Seed potatoes in the Netherlands and in the World

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Importance of certified seed

Degeneration from 0.1 to 100 % Infection can take place in few generations

Viruses severely reduce yields

Source: Beukema, Turkensteen, Peeten
Some types of seed potato systems

Types of seed potato systems

- Local and low input +/- selection
- Clonal multiplication
- Stem cuttings
- In vitro mini & micro tuber production
- New systems (Hydroponics)
- Imports & mass multiplication
- G3 to the factory
Implementing seed potato systems

Selected Clonal mother plant → Mini tuber

Pre-basic seed → 1st year clone

2nd year clone

3rd year clone (Class S)

4th year clone (Class S)

Basic seed

S

A

B

C

Certified seed

Farmers seed / Informal seed

Each year declassed automatically!!!
The complete certification scheme, at each step an inspector comes to the farm

1. approval of the field (rotation, no Q-diseases/pests, geo-referenced)
2. visual observations in the potato field (2-4 inspections)
3. haulm killing prior to critical date (to avoid post harvest control)
4. post harvest sampling of tubers for laboratory test for viruses and ab tests for Quarantine diseases (brown rot and ring rot)
5. post harvest assessment of seed lots and certification
6. inspection at delivery to client (rot mainly)
First inspection visit

Approval of the field

- Crop Rotation applied (2 years no potato in this field)
- Location of field establishes (GPS referenced)
- Was soil sampled for nematodes?
- No Quarantine organisms present?
## Second inspection visits

**SUBJECT TO INSPECTION (2-3 FIELDVISITS)**

Maximum levels tolerated visually in the field before haulm killing

<table>
<thead>
<tr>
<th>Class</th>
<th>S</th>
<th>SE</th>
<th>E</th>
<th>A</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy mosaic and leaf roll</td>
<td>0.02</td>
<td>0.05</td>
<td>0.1</td>
<td>0.25</td>
<td>2</td>
</tr>
<tr>
<td>Light mosaic</td>
<td>0.02</td>
<td>0.05</td>
<td>0.1</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Total virus (maximal)</td>
<td>0.02</td>
<td>0.05</td>
<td>0.1</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Bacterial diseases (Erwinia)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.03</td>
<td>0.1</td>
</tr>
<tr>
<td>Variety mixture</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.01</td>
<td>0.2</td>
</tr>
</tbody>
</table>
THIRD inspection visit

SUBJECT TO INSPECTION: VERIFICATION IF CROP IS KILLED BEFORE CRITICAL HAULM KILLING DATE, if not the crop will be subjected to post harvest control

The moment of haulm killing is determined by:

• the number of aphids trapped (suction traps and yellow water traps)
• the susceptibility of the variety to virus Y
• the current infection pressure in the field (number of virus plants)
• the degree of maturity of the crop (older crops become resistant)
Fourth inspection visit

SUBJECT TO INSPECTION

Maximum levels tolerated post harvest (Netherlands) viruses when farmers passed the mandatory haulm killing date

<table>
<thead>
<tr>
<th>Seed class</th>
<th>Maximum number of infected tubers per minimum sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>0 in 200 tubers</td>
</tr>
<tr>
<td>SE</td>
<td>1 in 200 tubers</td>
</tr>
<tr>
<td>E</td>
<td>2 in 200 tubers</td>
</tr>
<tr>
<td>A</td>
<td>5 in 100 tubers</td>
</tr>
<tr>
<td>C</td>
<td>10 in 100 tubers</td>
</tr>
</tbody>
</table>

IF 1 TUBER OF Q-DISEASE (BROWN ROT OR RING ROT) IS FOUND: LOT IS REJECTED
FIFTH inspection visit

Seed lot inspection prior to delivery to client (tolerances):

- tuber diseases such as dry and wet rot, scab and rhizoctonia
- defects such as sprouts, bruises, odd shapes and cold damage
- weight
- size grades
- contamination (e.g. soil tare)
- soil samples from grading are taken and checked for PCN (zero tolerance)
Lot inspection:

• After a lot of seed potatoes has been definitively approved, it is certified.
• All relevant information on each lot is specified on the NAK certificate.
• Only certified seed potatoes are allowed to be marketed.

The standards employed by the NAK are stricter than the minimum standards formulated by the EU for trade in seed potatoes within its area.
Why are seed potatoes such a success in the Netherlands?
SUCCESS FACTOR 1: INTERNAL DEMAND

Potato production in the Netherlands (million ton)

- Total: 7 million ton
  - Stardgh 2.5
  - Seed 1.0
  - Ware 3.5

- Seed potatoes:
  - Nether-lands 30%
  - Export 70%

- Ware potatoes:
  - Consumption 15%
  - Processing 85%

(Source: CBS)
## Potato Area Netherlands

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed potatoes</td>
<td>38</td>
<td>42</td>
<td>42</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Ware potatoes</td>
<td>80</td>
<td>84</td>
<td>66</td>
<td>72</td>
<td>72</td>
</tr>
<tr>
<td>Starch potatoes</td>
<td>61</td>
<td>49</td>
<td>51</td>
<td>47</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>179</td>
<td>175</td>
<td>156</td>
<td>157</td>
<td>159</td>
</tr>
</tbody>
</table>

(Source:CBS)
SUCCESS FACTOR 2 “ALL THINGS COMBINED"

**Favourable Climate**
- Grower knowledge base
- Cooperations (bank, purchases, sales)
- Soil type
- Neighbours (sea)
- Organization
- Mechanization
- Research
- Breeding >200 varieties
- Legislation, PBR, UPOV, certif seed
- Open market
- Potato hub NAFTC companies
  - Seed
  - Storage
  - Machinery
  - Chain mgmt
Potato hub, potato cluster
SUCCESS FACTOR 3: MECHANIZATION

Reducing costs of production: labour demand decreases
Increased area seed potatoes per farm

2000 specialized growers produce approx. 1 mln. ton high quality seed potatoes

Source: NAK
SUCCESS FACTOR 4: HIGH DEGREE of ORGANIZATION

Organisation Traders– Growers – Processors

NAO

Committee Ware Potatoes

Committee Seed Potatoes

Representatives from Ware- and Seed Potato Committee

VAVI; association of potato processing industry

LTO; growers organisation

NIVAP
SUCCESS FACTOR 5: EXPORT OPPORTUNITIES

Export of potatoes from the Netherlands

(million ton/year)
Worldwide distribution of Dutch Seed Potatoes

International seed potato trade

(avg ’06–’09)
- Netherlands: 60%
- France: 10%
- UK: 9%
- Germany: 8%
- Denmark: 5%
- Canada: 4%
- Brazil: 3%
- Australia: 1%

Several countries produce Dutch varieties under licence

NL: high quality seed potato production of innovative varieties
Potato has strong advantages compared to cereals, disadvantage of being clonally multiplied offers opportunities to make profits globally, the Netherlands are an example