

Phytophthora infestans in the Netherlands 2012

Geert Kessel



Sampling of *P. infestans*

■ Advisors, Researchers, Agrochemical companies, Breeders, farmers

■ 2000 – 2009

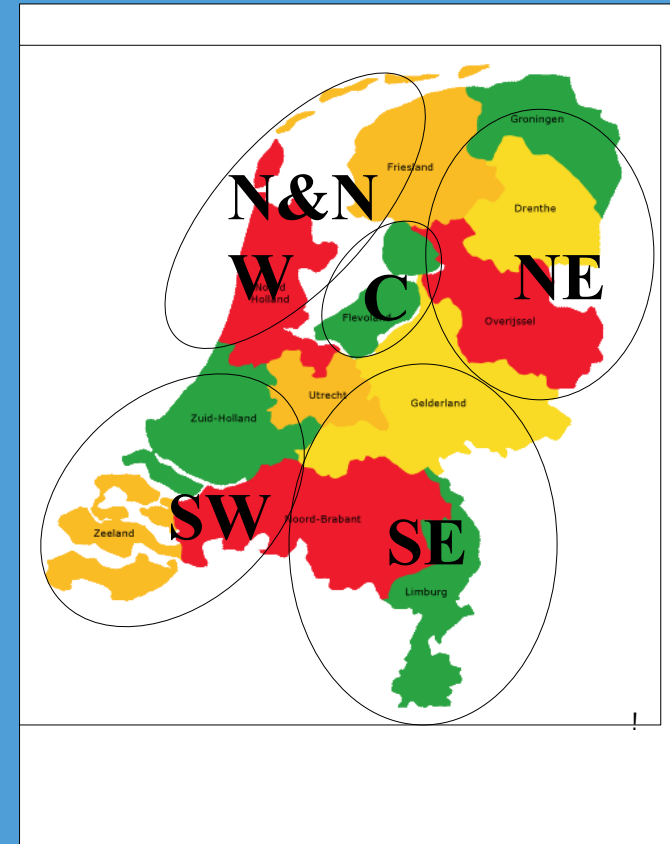
■ 5 Dutch potato-growing regions

- 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

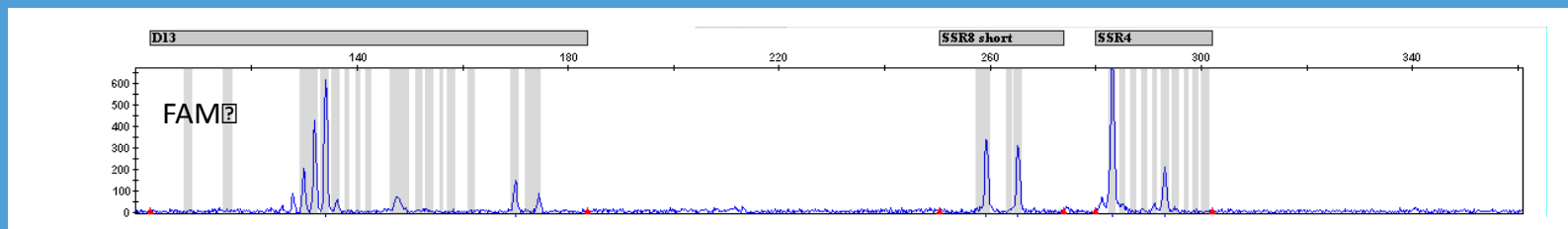
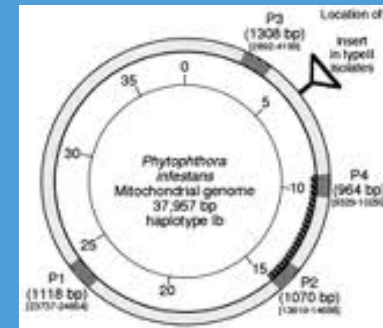
■ 207 different sampling locations

■ 652 isolates

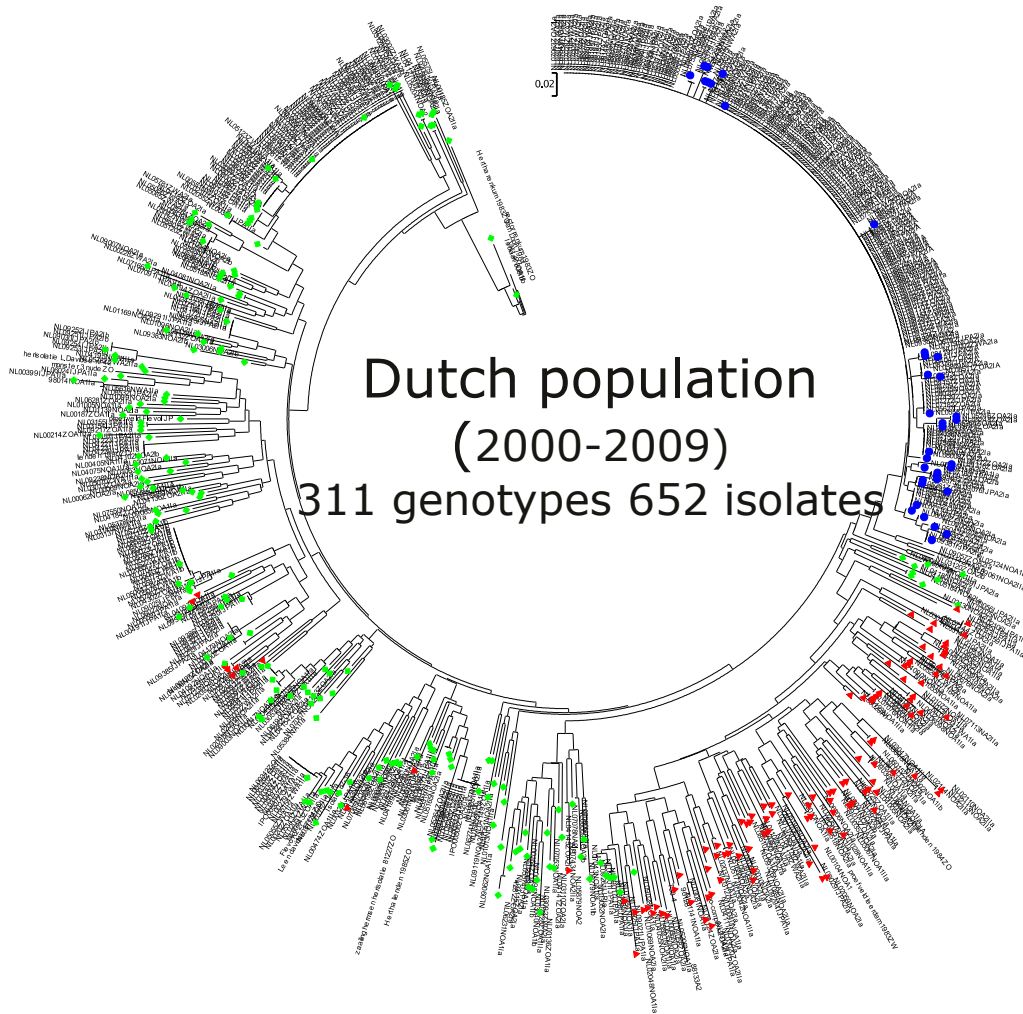


Characterisation

- 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)



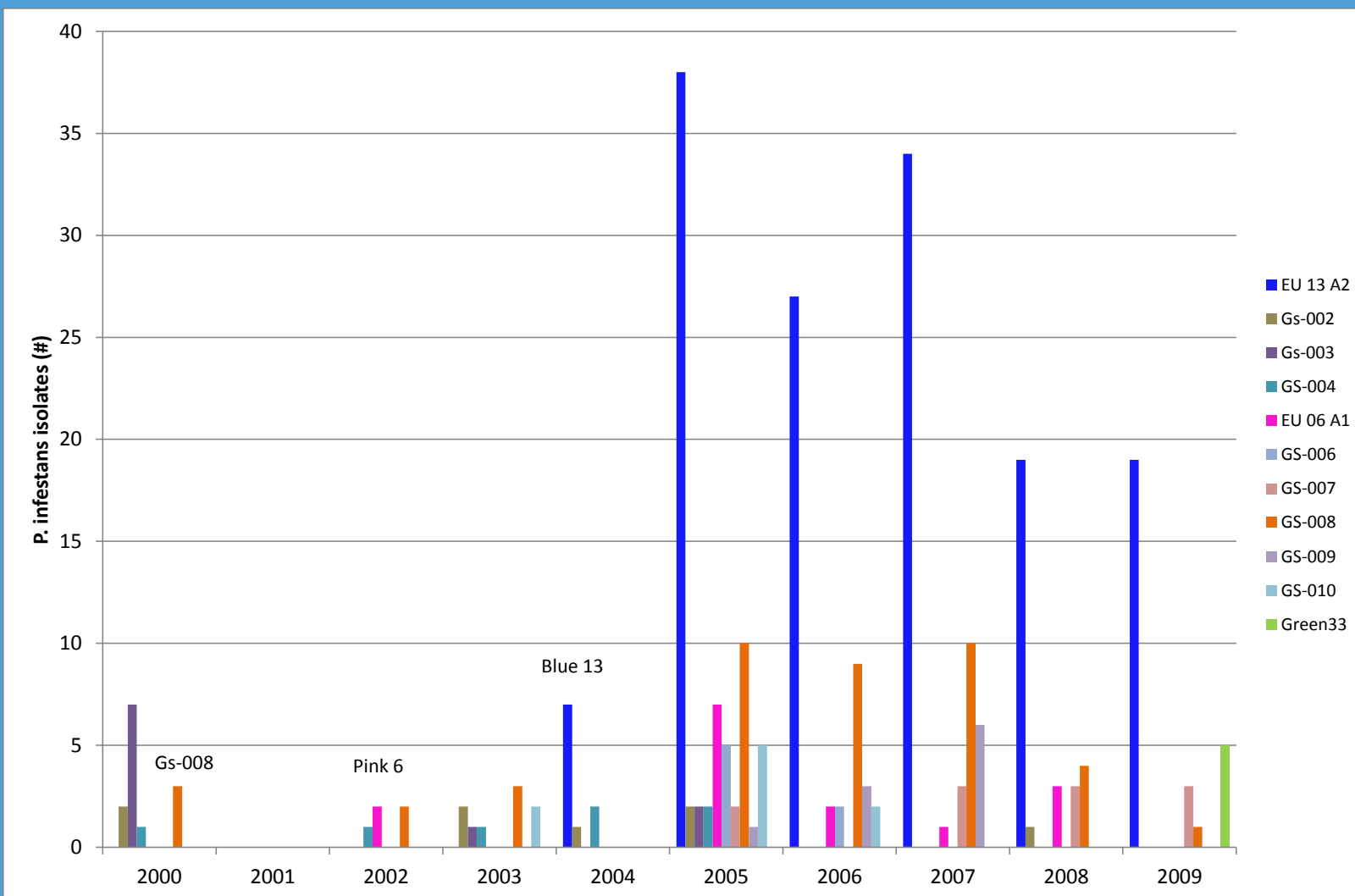
Combine PCA & STRUCTURE in a tree



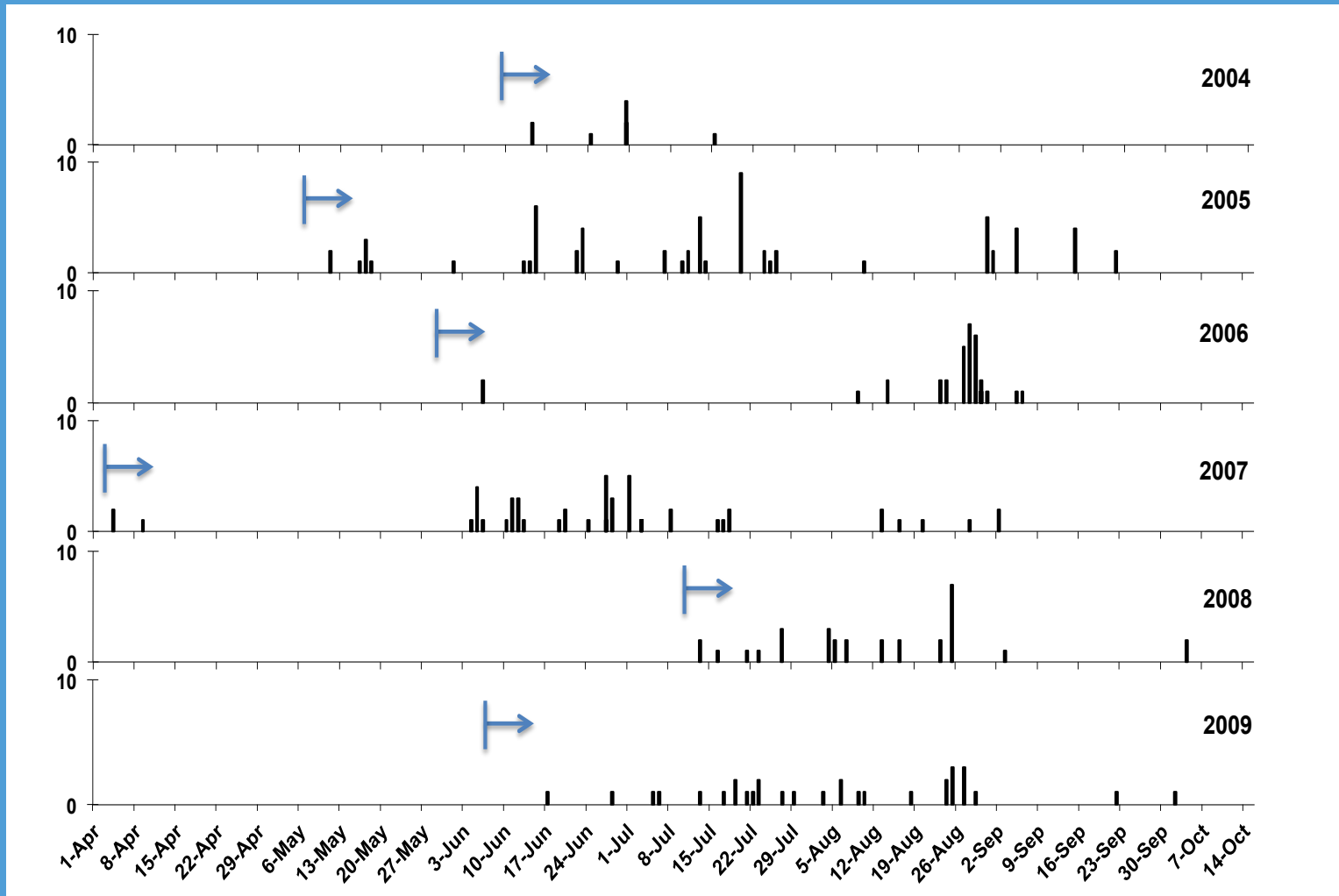
Blue = Group 1
Red = Group 2
Green = Group 3

3 groups were distinguished based on "PCA" & STRUCTURE results

Dominante klonale lijnen 2000 - 2009



Findings of the Blue-13 clonal lineage

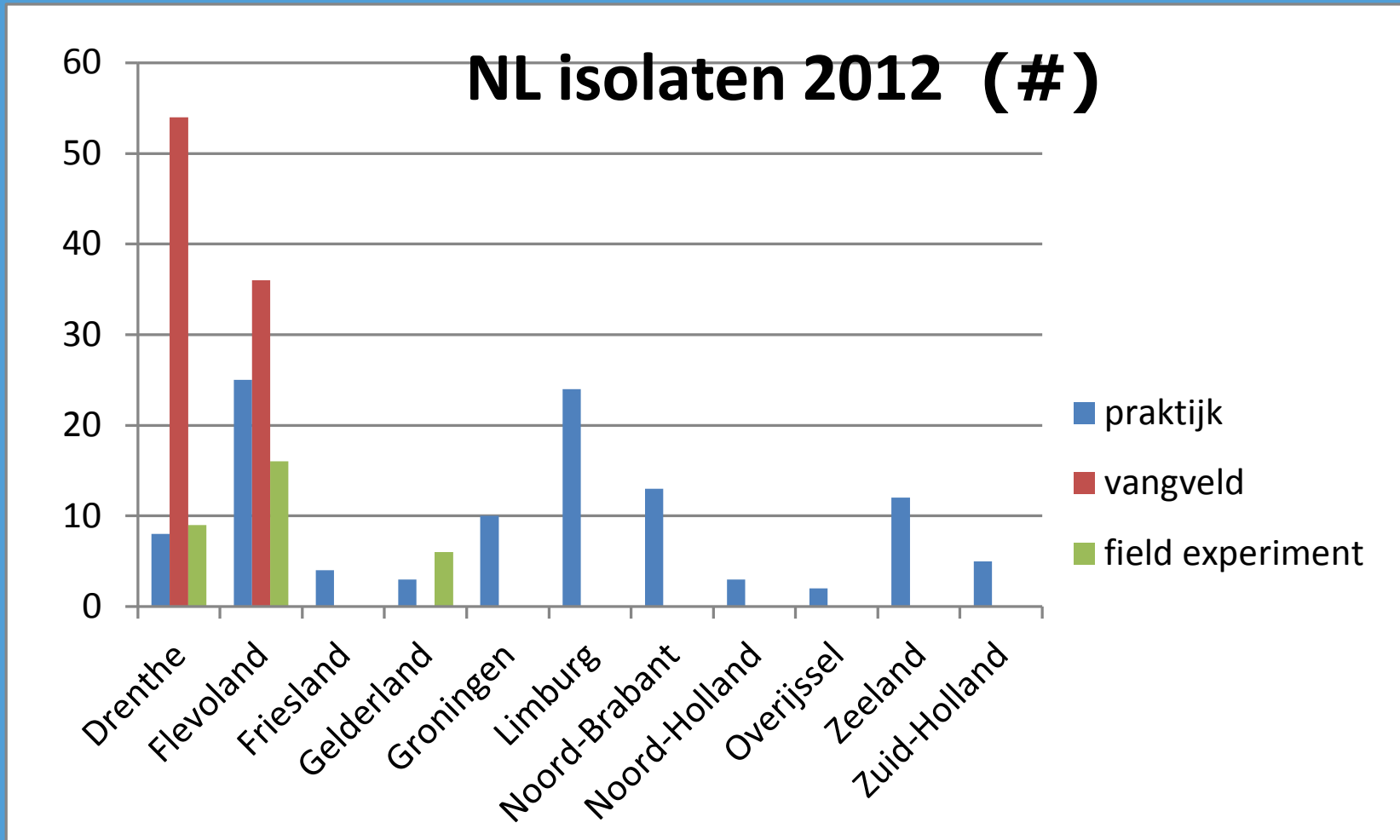


Origin of the 2012 samples

Thank you to all
samplers!

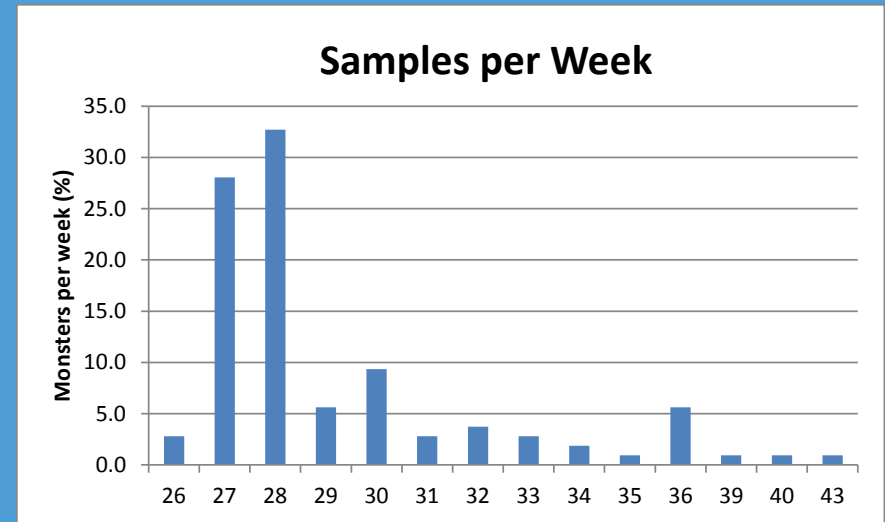
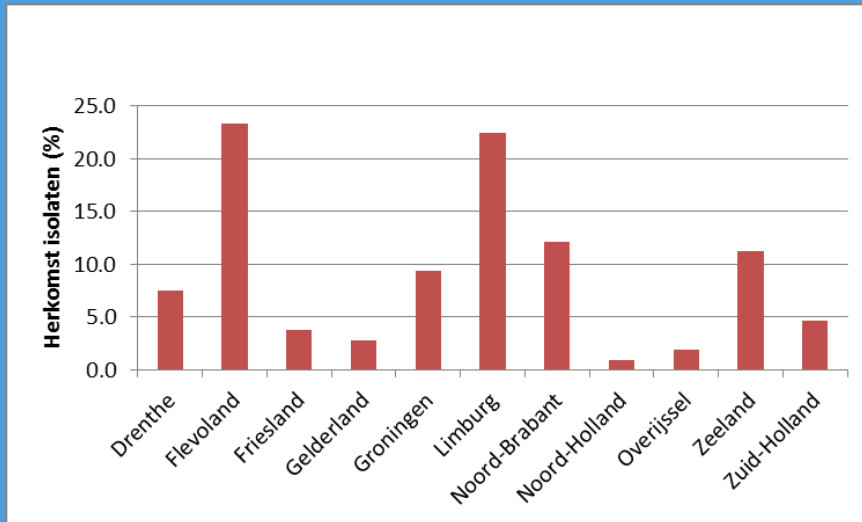


Origin NL *P. infestans* collection 2012



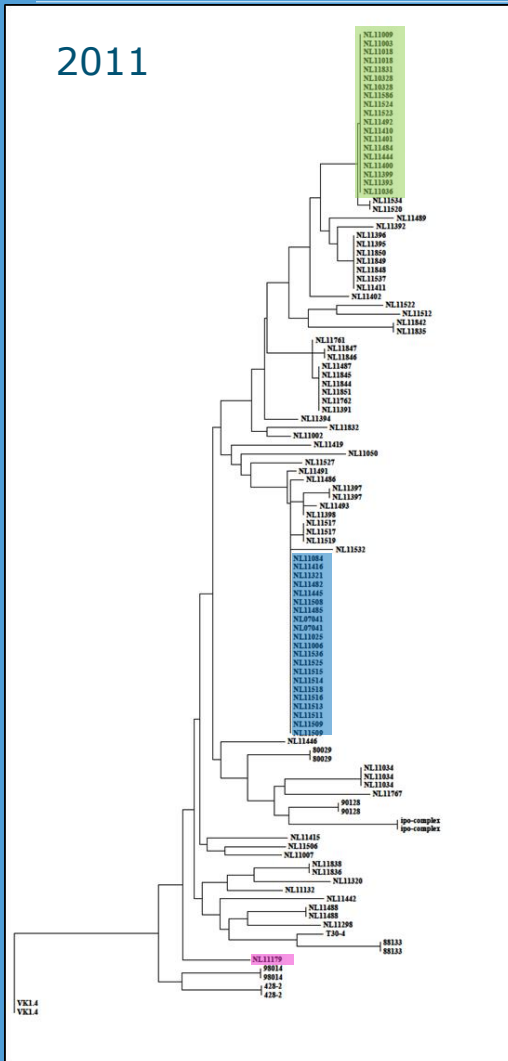
Origin NL *P. infestans* collection 2012

■ Per province

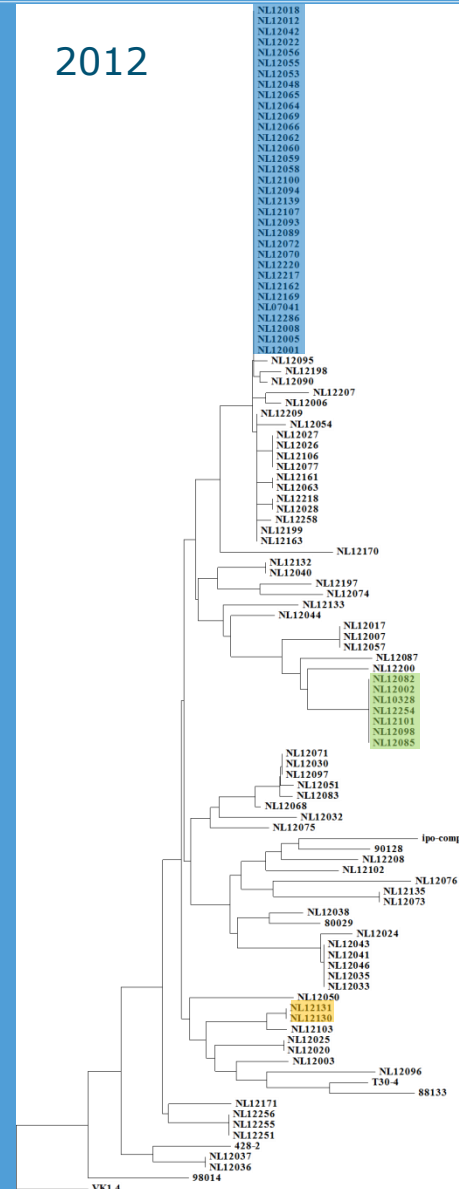


SSR Characterisation *P. infestans* isolates 2011 & 2012

2011



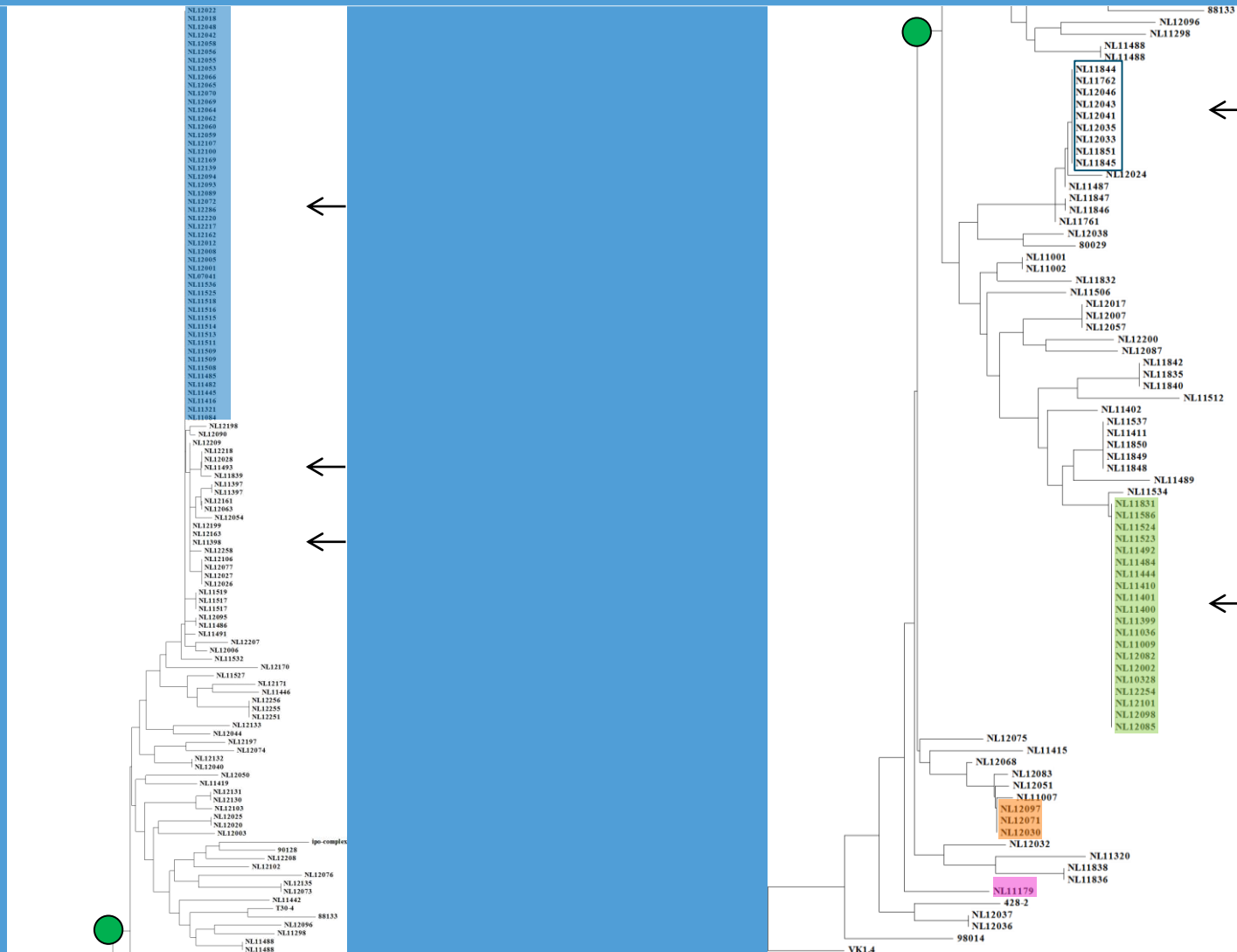
2012



- 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

- 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

- 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

- 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

- 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
- 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

