Pear growing in Holland

Anton Jongerius, Fruitconsult
Fruitconsult:

- Privat consulting organization
- Consulting in apple, pears, cherries and plums
- 10 consultants
  - 7 technical fruit management
  - 3 crop protection
- Main area: Holland + Belgium
  - Around 350 fruit growers
- Others: Germany, Italy, Poland, Turkey, England, etc..
• Fruitconsult:
• Total management of the research centre in Holland: Proeftuin Randwijk

• Partnership in Proeftuin Randwijk:
  ➢ PPO => Wageningen University
  ➢ NFO => Dutch Fruitgrowers Association
  ➢ CAF => Cooperative Fruitconsulting
Introduction

Anton Jongerius:
• Former pear grower in South West of Holland
• Consulting for ten years
• Main activities:
  ➢ Sweet Sensation consulting
  ➢ Pear study club
Overview Holland and Belgium

Area:
• Around 15,000 ha
• Last 10 years ± 2000 ha

Production
• 500,000 – 600,000 ton
Overview Holland and Belgium

Varieties

- 80 - 90% Conference
- 5% Doyenné du Comice
- 5% Beurré Alexandre Lucas, Durondeau
- 5% Other varieties
- No Condo, Abate Fétel, Packhams, Williams
New Varieties in Practice

Sweet Sensation

Xenia

Migo
New Varieties in trials Proeftuin Randwijk
New Varieties in trials Proeftuin Randwijk

Red blushed varieties: Celina, Gräfin Gepa, Lowry 1 and 2, Thimo, Regal Red, etc

Migo (Cepuna): new club variety (EFC)
Planting Systems

Traditional Spindle (3.25 x 1.25m)

- 2500 trees/ha
- Normally with table (with wires)
- Table branches shoot grow above horizontal
  - 45° is a nice angle
- Trunk is slender with young fruiting wood
- Normally we plant 2-year-old tree from the nursery
- Sometimes 3-year-old tree for extra volume
Planting systems

V-system (3,25 x 1,0 Meter)

- 3,000 trees / ha
- 4 dominant leaders, 50cm space per leader
- 12,000 leaders / ha
- In the first years with table top for extra production volume
- Normally we plant 2-year-old tree from the nursery
- After 3-5 years the tree volume have to be full
Planting systems

Mini Spindle tree (3,0 x 0,8 – 1,0 Meter)

- 3.300-4.200 trees / ha
- Same as traditional spindle system, however more slender
- Normally we plant 2-year-old tree from the nursery
  - Knip tree or run trough tree
- Normally in 2 years the tree volume it full
Planting systems

Super Spindle tree (2,80-3,00 x 0,5-0,6m)
- 5,500-7,200 trees / ha
- Only a trunk with young and slender wood
- Trees volume is full in 1-2 years

Only possible with rootstocks:
- Quince C, Adams, Q-Eline
Double leader system (3,25 x 1,0 m)

- 3,000 trees / ha
- One trunk with 2 leaders
- In the first years with table top for extra production volume
- Normally we plant 2-year-old tree from the nursery
- After 3-4 years the tree volume have to be full
## Benefits and difficulties

<table>
<thead>
<tr>
<th>Spindle</th>
<th>V-system</th>
<th>Superspindle</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ low investment costs</td>
<td>+ easy working</td>
<td>+ High and early productions</td>
</tr>
<tr>
<td>+ Growth regulation</td>
<td>+ more light reception</td>
<td>+ easy working</td>
</tr>
<tr>
<td>- Production in first years</td>
<td>+ Growth regulation</td>
<td>- Growth regulation</td>
</tr>
<tr>
<td>- Pruning with unschooled labor is more difficult</td>
<td>- Production in first years</td>
<td>- High investment costs</td>
</tr>
<tr>
<td></td>
<td>- Hand thinning</td>
<td>- Light reception in the bottom part</td>
</tr>
<tr>
<td></td>
<td>- Quality planting trees is critical</td>
<td>- Chance to make mistakes</td>
</tr>
</tbody>
</table>
Last 10 years around 2000 ha intensive systems were planted

- All systems are good, however the system have to suit to the type of the grower

- The quality of the planting trees is even more important
Developments in pear rootstocks
Pear rootstocks - current situation

- Traditionally 80% Quince MC
- Quince MC weakest rootstock
- Quince Adams a bit stronger, however no negative effect on production
Pear Rootstocks – current situation

• Current Advice:
  – Quince MC => okay, when everything is perfect:
    ➢ Soil quality and soil conditions
    ➢ Availability of water
  – Quince Adams => always good, preferable with:
    ➢ Replanted soil
    ➢ Less quality of soil
    ➢ Low availability of water
    ➢ 15-20% stronger compared to Quince MC

Resperation of pears is 100% higher compared to apples!!!!!
Introduction Q-Eline new pear rootstock

• Introduced by tree nursery Fleuren
• 2000 – 2010, Fleuren made Q-Eline virus free and got the plant breeders rights
• Goal: 2,5 – 3 miljoen rootstocks per year
• Introduced in 2013 as Q-Eline
Experiences with Q-Eline on Conference

• In trials on Proeftuin Randwijk since 2009
• February 2012: heavy frost in Holland till -25°C
• Half of the trial the rootstocks were covered
• Half of the trial the rootstocks were not covered
Frost resistance

Quince MC

Q-Eline
Frost resistance

Kwee MC  Kwee Adams  Kwee MH  Kwee Eline  Kwee C132

Onderstam **niet** afgedekt met champost gedurende winter 2011-2012 (foto's 11 september 2012)

Onderstam **wel** afgedekt met champost gedurende winter 2011-2012 (foto's 11 september 2012)
<table>
<thead>
<tr>
<th>Onderstam</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>Cumulatief</th>
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<tbody>
<tr>
<td>Kwee Adams</td>
<td>6,7</td>
<td>11,9</td>
<td>9,4</td>
<td>19,5</td>
<td>24,0</td>
<td>14,4</td>
<td>85,9</td>
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<tr>
<td>Kwee Eline®</td>
<td>6,0</td>
<td>14,7</td>
<td>7,9</td>
<td>21,4</td>
<td>23,4</td>
<td>13,2</td>
<td>86,6</td>
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<tr>
<td>Kwee MC</td>
<td>6,7</td>
<td>12,6</td>
<td>9,2</td>
<td>19,9</td>
<td>22,6</td>
<td>15,7</td>
<td>86,6</td>
</tr>
</tbody>
</table>

* Plantjaar 2009; 2856 bomen per beplante hectare
Tabel 6. Gemiddeld vruchtgewicht 2010 t/m 2015

<table>
<thead>
<tr>
<th>Onderstam</th>
<th>2010 t/m 2013</th>
<th>2014</th>
<th>2015</th>
<th>2010 t/m 2015</th>
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<tbody>
<tr>
<td>Kwee Adams</td>
<td>213</td>
<td>206</td>
<td>224</td>
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<td>Kwee Eline®</td>
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<td>212</td>
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<tr>
<td>Kwee MC</td>
<td>212</td>
<td>210</td>
<td>213</td>
<td>212</td>
</tr>
</tbody>
</table>
Skin quality Q-Eline
Skin quality trial Q-Eline
Skin quality
Q-Eline op Proeftuin Randwijk 2016

- Since 2009 trials with Q-Eline on Conference

- Since 2015 trials with Q-Eline on other varieties Lukas, Xenia, Migo, Sweet Sensation etc.
Future

- Q-Eline is very interesting new rootstock
- In Dutch nurseries 70% of the new rootstocks is Q-Eline
- Keep in mind Q-Eline on Conference is another type of Conference pear => smoother
Planting time: Plant always in warm soil
12-13°C

Above the soil: Warm
Under the soil: Cold
More problems with blind wood, when soil is too cold
More regrowth
Soil temperature $> 12 \, ^\circ C$
Roots 2 days in water for water uptake
Planting 5-7l of potting soil
Rootstocks cover with manure (mushroom compost)
• Moisture management
• Fertilisation

Resperation of pears is 100% higher compared to apples!!!!!
More growth
More growth
More flowerbuds at the end
Big amount of cluster leaves
More production
Flowerbuds straight to the trunk will not give fruit set: no cluster leaves
Pruning
Big amount of light in the trees
Young wood gives the best quality
Goal:
In every system we need young wood for high production and top quality
Wrong:
Old wood gives only vegetative growth
no light, bad production
Wrong:
Old wood gives only vegative growth
no light, bad production
Wrong:
Old wood gives only vegative growth
no light, bad production
Vital Wood
• Big
• Long

Weak Wood
• Small
• Short
Remove heavy old branches from the top and bottom part (table top)
Tree pruning

- Important rule: 2:1 rule

- Branches in the top should not be bigger than half of the trunk
Prune always on stumps of 0.5 – 1 cm
Shoots without end flowers
Shoot with end flower
A lot of cluster leaves during flowering give more fruit set
Never cut back on a flower bud
It gives heavy fruit set, however...
No flowerbuds for next year
Prune always through the 1-year old wood, on a leaf bud.
Growth on the end of the branch will be stimulated by click pruning.
Heavy growth on the end of the branche, gives less growth on the rest of the branche
Growth regulation by Root pruning
- Start in time when growth is too vigorous
- Sometimes already in the second year
- Balance in the trees is most important
Rootpruning

Moments:

• In winter (6 weeks after harvest till 6 weeks before flowering)

• In summer (6-8 weeks after flowering), when growth is heavy and productions is low
  
  ➢ Availability of water is crucial in the summer
Root pruning mit straight knife
Not straight, but with angled knife
With angled knife, more balance in the tree
Rootpruning

• Better to root prune 45 - 50 cm from the trunk with angled knife, than 30 - 35 cm with a straight knife

• Important
  – N shoot be avaible
  – Water shoot be available and checked 2 times per week
  – Check the growth and leaf conditions
A lot of flowers and too less growth => No root pruning necessary
Be careful with root pruning, when water is not enough available!

Resperation of pears is 100% higher compared to apples!!!!!!
Pollination in pears

Pollination is it necessary??

• Depends on variety
• However for all varieties, good pollination:
  • better quality
  • Pollination is important
Pollination in pears

- Minimum 2 good bee hives per ha
- Extra wild bees??
- Extra pollen??
Trials with mechanical pollination

- Mechanical Pollination => rebuild machine normally used in Kiwi growing
- 60-100gr Pollen from USA or South Korea
- A lot of trials, is it useful??
Goal:
Big, Green,
Light bronzed
Conference pears
Goal:

- 275,000 - 300,000 Conference pears per ha
- 55 - 65 ton/ha with 5.5 - 5 fruits per kg
Good luck!!