Duke. It is possible, however, that both varieties are grown, although only one has been observed. According to Hedrick (1915) and Einset (1933), the May Duke ripens over a long season, showing green and ripe fruits on the same tree, often having branches which ripen their fruit much later, as illustrated with the Knudson variety in Figures 21 and 22. The variety grown in Utah ripens rather uniformly and tends to bear heavily in clusters, a characteristic of the Royal Duke, which is considered by Wellington and Heinicke (1934) to be one of the most productive Duke varieties in New York, where it is recommended for home use, local market, or roadside stands. In the survey by Andrews (1927), 400 Royal Duke trees were reported from Utah orchards as compared to 64 May Dukes. The variety described here as Royal Duke is the one commonly grown in Utah.

This variety is the only Duke type cherry of importance in Utah and ranks next to Montmorency in number of trees. While found in considerable numbers in the older orchards, few plantings have been made in recent years. In season, Royal Duke follows Early Richmond and Dyehouse and precedes Montmorency, although the fruit does not attain its full richness and mildness until after Montmorency is harvested. This Duke is preferred over Montmorency by discriminating consumers because of the larger size and superior quality of its fruit; hence, it usually commands a better price than Montmorency. Einset (1933) considers Duke cherries of this type superior to sweet cherries for dessert and home-canning.

The trees are vigorous, upright, and productive, although not equaling Dyehouse in vigor and hardiness. They are not entirely hardy in
Utah, being inferior in hardiness to several of the hardier sweet varieties. The trees do not appear to be long-lived and are subject to crotch-injury, poor crotches being the rule, owing to the narrow, upright, branching habit.

The fruit is large for a subacid cherry, usually excelling Montmorency in this respect. The fruit is mild, and when fully ripe and dark red in color it is refreshing and delicious. As a cooked product it is unexcelled, making excellent pies and preserves, for which purposes it is usually picked when red in color and not fully ripe. When allowed to become fully mature, the fruit makes an excellent canned product.

For general market and canning-factory use, Royal Duke is of doubtful value. While the fruit is superior in quality and appearance and ear-

Fig. 24—Royal Duke (May Duke): This variety is commonly grown in Utah as May Duke. Because of its large fruits which are larger and milder than those of Montmorency, it is the only sour or Duke variety, aside from Montmorency, grown to any extent in Utah. When thoroughly ripe, the fruits are delicious and refreshing to eat out of hand. The trees are not hardy nor long enough lived to compete with Montmorency commercially, except where a higher price is obtained, but the variety should be more widely grown for home use and for market in early locations.
lier than Montmorency, the trees are not as hardy, long-lived and productive; because of this, the cherries would have to bring a substantial premium over Montmorency in order to be equally profitable. In early locations where the trees are relatively free from winter injury and the fruit could be marketed before Montmorency, Royal Duke may be profit-

Fig. 25—**Left**: Royal Duke tree growing in Station orchard at Farmington, showing characteristic upright growth habit (6 years of age). **Right**: Montmorency Ordinaire tree, 5 years old, in same orchard.

able in a limited way for a discriminating local trade. For home use the variety is indispensable, providing early cherries for pies and sauce and delicious fruit for eating out of hand when fully ripe. This variety also makes delicious dried cherries.

Royal Duke is an old variety, its exact origin being unknown. According to Hedrick (1915), it was probably first mentioned in the literature in 1791 under the name Royale d'Angleterre.

Tree vigorous, upright, symmetrical vase form, productive, moderately hardy, short lived, hardy in bud; crotches usually narrow and weak, bark reddish-brown, nearly covered with grey scarfskin; lenticels numerous, long, large, raised, conspicuous; leaves small, oblong-ovate, pointed, coarsely serrate, dark green.

Fruit early, large (¾ inch wide by ¾ inch long), stem long, slender, with bracts where attached to peduncle; round oblate, cheeks swollen, dorsal side shallowly grooved, ventral side flattened; suture a line; apex depressed with a prominent sunken dot of tan color; color bright cherry-red, deepening to mottled dark red when quite ripe; flesh translucent amber, with a reddish cast, veined, soft, juicy, tender; skin thin, tender; flavor acid turning to rich, piquant, refreshing subacid flavor when fully ripe; quality excellent for pies, jelly, and preserves when red, good for dessert when fully ripe. Stone clinging, round-oval, straw-colored, smooth.
LITERATURE CITED

Alwood, W. B. and Price, H. L.

Andrews, Frank

Bower, B. H.

Budd, J. L. and Hansen, N. A.

Close, C. P.

Coe, F. M.

Coe, F. M.

Crane, M. B.

Downing, A. J.
1889 Fruits and Fruit Trees of America. (Revised by Charles Downing) New York.

Drain, B. D.

Einset, Olav

Ellenwood, C. W. and Shoemaker, J. S.

Elliot, F. R.

Fite, A. B. and Garcia, Fabian

Fruit Branch, The
1914 The Fruits of Ontario. Published by Ontario Department of Agriculture. Toronto. (No author given.)

Gould, H. P.
Hedrick, U. P.


Hooper, E. J.

Howe, G. H.

Kinman, C. F.

Knudson, W. W.

Motts, G. N. et al.

Northrup, R. S.

Parry, J. H.

Philp, Guy L.
Palmer, E. F.

Powell, G. H.


Price, H. C. and Little, E. E.

Prince, W. R.

Richman, E. S.

Rogers, A. J.

Schanderl, H.

Schuster, C. E.

Sears, F. C.

Thomas, J. J.

Wellington, Richard


Wickson, E. J.


Wright, J. A.


(College Series No. 450)
RECOMMENDATIONS

1. Lambert and Bing remain the best of the tested large firm black cherries and are the only ones that should be planted for shipping. Because of superior hardiness, Lambert should be generally preferred, however. Because of earlier ripening, part of the black cherries planted in commercial orchards should be Bing.

2. Napoleon, although the trees were much injured by the winter of 1932-33, is still the best of the tested firm white canning varieties. It should continue to be planted where a cannery market is available in order to avoid complete dependence on shipping markets.

3. To minimize winter injury, commercial sweet-cherry plantings should be confined to the warmest, most frost-free upland locations.

4. Approximately 10 per cent of the trees should be of pollinizing varieties, since Bing, Lambert, and Napoleon, when planted exclusively, are inter-unfruitful and do not produce well. Windsor is the best of the tested pollinizing varieties, although Schmidt (Black Orb), Black Tartarian, and Yellow Spanish may be used. Black Tartarian is suitable on early ground where a market is available and Yellow Spanish may be used where a white cherry is desired. Pollinizers should be uniformly distributed in the orchard, every third tree in each third row being a suitable arrangement.

5. New varieties sufficiently promising to warrant trial by growers in a limited way as pollinizers are Deacon, Elkhorn, Seneca, and Major Francis. Deacon, a new firm black variety planted in the Northwest, appears to exceed Windsor in value of fruit, as does Elkhorn, which equals Bing and Lambert in fruit characters, but has not been widely tested in Utah. Seneca, a small extra-early cherry of Tartarian type appears to be the best cherry to precede that variety in early locations. It is a tested pollinizer. Major Francis, of Tartarian type and season, appears hardier. When new varieties are used as pollinizers, to insure successful pollination half of the trees should be Windsor or Black Tartarian.

6. The following new sweet varieties do not appear promising: Abundance, Burbank, Chapman, and Giant (California Type). Of the older varieties, Black Republican (including Lewelling), Black Spanish, Centennial, Black Eagle, and Early Purple (Early Black) are not worthy of further culture in Utah.

7. While Montmorency is still the best sour cherry for commercial and local market purposes, a limited planting of Early Richmond or Dyehouse and of Wragg or English Morello to extend the season for local market and home use would appear advisable. Neither Chase nor Suda appears to have value.

8. Royal Duke, commonly grown in Utah as May Duke, may have value for local market in early locations to precede Montmorency because of earliness and high quality. It is especially desirable for home and garden plantings. Reine Hortense, Late Duke, Knudson, and Sixteen-One do not appear to have commercial value.

9. Because of the occurrence of "sports" and the existence of strains within varieties, growers and nurserymen should propagate their trees from fruiting trees of the desired type and watch for desirable variations.