

Resultat af 2020 kampagnen for indsamling af skimmel til DNA analyse.

Hvad fandt vi?

Jens G. Hansen, Isaac K. Abuley & Poul Lassen, Aarhus Universitet
og alle konsulenterne



Year
2020

Continent
Europe

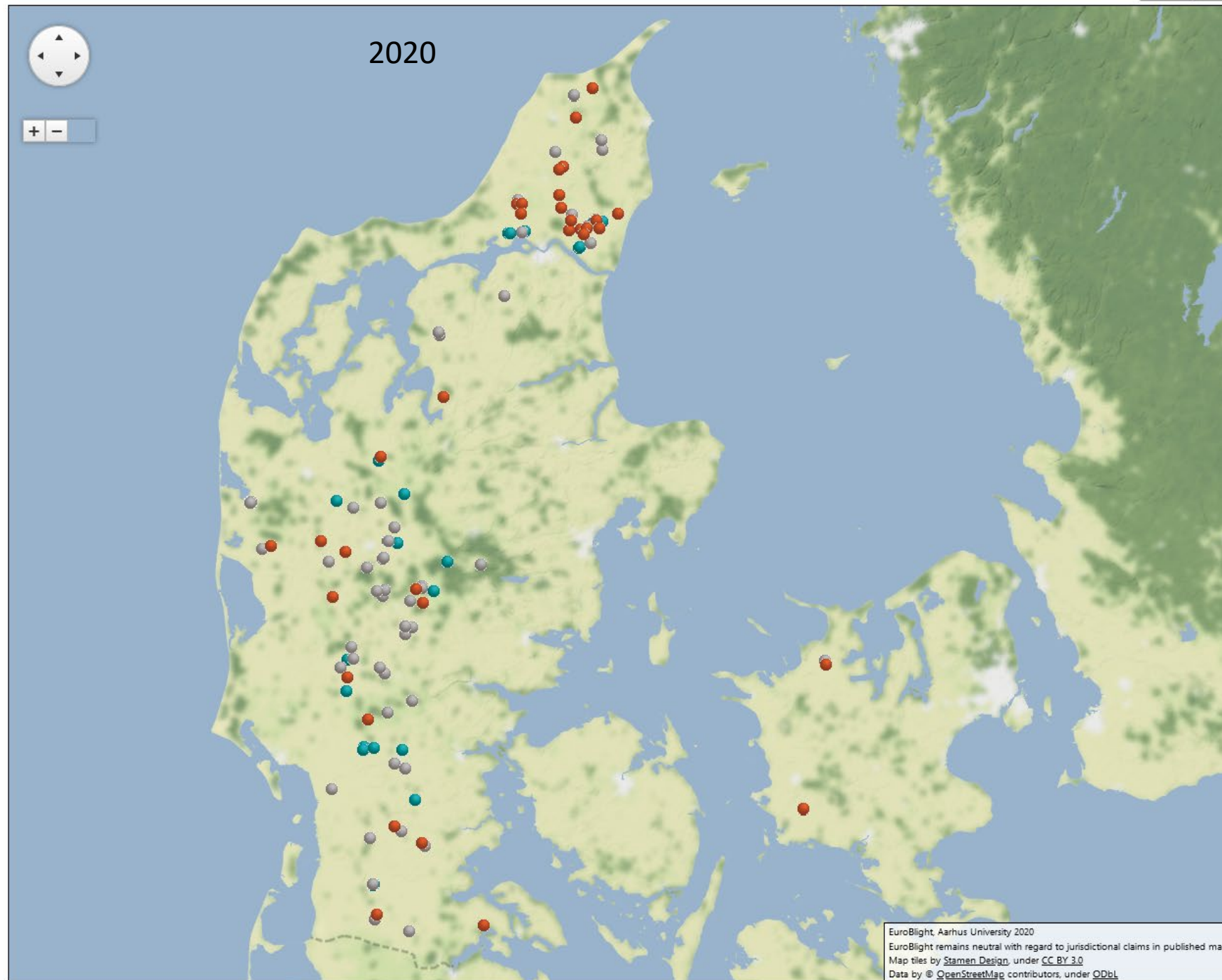
Country
All countries selected

Host
☒ All
☒ Potato

Genotypes ?
☒ All
☒ EU_41_A2 ☒ EU_43
☒ Other

Map names
☒ No ☐ Yes

Show



136 isolates indsamlet
fra 12 June til October

DK population af
*Phytophthora
infestans*: (SSR genotypning)

Other: 74

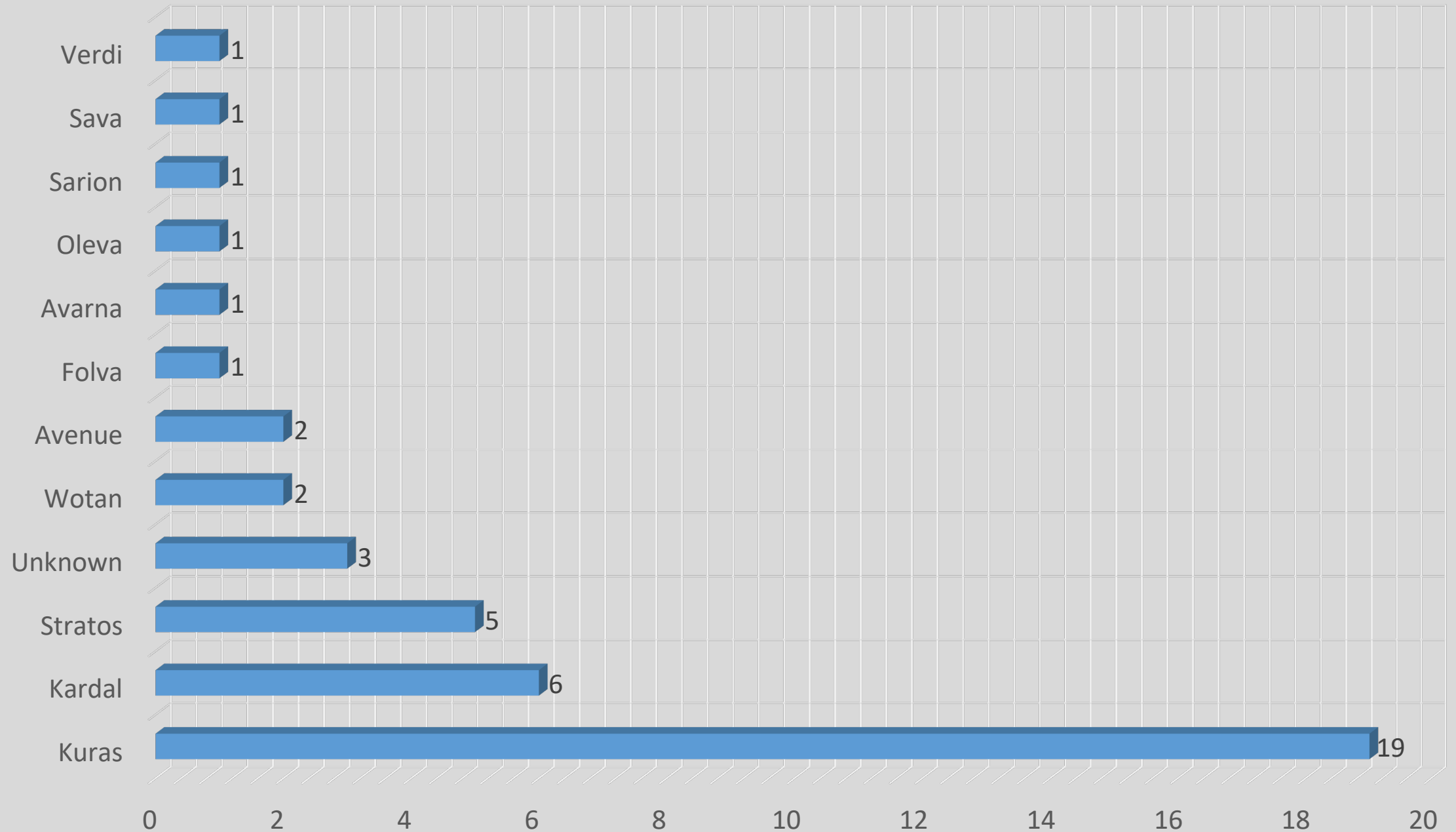
EU41: 37

EU43: 25

EU36 forsvandt (2 marker
i 2019)

EU43 bredte sig fra
Midt/Syddjylland til
Nordjylland

EU43 - Hvilke sorter er den fundet på 2018-2020?



Year
2017

Continent
Europe

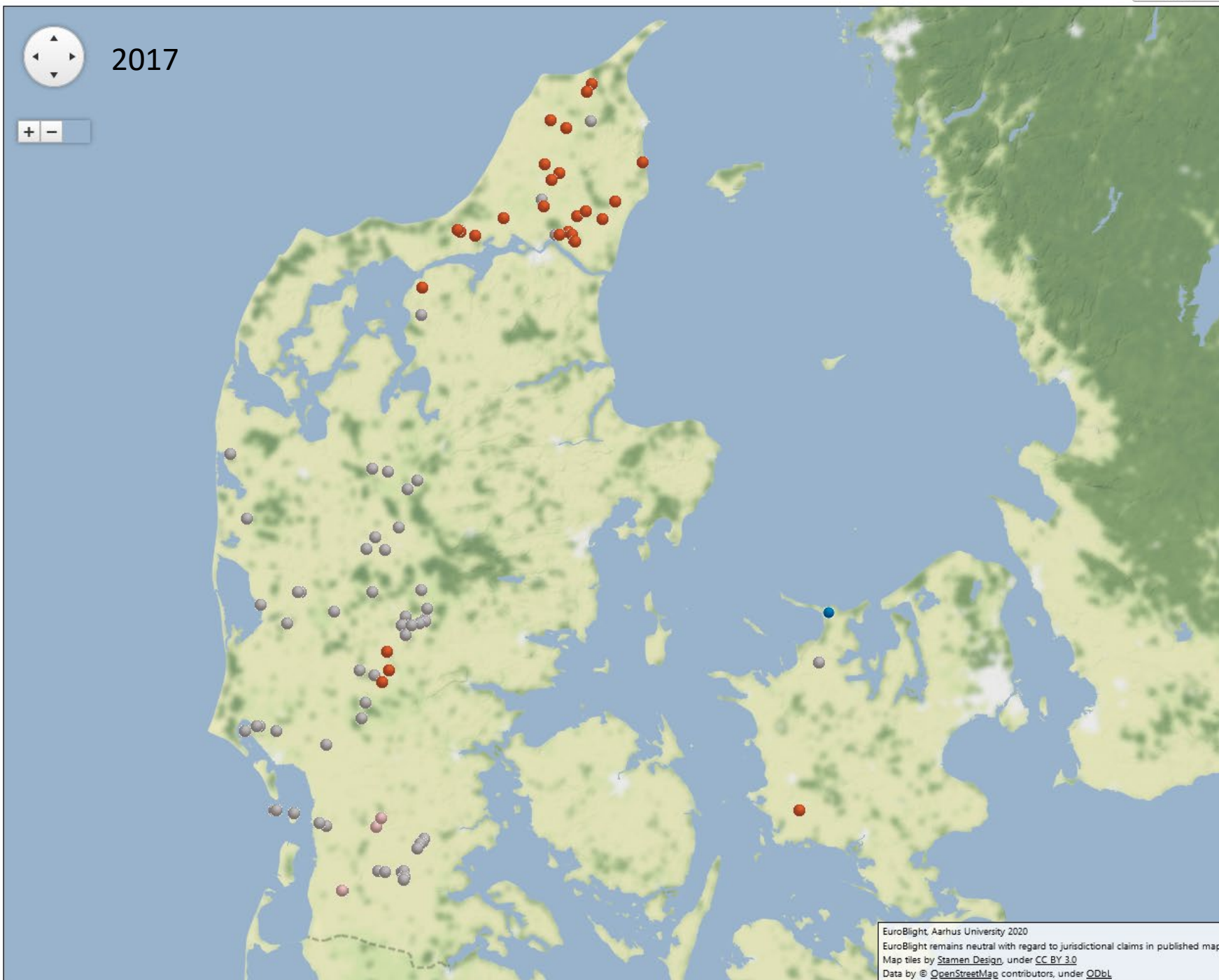
Country
Denmark

Host
☒ All
☒ Potato

Genotypes ?
☒ All
☒ EU_13_A2 ☒ EU_36_A2
☒ EU_41_A2 ☒ Other

Map names
☒ No ☐ Yes

Show



EU41 i Nordjylland & Midt/Syddjylland

Tre marker med EU36 i Sydjylland

En EU13 in NordSjælland

Year
2018

Continent
Europe

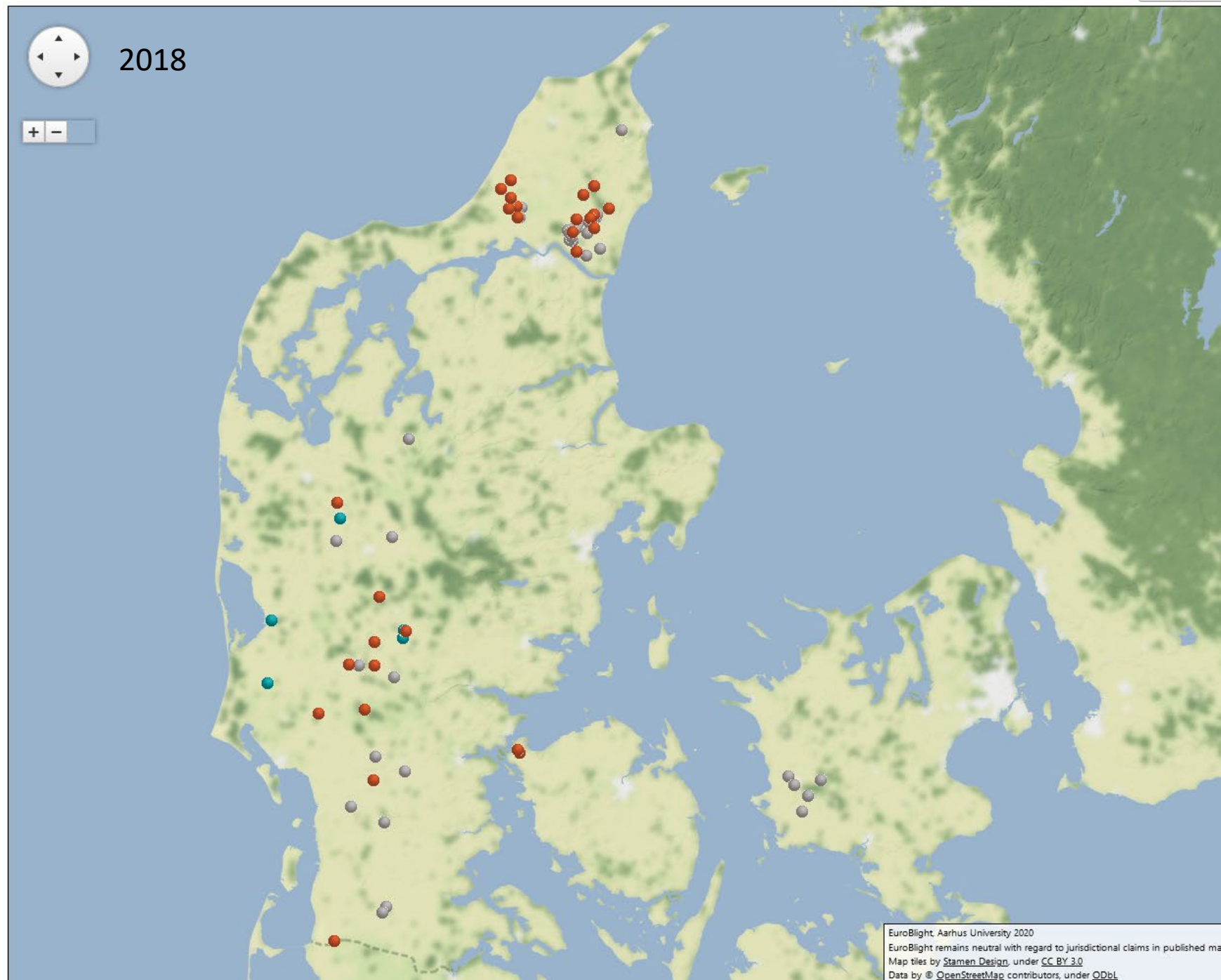
Country
Denmark

Host
☒ All
☒ Potato

Genotypes ?
☒ All
☒ EU_41_A2 ☒ EU_43
☒ Other

Map names
☒ No ☐ Yes

Show



EU41 udbredte sig i
Midtjylland

EU36 forsvandt

NY EU43 fundet for
første gang i Midt/vest
Jylland

Year
2019

Continent
Europe

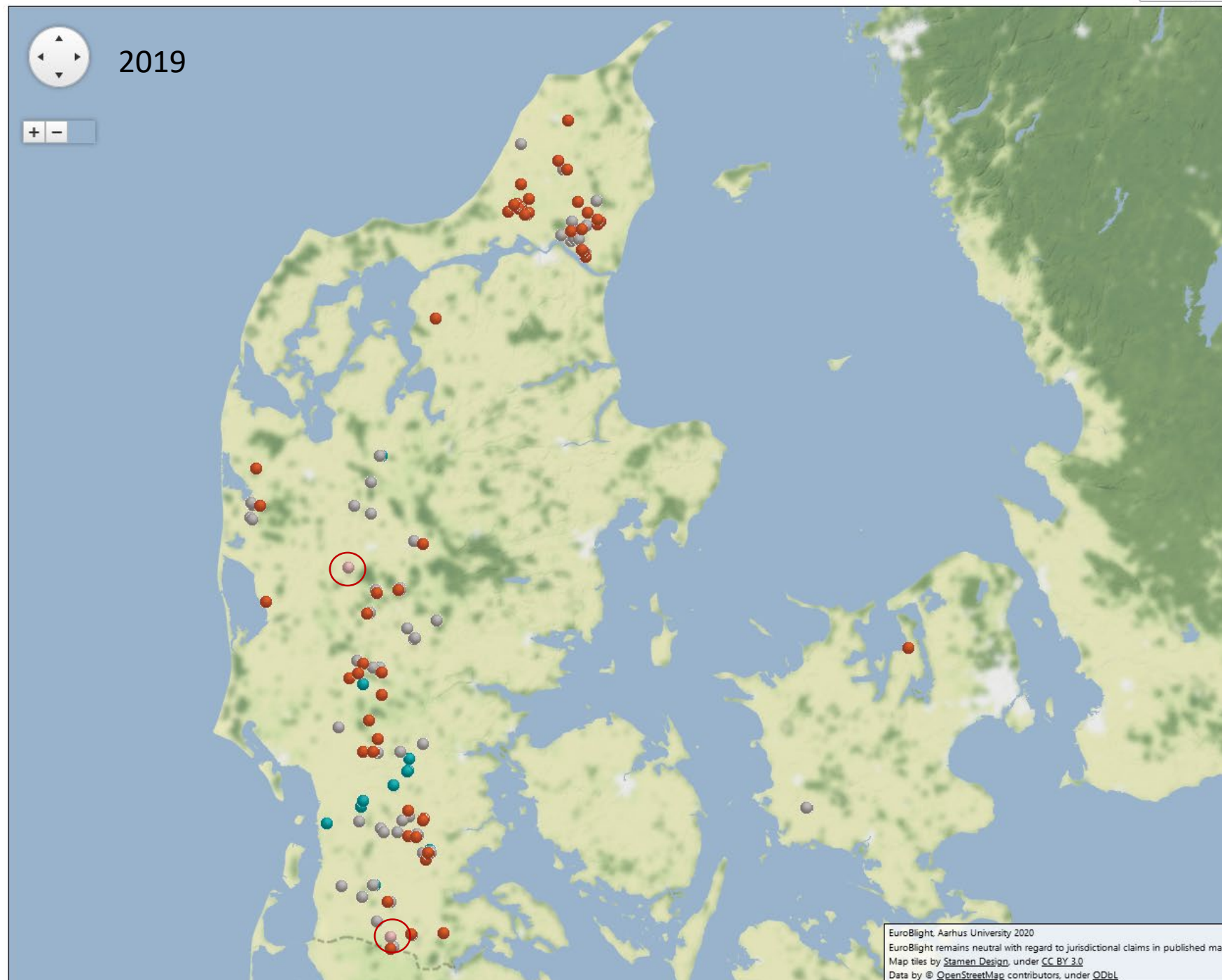
Country
Denmark

Host
☒ All
☒ Potato

Genotypes ?
☒ All
☒ EU_36_A2 ☒ EU_41_A2
☒ EU_43 ☒ Other

Map names
☒ No ☐ Yes

Show



EU41 og EU43 bredte sig mod syd

EU36 blev fundet i 2 marker

Year
2020

Continent
Europe

Country
All countries selected

Host
☒ All
☒ Potato

Genotypes ?
☒ All
☒ EU_41_A2 ☒ EU_43
☒ Other

Map names
☒ No ☐ Yes

Show



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i 2019)

EU43 bredte sig fra
Midt/Syddjylland til
Nordjylland

EU43 – en ny genotype i Danmark. Navngivet I 2020 og “genfundet” ved DNA analyser i 2018 og 2019. Ikke tidligere!

2018



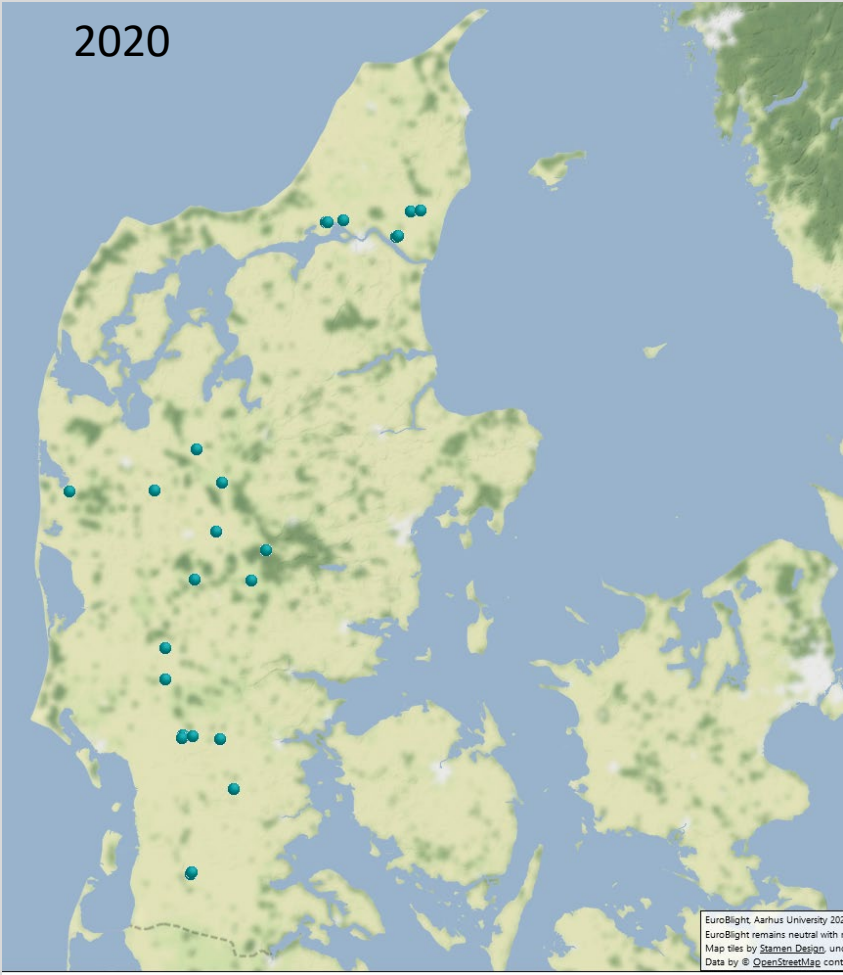
Midt-Vest Jylland

2019



Breder sig mod syd

2020



Mere udbredt – også Nordjylland

GENOTYPE

[Genotype map](#)
[Genotype frequency map](#)
[Genotype frequency chart](#)
[Frequency rank](#)
[World map](#)

Continent

Europe

Year

- ☐ All
☒ 2020 ☒ 2019
☒ 2018 ☒ 2017
☐ 2016 ☐ 2015
☐ 2014 ☐ 2013
☐ 2012 ☐ 2011
☐ 2010 ☐ 2009
☐ 2008 ☐ 2007
☐ 2006 ☐ 2005
☐ 2004

Host

- ☒ All
☒ Potato ☒ Tomato

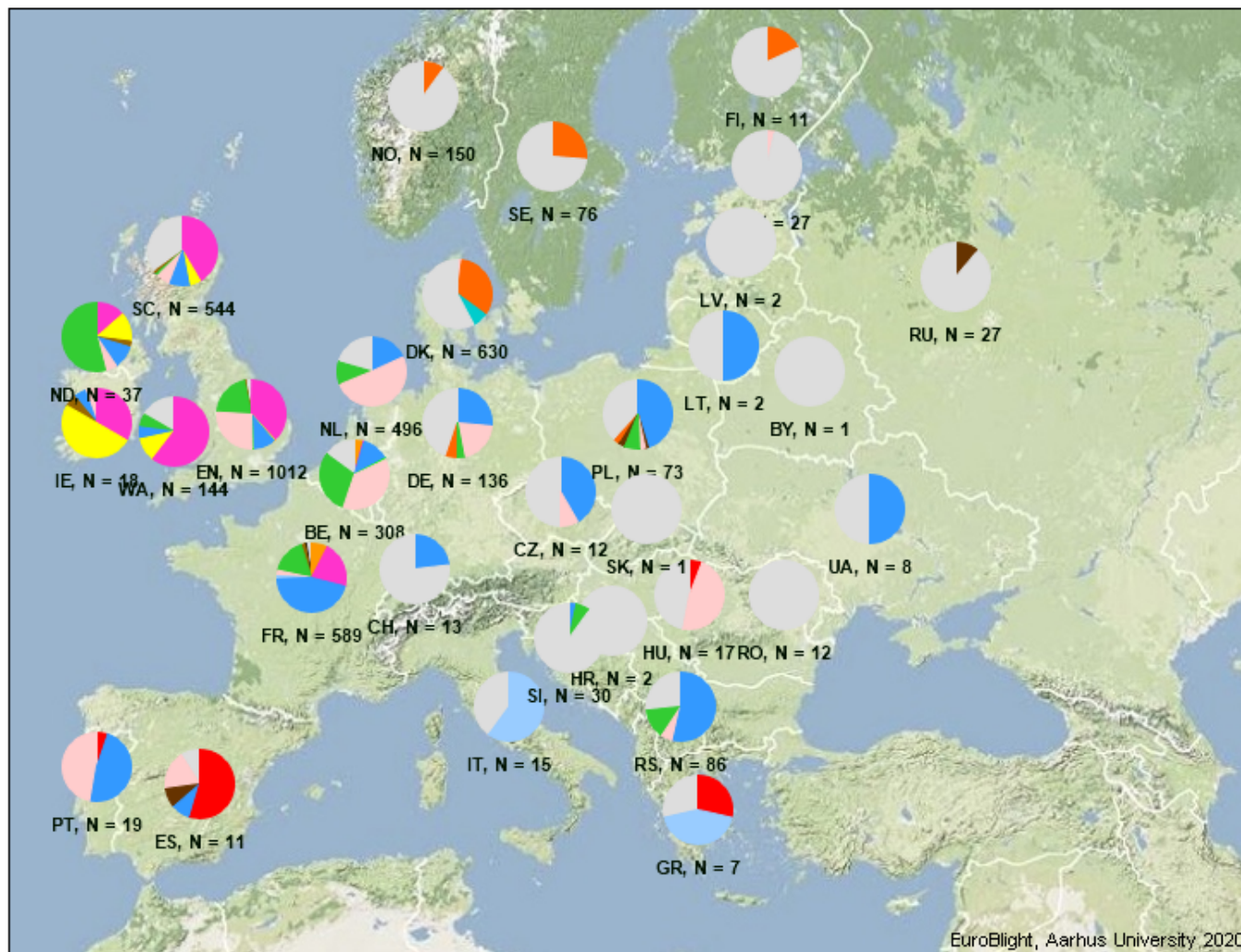
Show

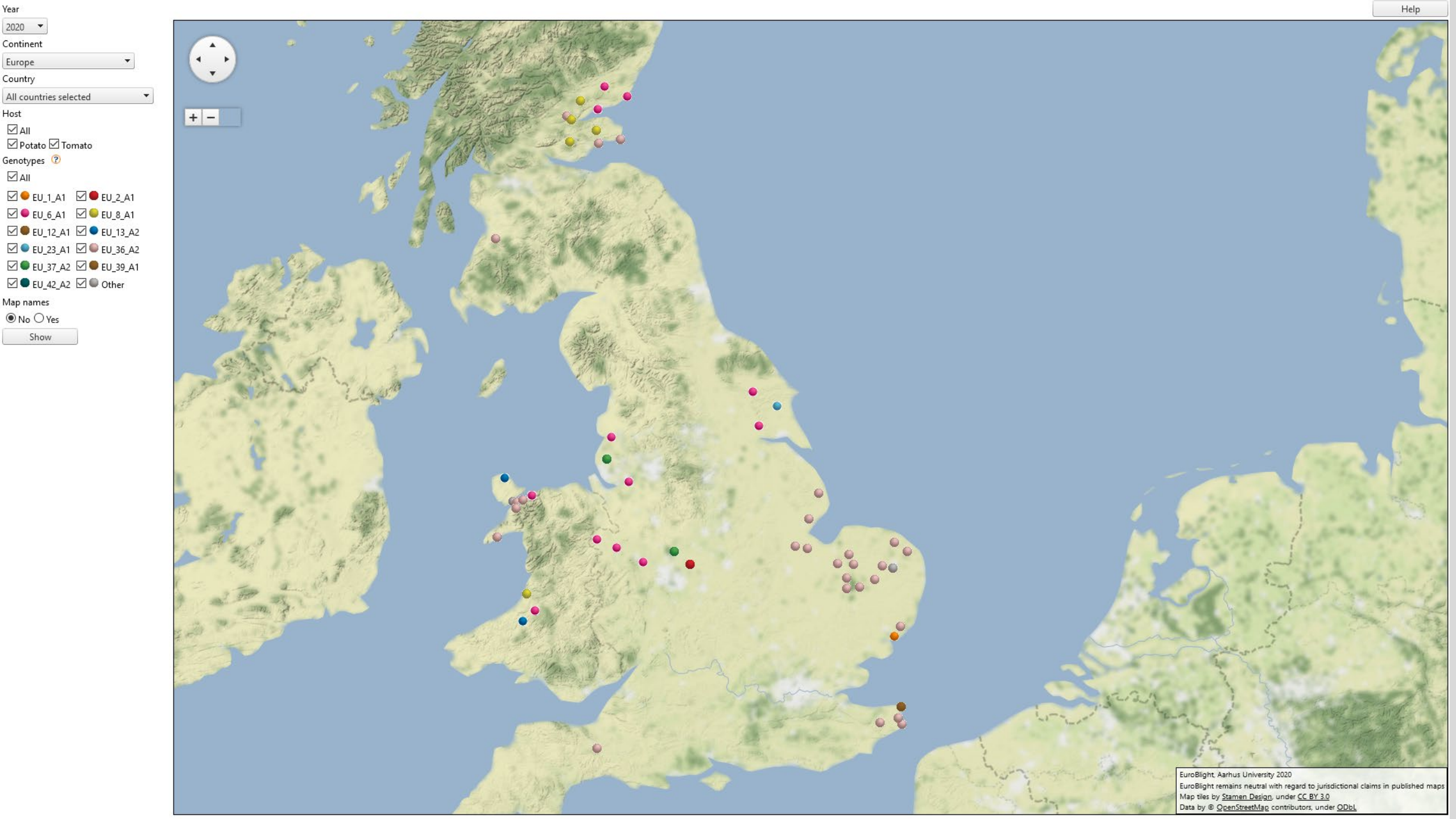
Genotype legend ?

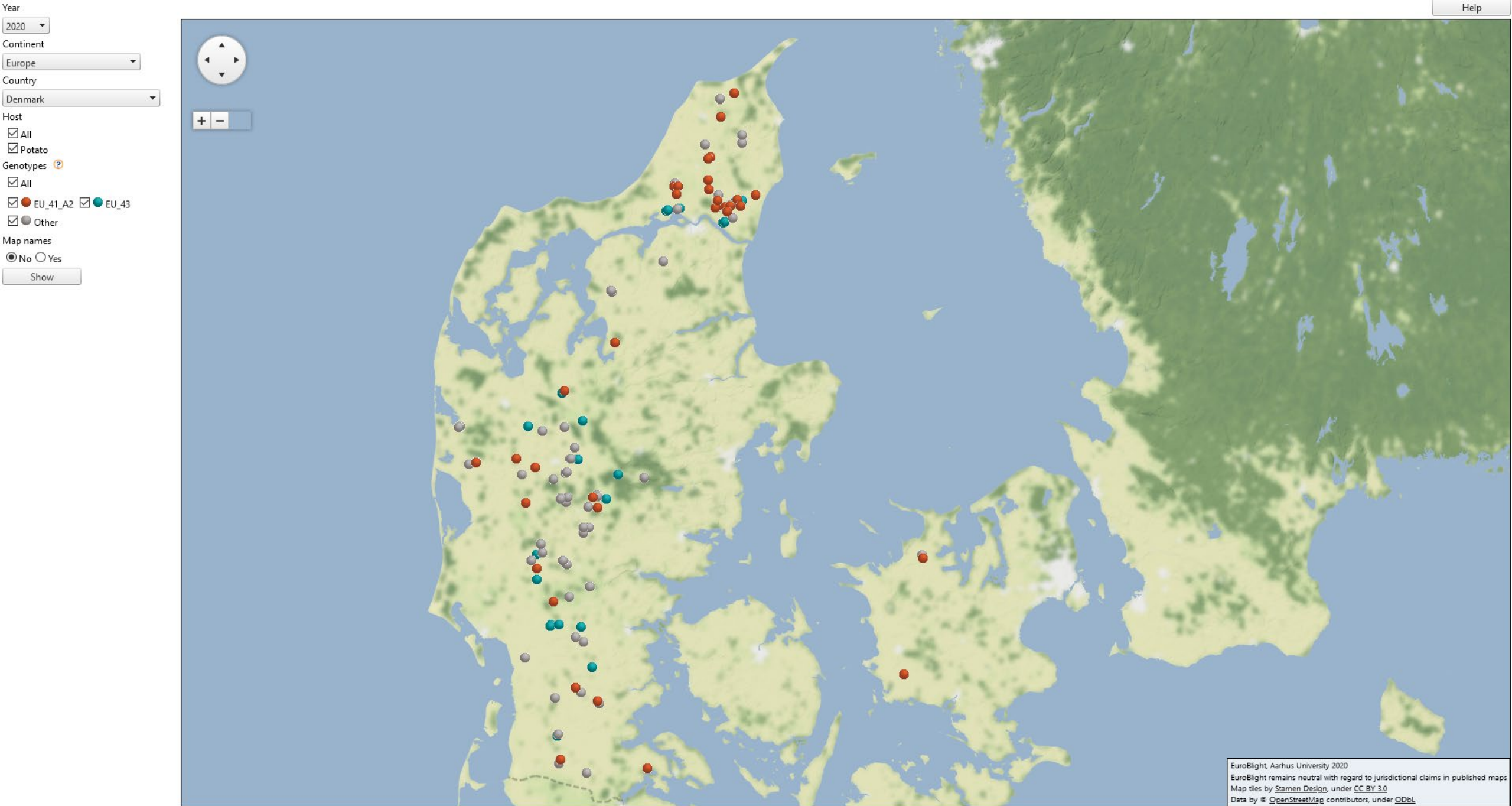
- | | |
|---|---|
| ■ EU_1_A1 | ■ EU_2_A1 |
| ■ EU_6_A1 | ■ EU_8_A1 |
| ■ EU_12_A1 | ■ EU_13_A2 |
| ■ EU_23_A1 | ■ EU_33_A2 |
| ■ EU_34_A1 | ■ EU_36_A2 |
| ■ EU_37_A2 | ■ SIB_1_A1 |
| ■ EU_39_A1 | ■ EU_38_A2 |
| ■ EU_41_A2 | ■ EU_43 |
| ■ Other | |

Genotype frequency distribution

Help







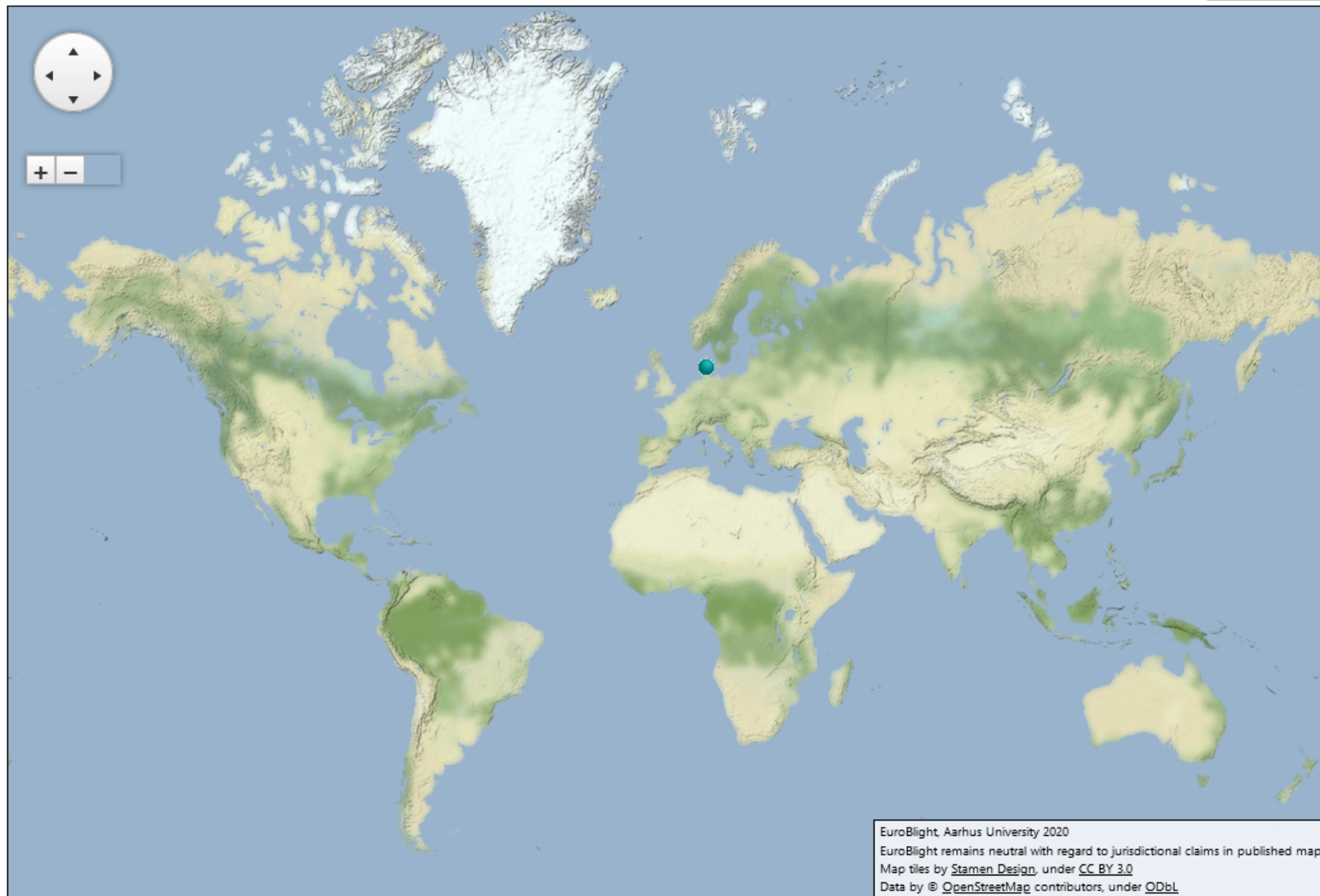
GENOTYPE

[Genotype map](#)
[Genotype frequency map](#)
[Genotype frequency chart](#)
[Frequency rank](#)
[World map](#)

Genotype ?

[Help](#)

- ☐ EU_1_A1
- ☐ EU_2_A1
- ☐ EU_5_A1
- ☐ EU_6_A1
- ☐ EU_8_A1
- ☐ EU_12_A1
- ☐ EU_13_A2
- ☐ EU_23_A1
- ☐ EU_33_A2
- ☐ EU_34_A1
- ☐ EU_35_A2
- ☐ EU_36_A2
- ☐ EU_37_A2
- ☐ KR_1_A1
- ☐ SIB_1_A1
- ☐ US_1_A1
- ☐ EU_39_A1
- ☐ EU_38_A2
- ☐ US_11_A1
- ☐ EU_40_A2
- ☐ EU_41_A2
- ☐ EU_10_A2
- ☐ EU_22_A2
- ☐ EU_3_A2
- ☐ AU_1
- ☒ EU_43
- ☐ Other



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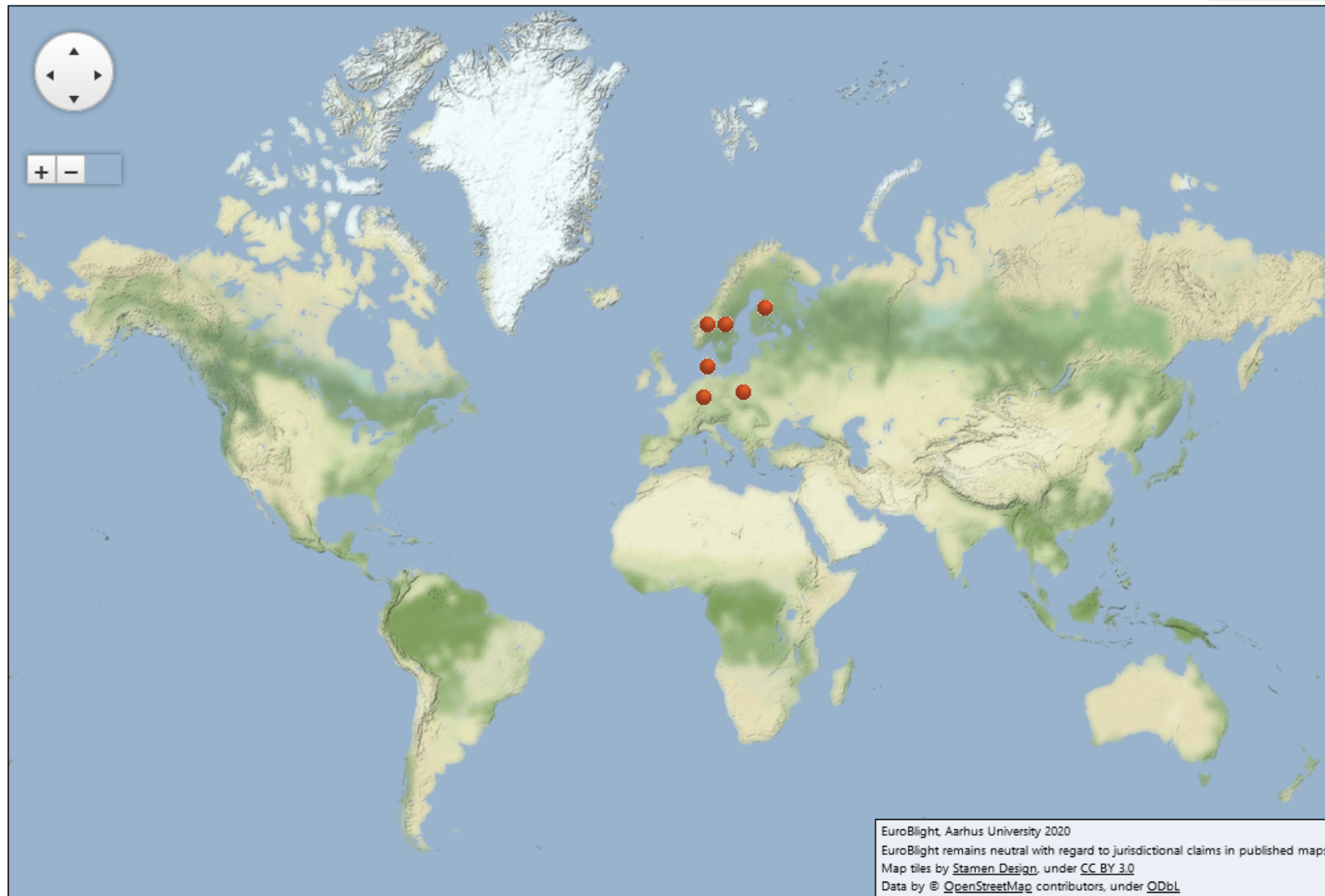
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[Frequency rank](#)
[World map](#)

Genotype ?

[Help](#)

- ☐ EU_1_A1
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- ☐ EU_6_A1
- ☐ EU_8_A1
- ☐ EU_12_A1
- ☐ EU_13_A2
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- ☐ EU_33_A2
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- ☐ EU_36_A2
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- ☐ EU_3_A2
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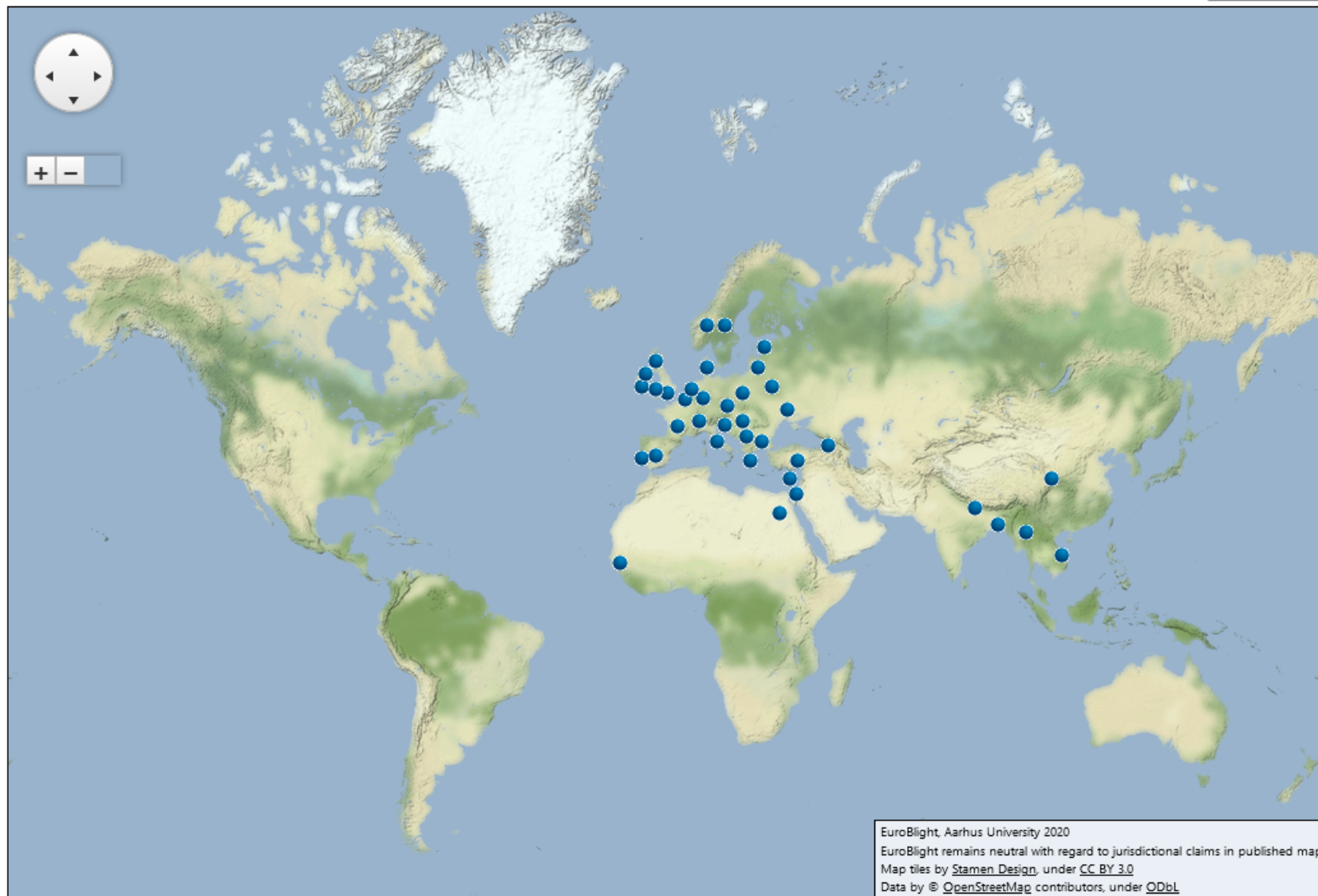
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Genotype [?](#)

[Help](#)

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- ☐ EU_23_A1
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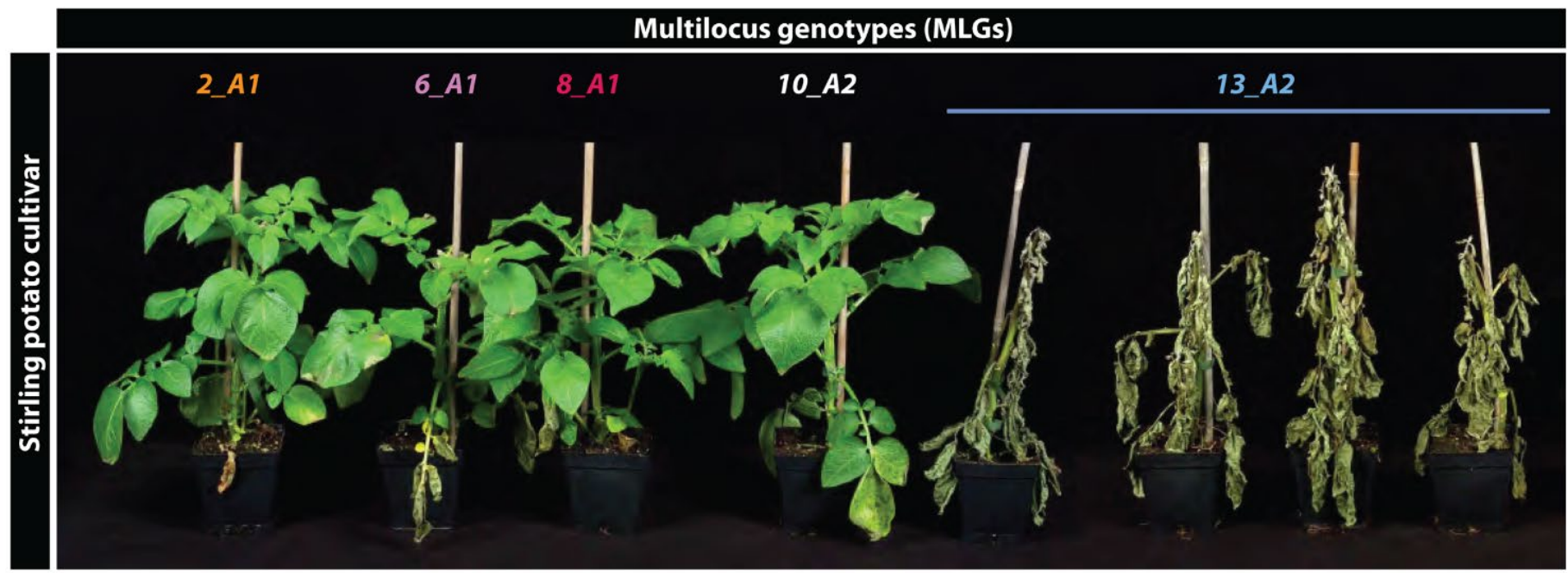
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Hvad betyder de nye skimmeltyper (EU13, EU36, EU37, EU41 og EU43) for praksis?

Hvorfor har de succes?

- Mere aggressive?
- Mindre følsomme overfor fungicider?
- Kan overkomme resistensen i de sorter vi dyrker eller de tilpasser sig sorterne over tid?

A



2012

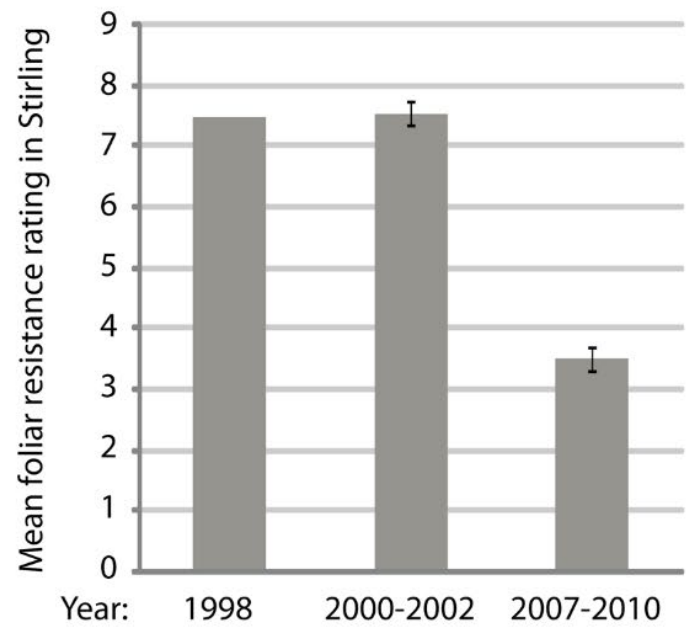
EU_13 er meget mere aggressiv end andre typer i UK

David E. L. Cooke et al. 2012
Genome Analyses of an Aggressive and Invasive Lineage of the Irish Potato Famine Pathogen

2019

EU_41 har ca. same aggressivitet som EU_13

B



Why do we need to work preventive?

STOP-trial: treatments started at very first visible lesion



Source: Belchim, EuroBlight workshop 2019, York (UK)

Hvad kan vi gøre ?

- Skifte til mere resistente sorter
- Minimere primære smittekilder (affalddynger, spildkartofler, brug sundt læggemateriale)
- Flere år mellem kartoflerne for at minimere risikoen for oosporer (+PED)
- Vælge, kombinere og “time” brugen af fungicider på en “smart” måde.

Vi gør det sammen!

Hvad gør AU?

- Er meget aktiv internationalt bl.a. Koordinator for EuroBlight
- Koordinerer BlightManager et GUDP project om bedre beslutningsstøtte om bekæmpelse af skimmel og bladplet
- KAF project om Alternaria Spp. Fungicidresistens
- Undersøger alternative bekæmpelsesmidler mod skimmel og bladplet i H2020 Organic Plus og ERA-NET Ecosol

Akut behov

- Undersøge karakteristika af både EU41 og EU43 (aggr. - fungicid, - virulens)
- Sammen med erhvervet udvikle anti resistens bekæmpelsesstrategier
- Tilpasse vores beslutningsstøtte og anbefalinger



Tak for opmærksomheden

