Phytophthora infestans in the Netherlands 2012

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Sampling of *P. infestans*

- Advisors, Researchers, Agrochemical companies, Breeders, farmers
- 2000 – 2009
- 5 Dutch potato-growing regions:
  - South West: Ware Potatoes
  - South East: Ware Potatoes
  - North & North West: Seed/Ware Potatoes
  - Central: Seed/Ware potatoes
  - North East: Starch Potatoes
- Infected leaflets from farmers fields
- 207 different sampling locations
- 652 isolates
Characterisation

- Mating type (A1 of A2): test on agar
- Haplotype (Ia, IIa, Ib or IIb): pcr & digestion
- SSR: Single Sequence Repeats
  - multiplex PCR → DNA fingerprinting (currently 112 alleles)
Combine PCA & STRUCTURE in a tree

Dutch population (2000-2009)
311 genotypes 652 isolates

3 groups were distinguished based on “PCA” & STRUCTURE results

Blue = Group 1
Red = Group 2
Green = Group 3
Dominante klonale lijnen 2000 - 2009

P. infestans isolates (#)

EU 13 A2
Gs-002
Gs-003
GS-004
EU 06 A1
GS-006
GS-007
GS-008
GS-009
Green33
Blue 13
Pink 6
Gs-008

2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
Findings of the Blue-13 clonal lineage
Origin of the 2012 samples

Thank you to all samplers!
Origin NL *P. infestans* collection 2012

**NL isolaten 2012 (#)**

**Origin:**
- Drenthe
- Flevoland
- Friesland
- Gelderland
- Groningen
- Limburg
- Noord-Brabant
- Noord-Holland
- Overijssel
- Zeeland
- Zuid-Holland

**Categories:**
- praktijk
- vangveld
- field experiment

**Legend:**
- Blue: praktijk
- Red: vangveld
- Green: field experiment
Origin NL *P. infestans* collection 2012

- Per province
SSR Characterisation *P. infestans* isolates 2011 & 2012

- **2011:**
  - 22% Blue13
  - 20% Green33
  - 1x Pink6
  - 0 x GS008

- **2012:**
  - 31% Blue13
  - 6% Green33
  - 0 x Pink6
  - 2 x GS008
Combined analysis 2011 + 2012
Utrecht and NOP genotype

- **2011**
  - NL11851 Kraggenburg
  - NL11845 Werkhoven
  - NL11844 Werkhoven
  - NL11762 Nagele

- **2012**
  - NL12046 Nagele
  - NL12043 Luttelgeest
  - NL12041 Nagele
  - NL12035 Marknesse
  - NL12033 Ens
Blue13 in the Netherlands
Green 33 throughout the years

- 2009: 7 Green 33 isolates
  - 62 x farmers fields: 5xG33
  - 142 x bait field 1x G33
  - 48 x field exp 1x G33
- 2010: 28 Green 33 isolates
  - 37 x farmers field 6x G33
  - 128 x bait field, 17x G33
  - 34 x field exp., 5x G33
- 2011: 87 isolates, 17x G33
Green 33 throughout the years

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- 2012: 107 isolates, 6x G33
Green33 in 2012 in the Netherlands
GS-008 / Orange8 in the Netherlands
A mixed population?
Some conclusions

- *P. infestans* still highly dynamic and adaptive
- NL population composed of a number of clonal lineages (50 – 80%) + a large number of unique genotypes
- Unique genotypes are displaced quickly
- Very successful genotypes survive and become a dominant clonal lineage
- Clonal lineages are displaced slowly