Sour cherry breeding activities in Turkey

Prof. Dr. Sezai Ercisli

Ataturk University Agricultural Faculty
Department of Horticulture
25240 Erzurum-Turkey
WORLD SOUR CHERRY PRODUCTION (2011)

Production

1- Turkey 183.000
2- Poland 175.000
3- Ukraina 173.000
4- USA 106.000

Russian Federation????
Iran??????
SOUR CHERRY AND ANATOLIA

Sour cherries have a large history in Turkey’s fruit growing

It is famous traditional fruit

The most preferred fruits for jam making
SOUR CHERRY UTILIZATION AND BREEDING GOALS

EUROPE

Processing

TURKEY

Processing, Fresh market
SOUR CHERRY

- Leader country in term of production amount
- Rich wild and semi-wild materials throughout country
- The most demanded fruit in juice and jam industry in Turkey
- Monoculture (cv. Kutahya, 90%), Montmorency (6%), (Macar, Katirli, English Morello, Heimanns Rubin)
<table>
<thead>
<tr>
<th>Cultivars</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kutahya</td>
<td>Late harvested cultivar, bright dark red peel color, sour, high juice yield, Dark red fruit juice, firm fruit flesh, very high fruit quality, high yielding capacity, cracking resistance, suitable both fresh and processing, stable fruit set, tolerance to biotic and abiotic stress, late blooming</td>
</tr>
<tr>
<td>Montmorency</td>
<td>Earlier than Kutahya (15 days), Ligt red or red peel color with dark red spots, soft fruit flesh, yellowish-pink, high quality, sour, pink fruit juice. High yielding capacity, cracking resistance</td>
</tr>
<tr>
<td>H. Rubin</td>
<td>Earlier than Kutahya (5 days), dark red peel color, high juice yield, dark red flesh color, soft flesh, high yielding capacity and suitable for processing</td>
</tr>
<tr>
<td>E. Morello</td>
<td>Dark red-blackish peel color, dark red flesh color, firm flesh, dark red juice color</td>
</tr>
<tr>
<td>Macar (Ujfehertoi fürtös???)</td>
<td>2 weeks earlier than Kutahya, dark red peel color, soft fruit flesh, sour, high juice yield, suitable for juice processing</td>
</tr>
<tr>
<td>Katirli</td>
<td>Late harvested cultivar, bright dark red peel, sour, aromatic dark red fruit juice, soft fruit flesh, very high quality, very high yielding capacity, suitable for industry</td>
</tr>
</tbody>
</table>
SOUR CHERRY

• ONE CULTIVAR GROWN SUCCESSFULLY DIVERSE AGRO-CLIMATIC CONDITIONS ??? WHY???

• High adaptation capacity to diverse agro-climatic conditions
• Availability of different rootstocks (P. avium, P. mahaleb, P. cerasus)
• Tolerance to biotic and abiotic stress conditions
<table>
<thead>
<tr>
<th>Rootstocks</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>P. mahaleb</em></td>
<td>The most used rootstocks for sour cherries, seed propagated mainly, preferred for sandy and calcareous soils, sensitive to wet and heavy soils, lower plant height than <em>P. avium</em>, less living period (around 20 years)</td>
</tr>
<tr>
<td><em>P. avium</em></td>
<td>Strong rootstock for sour cherries, used for relatively heavy soils for sour cherries, seed propagated in general, prolonged life span.</td>
</tr>
<tr>
<td><em>P. cerasus</em></td>
<td>Resistant to drought, propagated by seeds and suckers, more tolerant to wet and heavy soils than <em>P. mahaleb</em> and <em>P. avium</em>, weak soil connection.</td>
</tr>
</tbody>
</table>
Main sour cherry production areas in Turkey

Afyon: 50,000; Ankara: 30,000; Konya: 27,000 tons
cv. Kutahya
- Selection material among natural growing plants
- Very late harvest time. Long fruit stalk (50 mm)
- Very attractive round fruit shape and thin peel
- Average 7 g, dark purplish peel and flesh color
- Firm fruit flesh texture
- High eating and processing quality (high fruit juice)
- Trees are very productive
- Resistance to fruit cracking

IT MEETS MOST OF THE DEMANDS OF GROWERS !!!!!!
Suitable for
- Fresh consumption
- Processing (Juice, jam, marmalade...).

IT MEETS MOST OF THE DEMANDS OF GROWERS !!!!!!
BREEDING ACTIVITIES ON SOUR CHERRY IN TURKEY

-‘Kütahya’ cultivar has been grown for centuries in nearly all parts of Turkey.
-Sour cherry breeding efforts based on a) Clonal selection of cv. Kutahya, b) Selection of cultivar candidates among naturally seed propagated unnamed types (semi-wild).
BREEDING ACTIVITIES ON SOUR CHERRY IN TURKEY

a) Clonal selection of cv. Kutahya
MAIN BREEDING GOALS

'Sour cherry breeding usually aims at developing cultivars with

- Improved fruit quality
- A range of ripening dates
SELECTION CRITERIA

- High and sustainable yield
- High flesh ratio
- High juice yield
- Better juice color
- Better organoleptic properties
- Better soluble solids/acid ratio for processing (8.5-9.0)
- High fruit size
- Attractiveness

cv. Kutahya
CLONAL SELECTION ON cv. Kutahya SOUR CHERRY

-Many clones of ‘Kütahya’ were evaluated, under National Sour Cherry Selection Program and adaptation trials

-Phonological and pomological characteristics of ‘Kütahya’ sour cherry clones were evaluated

-No big differences among clones under same collections

-Huge environmental effects (Soil, Rootstocks etc.)
b) Selection of cultivar candidates among naturally seed propagated unnamed types (semi-wild).
b) Numerous selections on semi wild growing sour cherries grown different parts of Turkey

Some promising genotypes but not replaced to cv. Kutahya

No governmental program for evaluation
In selection study on natural seed propagated material, sour cherry genotypes were selected from the population consisting of native seedling trees.

Some physical and chemical traits of 30 promising genotypes were described in comparison with the standard cultivar Kutahya for future breeding efforts.
They had a range of 2.01 to 5.19 g in fruit weight; 39.8-92.4 mm in fruit stalk length, 0.22-0.53 g in seed weight, 1.28-2.95% in acidity and 11.0-20.1% in soluble solid contents.

The percentage of fruit cracking was 0% in all genotypes.

The majority of genotypes had light-dark colored fruit skins, red colored fruit fleshes and free separating stones.
THANK YOU VERY MUCH