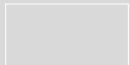


Monitoring the Danish population of potato late blight (*P. infestans*) 2011-2012 and occurrence of 13_A2

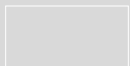
Bent J. Nielsen, David Cooke & Jens G. Hansen

***Aarhus University, Department of Agroecology
James Hutton Institute***

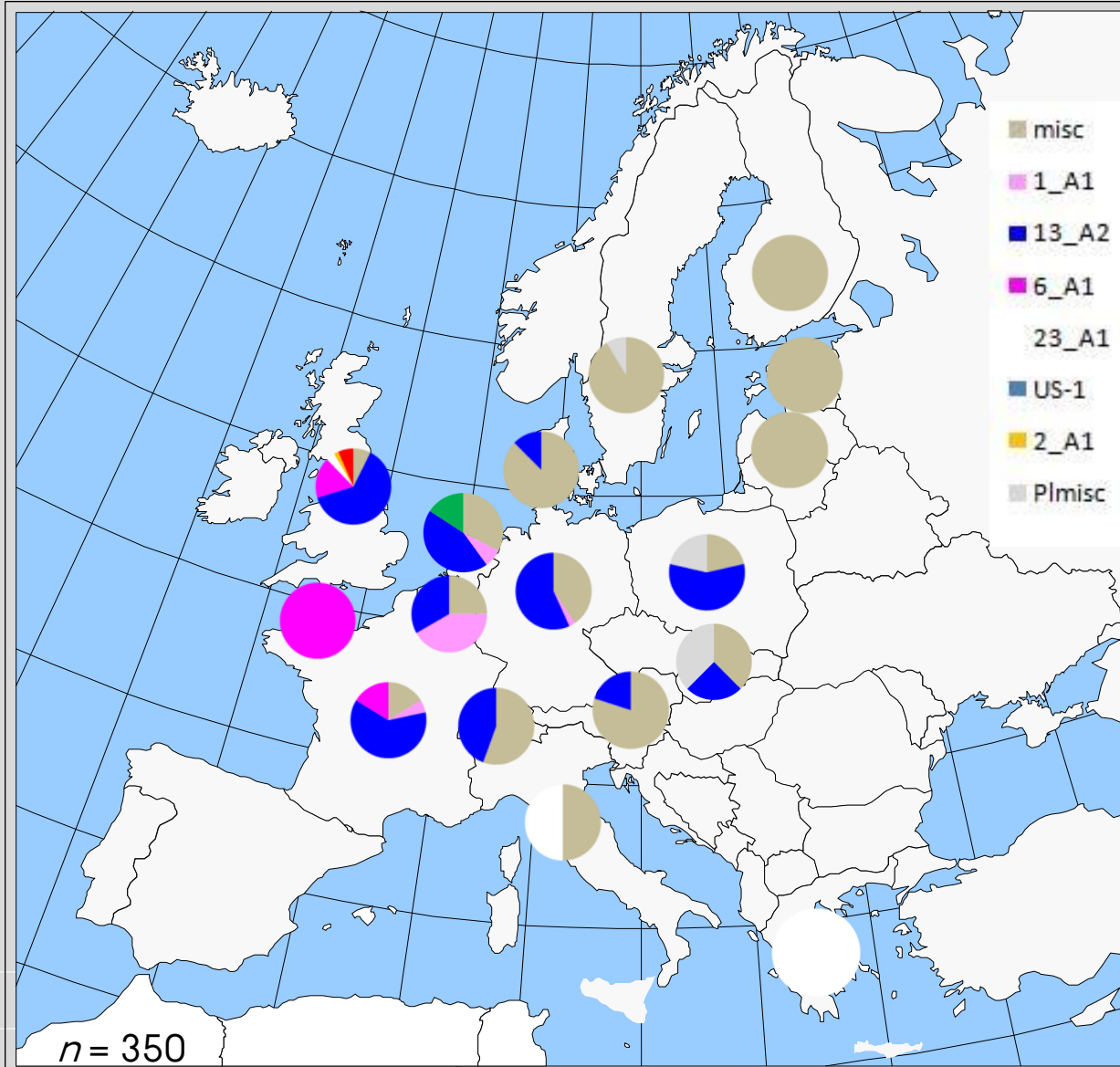


Objective:

- Population structure compared to european countries
- Do we have Blue 13, Green 33?
- Risk of resistance against metalaxyl



EU *P. infestans* genotypes (2008-10)



- > 13_A2 still present in many areas (less due to reduced Metalaxyl use?)
- > A high proportion of novel 'misc' types particularly in NE
- > New genotype in PL, SK & SE
- > 23_A1 on tomato in Italy & GK
- > Active collaboration among EU scientists helps industry
- > Thanks to Bayer and Syngenta, Howard Hinds, Vangelis Vellios

Isolates of potato late blight 2011-2012

- Isolates collected DK
 - Early September 2011
 - July – September 2012

- Different potato fields from potato growing areas

- One isolate per field (in most cases)

- Reference isolates from Flakkebjerg

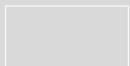
- Conserved on FTA cards (for genotyping)

- Identification of genotypes at the James Hutton Institute,
 Scotland (SSR)

74 isolates tested 2011 (52 fields)

- ❑ 9 isolates (12%) genotype 13_A2 (“Blue 13”)
 - ❑ 6 of the 9 isolates (13_A2) came from North Jutland

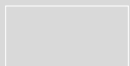
- ❑ No “green33” isolates



112 isolates tested 2012 (102 fields)

- ❑ 28 isolates (25%) genotype 13_A2 (“Blue 13”)
 - ❑ 22 of the 28 isolates (13_A2) came from North Jutland
 - ❑ 6 isolates (13_A2) from mid-Jutland

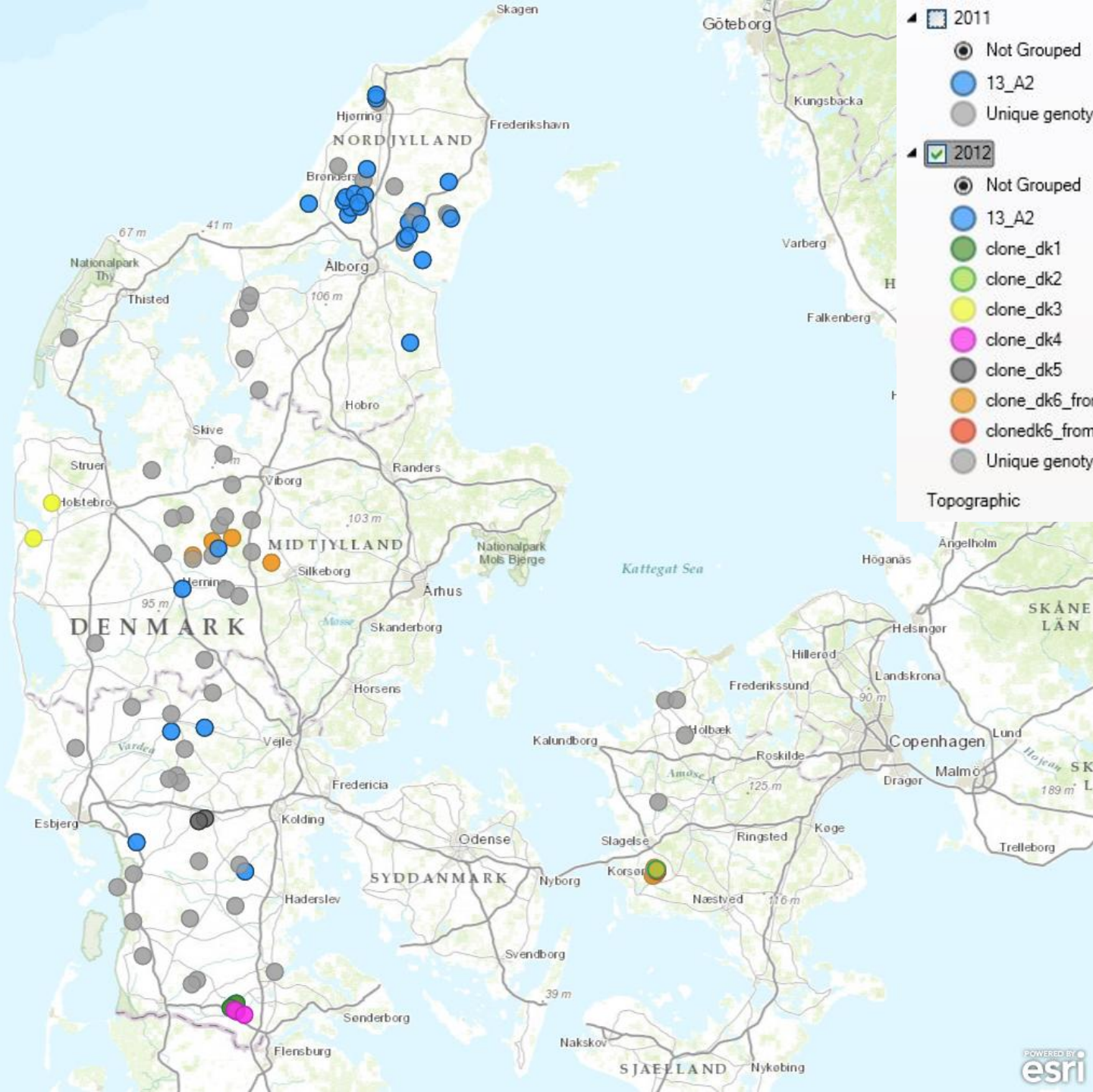
- ❑ No “green33” isolates



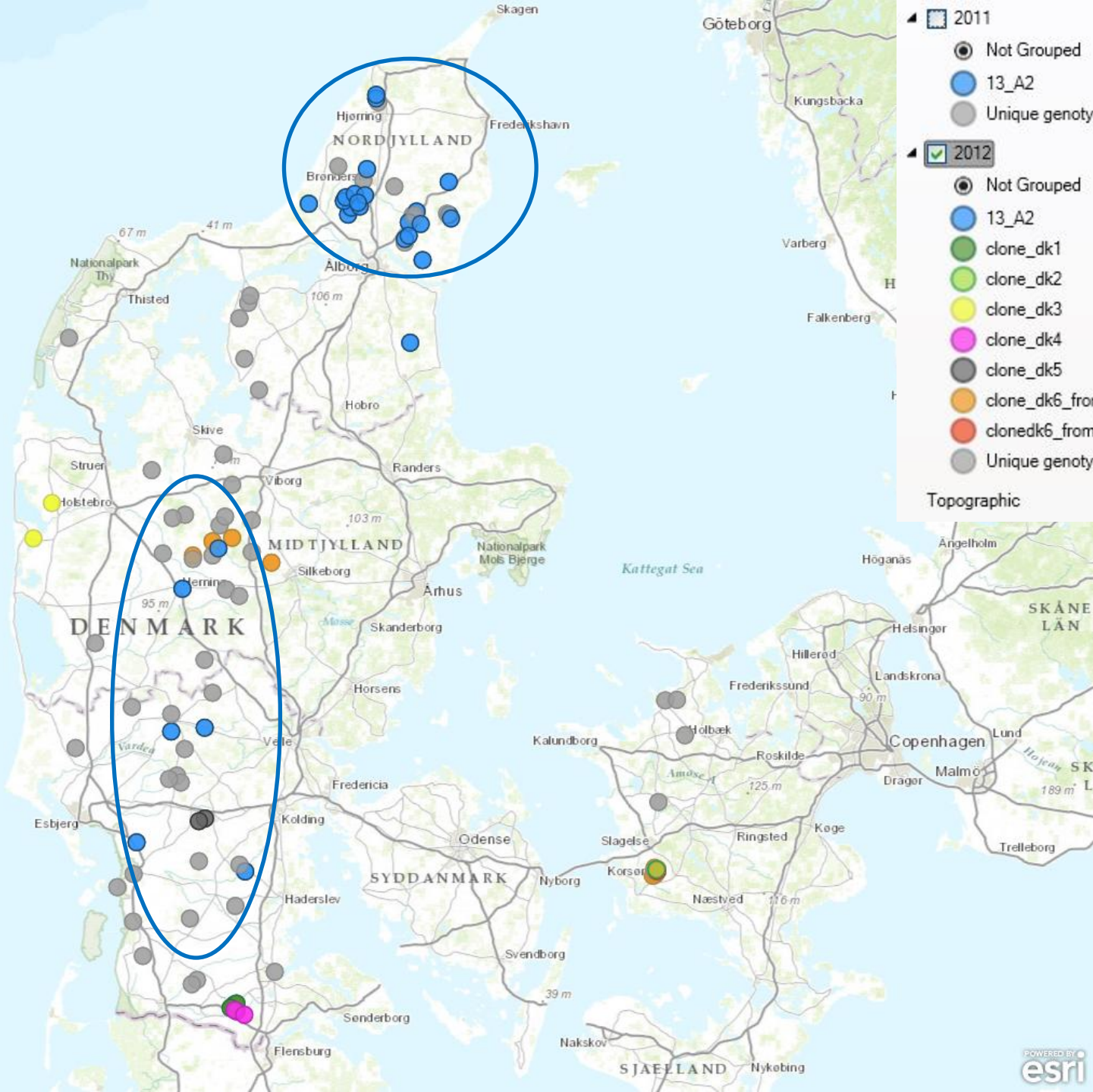
2011



2012



2012



- 13_A2
- clone_dk1
- clone_dk2
- clone_dk3
- clone_dk4
- clone_dk5
- clone_dk6_from 2011
- clonedk6_from 2011
- Unique genotype

Other recordings of "13-A2":
Late July - September

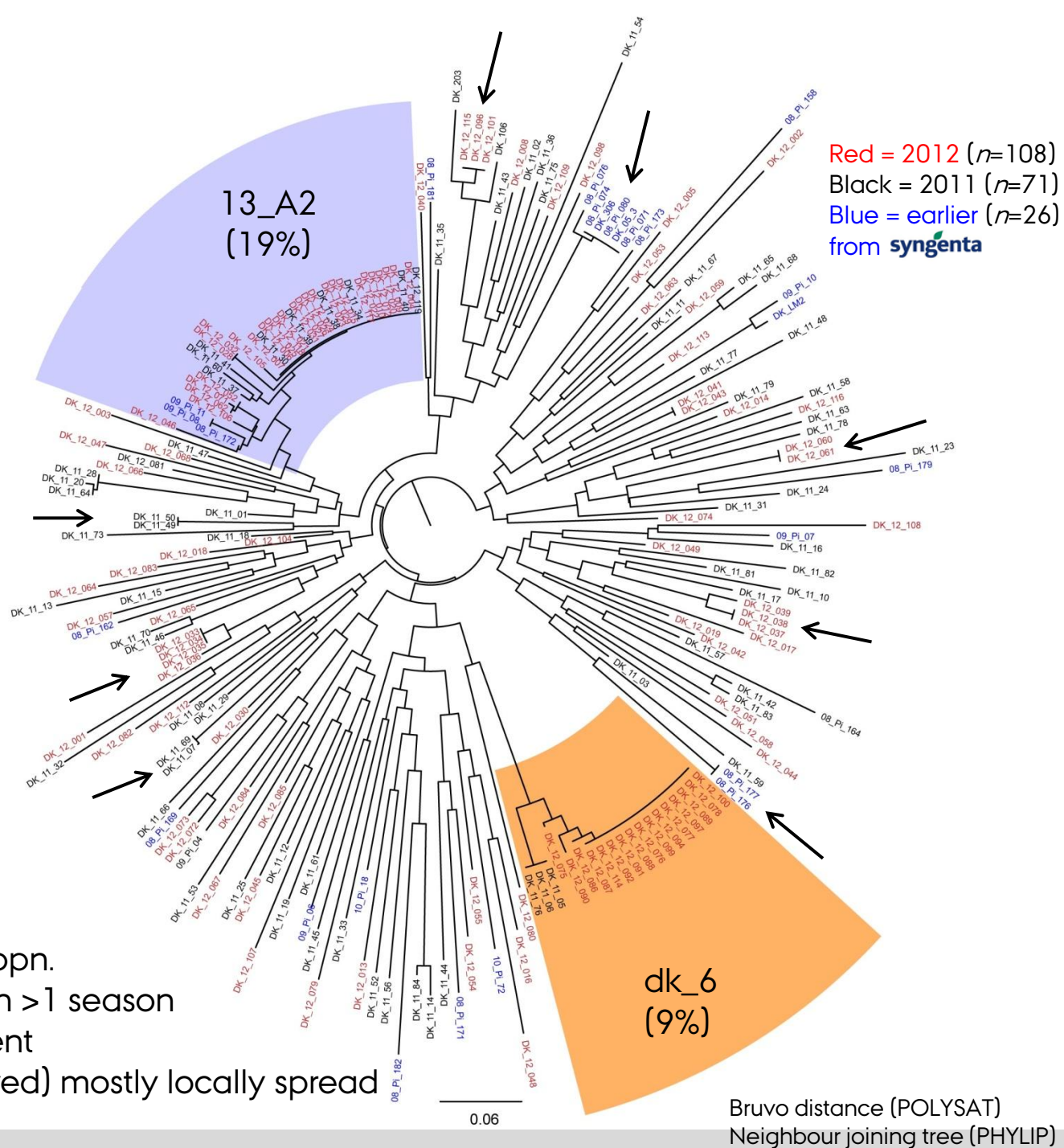
Potato growing
area:

First recordings of
LB 3 July 2012

Ridomil treatments
the following 2-3
weeks

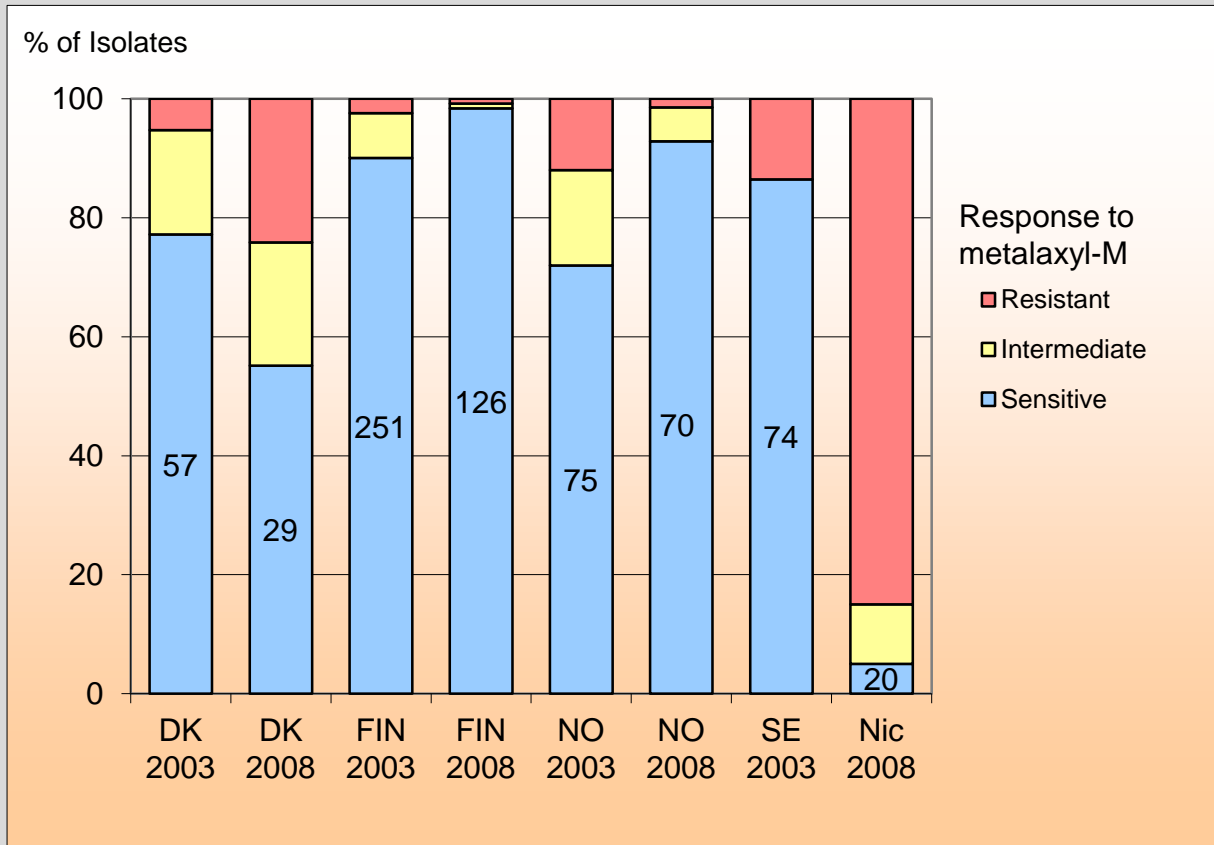
"13_A2" found
13-19 July

SSR analysis



- Highly diverse population
- Only two clones >3% of popn.
- 13_A2 and dk_6 present in >1 season
- Sub-clonal variation evident
- Other minor clones (arrowed) mostly locally spread

Previous monitoring for metalaxyl resistance in Denmark



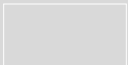
A. Hanukkala, unpubl.

2003 and 2008: 5-25% resistant isolates (leaf test with isolates)

2011-2012: 12-28% 13_A2 (genotype test)

Conclusions

- ❑ Danish *P. infestans* population very diverse
- ❑ Same pattern in N, S and F
- ❑ Indication of sexual recombination in these countries (oospores)



Conclusions

- ❑ Genotype 13_A ("Blue 13") present in DK from 2009
 - ❑ 2011: 12%
 - ❑ 2012: 29%

- ❑ Probably metalaxyl-resistant isolates

- ❑ 13_A2 concentrated in areas where many fields were sprayed with metalaxyl early July

- ❑ Will 13_A2 expand further

- ❑ Change in recommendations for metalaxyl use 2013

- ❑ No Green-33 found in the surveys 2011-2012

