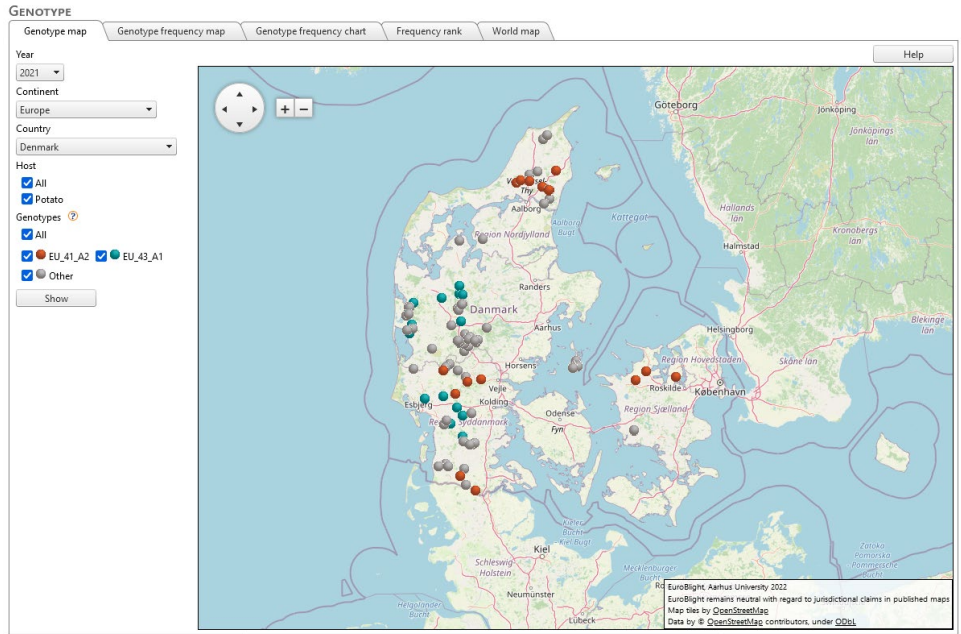
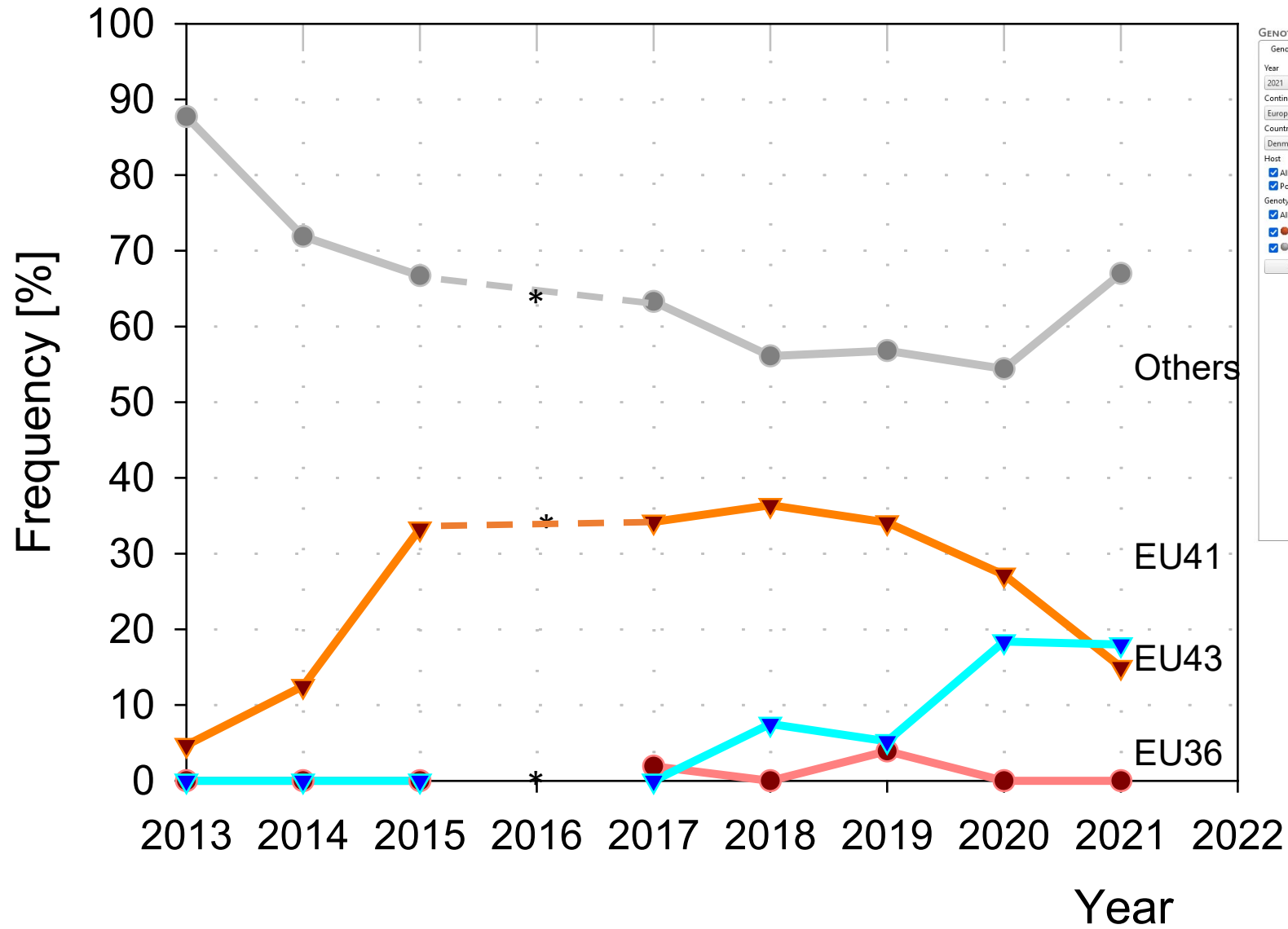


Systems approach for early warning and control of late blight and early blight in Denmark

Jens G. Hansen, Isaac K. Abuley & Poul Lassen, Aarhus University





Genotypes in Denmark, 2021

145 samples

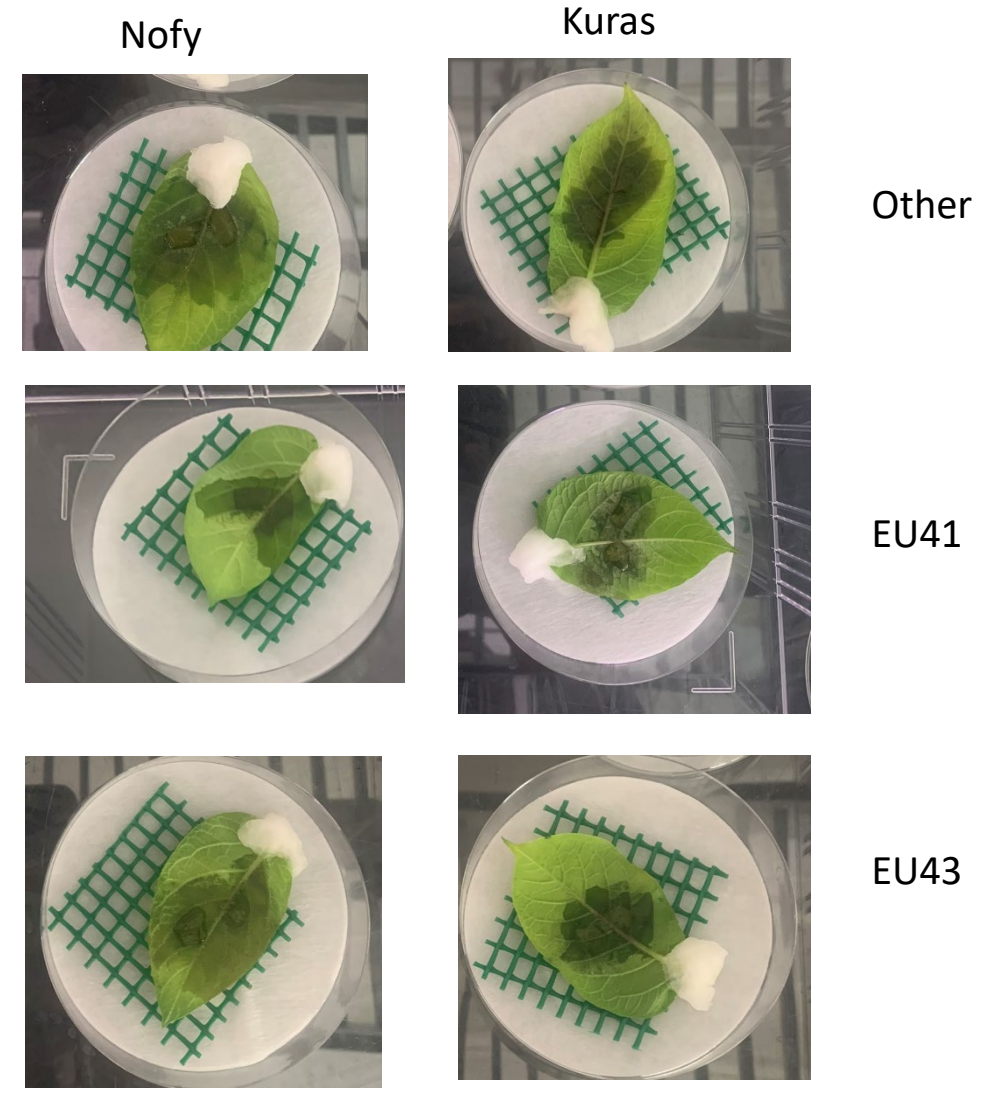
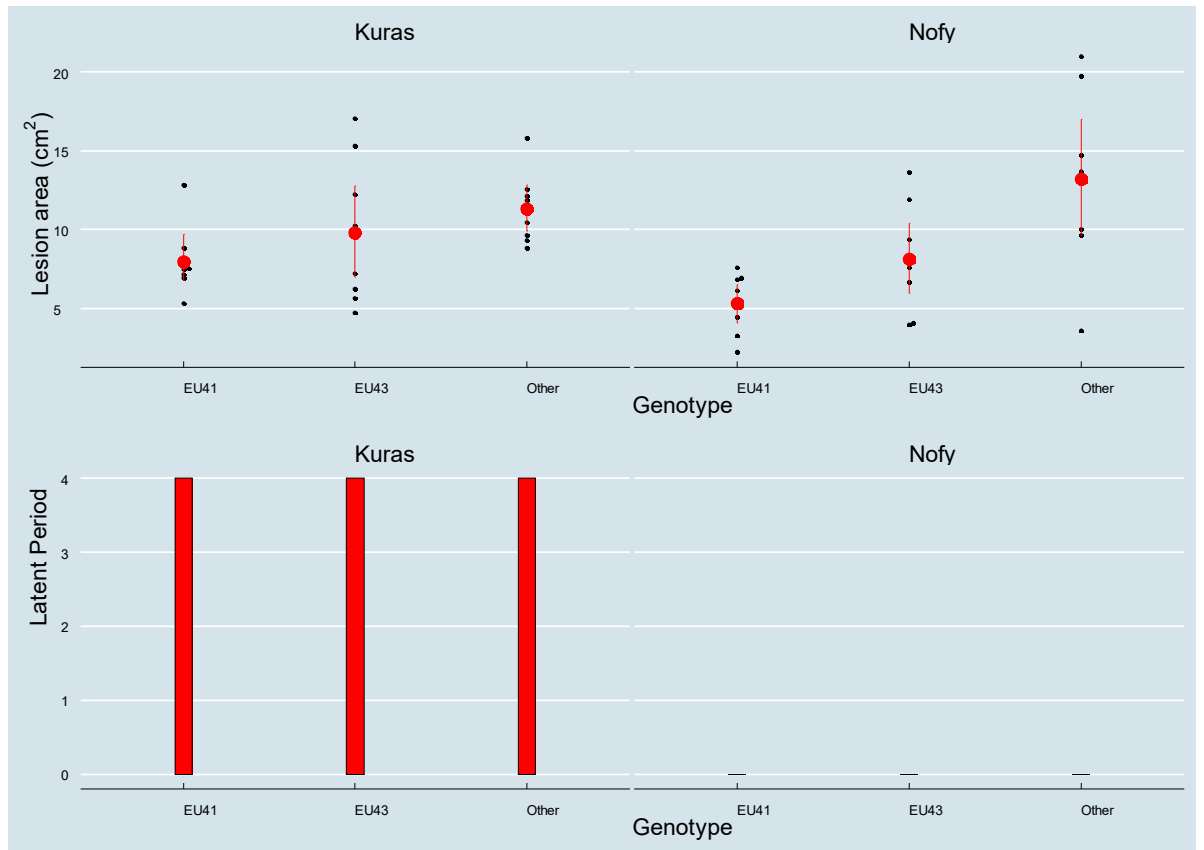
EU41: 15%

EU43: 18%

Other: 67%

* No data in 2016

- The clones (EU41 & EU43) are less aggressive compared to the other types
- Factors supporting their dominance still remains to be answered?



IPMBlight2.0 also concluded that EU41 is not more aggressive than the "other" types

Some conclusions

Due to climate change, we have milder winters. More (infected) tubers survive in dumps and as volunteer plants and this might explain the expansion of the clonal population of EU41 and EU43.

Volunteer plants act as “false crop rotations”

Increased pathogen diversity from oospore driven epidemics is a threat to a sustainable potato production in Europe

- Host specificity
- Erosion of host resistance
- Risk of fungicide resistance



Oospores in Denmark. Documented since 1997

BlightTracker

Select weather data file
Weather_2021_9330_Dronninglund_Normal_DK.csv

Date
onsdag den 27. maj 2020

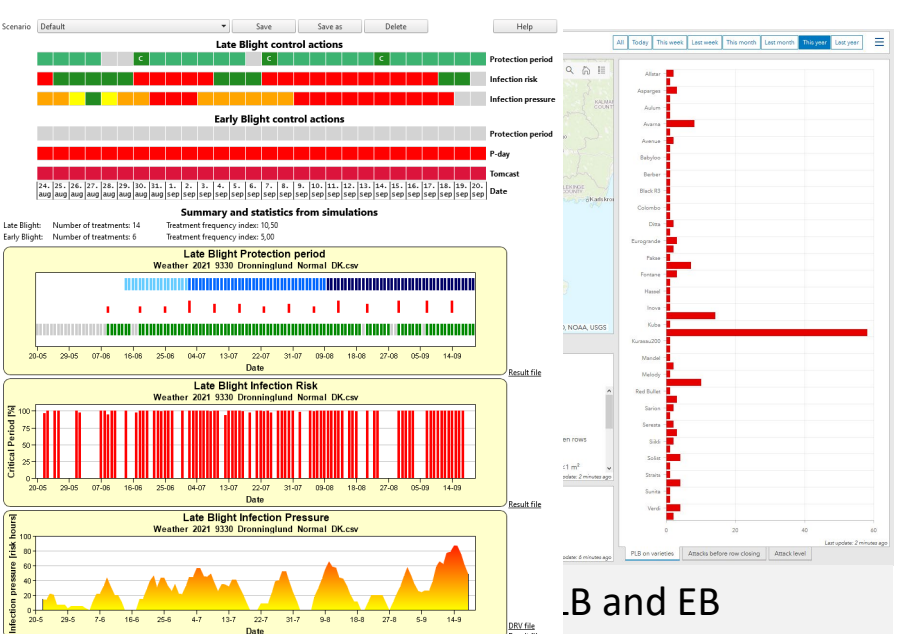
Location name
Try

Survey site *
Organic

Growth Stage *
10 % of plants meet between

Cultivar name *
Solist

Late Blight
Early Blight



BlightTr

.B and EB

POTATO LATE BLIGHT TOOLBOX

Home Survey Samples Trials Models Fungicides Skimmelstyring Skimmelstyring for Sverige Partners Administration

Welcome Jens Grønbech Hansen [logout](#)

TRIAL APPLICATION INPUT

Trial site: **Arnborg**

Trial: **Late Blight_Avarna, Arnborg**

Treatment: **Brande**

Weather data: **Arnborg**

Start phase 2: 12. jun

Start phase 3: 12. jun

Start phase 4: 19. aug

Model charts: 1 1 1 1 1 1

Weather data: 1 1 1 1 1 1

Report

Late Blight Infection Risk

Late Blight Infection Pressure

2. Routine, Last application: Date: 8. juli 2020, Fungicide: Ranman Top, Dosage: Full

3. Skimstyr fast int. Last application: Date: 8. juli 2020, Fungicide: Ranman Top, Dosage: Half

4. BM dyn int. Last application: Date: 2. juli 2020, Fungicide: Ranman Top, Dosage: Full

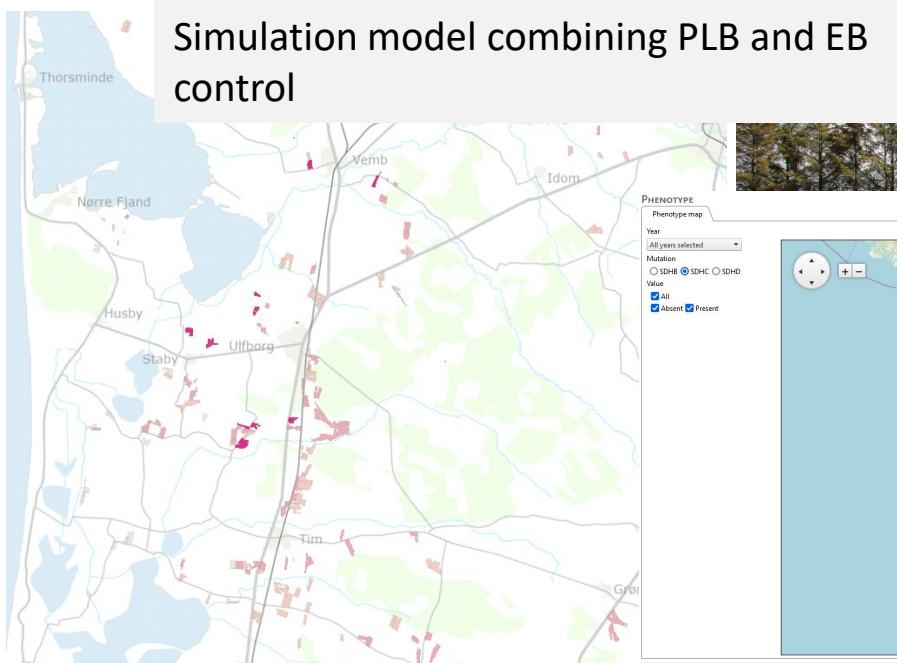
5. BM fuld dos. Last application: Date: 2. juli 2020, Fungicide: Ranman Top, Dosage: Full

20 21 22 23 24 25 26 27 28 29 30 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16

Date: 07 - 08

Improved models, Data management and mapping tools

Genotyping of *P. infestans*



GIS Risk model for oospores



Monitoring fungicide resistance, EB

aled

CropManager

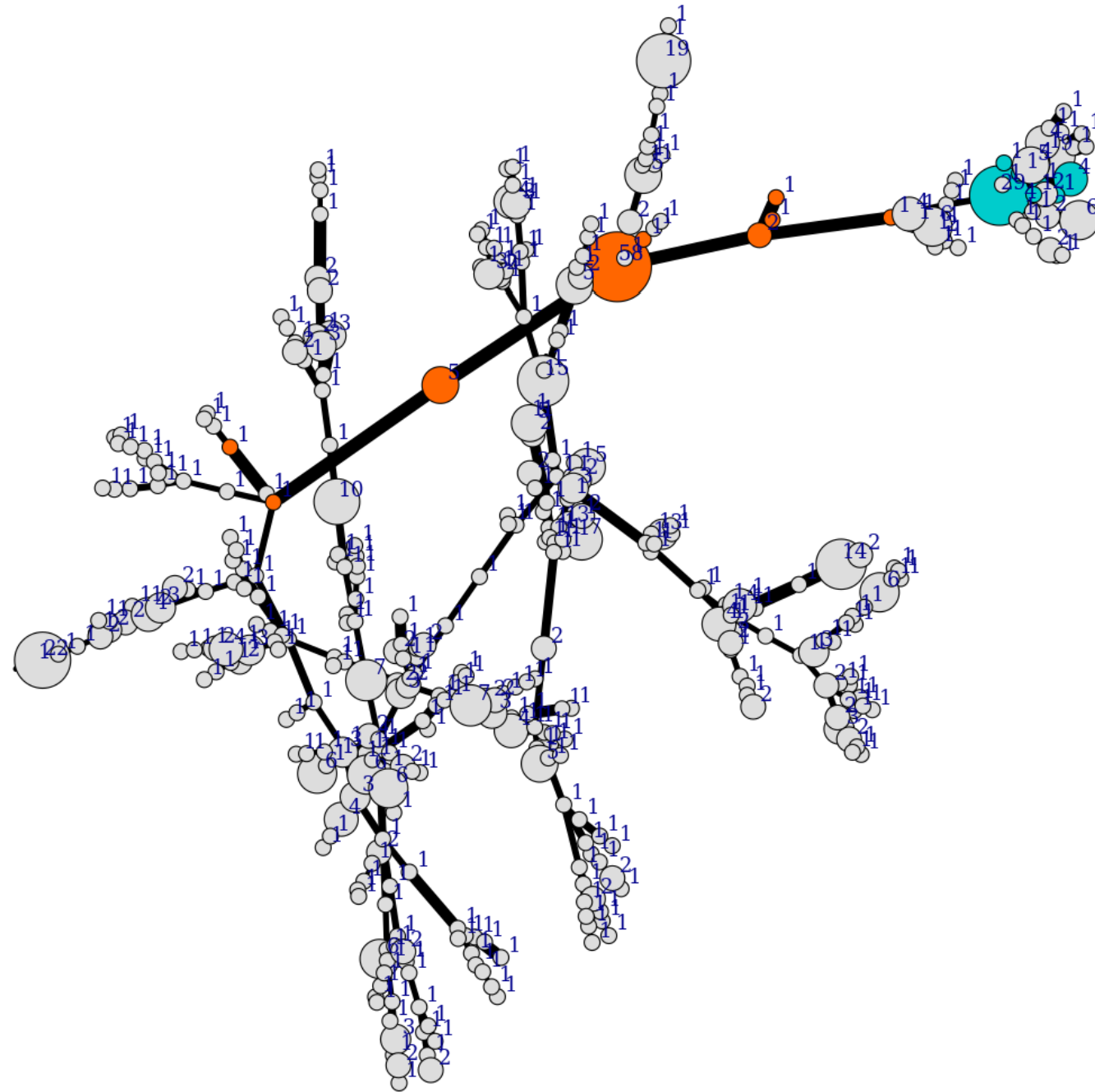
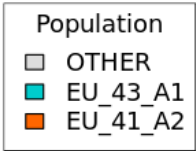
Kartoffelskimmel risiko

Wæddel, Høved, Stensdal, Spørgsenge

Progress: 100%

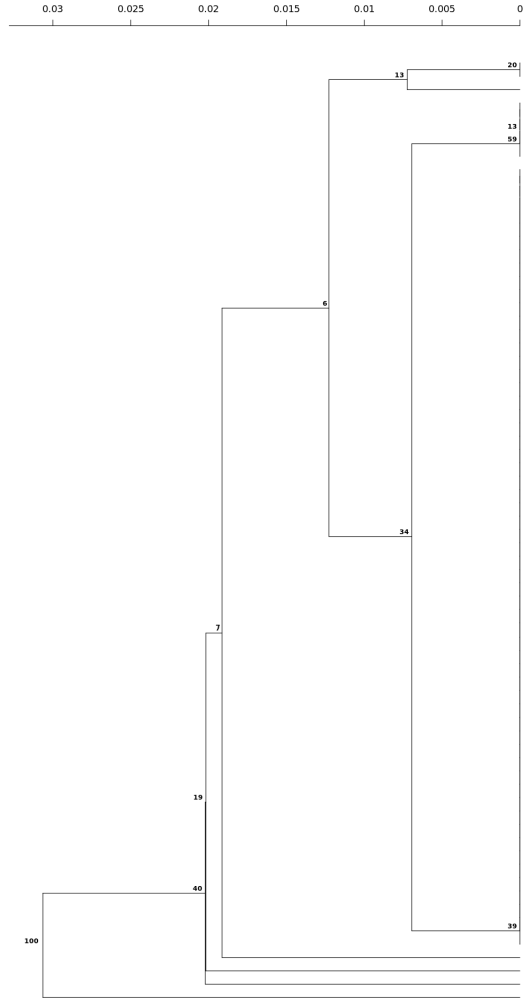
Marker	Alfgrde	Dato	Produkt	Mængde	Risiko	Rog-skimmel	Soweste behandling	Status
4-0	Kartoffel, stivelse						14-05-2021	Udført
6-0	Kartoffel, stivelse						14-05-2021	Udført
11-0	Kartoffel, stivelse						14-05-2021	Planlagt
20-0	Kartoffel, stivelse						14-06-2021	Planlagt
		10-03-2021	Produkt task #1	0.5 l pr. ha				Udført
		04-04-2021	Produkt task #2	0.5 l pr. ha				Udført
			Produkt task #2	0.5 l pr. ha				
			Produkt task #2	0.5 l pr. ha				
		04-04-2021	Produkt task #3	0.5 l pr. ha				Planlagt
		14-04-2021	Produkt task #4	0.5 l pr. ha				Planlagt
27-0	Kartoffel, stivelse						14-05-2021	

BlightManager in CropManager



Following radio buttons can be used to select the color of node labels. This is useful only if the population structure is set as something other than country. When the population structure is set as country, the radio buttons are not useful.

Choose color for node labels: Genotype
 Choose pop to be displayed: All
 Remove Clones: Yes No
 Type of tree: phylogram unrooted
 Bootstrap replicates: 10,000
 Cutoff value: 5



BE
CZ
DE
DK
EE
IS
NL
NO
PL
SC

- 2021 DK DK-BM-2021-AU-010
- 2021 DK DK-BM-2021-AKV-083
- 2021 DK DK-BM-2021-AKV-078
- 2021 DK BELCHIM21020
- 2021 BE CRAW21144
- 2021 DK DK-BM-2021-AKV-122
- 2021 DK DK-BM-2021-AU-092
- 2021 DK DK-BM-2021-BJAGRO-119
- 2021 CZ 21-PI-CZ-002-01
- 2021 BE CRAW21030
- 2021 CZ 21-PI-CZ-002-03
- 2021 CZ 21-PI-CZ-003-01
- 2021 CZ 21-PI-CZ-003-03
- 2021 CZ 21-PI-CZ-003-05
- 2021 CZ 21-PI-CZ-004-01
- 2021 CZ 21-PI-CZ-004-03
- 2021 CZ 21-PI-CZ-004-04
- 2021 CZ BELCHIM20059
- 2021 CZ BELCHIM20060
- 2021 CZ BELCHIM21005
- 2021 DE CORTEVA21031
- 2021 DE CORTEVA21046
- 2021 DE CORTEVA21055
- 2021 DE CORTEVA21068
- 2021 DE CORTEVA21094
- 2021 DE CORTEVA21171
- 2021 DE CORTEVA21193
- 2021 DE CORTEVA21198
- 2021 DE SYNGENTA21109
- 2021 DK AU19038
- 2021 DK DK-BM-2021-AKV-082
- 2021 DK DK-BM-2021-AKV-106
- 2021 DK DK-BM-2021-AKV-109
- 2021 DK DK-BM-2021-AU-008
- 2021 DK DK-BM-2021-AU-016
- 2021 DK DK-BM-2021-BJAGRO-067
- 2021 DK DK-BM-2021-BJAGRO-080
- 2021 DK DK-BM-2021-BJAGRO-128
- 2021 DK DK-BM-2021-BJAGRO-129
- 2021 DK DK-BM-2021-BJAGRO-130
- 2021 DK DK-BM-2021-KMC-017
- 2021 EE EMU21033
- 2021 EE EMU21043
- 2021 FR BAYER20168
- 2021 IS RML21001
- 2021 IS RML21002
- 2021 IS RML21003
- 2021 IS RML21004
- 2021 IS RML21005
- 2021 IS RML21006
- 2021 IS RML21007
- 2021 IS RML21008
- 2021 IS RML21009
- 2021 NL ADAMA20003
- 2021 NL NL21003
- 2021 NL NL21018
- 2021 NO SYNGENTA19007
- 2021 NO SYNGENTA21203
- 2021 NO SYNGENTA21205
- 2021 NO SYNGENTA21207
- 2021 PL 21-PI-PL-016-01
- 2021 PL 21-PI-PL-018-03
- 2021 SC W00012616A
- 2021 SC W00012616B
- 2021 SC W00012616C
- 2021 SC W00012616D
- 2021 SC W00012616E
- 2021 DE BELCHIM21061
- 2021 DK DK-BM-2021-AKV-102
- 2021 DK AU2021003
- 2021 DK DK-BM-2021-AKV-097


Recommendations

Early warning & control

1. Continue monitoring of *P. infestans* population (+phenotypic traits!) and collaborate with many partners
2. Stepping up IPM e.g. reduce primary inoculum sources and increase attention on more sanitation measures
3. Introduce new and more resistant cultivars and describe the resistance type, level and stability (for use in DSS)
4. More research in use of biologicals and combinations of biologicals with traditional fungicides
5. Improve our DSS and integrate LB and EB models and spray recommendations also for use of biologicals
6. Support increase in organic potatoes – area, yield and quality
7. More and better education and knowledge transfer in the use of biologicals.
8. Extension (SEGES) implement a Field specific (GIS based) version of the basic DSS components developed by AU
9. Political focus on the Potato Value Chain and EU Green Transition, Farm to Fork (industry establish demo farms)
10. Continue a research and early warning infrastructure that includes all stakeholders

[< Previous](#)

Characterisation of the level and type of resistance of potato varieties to late blight (*Phytophthora infestans*)

Isaac Abuley  and Jens G. Hansen

Published Online: 31 Mar 2022 | <https://doi.org/10.1094/PHYTO-07-21-0309-R>




PDF



PDF PLUS

Eur J Plant Pathol (2021) 161:645–663
<https://doi.org/10.1007/s10658-021-02350-4>



An epidemiological analysis of the dilemma of plant age and late blight (*Phytophthora infestans*) susceptibility in potatoes

Isaac Kwesi Abuley  · Jens Grønbech Hansen

Accepted: 2 August 2021 / Published online: 20 August 2021
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Thank you for your attention