Sweet Cherry Rootstock Trials in Turkey:

A journey from generative to vegetative rootstocks

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Sweet cherry trees on dwarf and standard rootstocks.

Photo by L.E. Long
SOME FACTS ABOUT SWEET CHERRY IN TURKEY

- Turkey is origin center of sweet cherries
- From 1996, leading country (in terms of production amount and also export level)
- Before 1996, generally high quality fruit being produced with little understanding of sound horticultural principles.
- Turkish growing techniques were very primitive, wages were extremely low, and the problems in the Balkans often disrupted the shipment of cherries from Turkey to Europe
- The big progress had been made after 1996
SOME FACTS ABOUT SWEET CHERRY IN TURKEY

- Good soils, a perfect climate and the fact that sweet cherries are native to this area of Asia Minor means that Turkey has perfect conditions to grow sweet cherries throughout the country.

- Although Turkey is, for the most part, a one variety producer (cv. 0900 Ziraat), their production region extends over such a vast area, through changing climate and elevation, that their production season continues for 60 to 70 days.

- With the introduction of new early varieties from California and late varieties from Canada, the potential is an April through August harvest.
IMPACT OF PRIVATE SECTOR ON DEVELOPMENT
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- Alara Corporation, the largest exporter of fresh cherries in Turkey, controlling 25-30% of the market

- They introduced Gisela series to Turkey and produce planting material as well (cultivars grafting on Gisela series)

- Alara package and export cherries, but they have their own orchards scattered throughout the country that they use for both demonstration and commercial production purposes
One of the advantages that Alara has over its competitors is the fact that they produce their own nursery stock for themselves and their growers.

Alara holds the exclusive license for Gisela in Turkey. Alara sold about 500,000 cherry trees per year, an indication as to how quickly cherry production is expanding in Turkey.

Their biggest customer is the Turkish Ministry of Agriculture. In order to help subsidize these new plantings, the government purchases Gisela rooted trees for $10.00, or mazzard rooted trees for $5.00 and sells them to growers at half price.
IMPACT OF PRIVATE SECTOR ON DEVELOPMENT

- Private sector had big impact on development of sweet cherry sector in Turkey
- In particular they open the way from generative rootstocks to vegetative rootstocks
- There are several big companies that produce rootstocks by using tissue culture techniques
Although still easy to find examples of poor horticultural practices on cherries in Turkey, it is obvious that much progress has been made in the last 20 years.

Over the past few decades, however, several new rootstocks have gained prominence, offering important attributes lacking in ‘Mazzard’ and ‘Mahaleb’ seedlings.
Many of these new semi-dwarfing rootstocks, although reducing tree vigor, may impart some disease resistance, induce precocity, and enable growers to harvest premium-quality fruit from high-density orchards.

Furthermore, full production may now be achieved on these semi-dwarfing rootstocks within five or six years, compared to similar trees on ‘Mazzard’, which may take up to twelve years to reach full production.
In 1996, Turkish scientists were beginning to work on cherry-related issues of importance to the industry but they lacked an associated Extension Service to help disseminate new concepts to the growers.

Horticulture Research Institutes and Alara helps to fill that gap by inviting their growers to corporation-owned orchards where they conduct trainings.

At these trainings growers learn about pest management, proper irrigation practices, the advantages of dwarfing rootstocks and how to train and prune trees.
IMPACT OF PRIVATE SECTOR ON DEVELOPMENT
Until 1980, only seedlings of *P. avium* and *P. mahaleb*

F12/1, Colt and SL64 introduced for research purposes but not gained much importance in commercial orchards

With introduction of Gisela series in 1995, numerous orchards established with Gisela series (Gisela 5 and Gisela 6)
# Sweet Cherry Rootstock Journey in Turkey

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Mazzard seedlings</td>
<td>60-65%</td>
<td>40%</td>
<td>16%</td>
<td>11%</td>
</tr>
<tr>
<td>Mahaleb seedlings</td>
<td>35-40%</td>
<td>30%</td>
<td>20%</td>
<td>13%</td>
</tr>
<tr>
<td>Gisela 5</td>
<td>-</td>
<td>10%</td>
<td>24%</td>
<td>19%</td>
</tr>
<tr>
<td>Gisela 6</td>
<td>-</td>
<td>15%</td>
<td>21%</td>
<td>15%</td>
</tr>
<tr>
<td>MaxMa14</td>
<td>-</td>
<td>2%</td>
<td>7%</td>
<td>15%</td>
</tr>
<tr>
<td>MaxMa60</td>
<td>-</td>
<td>2%</td>
<td>8%</td>
<td>17%</td>
</tr>
<tr>
<td>P-HL C</td>
<td>-</td>
<td>1%</td>
<td>4%</td>
<td>10%</td>
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**SWEET CHERRY ROOTSTOCK JOURNEY IN TURKEY**

<table>
<thead>
<tr>
<th>Rootstocks</th>
<th>Before 1996</th>
<th>1996-2006</th>
<th>2006-2010</th>
<th>2010-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generative</td>
<td>100%</td>
<td>70%</td>
<td>36%</td>
<td>24%</td>
</tr>
<tr>
<td>Vegetative</td>
<td>-</td>
<td>30%</td>
<td>64%</td>
<td>76%</td>
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</table>
# Sweet Cherry Rootstock Journey in Turkey

<table>
<thead>
<tr>
<th>Rootstock</th>
<th>Vigor</th>
<th>Resistance to lime</th>
<th>Resistance to ground water level</th>
<th>Resistance to drought</th>
<th>Planting distance (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gisela 5</td>
<td>x</td>
<td>xxx</td>
<td>xxxx</td>
<td>x</td>
<td>1.5 x 2.5</td>
</tr>
<tr>
<td>Gisela 6</td>
<td>xx</td>
<td>xxx</td>
<td>xxxx</td>
<td>xx</td>
<td>4.5 x 3.5</td>
</tr>
<tr>
<td>CAP 6P</td>
<td>xxx</td>
<td>xxx</td>
<td>xxxxx</td>
<td>xxx</td>
<td>5 x 3</td>
</tr>
<tr>
<td>MaxMa 14</td>
<td>xxx</td>
<td>xxx</td>
<td>xxx</td>
<td>xxx</td>
<td>5 x 4</td>
</tr>
<tr>
<td>MaxMa 60</td>
<td>xxxxx</td>
<td>xxx</td>
<td>xx</td>
<td>xxxxx</td>
<td>5 x 4</td>
</tr>
<tr>
<td>SL64</td>
<td>xxxxx</td>
<td>xxxxx</td>
<td>x</td>
<td>xxxxx</td>
<td>5 x 4.5</td>
</tr>
<tr>
<td>Mazzard</td>
<td>xxxxx</td>
<td>xx</td>
<td>xxxxx</td>
<td>xx</td>
<td>6 x 5</td>
</tr>
</tbody>
</table>
Rootstocks vigor

Kiraz anaçları

Modern kiraz yetiştiriciliğinde kullanılan muhtelif klonal anaçlar ve önemli özellikleri

| MAZZARD (Kuş Kirazı) F12/1 | MAHALEB (İdris) SL64 COLT MaxMa60, Piku1 | MaxMa 14 Cab 6 P | Oblacinska Gisela 6 P-HL A | Gisela 5 P-HL C |
Current situation

- Vigorous sweet cherry rootstocks still common in Turkey’s fruit orchards
- Seedlings of *Prunus mahaleb* L. and *P. avium* L. are the major rootstocks used for sweet cherry production and they are vigorous and difficult to maintain
- *P. mahaleb* seedlings slightly reduce tree growth vigour and mostly perform good in calcareous soils prevalent in a larger part of Turkey
- Compatibility of different sweet cherry cultivars grafted on *P. mahaleb* is unpredictable
Cultivars on Gisela rootstock trained to the Vogel Spindle system

Gisela 5 is the most popular rootstock, but on poorer soils, Gisela 6 is recommended.

When soils are deemed adequately porous, growers are required to choose a Gisela rootstock in any new planting.
A modern “0900 Ziraat’ orchard grown on Gisela 6 rootstock owned by Alara Corporation.
Problems with Gisela series

- They need more nutrients and a drip irrigation system.
- Expensive and not relevant for different soil conditions.
- Incompatibility with scions after 7th years.
Characteristics of rootstocks

1-Mazzard (P. avium seedlings)

- Very strong rootstocks,...late fruit bearing and cultivars grafted on this this rootstock after 2 years of seed sowing...
- Difficult to rooting, good root system
- Good compatible with sweet cherry cultivars
- 5x6 m or 6x7 m planting distance...
- Relevant for heavy soils
- After 7th year normal yield start
- Resistance to root rot
Characteristics of rootstocks

2-Mahaleb (P. mahaleb seedlings)

- Strong rootstocks, 20% percent smaller than mazzard,...late fruit bearing and cultivars grafted on this rootstock after 1 years of seed sowing...
- Difficult to rooting
- Some compatible problems with sweet cherry cultivars
- 4x5 m or 5x6 m planting distance...
- Relevant for calcareous and dry soils
- After 4th or 5th year normal yield start
Characteristics of rootstocks

3-SL 64 (P. mahaleb)

- Semi strong, 20% percent smaller than P. mahaleb seedlings
- Sensitive to heavy soil, high groundwater level,
- Some compatible problems with sweet cherry cultivars
- 5x4 m planting distance.
- Relevant for calcareous and dry soils
- After 4th year normal yield start
- Good root system
Characteristics of rootstocks

3-SL 64 (*P. mahaleb*)
Characteristics of rootstocks

4-CAB 6P

- Semi dwarf-strong growth
- Resistance to heavy soils
- Resistance to root rot
- Better adaptation on lime, drought and heavy soils than Mazzard
- After 3rd year normal yield start
Characteristics of rootstocks

4-CAB 6P
Characteristics of rootstocks

5-MaxMA14

- Semi dwarf
- Earlier cropping
- Resistance to lime soil
- Sensitive to root rot in heavy soils
- After 3<sup>rd</sup> year normal yield start
Characteristics of rootstocks

6-MaxMA60

- Semi dwarf-strong growth
- Earlier cropping and fast growth than mahaleb
- Resistance to lime soil
- Sensitive to root rot in heavy soils
- After 4th year normal yield start
Characteristics of rootstocks

MaxMA
Characteristics of rootstocks

7-PHL-C

- Dwarf-growth
- Semi resistance to lime soil
- Resistance to ground water
- Sensitive to root rot in heavy soils
- After 2\textsuperscript{nd} and 3\textsuperscript{rd} year normal yield start
- Relevant for Turkey’s condition
Characteristics of rootstocks

PHL-C
Characteristics of rootstocks

8-Gisela 5

- Dwarf-growth
- Sensitive to drought, heavy soils, high groundwater level
- After 2\textsuperscript{nd} and 3\textsuperscript{rd} year normal yield start
- High fruit set and small fruits with self-compatible cultivars (Sweet Heart, Lapins, Chelan)
Characteristics of rootstocks

9-Gisela 6

- Semi Dwarf-growth
- Better resistance to drought than Gisela 5
- Sensitive to heavy soils
- After 3rd and 4th year normal yield start
Characteristics of rootstocks

Gisela series
THANK YOU FOR YOUR PATIENCE