Fruitconsult - www.fruitconsult.com
- Dutch consulting company
- Based in Randwijk, Netherlands
- 7 advisors
  - pip- and stone fruits
  - different specialists
    - nutrition/irrigation
    - plant management
    - plant protection

Fruitconsult - www.fruitconsult.com
- Working area
  - Holland
  - Belgium
  - Germany
  - Scandinavia
  - Poland
  - Tsjechien
  - Hungary
  - Italy
  - United Kingdom

Pip fruit industry in Holland
- 1500 professional growers
  # family run businesses
- 17,000 ha pip fruit
- Average farm size 11 ha
  - number of growers decreases
  - average farm size increases quite fast

Pip fruit industry in Holland
- mainly situated on river or sea sediments (high pH - clays soils)
- 700-900 mm rainfall/yr
- moderate climate
- 5 main areas
  - Betuwe (Tiel/Geldermalsen)
  - Utrecht
  - Zeeland (Goes)
  - Noord Holland (Hoorn)
  - Zuid Limburg (Maastricht)

Apple industry in Holland
1990: 20,000 ha
2010: 8,500 ha

Average production level:
1990: 34,000 kg/ha
2009: 45,000 kg/ha
Upper 10%: 60-65,000 kg/ha
Development in apple varieties in NI
- Elstar 40% of production
- Jonagold 30%
- Golden delicious 6%
- Boskoop 6%
- Cox’s, Delcorf etc 8%
- New varieties
  - Kanzi 400 ha
  - Rubens 150 ha
  - Junami 400 ha
  - Wellant 100 ha
  - Pinova – Evelina
  - Topaz – Evita
  - Maribelle

Club varieties
- Strong tendency to club varieties
- 2009 -> 1000 ha = 12-13%
- In 2009 10,000 tonnes premium quality of different club varieties
  - Average prices including packing and packing material € 1.20 – 1.30
  - Growers prices €0.45 – 0.60
  (traditional varieties € 0.25 – 0.35)

Club varieties
- only superior quality is sold
- apples with minor deficiencies:
  <45% colour, light hail damage etc
  -> industry
  - High and early production in order to keep the investment down
  - Tree training etc has to be focused at 85-95% suitable for top quality label
    - open tree + balanced growth + optimum fruit number
  - Hail netting is getting inevitable
  - 3-5 x picking in order to create a very even quality

Development in varieties in EU
- Cripps Pink/Pink Lady (Lady Williams x Golden delicious)
  - Rosy Glow
- Nicoter/Kanzi (Gala x Breslum)
- Modi (Liberty x Gala)
- Civni/Rubens (Gala x Elstar)
  - Civni Red
- Milwa/Junami (Idared x Maigold) x Elstar
- Wellant ((5544-220 x Elstar) x Elise)
- Pinova (Clivia x Golden)
  - Evelina

Development in varieties in EU
- Topaz (Rubin x Vanda)
  - Evita
- Honeycrisp (Macoun x Honey Gold)
- Cameo (Golden delicious x Red delicious?)
- Jazz (Gala x Breslum)
Pear industry in Holland
1999: 6,000 ha
2010: 8,000 ha

Average production level
1999: 27,000 kg/ha
2009: 42,000 kg/ha
Upper 10% average production
55-60,000 kg/ha

Development in pear varieties in NL
- Conference 75% of production
- Comice 10%
- Gieser Wildeman 4%
- Beurre Alexandre Lucas 4%

New varieties
- Sweet Sensation (Red Comice) 100 ha
- Xenia (Noiabriskaja) 15 ha
- Gold Sensation (Uta)
- Elliot/Selena

Succesfull apple production
- Early productions of good quality
  - yr 2: 25-30 tonnes
  - yr 3: 40-45 tonnes
  - yr 4: 50-55 tonnes
  - yr 5: 55-60 tonnes
- apples: 3000-4500 trees/ha
- pears: 3000-7000 trees/ha
- good quality planting material (well-feathered)
  - > 15 mm² at 10 cm above union
  - 6-8 feathers that are well in balance with leader

Succesfull apple production
- Early and high production
  - virgin soil <-> replant soils
  - before planting -> correction based on soil test
  - replant -> use of potting compost + manure
  - planting when soil temperature higher than 12°C
  - drip irrigation + nutrition (fertigation)
- Plant volume!!
  - Relative high number of trees
  - apples -> table top system
  - pears -> V-system
  - -> table top
  - -> super spindle
Conditions of planting

- Colder climate
  - Planting when soil temperature >12°C
  - Better start
  - More 1 yr shoots with flowerbuds
  - Less bare wood
  - More production in 2nd leaf
- Warm climate
  - Take care of enough chilling units
  - Store trees first 4–6 weeks at 4°C
  - 48 hours roots in containers with water + immediate watering after planting
  - Planting under good conditions (early spring)

Planting year: much growth, but divided over many (light) shoots

Very consequent tree training

- Within table top 6–8 lightest branches are kept
  - Towards 4th/5th leaf down to 4 branches
- Leader well garnished with young wood
  - Older wood removed
  - 1 yr old wood without flower bud removed
  - No bending of wood on leader
  - Window above table top
- Winter height at 2.7 metres with cut through 1 yr wood
- Branches are light and slender with growth at end
Colour and numbers of fruit/tree

Rubens 2nd leaf

Rubens 75 fruits/tree

Rubens 4th leaf

Much wood = Much fruit
Less wood = More quality

Chemical thinning in 2nd leaf is important

Picture of Elstar in 3rd leaf

< no ATS in previous yr; ATS in previous yr ->

Rubens 2nd leaf

75 fruits/tr
100 fruits/tr
125 fruits/tr

Rubens 4th leaf (90 cm tree space)

Quality and thinning starts with pruning
- Shadow
- Much thinning labour
- Poor quality (colour and size)
Only 1yr and 2yr wood on the leader and 'window' above table-top.

Branches table-top slender as well. Often too much wood in table top. => outside is nice, but inside…….

Allowing heavy side branches on branches leads to bare wood and more problems with colouring.

Proper pruning gives: Shorter wood + more flowerbuds directly on the branches (better colouring).

Slender branches => more quality.
Junami in 4th leaf

Consequent pruning -> proper growth control
- rootstock M9 (T337 or Fleuren 56)
  - # union 20-25 cm above ground
- consequent pruning
- remove heavy wood
- remove unfinished shoots
- controlled water stress
- root pruning
- limited use of Regalis (only on apples)

Good monitoring
- Soil samples before planting
- monitoring soil humidity with watermark tensiometres
- monitoring nitrogen content in soil
- 2x per yr leaf sampling

Consequent pruning
- removal of heavy wood
- removal of unfinished shoots
- controlled water stress
- root pruning
- limited use of Regalis (only on apples)

Root pruning
- Mostly in winter period
- Under an angle
- Only 1 side per yr
- Start well in time instead of starting when trees are already far out of balance
- Less risk of too strong effect when combined with consequent pruning

Growth control apple
Regalis
- Best results when only slight growth reduction is necessary
  - Less June-drop needed -> 1st treatment at 3-4 developed cluster leaves
  - Well balanced orchards with diploid varieties -> proper chemical thinning necessary -> no Regalis or relative late
  - We work with lower doses than advised on label
  - Trees get ‘addicted’ to Regalis, winter after Regalis always rootpruning
Chemical thinning

- Start with ATS
  - 1st application 1-2 days after full bloom
    with 15 kg a.i.
  - 2-3 treatments
- (Ethrel, 150-250 ml/ha)
- Mechanical thinning (mainly organic)
  - 1-1.5 litres of BA (10% a.i.) at 10 - 16 mm
- Hand thinning: 1-1.2 fruits per centimetre planting distance (at 3-3.25 metre row distance)

---

Dunproef Golden 2007, NPGF Velm

<table>
<thead>
<tr>
<th>fruits/tree</th>
<th>hand thinned weight (gr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>212</td>
</tr>
<tr>
<td>May 18th 1 ltr BA (10% a.i.)</td>
<td>188</td>
</tr>
<tr>
<td>May 18th 1 ltr BA + wetting</td>
<td>171</td>
</tr>
<tr>
<td>May 18th 1 ltr BA + 100 ml NAA (10% a.i.)</td>
<td>137</td>
</tr>
</tbody>
</table>

Resultaten proef universiteit Bonn 2007 op Golden delicious

Bron: NPGF Velm
Developments in orchard practices

- High number of trees, a good balance between growth and production and a proper pruning have many advantages:
  - better quality
  - fruit numbers are easier to manage
  - less biannual bearing
  - earlier finish of growth demands less plant protection
  - residue free/poor is becoming a big item
  - easier to prune with unskilled labour
  - no summer pruning
  - longer life cycle of the trees

Tree management in future

- 4000 trees/ha
- 3 mtr winter height
- only 2-3 yr old wood,
- no branches
- no table top
- easier to prune with unskilled labour
- all fruits close to leader
- fruits fully lighted

Goal 55-60 tonnes
- 90-95% packout

Tree management in future

-> Or ................

Trees without branches, like CATS trees from Geisenheim

Developments in spraying

KWH Munckhoff

Multi row sprayers

Adapting hail netting systems to multi row spraying?
(Fruit Security - Austria)

LIPCO
Multi row tunnel sprayers

- 25-30% re-use of pesticides

Harvest now and in future
Summary

- Best orchards
  - good soil preparation
  - well feathered trees
  - plant volume full
  - excellent start is essential
    - timing of planting
    - watering
    - potting compost
    - fertigation
  - monitoring soil, leaf and water
  - manage cropping level well through chemical and hand thinning (1-1.2 fruits per cm planting distance)

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- watering
- potting compost
- fertigation
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Summary

- Best orchards
  - tree management from 4th leaf onwards
  - 4 branches (on table top) + slender leader
  - create good balance in tree
    - root pruning
    - Regalis
  - Much attention to chemical- and hand thinning

As for club varieties minor quality apples are hard to sell, the future fruit culture will be even more consequent in tree training -> only leaders at 75 cm?

Thank you for your attention !!!