CHERRY BREEDING PROGRAM AT UNIVERSITY OF BOLOGNA (ITALY)

TOWARDS HIGH QUALITY

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BREEDING PROGRAMS
AT UNIBO
CHERRY BREEDING AT UNIBO

Historic program - 40 years of successful breeding experience

1st STAGE: 1980 – 2000
Project leader: S. Sansavini & S. Lugli
Generated internationally acclaimed STAR SERIES (Grace Star, Lala Star, Black Star)
Total 7 protected varieties
Co-ownership UNIBO & CRPV

2nd STAGE: 2000 – 2019
Project leader: S. Lugli
Generated internationally acclaimed SWEET SERIES & MARYSA
Total 7 protected varieties (+ 1 underway)
Ownership UNIBO
LATEST RESULTS FROM STAGE 2
CHERRY BREEDING PROGRAM

FROM CONCEPT TO REALIZATION

• Project management
• Breeding description & objectives
• Breeding outcomes
• Technical description
  • Sweet Series
  • Marysa®
PROJECT DESCRIPTION

Started in 2000 ~ 20 years ago

OLD Vignola varieties:
Firmness, Sugar, Acid, Flavour

NEW California varieties:
Appearance, Size, Shape

3000 SEEDLINGS

Strict selection criteria:
organoleptic quality

Strict selection criteria:
production parameters
Strict selection criteria thresholds

- **Size**
  \( \geq 28 \text{ mm calibre} \) minimum
- **Skin colour**
  4-6 CTIFL scale skin colour
- **Flesh firmness**
  \( \approx 400 \text{ g flesh firmness} \)
- **Sugar content**
  \( \geq 18 \text{ °Brix} \) sugar content
- **Acidity**
  7-8 g/l malic acid
BREEDING OUTCOMES

1. SWEET SERIES

- Sweet Dave
- Sweet Aryana®
- Sweet Lorenz®
- Sweet Gabriel®
- Sweet Valina®
- Sweet Saretta®
- Sweet Stephanie®

Ripening periods of the Sweet Series compared to reference varieties in the Vignola area

2. MARYSA®
PA6UNIBO®

ALMA MATER STUDIORUM — UNIVERSITÀ DI BOLOGNA
IL PRESENTE MATERIALE È RISERVATO AL PERSONALE DELL'UNIVERSITÀ DI BOLOGNA E NON PUÒ ESSERE UTILIZZATO AI TERMINI DI LEGGE DA ALTRE PERSONE O PER FINI NON ISTITUZIONALI
Sweet Dave PA8UNIBO*

Origin: University of Bologna, Italy.
Breeders: S. Lugli, R. Correale and M. Grandi.
Parentage unknown. Tested as DCA BO A1A70

VARIETY STRENGTHS:
• Comes into 1st production early
• Good yield at 3rd year: 5,5 t/ha on Gisela®6; 10,7 t/ha on Pi-Ku1®
• Uniform maturation
• Large fruit & very good size distribution (80% > 28 mm caliber)
• Excellent flesh consistency & excellent organoleptic quality
• Good on-tree fruit durability (harvest window ≈ 7 - 10 days)

VARIETY WEAKNESSES:
• Medium-high susceptibility to cracking

NOTES:
• Adaptable to different planting systems
• Not self-fertile (S3S4)
• Recommended pollinators: Sweet Aryana® & Sweet Lorenz®

NEW!!

<table>
<thead>
<tr>
<th></th>
<th>Sweet Dave</th>
<th>Burlat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (g)</td>
<td>14,1</td>
<td>9,4</td>
</tr>
<tr>
<td>Durofel</td>
<td>62</td>
<td>40</td>
</tr>
<tr>
<td>Firmness (kg)</td>
<td>0,44</td>
<td>0,28</td>
</tr>
<tr>
<td>Sugar content</td>
<td>18,1</td>
<td>15,0</td>
</tr>
<tr>
<td>(°Brix)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acidity (g/l)</td>
<td>9,6</td>
<td>5,7</td>
</tr>
</tbody>
</table>

*Sweet Dave mean values 2017-2018
Burlat mean values 2015-2018
Sweet Aryana® PA1UNIBO®

Origin: University of Bologna, Italy.
Breeders: S. Lugli, R. Correale and M. Grandi.
Parentage unknown.
Tested as DCABO A1A1;
EU PVR 48925/2018; USPP 25,996; 20 Oct. 2015

VARIETY STRENGTHS:
• Self-fertile (S3S4')
• Comes into 1st production early
• At full production, good and constant yields: 12-15 t/ha in MDP; 18-20 t/ha in HDP
• Uniform maturation
• Good fruit size & very even distribution (50% > 28 mm caliber)
• Very good flesh consistency & good organoleptic quality
• Good fruit durability on tree (harvest window ≈ 10 -12 days)

VARIETY WEAKNESSES:
• Medium-high susceptibility to cracking

NOTES:
• Adaptable to different planting systems
• Very promising first results in VHDP

<table>
<thead>
<tr>
<th></th>
<th>Sweet Aryana®</th>
<th>Burlat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (g)</td>
<td>11,6</td>
<td>9,4</td>
</tr>
<tr>
<td>Durofel</td>
<td>57</td>
<td>40</td>
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<tr>
<td>Firmness (kg)</td>
<td>0,40</td>
<td>0,28</td>
</tr>
<tr>
<td>Sugar content (*Brix)</td>
<td>16,8</td>
<td>15,0</td>
</tr>
<tr>
<td>Acidity (g/l)</td>
<td>7,7</td>
<td>5,7</td>
</tr>
</tbody>
</table>

Mean values 2015-2018

+3-5 Burlat*
* Vignola area
Sweet Lorenz® PA2UNIBO*

Origin: University of Bologna, Italy.
Breeders: S. Lugli, R. Correale and M. Grandi.
Parentage unknown.
Tested as DCABO A1C27;
EU PVR 48926/2018; USPP 25,982; 13 Oct. 2015.

+8-10 Burlat*
* Vignola area

VARIETY STRENGTHS:
• Comes into 1st production early
• At full production, good and constant yields: 9-11 t/ha in MDP; 14-15 t/ha in HDP
• Uniform maturation
• Very good fruit size & even distribution (40% > 30 mm caliber)
• Excellent flesh consistency & excellent organoleptic quality
• Very good on-tree fruit durability (harvest window ≈ 12 - 14 days)

VARIETY WEAKNESSES:
• Higher vigour and poor lateral branching

NOTES:
• Not self-fertile (S3S4). Recommended pollinators: Sweet Aryana® & Sweet Gabriel®
• Good agronomic performance on training system multi-axes on vigorous & single axis on dwarfing rootstocks

<table>
<thead>
<tr>
<th></th>
<th>Sweet Lorenz®</th>
<th>Celeste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (g)</td>
<td>13,7</td>
<td>11,1</td>
</tr>
<tr>
<td>Durofel</td>
<td>63</td>
<td>55</td>
</tr>
<tr>
<td>Firmness (kg)</td>
<td>0,54</td>
<td>0,39</td>
</tr>
<tr>
<td>Sugar content (*Brix)</td>
<td>19,1</td>
<td>17,3</td>
</tr>
<tr>
<td>Acidity (g/l)</td>
<td>8,9</td>
<td>6,1</td>
</tr>
</tbody>
</table>

Mean values 2015-2018
Sweet Gabriel® PA3UNIBO*

Origin: University of Bologna, Italy.
Breeders: S. Lugli, R. Correale and M. Grandi.
Parentage unknown.
Tested as DCABO A1C40;

VARIETY STRENGTHS:
• Comes into 1st production early
• At full production, very good & constant yields: 18 – 20 t/ha in MDP & HDP
• Uniform maturation
• Very good fruit size & even distribution (40% > 30 mm caliber)
• Excellent flesh consistency & good organoleptic traits
• Excellent on-tree fruit durability (harvest window ≈ 12 -14 days)

VARIETY WEAKNESSES:
• Medium-high susceptibility to cracking

NOTES:
• Not self-fertile (S1S4). Recommended pollinators: Sweet Aryana® & Sweet Lorenz®
• Good adaptability to different training systems. Promising first results in VHDP

<table>
<thead>
<tr>
<th></th>
<th>Sweet Gabriel®</th>
<th>Giorgia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (g)</td>
<td>13,7</td>
<td>10,3</td>
</tr>
<tr>
<td>Durofel</td>
<td>60</td>
<td>65</td>
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<tr>
<td>Firmness (kg)</td>
<td>0,45</td>
<td>0,43</td>
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<tr>
<td>Sugar content (*Brix)</td>
<td>17,6</td>
<td>16,8</td>
</tr>
<tr>
<td>Acidity (g/l)</td>
<td>10,9</td>
<td>9,9</td>
</tr>
</tbody>
</table>

Mean values 2015-2018
Sweet Valina® PA4UNIBO*

Origin: University of Bologna, Italy.
Breeders: S. Lugli, R. Correale and M. Grandi.
Parentage unknown.
Tested as DCABO B5D23;

+18-20 Burlat*
* Vignola area

VARIETY STRENGTHS:
• Good and constant yields: 12 -14 t/ha in MDP
• Uniform maturation
• Very good fruit size & even distribution (40% > 30 mm caliber)
• Excellent organoleptic quality
• Good fruit durability on the tree (harvest window ≈ 10 days)

VARIETY WEAKNESSES:
• Higher susceptibility to cracking
• Tends to yield smaller fruits on vigourous rootstocks

NOTES:
• Not self-fertile (S3S4). Recommended pollinators: Sweet Gabriel® & Sweet Saretta®
• Good adaptability to different training systems. Promising first results in VHDP

<table>
<thead>
<tr>
<th></th>
<th>Sweet Valina®</th>
<th>Giorgia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (g)</td>
<td>15,9</td>
<td>10,3</td>
</tr>
<tr>
<td>Durofel</td>
<td>53</td>
<td>65</td>
</tr>
<tr>
<td>Firmness (kg)</td>
<td>0,38</td>
<td>0,43</td>
</tr>
<tr>
<td>Sugar content (°Brix)</td>
<td>17,6</td>
<td>16,8</td>
</tr>
<tr>
<td>Acidity (g/l)</td>
<td>9,0</td>
<td>9,9</td>
</tr>
</tbody>
</table>

Mean values 2015-2018
Sweet Saretta® PA5UNIBO*

Origin: University of Bologna, Italy.
Breeders: S. Lugli, R. Correale and M. Grandi.
Parentage unknown.
Tested as DCABO B5A87;
EU PVR 48929/2018; USPP 25,981; 13 Oct. 2015.

+ 22-24 Burlat*
* Vignola area

VARIETY STRENGTHS:
• Auto-fertile (S3S4')
• Comes into 1st production early
• Good and constant yields: 15 t/ha in MDP & HDP
• Uniform maturation
• Very good fruit size & even distribution (50% > 30 mm caliber)
• Excellent flesh consistency & excellent organoleptic quality
• Good fruit durability on the tree (harvest window ≈ 10 days)

VARIETY WEAKNESSES:
• Higher susceptibility to cracking

NOTES:
• Good adaptability to different training systems including VHDP

<table>
<thead>
<tr>
<th></th>
<th>Sweet Saretta®</th>
<th>Lapins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (g)</td>
<td>14,3</td>
<td>10,7</td>
</tr>
<tr>
<td>Durofel</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td>Firmness (kg)</td>
<td>0,42</td>
<td>0,40</td>
</tr>
<tr>
<td>Sugar content (*Brix)</td>
<td>17,2</td>
<td>15,1</td>
</tr>
<tr>
<td>Acidity (g/l)</td>
<td>10,8</td>
<td>8,5</td>
</tr>
</tbody>
</table>

Mean values 2015-2018
Sweet Stephany® PA7UNIBO*

Origin: University of Bologna, Italy.
Breeders: S. Lugli, R. Correale and M. Grandi.
Parentage unknown.
Tested as DCABO B5A89; DOM. EU PVR 2015/2594 (pending); USPP 25,972; 6 Oct. 2015.

VARIETY STRENGTHS:
• Auto-fertile (S3S4*)
• Comes into 1st production early
• Good and constant yields
• Uniform maturation
• Very good fruit size & even distribution (50% > 30 mm caliber)
• Excellent flesh consistency & excellent organoleptic quality
• Good fruit durability on tree (harvest window ≈ 10 days)

VARIETY WEAKNESSES:
• Higher susceptibility to cracking

NOTES:
• Good adaptability to different training systems MDP & HDP, testing on-going for VHDP

<table>
<thead>
<tr>
<th></th>
<th>Sweet Stephany®</th>
<th>Lapins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (g)</td>
<td>14,0</td>
<td>10,7</td>
</tr>
<tr>
<td>Durofel</td>
<td>58</td>
<td>54</td>
</tr>
<tr>
<td>Firmness (kg)</td>
<td>0,45</td>
<td>0,40</td>
</tr>
<tr>
<td>Sugar content (*Brix)</td>
<td>18,7</td>
<td>15,1</td>
</tr>
<tr>
<td>Acidity (g/l)</td>
<td>11,5</td>
<td>8,5</td>
</tr>
</tbody>
</table>

Mean values 2015-2018

* Vignola area
Marysa® PA6UNIBO®

Origin: University of Bologna, Italy.
Breeders: S. Lugli, R. Correale and M. Grandi.
Parentage unknown.
Tested as DCA BO B5D20;
DOM. EU PVR 2014/2270; USPP 15/330,470 18 Sett 2018

+ 8-10 Burlat*
* Vignola area

VARIETY STRENGTHS:
• Auto-fertile (allelic profile S3S4')
• Comes into production early
• High and constant yields: 16 -18 t/ha in MDP and HDP
• Uniform maturation
• Very good fruit size & even distribution (50-60% >30mm caliber) with long peduncle
• Excellent flesh consistency & excellent organoleptic quality
• Good fruit durability on tree (harvest window ≈ 8 -10 days)
• Intermediate susceptibility to cracking

VARIETY WEAKNESSES:
• Medium flesh firmness
• Taste can tend to be slightly acidic

NOTES:
• Very easy to manage in different types of training systems

<table>
<thead>
<tr>
<th></th>
<th>Marysa®</th>
<th>Celeste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (g)</td>
<td>13,1</td>
<td>11,1</td>
</tr>
<tr>
<td>Durofel</td>
<td>53</td>
<td>55</td>
</tr>
<tr>
<td>Firmness (kg)</td>
<td>0,46</td>
<td>0,39</td>
</tr>
<tr>
<td>Sugar content (°Brix)</td>
<td>16,8</td>
<td>17,3</td>
</tr>
<tr>
<td>Acidity (g/l)</td>
<td>9,5</td>
<td>6,1</td>
</tr>
</tbody>
</table>

Mean values 2015-2018
GLOBAL FOOTPRINT
OF LATEST UNIBO CHERRY VARIETIES

- Global partnerships in licensing contracts, test agreements, negotiation, protection & quarantine activities
- Sweet material managed by UNIBO in centrally housed offices of KTO
- KTO in collaboration with DISTAL manages all protection & exploitation activities of all UNIBO plant material with partners in Italy, Europe and the rest of the world
CHERRY BREEDING PROGRAM CONTINUES...
Thank you for your attention
Barbara Novak
Knowledge Transfer Office (KTO)
barbaramila.novak3@unibo.it;
kto@unibo.it