Maintenance of cherry quality by innovative postharvest treatments

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<td>① The <em>Prunus</em> Sweet cherry</td>
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<td>② <em>Postharvest Treatments</em></td>
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Importance Sweet Cherry Production

Top 15 Countries

Tons x 1000

Source FAO (2009)

Turkey United States Iran Italy Spain Syria Russia Romania Uzbekistan Chile France Ukraine Poland Greece Germany

120000 t
Ripening of Sweet Cherry. On Tree

Introduction

BLOOM

Bloom

Cell division

Cell enlargement

Maturation

Ripening Senescence

Fruit Growth

Color a*

Ethylene Non climacteric

① Ripening of Sweet Cherry. On Tree
Ripening of Sweet Cherry. At Harvest

Introduction

Material & Methods

Results & Discussion

Conclusions

- Texture
- Soluble Solids
- Flavor & Aroma
- Acidity
- Color

Fruit Quality

Introduction

Ripening of Sweet Cherry. At Harvest

Material & Methods

Results & Discussion

Conclusions

- Texture
- Soluble Solids
- Flavor & Aroma
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- Color

Fruit Quality
Ripening of Sweet Cherry. At Harvest

Introduction:

Material & Methods:

Results & Discussion:

Conclusions:
Ripening of Sweet Cherry. At Harvest

**Anthocyanins**

1. Cyanidin 3-glucoside
2. Cyanidin 3-rutinoside
3. Pelargonidin 3-rutinoside

HPLC-DAD
Postharvest Sweet Cherry. Losses

Harvest: **ENDS** nutrient intake, acceleration of **RIPENING** and irreversible loss of **QUALITY**.

- Respiration
- Transpiration
- Sugars
- Firmness
- Colour
- Taste
- Aroma
- Acidity
- Vitamins
- Nutrients
- Fiber
- Polyphenols
- Anthocyanins
- Carotenes

CRACKING  DECAY  STEM DEHYDRATION
Postharvest Sweet Cherry Losses

Introduction

Material & Methods

Results & Discussion

Conclusions

Sonata

<table>
<thead>
<tr>
<th>Days at 2°C</th>
<th>Firmness (N mm⁻¹)</th>
<th>Weight Loss (%)</th>
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<tbody>
<tr>
<td>0</td>
<td></td>
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<tr>
<td>4</td>
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<tr>
<td>8</td>
<td></td>
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<td>12</td>
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<tr>
<td>16</td>
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</tbody>
</table>

Days at 2°C

Firmness (N mm⁻¹)

Weight Loss (%)
**Postharvest Sweet Cherry. Losses**

**Introduction**

Natural Compounds

Acting Low

Role in Plant Defense

Mechanism

Signal Molecules in Plant Stress Responses

Innovative: Never used in Sweet Cherry

SALICYLIC ACID

ACETYLSALICYLIC ACID

OXALIC ACID

Endogenous concentration is considered as a natural antioxidant: Suppressing Lipid Peroxidation

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**Material & Methods**

**Results & Discussion**

**Conclusions**
Objectives

1. To Determine the Effect of Several Natural Compounds on Sweet Cherry
2. To Analyse the Impact of the Treatments on Quality Attributes during Storage
3. To Establish the Shelf Life Period based on Overall Quality Parameters in Control and Treated Cherries
Plant Material: Peach and Sweet Cherry

Cristalina

Prime Giant
Experimental Design

- **Harvesting**: 1020 Cherries
- **Selection Lots**: Cherries 21 Lots
- **Treatments**: Control, OA 1 mM, SA 1 mM, ASA 1 mM
- **Storage 2°C**: Cherries 0, 5, 10, 15 & 20 Days
- **Analysis**: Firmness, Colour, Soluble Solids, Acidity, Visual Aspect
Results and Discussion

COLOR

<table>
<thead>
<tr>
<th>Day 0</th>
<th>Day 10</th>
<th>Control</th>
<th>SA</th>
<th>ASA</th>
<th>OA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color (Chroma Index)</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Cristalina, LSD=0.13</td>
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<td></td>
<td></td>
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<tr>
<td>Prime Giant, LSD=0.27</td>
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</tbody>
</table>

FIRMNESS

<table>
<thead>
<tr>
<th>Day 0</th>
<th>Day 10</th>
<th>Control</th>
<th>SA</th>
<th>ASA</th>
<th>OA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit Firmness (N mm⁻¹)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Cristalina, LSD=0.03</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Prime Giant, LSD=0.03</td>
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</tbody>
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After 20 Days at 2°C
4 Results and Discussion

ACIDITY

SOLUBLE SOLIDS

Results and Discussion

1.0 Cristalina, LSD=0.01
1.0 Prime Giant, LSD=0.01

Total Soluble Solids (g 100 g$^{-1}$)

<table>
<thead>
<tr>
<th></th>
<th>Day 0</th>
<th>Day 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>SA</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>ASA</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>OA</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

Total Acidity (g 100 g$^{-1}$)

<table>
<thead>
<tr>
<th></th>
<th>Day 0</th>
<th>Day 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>SA</td>
<td>0.4</td>
<td>0.4</td>
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<tr>
<td>ASA</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>OA</td>
<td>0.8</td>
<td>0.8</td>
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After 20 Days at 2°C

Cristalina, LSD=0.35
Prime Giant, LSD=0.34
After 20 Days at 2°C

**Control**

**Oxalic Acid 1mM**

**Salicylic Acid 1mM**

**Acetyl S Acid 1mM**

After 10 Days at 2°C
Conclusions

1. This is the First Time in Which the Natural-Occurring Compounds Oxalic Acid, Salicylic Acid and Acetyl Salicylic Acid Can Modulate the Postharvest Behaviour of Sweet Cherries

2. There was a significant reduction of ripening process on postharvest storage: Softening, Colour changes, Increase in TSS and decrease in TA

3. Shelf-Life for Control Cherries was 10 days and Increased up to 20 Days in Treated Sweet Cherries
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THANKS FOR YOUR ATTENTION

Questions Welcome