Help de es voor het Nederlandse landschap te behouden

Joukje Buiteveld & Paul Copini

29 september 2017, Beheerdersdag

WAGENINGEN UR
For quality of life

Centre for Genetic Resources, the Netherlands

Deze presentatie

- Introductie: De es en achtergrond essentaksterfte
- Hoe herken je de ziekte?
- Inventarisatie via www.essentaksterfte.nu
- Onderzoek Herkomstenproeven, testen gevoeligheid
- Vragen

Introductie: De es en achtergrond essentaksterfte

De Oessoeri

Fraxinus mandschurica, *Quercus mongolica*, *Tilia amurensis*, *Tilia mandschurica*.

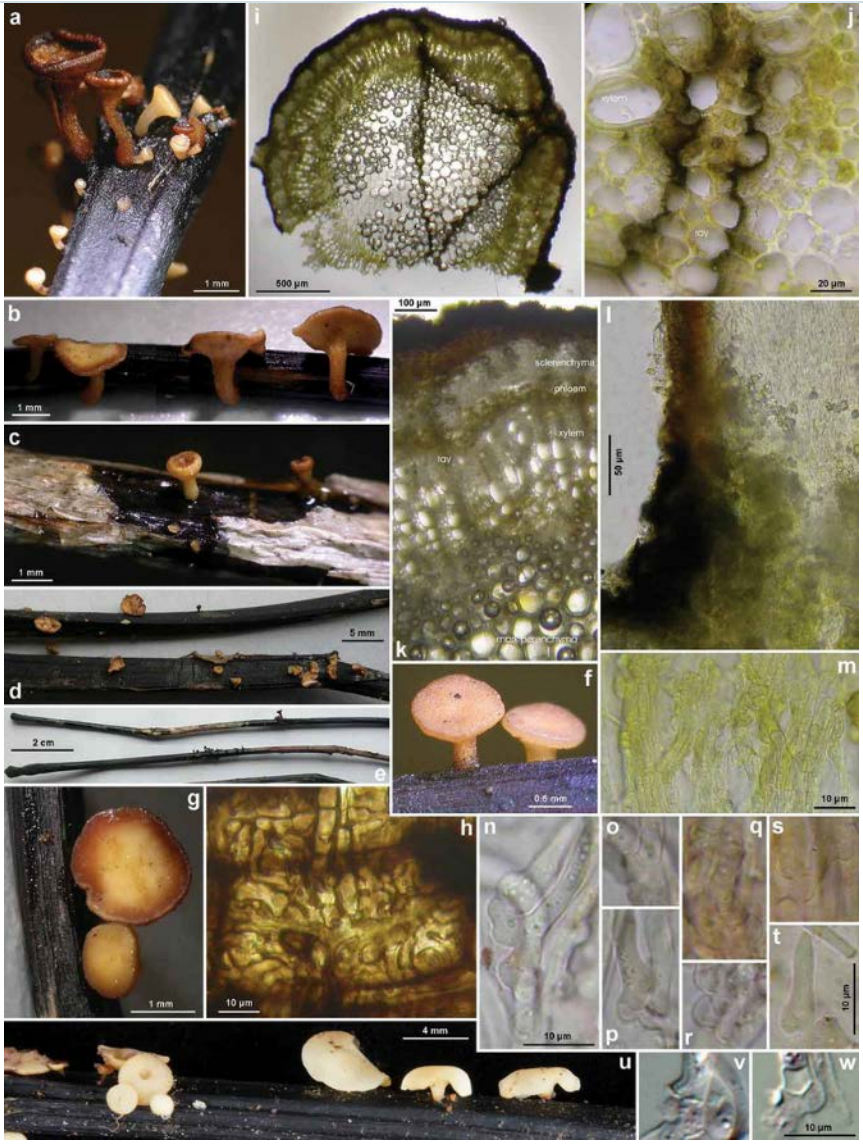
Bron: Andshel Wikipedia

Fraxinus mandschurica

Credits: Herman, D.E wikipedia

Vals essenvlieskelkje (Hymenoscyphus fraxineus)

Credits: Herman, D.E wikipedia



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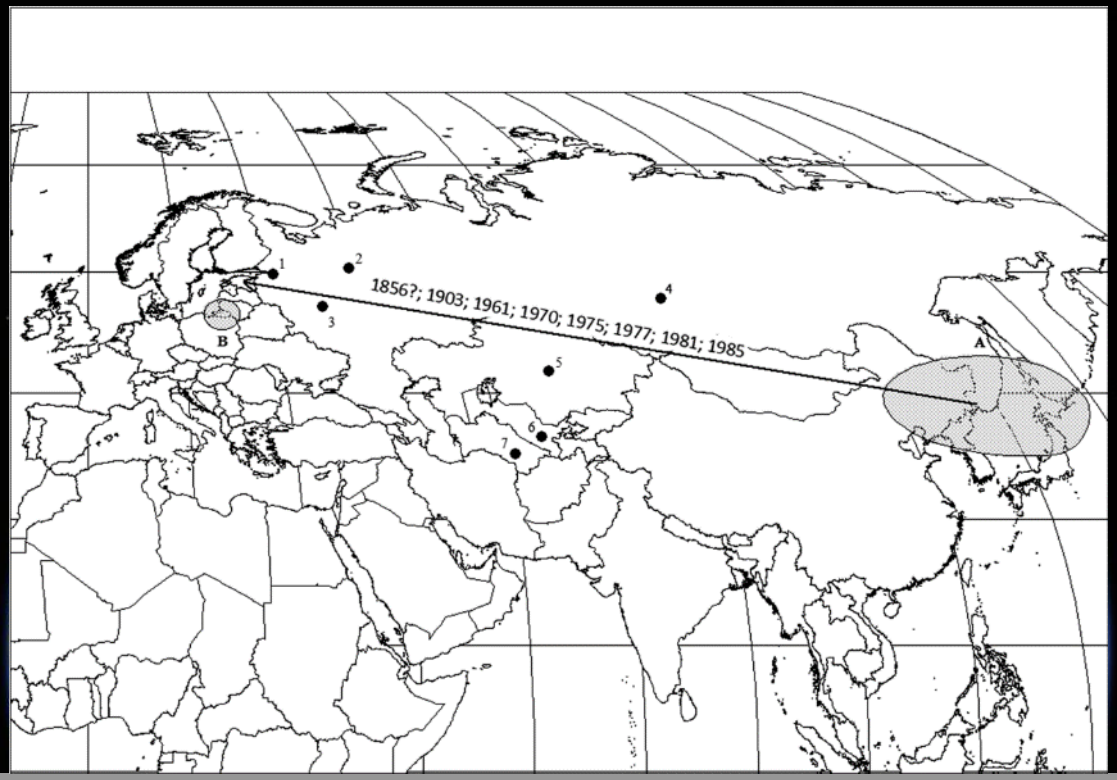
Mycology, 2014 Vol. 5, No. 4, 228–290, http://dx.doi.org/10.1080/21501203.2014.963720


?
8000km



Drenkhan et al 2014 :

From the 1960s to the 1980s, several consignments of F. mandshurica, originating directly from the natural range of F. mandshurica in East Asia (in the Russian Far East), were brought and planted in Baltic areas. These consignments consisted mainly of seeds, but sometimes also of young plants. Currently, the natural infection of seeds by the fungus was demonstrated by Cleary et al. (2013), increasing the probability of accidental long-distance transmissions of the fungus.

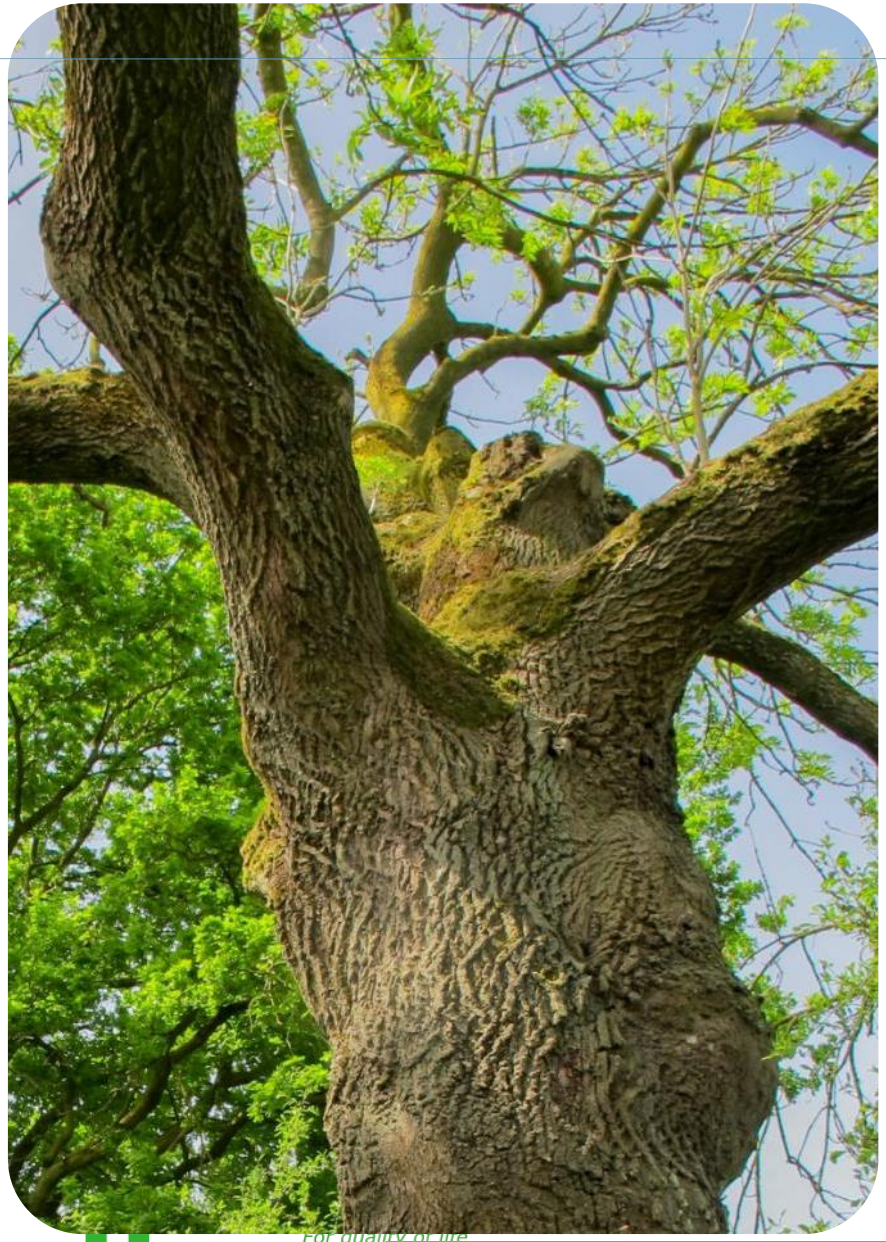
Mycology, 2014 Vol. 5, No. 4, 228–290, http://dx.doi.org/10.1080/21501203.2014.963720

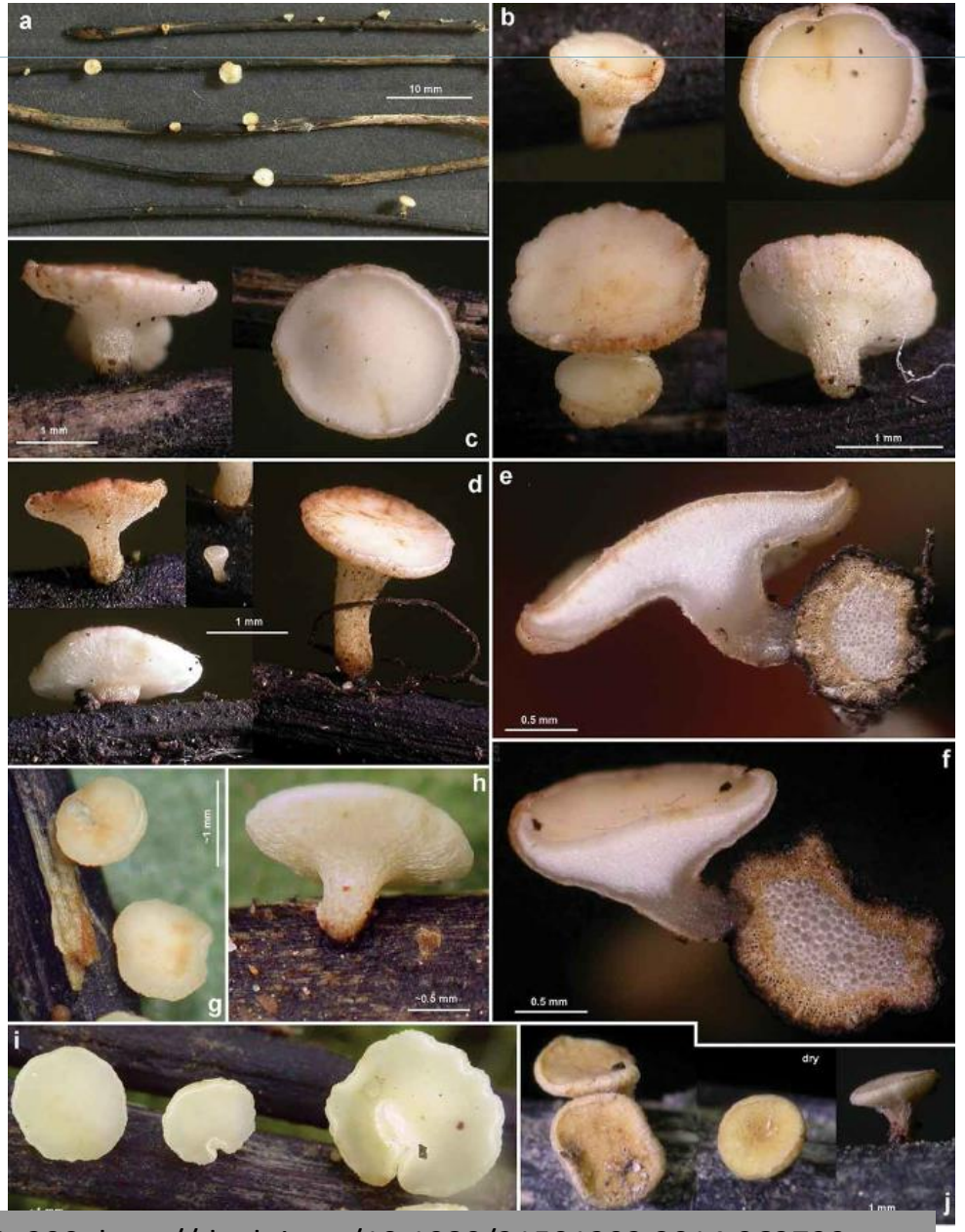
Fraxinus mandshurica planted in Southern Sweden showing no evidence of crown dieback; (**b**) chronic and progressive dieback symptoms including epicormics branching along the stem of *Fraxinus excelsior* trees infected by *Hymenoscyphus fraxineus* in Southern Sweden. Photos taken by Michelle Cleary. Scientific **Reports** | 6:21895 | DOI: 10.1038/srep21895

Bron: Paul Copini

Credits: Herman, D.E wikipedia

essenvlieskelkje (*Hymenoscyphus albidus*)





Mycology, 2014 Vol. 5, No. 4, 228–290, http://dx.doi.org/10.1080/21501203.2014.963720

Hymenoscyphus albidus

Hymenoscyphus fraxineus

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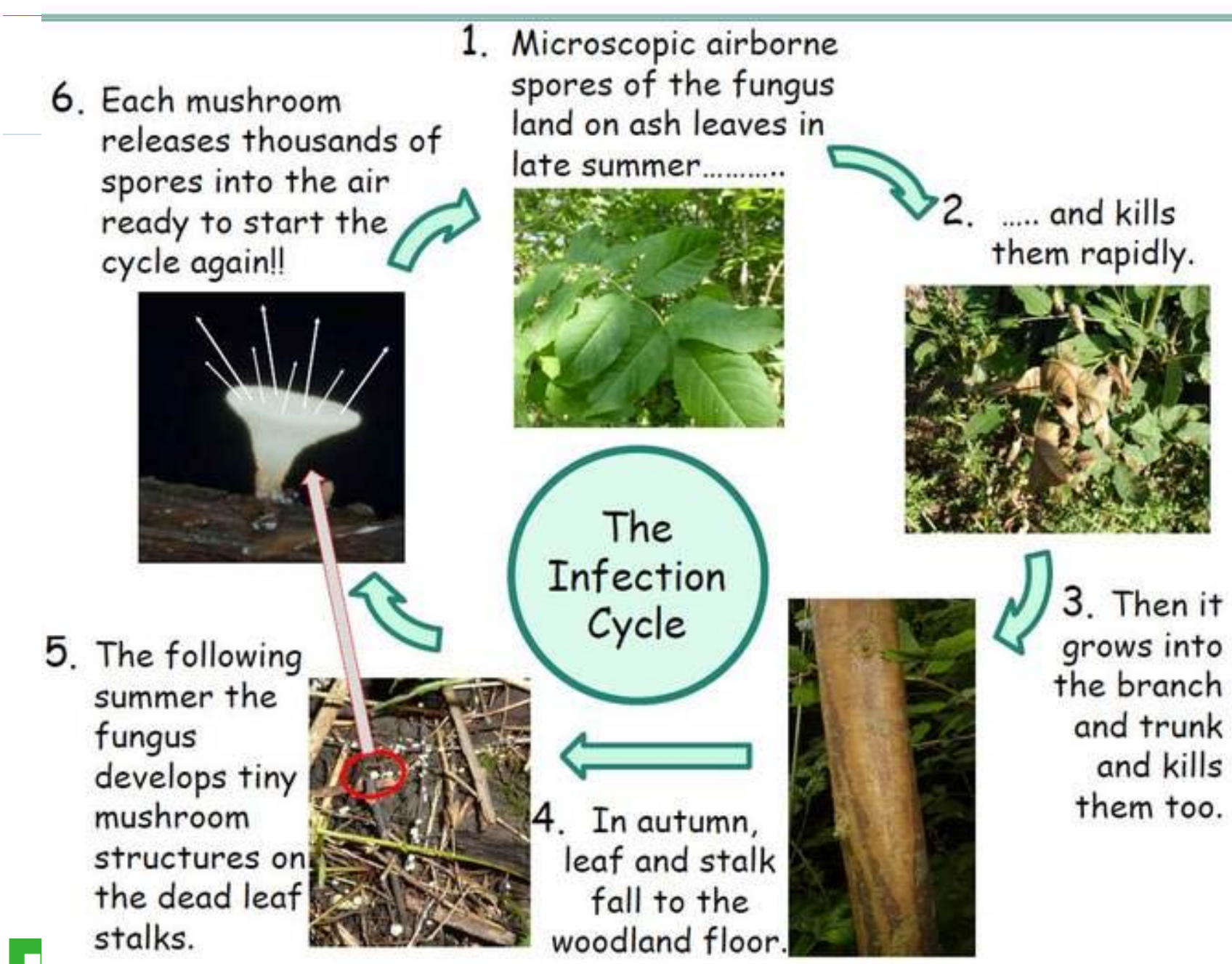
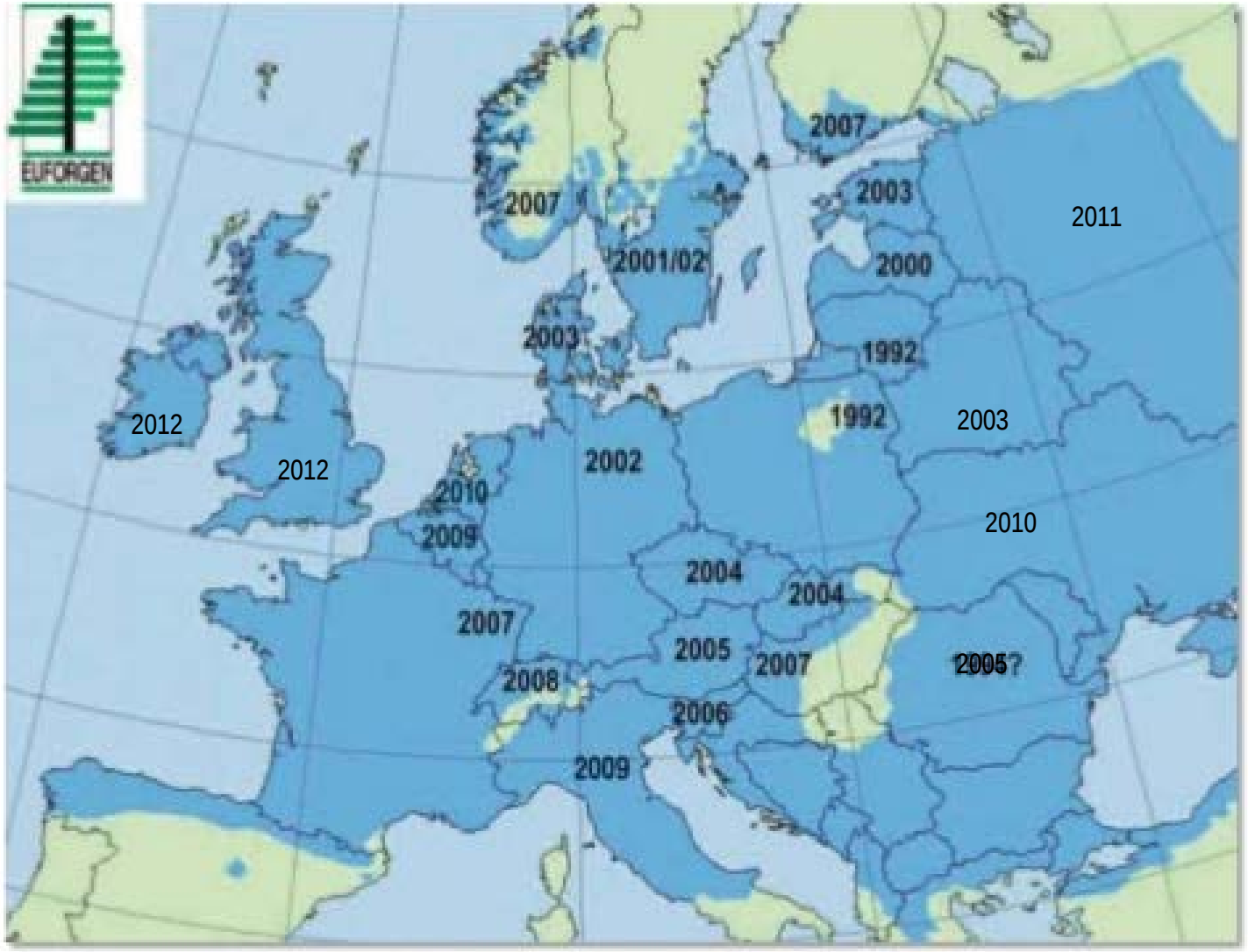
Mycology, 2014 Vol. 5, No. 4, 228–290, http://dx.doi.org/10.1080/21501203.2014.963720



The ash dieback disease fungal cycle. Credit: A Edwards

Bron: Steven Venema

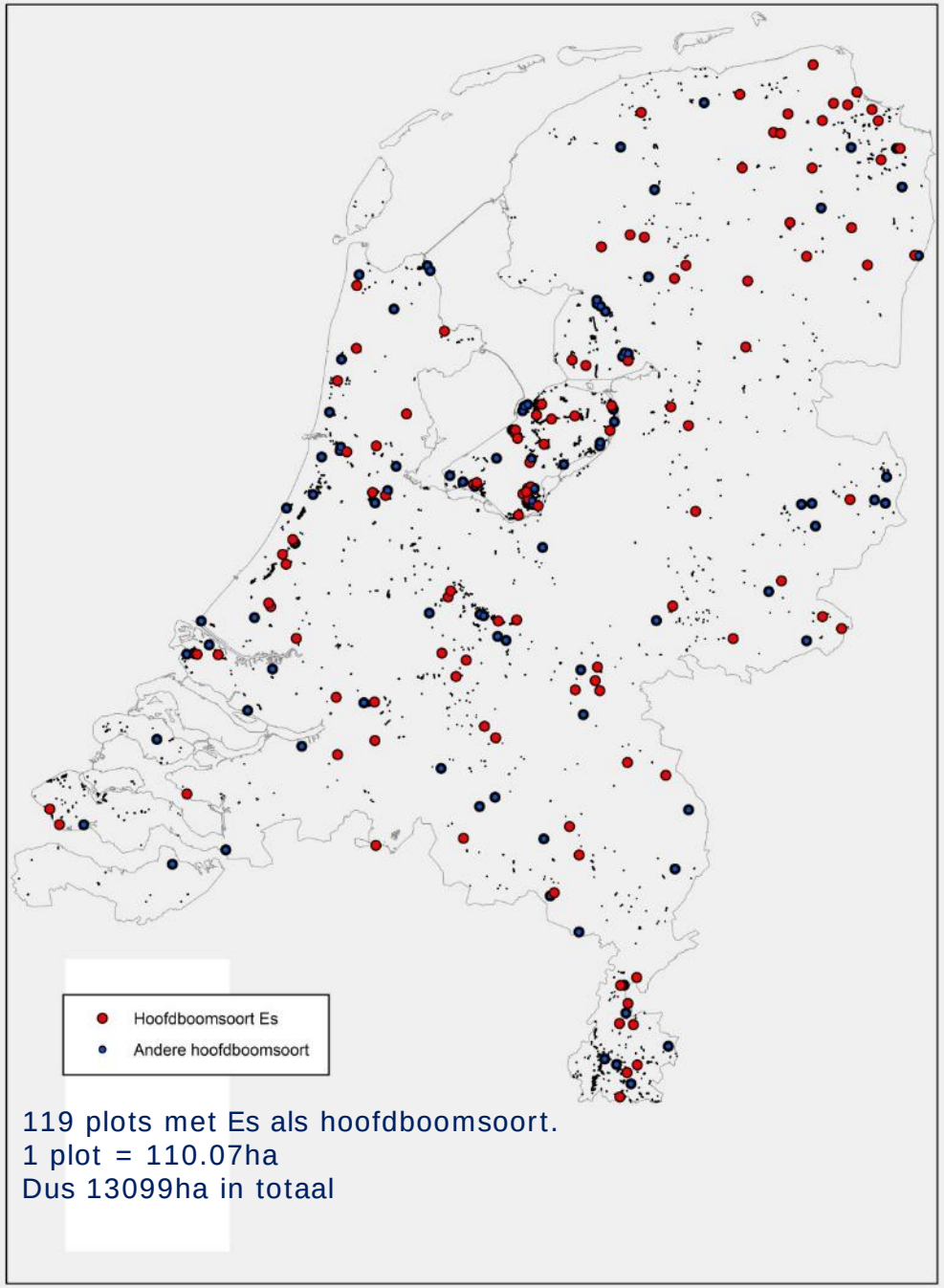
Natural range of ash (*Fraxinus excelsior*) in Europe



Dates indicate the spread of infection across Europe, with the earliest cases being confirmed in Poland (1992).

Adapted from Edward Wilson

Map; EUFORGEN



119 plots met Es als hoofdboomsoort.
1 plot = 110.07ha
Dus 13099ha in totaal

Provincie	Es Hoofdboomsoort (Ha)
Overijssel	440
Zeeland	440
Utrecht	550
Friesland	660
Drenthe	771
Limburg	991
Noord-Holland	991
Gelderland	1.211
Noord-Brabant	1.211
Zuid-Holland	1.321
Groningen	1.871
Flevoland	2.642
Nederland	13.099

Zesde Nederlandse Bosinventarisatie: methoden en basisresultaten

M.J. Schelhaas, A.P.P.M. Clerkx, W.P. Daamen, J.F. Oldenburger, G. Velema, P. Schnitger, H. Schoonderwoerd en H. Kramer

ALTERRA WAGENINGEN UR · Silve · Bureau Daamen · probos

Es op de derde plaats van meest aangeplante bomen, achter de eik en de linde

Bron: Arnold van Vliet

Forestry Commission

Alice Broome and Ruth J. Mitchell 2017

Research Note

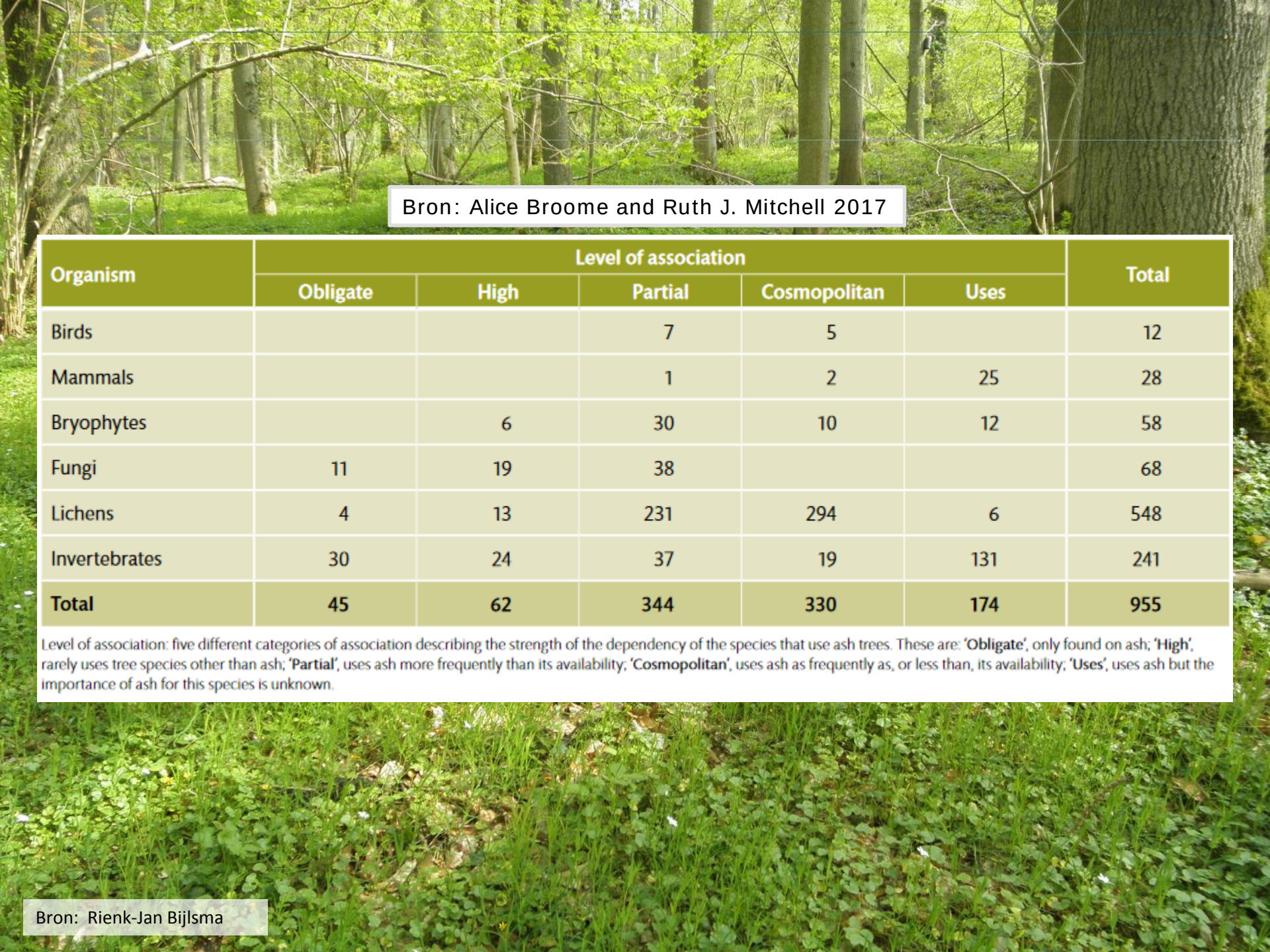
Ecological impacts of ash dieback and mitigation methods

Bron: Alice Broome and Ruth J. Mitchell 2017

Bron: Rienk-Jan Bijlsma

Table 5 Comparison of how well ecosystem function is performed by 11 native broadleaved species compared to ash in three categories: similar rate/quality (green); slightly lower rate/poorer quality (amber); much lower rate/poorer quality (red). No data (blank).

Species	Decomposition	Litter quality	Nutrient cycling
Field maple (*Acer campestre*)			
Sycamore (*Acer pseudoplatanus*)			
Alder (*Alnus glutinosa*)			
Birch (*Betula pubescens/pendula*)			
Beech (*Fagus sylvatica*)			
Common walnut (*Juglans regia*)			
Aspen (*Populus tremula*)			
Wild cherry (*Prunus avium*)			
Oak (*Quercus robur/petraea*)			
Rowan (*Sorbus aucuparia*)			
Small-leaved lime (*Tilia cordata*)			



Bron: Alice Broome and Ruth J. Mitchell 2017

Organism	Level of association					Total
	Obligate	High	Partial	Cosmopolitan	Uses	
Birds			7	5		12
Mammals			1	2	25	28
Bryophytes		6	30	10	12	58
Fungi	11	19	38			68
Lichens	4	13	231	294	6	548
Invertebrates	30	24	37	19	131	241
Total	**45**	**62**	**344**	**330**	**174**	**955**

Level of association: five different categories of association describing the strength of the dependency of the species that use ash trees. These are: **'Obligate'**, only found on ash; **'High'**, rarely uses tree species other than ash; **'Partial'**, uses ash more frequently than its availability; **'Cosmopolitan'**, uses ash as frequently as, or less than, its availability; **'Uses'**, uses ash but the importance of ash for this species is unknown.

Bron: Rienk-Jan Bijlsma

Hoe herken je de ziekte?

Bron: Jitze Kopinga

Bron: CGN

Bron: Paul Copini

Bron: Paul Copini

Bron: Paul Copini

Bron: Jitze Kopinga

Bron: Paul Copini

Bron: CGN

Bron: Jitze Kopinga

Bron: Leo Goudzwaard

Bron: Steven Venema

Bron: CGN

Fig. 1
Collar lesion on *F. excelsior* in autumn 2012 on the site of Weisweil. By cutting into the necrotic bark, white mycelial fans of *Armillaria* mycelium could be detected in most collar rots

European Journal of Forest Research
November 2013, Volume 132, Issue 5–6, pp 865–876 | Cite as

Temporal development of ash dieback symptoms and spatial distribution of collar rots in a provenance trial of *Fraxinus excelsior*

Authors Authors and affiliations

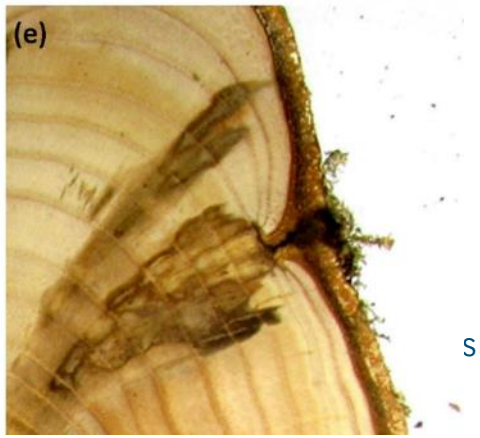
Rasmus Enderle ✉, Franziska Peters, Aikaterini Nakou, Berthold Metzler

doi: 10.3832/ifor2407-010

RESEARCH ARTICLES

Temporal development of collar necroses and butt rot in association with ash dieback

Rasmus Enderle, Felicitas Sander, Berthold Metzler



S

Bron: CGN

Bron: Paul Copini


Inventarisatie via www.essentaksterfte.nu

Hulp publiek gezocht voor landelijke zoektocht naar essen resistent tegen essentaksterfte

Centrum voor Genetische Bronnen Nederland

26-JUN-2017 - Door de essentaksterfte blijkt grootschalige kap van de es, een belangrijke boomsoort van ons land, onafwendbaar. Enkel een zeer klein deel van de essen is opgewassen tegen het invasieve vals essenvlieskelkje. Het Centrum voor Genetische Bronnen Nederland roept de hulp van het publiek in bij de zoektocht naar de nog gezonde essen. Waarnemingen kunnen doorgegeven worden via

WWW.ESSENTAKSTERFTE.NU

Help mate van aantasting in kaart te brengen

De onderzoekers van het CGN vragen vanaf vandaag het publiek om mee te helpen om op www.essentaksterfte.nu de locatie van essen aan te geven en een indicatie van de mate van aantasting te geven. De volgende categorieën kunnen aangegeven worden:

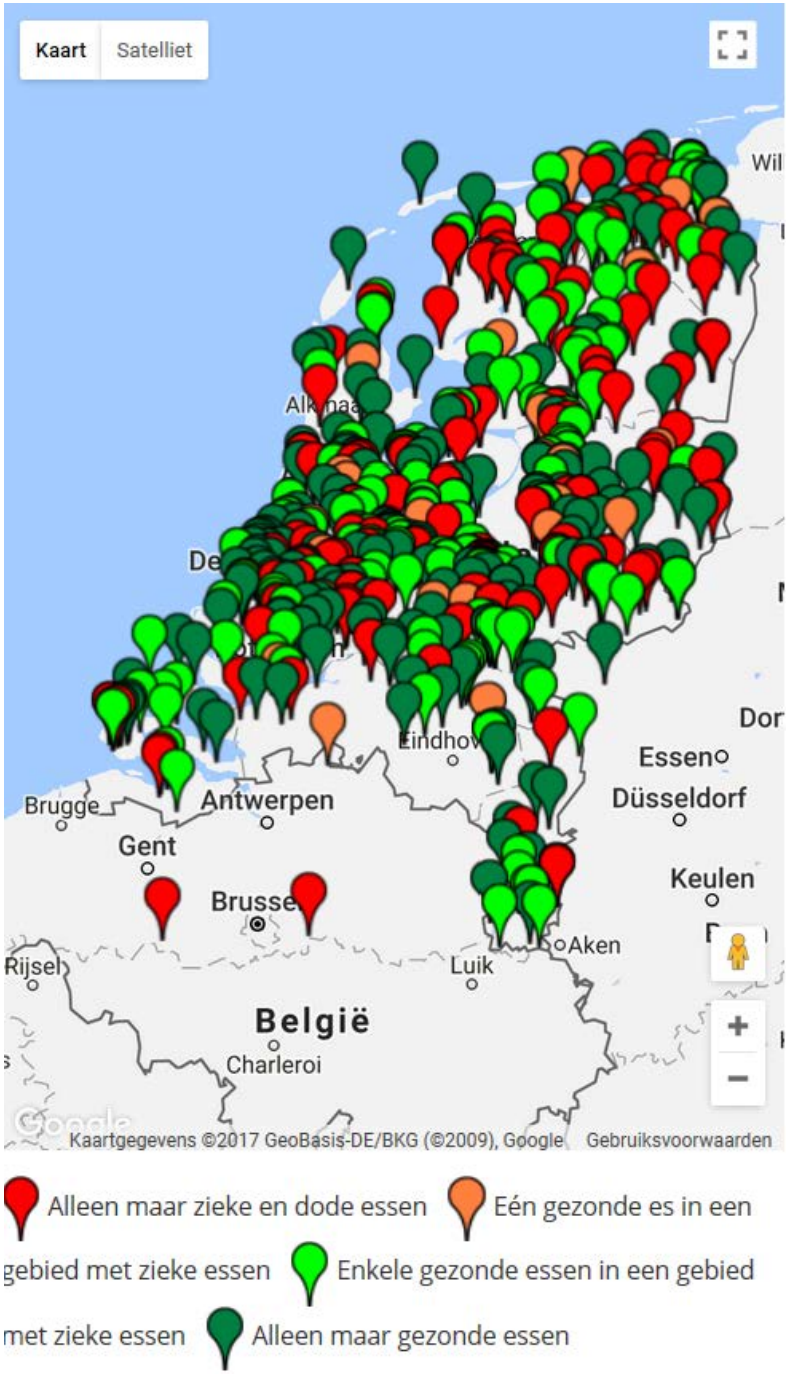
- Alleen maar zieke en dode essen
- Eén gezonde es in een gebied met zieke essen
- Enkele gezonde essen in een gebied met zieke essen
- Alleen maar gezonde essen

Bladeren van de es (Bron: Paul Copini)

Geef uw waarneming hier Anoniem door of met een Nature Today-account. Als u een waarneming met account doorgeeft, dan kunt u uw eigen waarnemingen later terugkijken.
Een Nature Today-account kunt u hier aanmaken. U kunt dan ook dagelijks of wekelijks een overzicht krijgen van alle natuurberichten die door topecologen geschreven worden over actuele ontwikkelingen in de natuur waaronder de updates over het essentaksterfte onderzoek.

www.essentaksterfte.nu

> 550 meldingen sinds eind juni 2017



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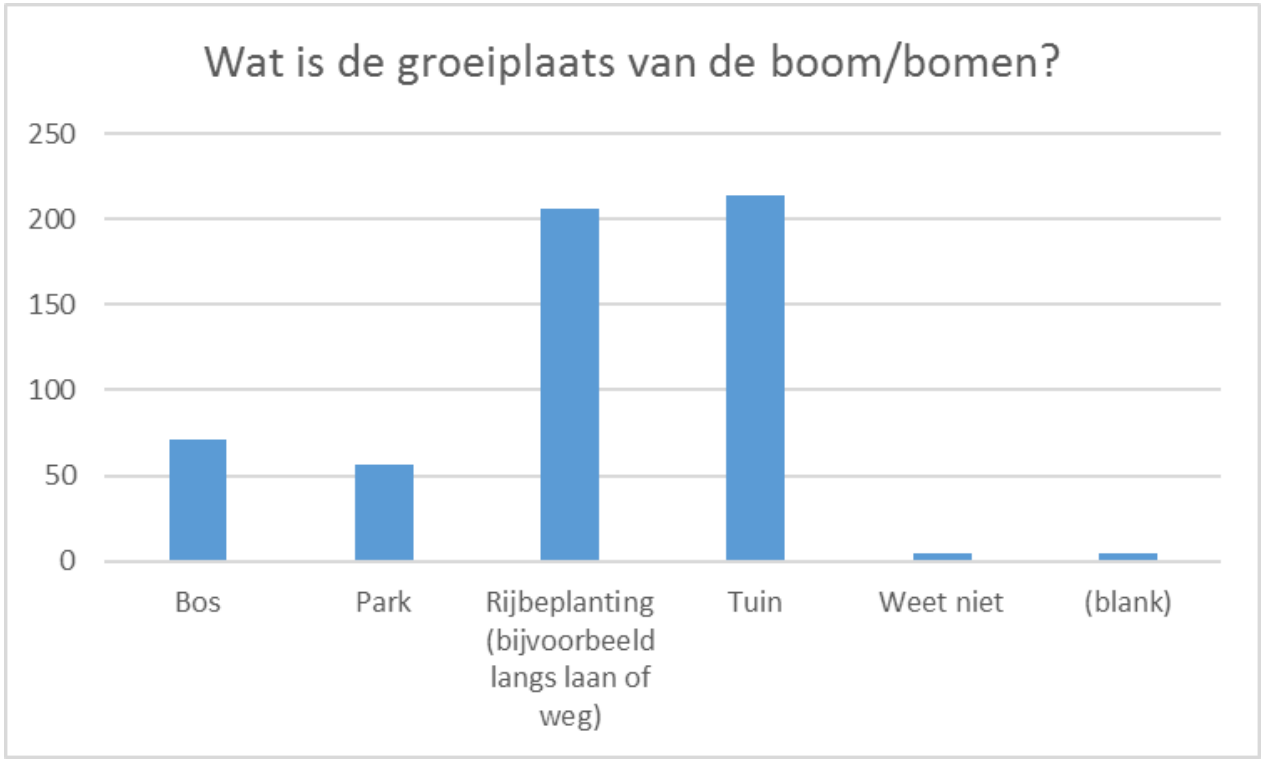
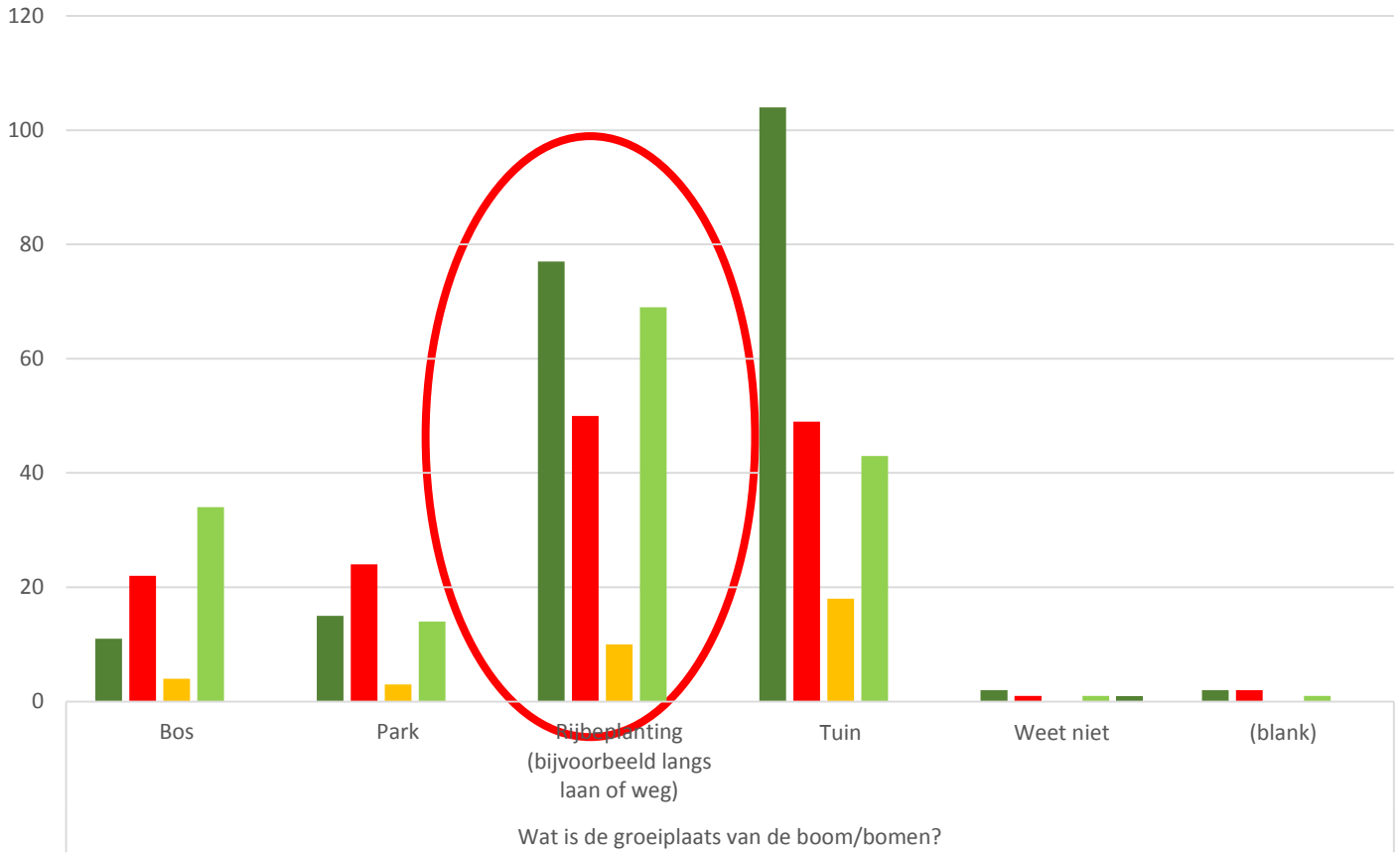
Stand van zaken meldingen

- Vaak rijbeplanting of tuinen



Stand van zaken meldingen




Flevoland
Dronten
Kampen
Lelystad
Rietweg
Hattem
Oldebroek
Elburg
Heerde
Almere
Harderwijk
Nunspeet
Epe
Ermelo
Putten
Image © 2017 DigitalGlobe
© 2017 Google
Image © 2017 Aerodata International Surveys
Tour Guide
Imagery Date: 6/30/2015 lat 52.569997° lon 5.234850° elev


Rietweg
Biddinghuizen, Flevoland
Veel Fraxinus excelsior klonen langs wegen
Cultivars zoals 'Westhof's Glorie'
Rietweg
Google
© 2017 Google
Terms
Report a problem

Essen in vakken langs wegen met veel essentaksterfte

18

N835

Tiel

Terweistraat

Zoelen

157000

157500

158000

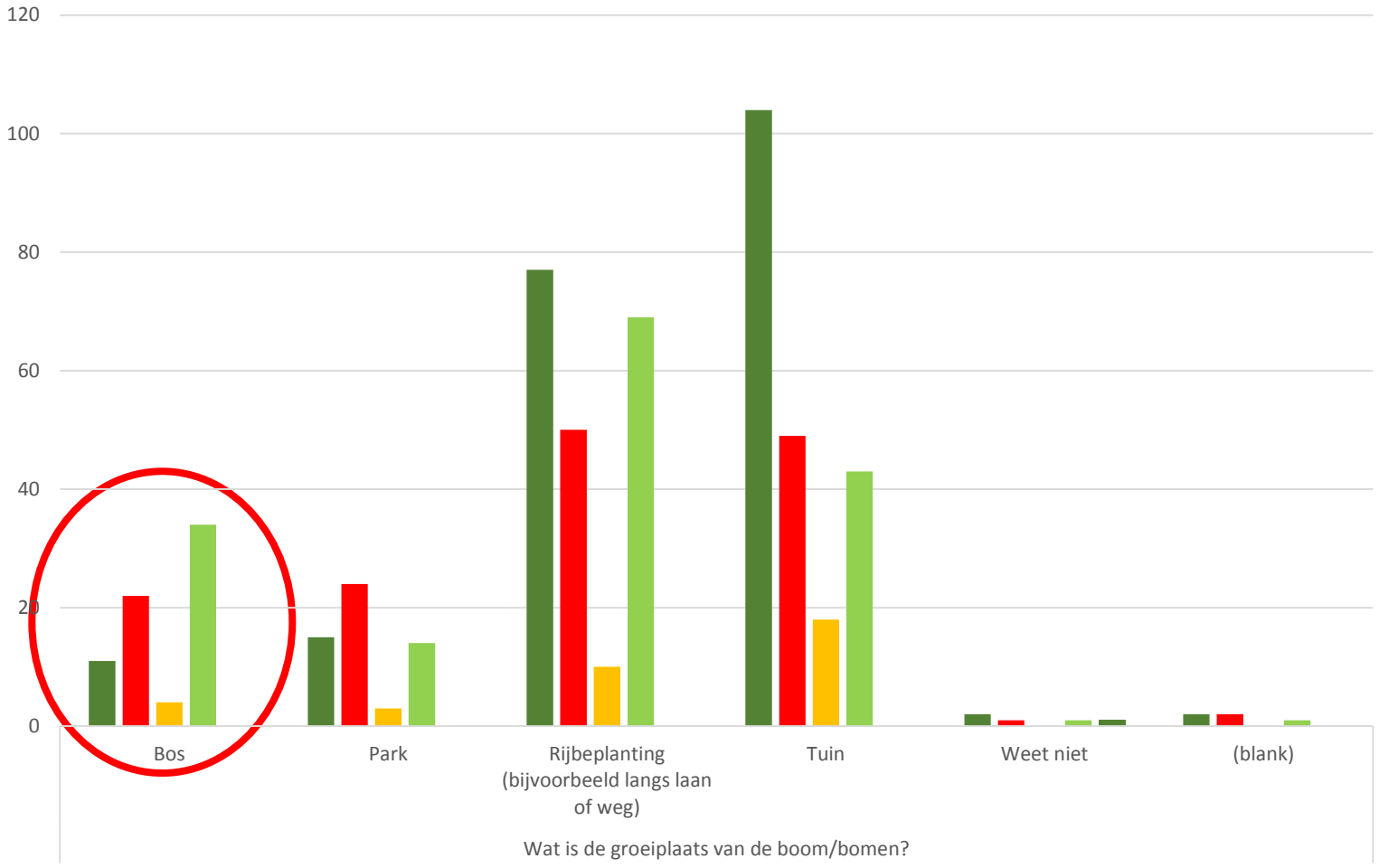
Essen Rammelwaard SBB

Meters
0 2040 80 120 160

N

Essen nabij Vorchten SBB

Stand van zaken meldingen



Veel sterfte in hakhout

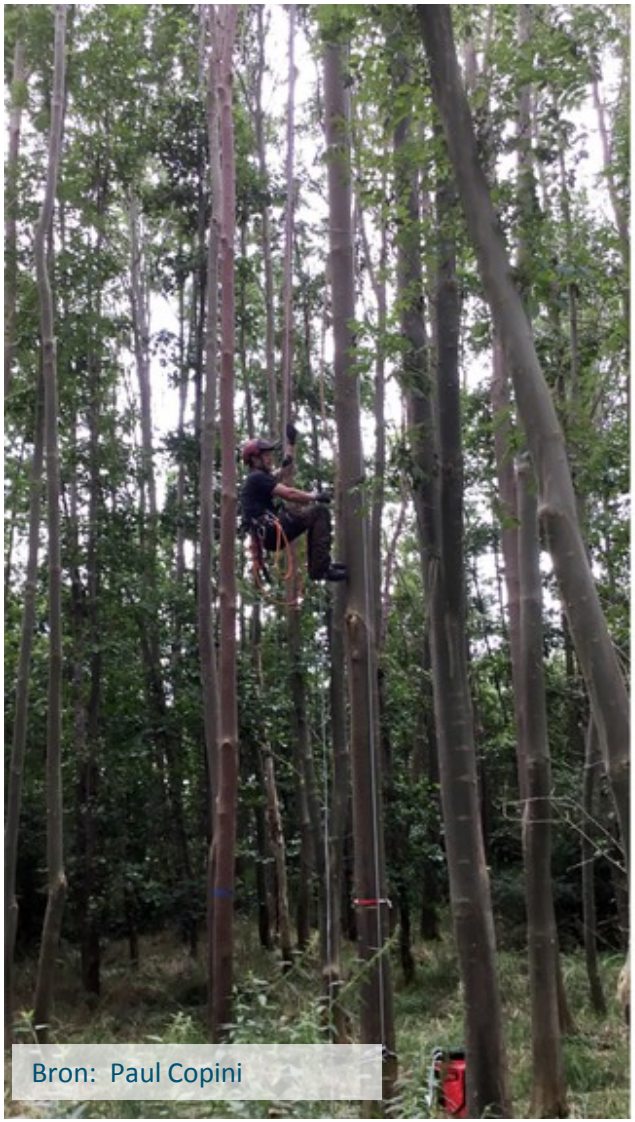
Landgoed Kolland

Bron: Paul Copini

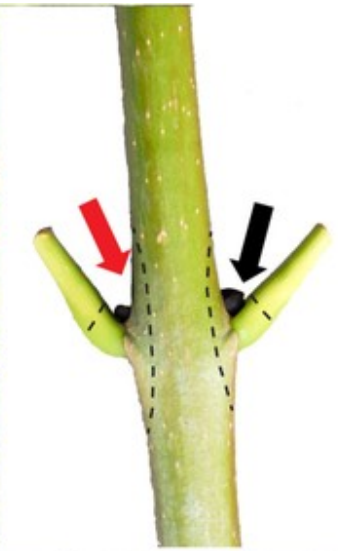
Opgaande bossen; weinig bomen liepen uit dit voorjaar

Bron: Paul Copini

Vermeerderen van de es



Bron: Paul Copini

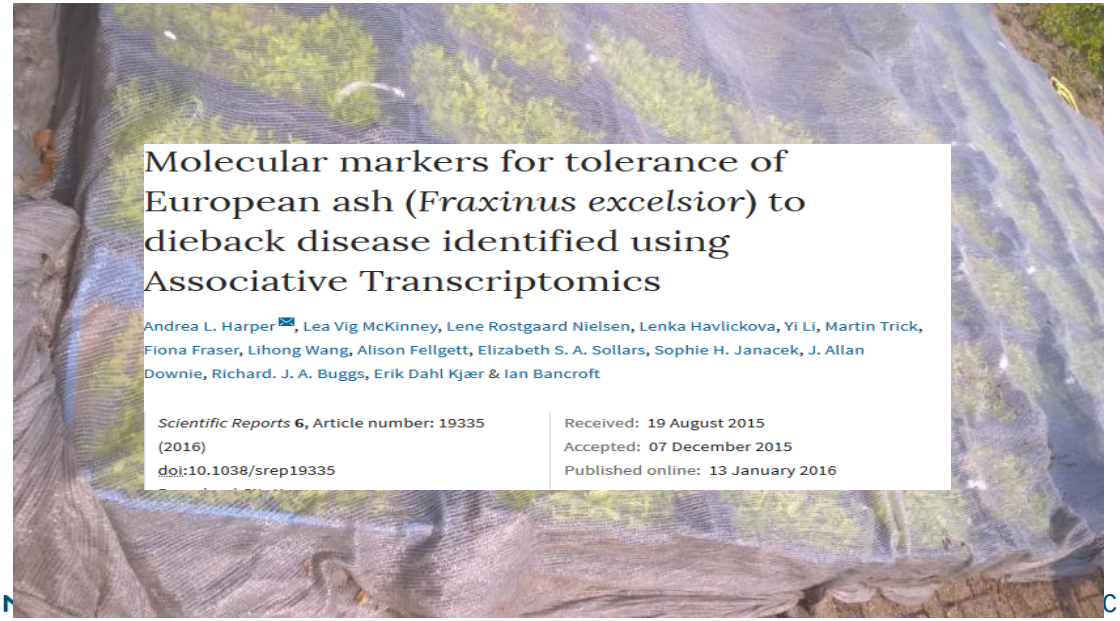



76 essen op de kwekerij, op naar de 200.
Bron: Paul Copini

Onderzoek Herkomstenproeven, testen gevoeligheid

Stand van zaken onderzoek

- In diverse Europese landen: verspreiding ziekte in beeld brengen
- Bestuderen ziekteproces en vinden van resistentiebronnen
- Screenen van materiaal



Dieback of European Ash (*Fraxinus* spp.)

– Consequences and Guidelines for Sustainable Management

Edited by Rimvydas Vasaitis & Rasmus Enderle

cost
EUROPEAN COOPERATION
IN SCIENCE AND TECHNOLOGY

Ash dieback in Germany: research on disease development, resistance and management options

R. ENDERLE*[1], B. FUSSI[2], H. D. LENZ[3], G. LANGER[4], R. NAGEL[5], B. METZLER[1]

Figure 1 First reports and laboratory-confirmed evidence (bold) of ash dieback caused by *Hymenoscyph fraxineus* in Germany (●) and percentage of ash in forest areas in German federal states (except city stat according to the German National Forest Inventory 3 (2012): ■ = 0.3 % ash, ■ = 1-1.7 % ash, ■ = 2.1-2.4 ash, ■ = 3.1-3.6 % ash, ■ = 4.9 % ash. Map created by the Northwest German Forest Research Station in 20 Dep. Forest Protection B4, compiled by Gitta Langer. Data of the National Forest Inventory 3 (BWI 2012) w provided by Gerald Kändler, FVA-BW. Background source: GeoBasis-DE/BKG2010.

Ash dieback in Germany: research on disease development, resistance and management options

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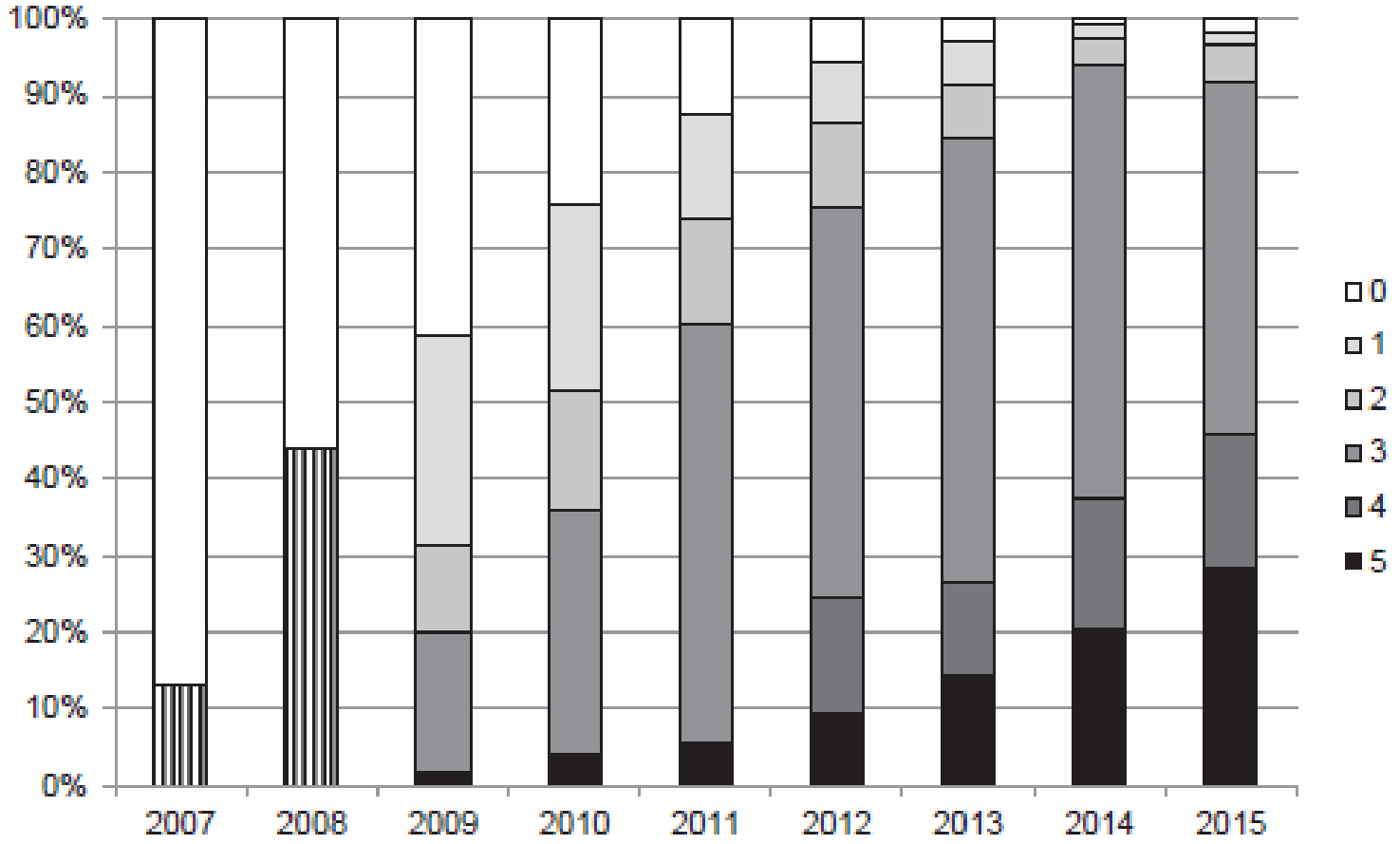


Figure 2 Development of the proportion of trees in classes of disease intensity in a provenance trial from 2007 to 2015, updated from Enderle et al. 2013. For retrospectively analysed years, data are only distinguishing between healthy and affected (hatched bars) individuals. Class 0: healthy, class 1: less than three symptomatic shoots, class 2: less than five symptomatic shoots, class 3: five or more symptomatic shoots, class 4: more than 50 % symptomatic shoots (has been applied since 2012), class 5: dead.

Denmark

Ash breeding projects in Denmark

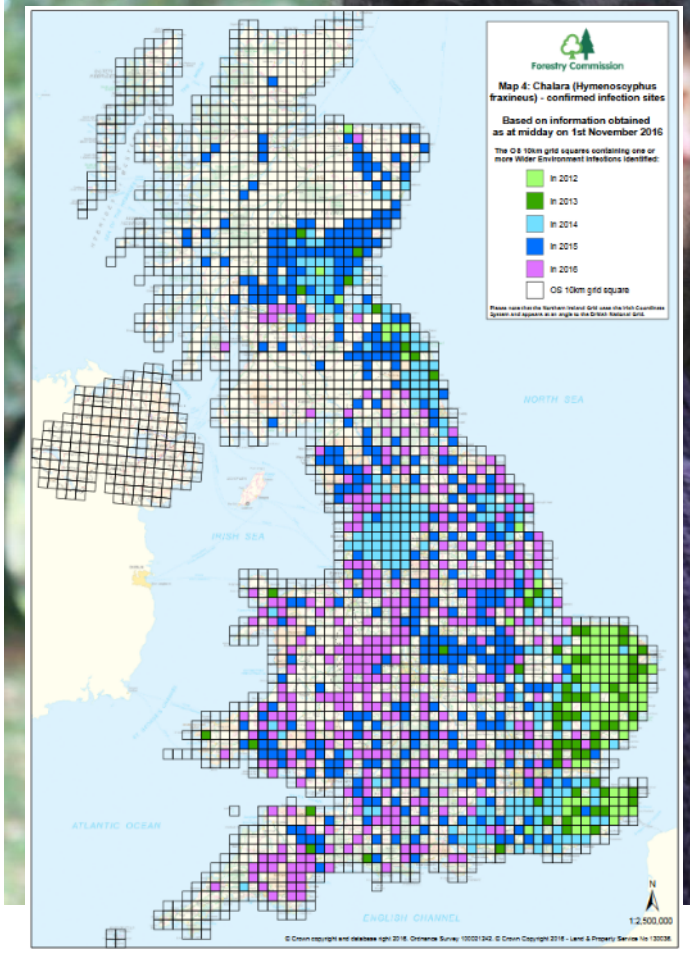
E. D. KJÆR[1], L. V. MCKINNEY[1], C. KOSAWANG[1], L. N. HANSEN[1], D. C. OLRIK, A. LOBO[1], D. SEMIZERCUMING[1], I. M. THOMSEN[1], J. K. HANSEN[1], L. R. NIELSEN[1]

University of Copenhagen, Danish Nature Agency, Environment and Food Ministry

An overview on selection and breeding for resistance in Denmark was presented. Among two infected clonal sites consisting of 39 clones, 63% of all genotypes have died since 2007 and only 1 – 2% remain healthy. It was determined that early leaf senescence in autumn was associated with higher levels of resistance. In addition the heritability of mother to offspring correlation was very strong. Similarly the correlation of mother tree to vegetatively propagated offspring was also very high indicating the strong genetic component to disease resistance. Seeds have been collected from 101 resistant trees and their offspring is now being tested on 14 sites throughout Denmark. In addition, they have established four clonal seed orchards consisting of 113, 121, 40 and 40 resistant genotypes in each respectively. The resistant trees selected were in mature stands and also in younger pole stage stands.

https://livingashproject.org.uk/

LIVING ASH PROJECT



Onderzoek in Nederland

- Monitoring gevoeligheid klonen in genenbank
- Monitoren ziekte in proefvelden
- Kunstmatige infectie proeven met verzameld material

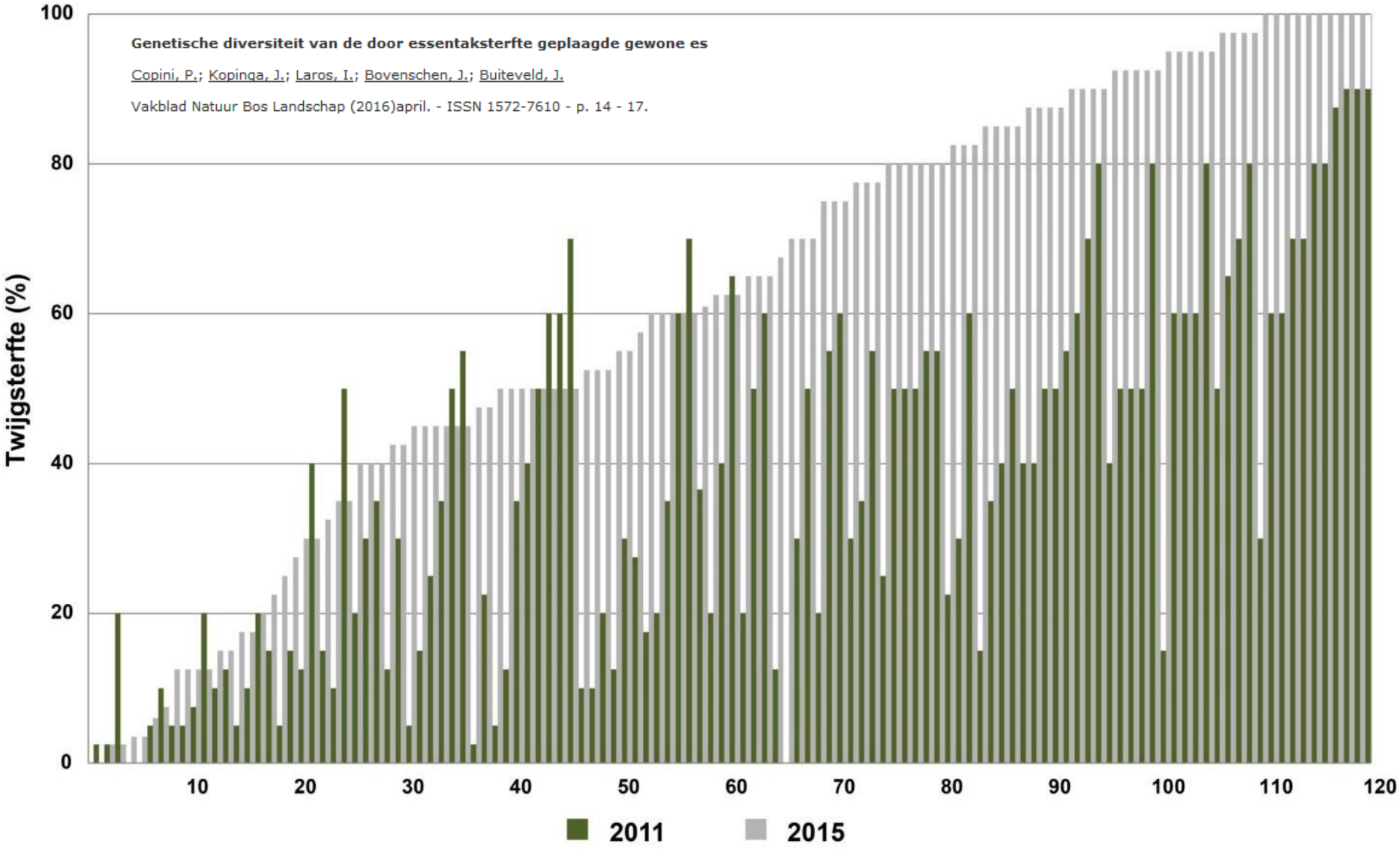
- Doel: aanleg collectie resistente essen

Monitoring van klonen in genenbank (SBB)

2011

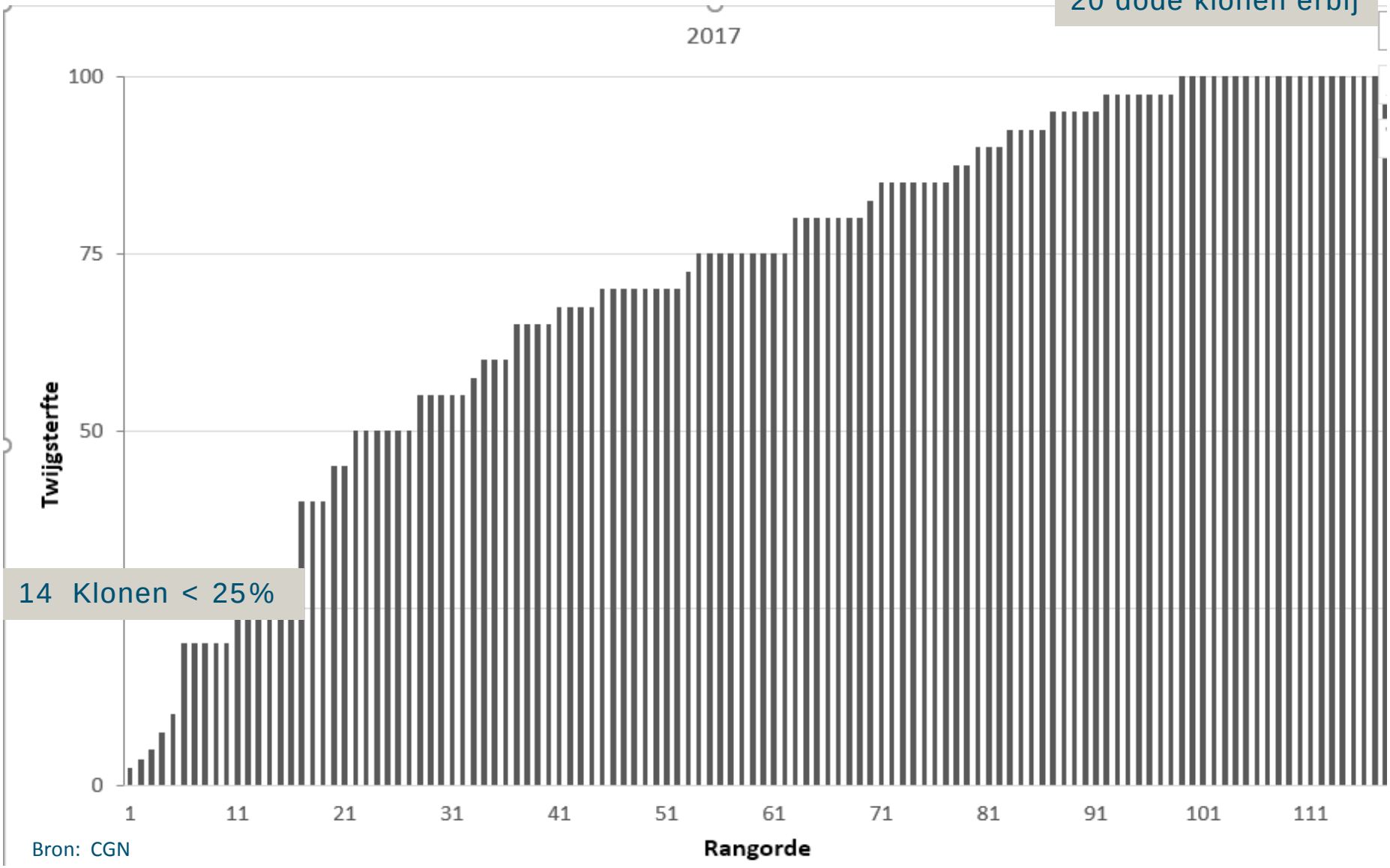
Bron: Jitze Kopinga

Grote verschillen in aantasting 2011-2015



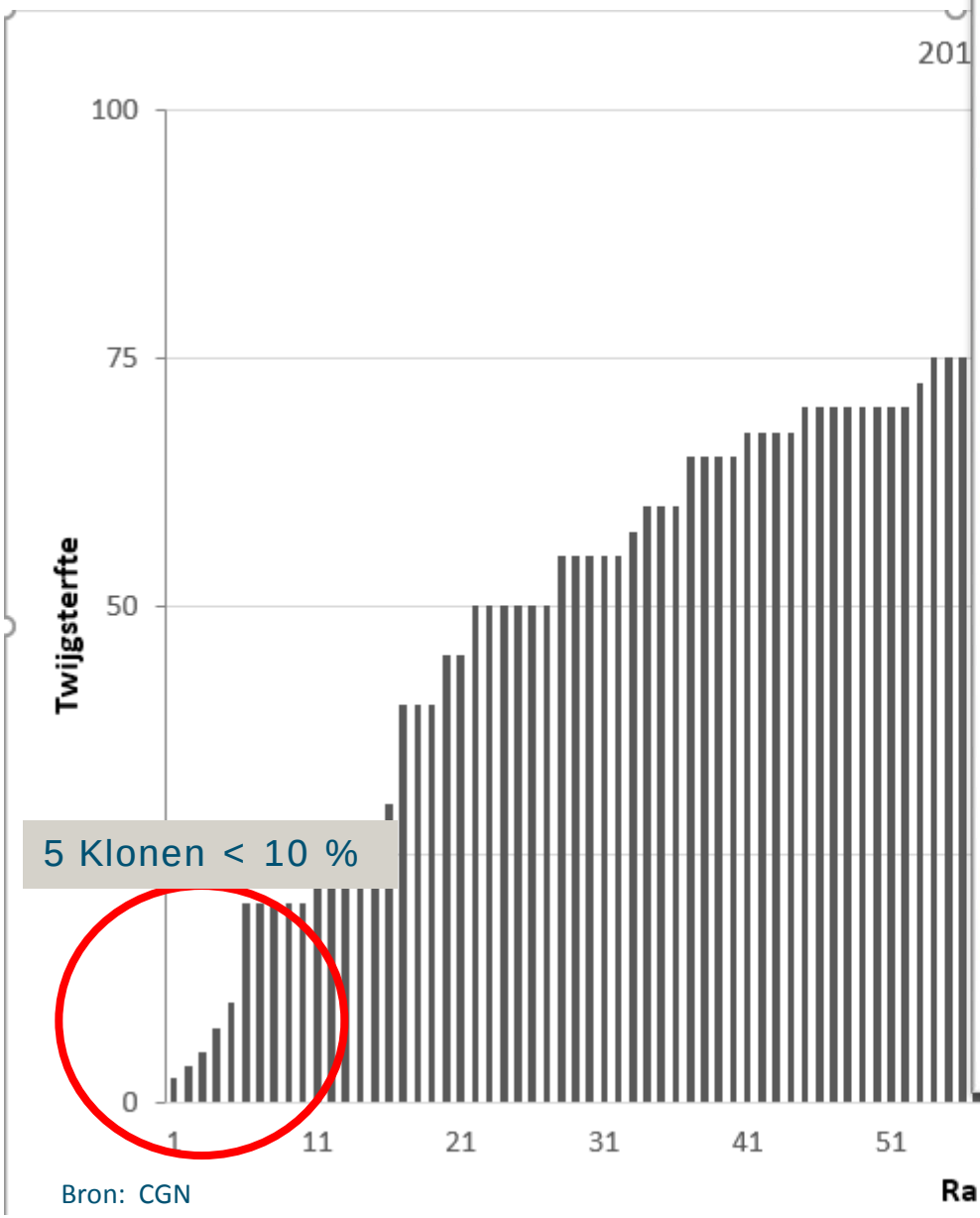
Genenbank Roggebotzand 2017

20 dode klonen erbij



14 Klonen < 25%

Bron: CGN



5 Klonen < 10 %

3 Klonen altijd < 10 %

TS2017	TS2015	TS2011
2.5	0.0	2.5
3.75	2.5	2.5
5	3.5	0.0
7.5	2.5	20.0
10	12.5	5.0

Bron: CGN

Monitoring in proefvelden & zaadgaard

Bron: Leo Goudzwaard

Vaartbos

Proefvelden CGN WUR

Legend

Groningen

Friesland

Bremen

Drenthe

North Holland

Flevoland

Overijss

Netherlands

South Holland

Gelderland

Zeeland

North Brabant

Limburg

Flanders

Google Earth

Bron: Paul Copini

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47 nakomelingschappen in 4 herhalingen.
1 nakomelingschap in 3 herhalingen.

Aanleg: Voorjaar 1994.
Plantverband: 1.50 x 1.50 m.
Per vak: 25 bomen.

Proefvak:

x x x x x
x x x x x
x x x x x
x x x x x
x x x x x
o = piket.

BLOK 3 BLOK 4

140 III	443 III	524 III	143 I	137 III	433 III	532 IV	140 IV	115 IV	503 IV	523 IV	502 IV
222 III	502 III	216 III	503 I	437 III	121 III	222 IV	533 IV	209 IV	437 IV	436 IV	132 IV
436 III	533 III	522 III	46-18 I	523 III	132 III	09-18 IV	136 IV	257 IV	527 IV	253 IV	441 IV
206 III	54-18 III	447 III	501 I	449 III	431 III	245 IV	131 IV	121 IV	451 IV	449 IV	137 IV
531 III	55-18 III	257 III	114 I	527 III	503 III	139 IV	46-18 IV	143 IV	534 IV	206 IV	526 IV
136 III	253 III	528 III	131 I	131 III	532 III	501 IV	530 IV	528 IV	54-18 IV	531 IV	524 IV
09-18 III	534 III	128 III	527 I	139 III	143 III	431 IV	433 IV	128 IV	120 IV	525 IV	447 IV
525 III	120 III	115 III	502 I	501 III	441 III	522 IV	443 IV	55-18 IV	216 IV	114 IV	529 IV
253 I	449 I	245 I	529 III	534 I	443 I	209 II	206 II	447 II	143 II	114 II	433 II
431 I	216 I	524 I	526 III	09-18 I	55-18 I	253 II	437 II	46-18 II	245 II	128 II	132 II
441 I	206 I	132 I	245 III	120 I	526 I	216 II	121 II	139 II	55-18 II	136 II	528 II
433 I	137 I	530 I	209 III	139 I	447 I	522 II	431 II	501 II	443 II	529 II	524 II
436 I	531 I	451 I	114 III	121 I	523 I	449 II	533 II	502 II	532 II	523 II	137 II
128 I	54-18 I	532 I	451 III	528 I	222 I	531 II	09-18 II	503 II	115 II	120 II	526 II
437 I	257 I	140 I	46-18 III	522 I	529 I	131 II	530 II	527 II	534 II	451 II	257 II
209 I	525 I	533 I	530 III	115 I	136 I	222 II	54-18 II	441 II	436 II	525 II	

BLOK 1 BLOK 2

Kunstmatige infectieproeven

Bron: Paul Copini

Kunstmatige infectie proeven

Stamwond infectie

Randwijk BBF (WUR)

Kowalski T, Bilański P, Holdenrieder O (2015) Virulence of Hymenoscyphus albidus and H. fraxineus on Fraxinus excelsior and F. pennsylvanica. PLoS ONE 10(10): e0141592. doi:10.1371/journal.pone.0141592 http://journals.plos.org/plosone/article?id=info:doi/10.1371/journal.pone.0141592

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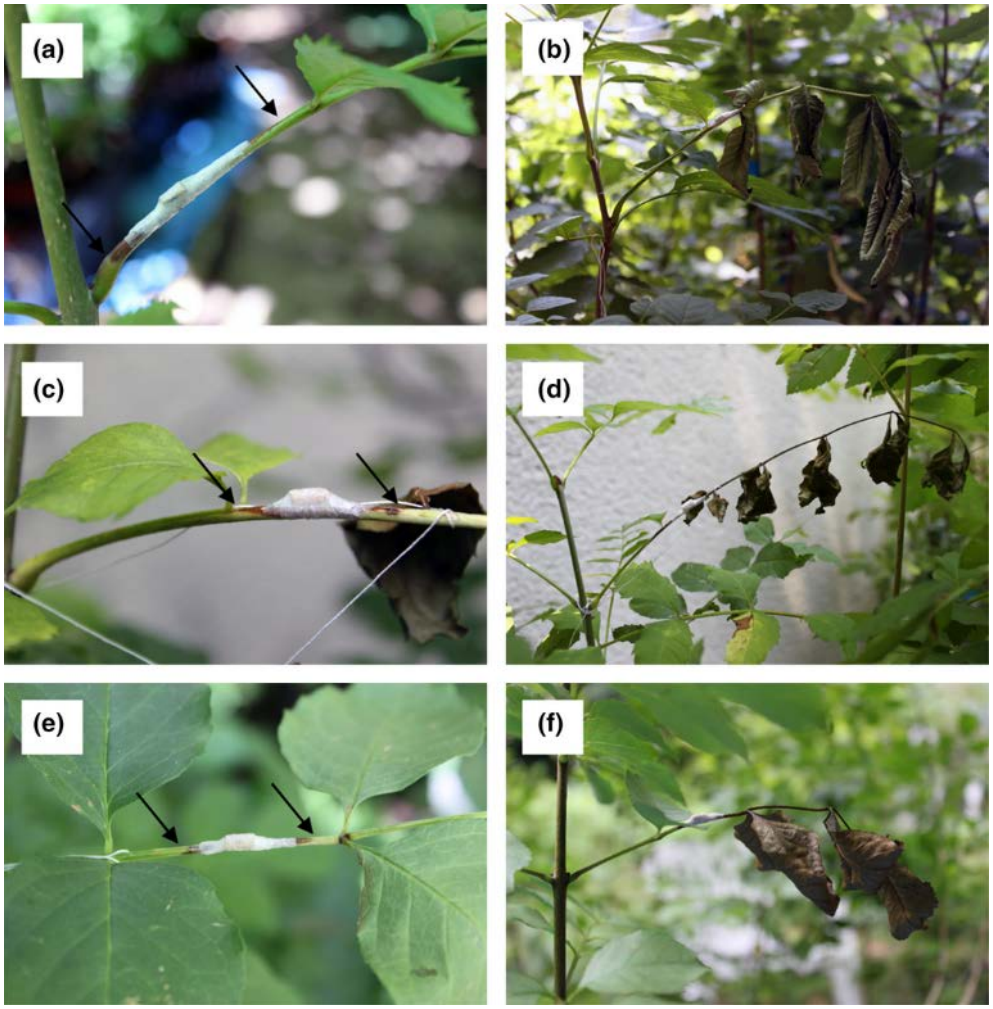

Plant Pathology
Volume 65, Issue 7, pages 1071-1083, 10 MAR 2016 DOI: 10.1111/ppa.12499
http://onlinelibrary.wiley.com/doi/10.1111/ppa.12499/full#ppa12499-fig-0001

Gezonde essen voor de toekomst?

Welke beheersmaatregelen?

- Zie praktijkadvies essentaksterfte, VBNE Anne Reigelt

www.vbne.nl

Vragen?

- Paul.copini@wur.nl
- Joukje.Buiteveld@wur.nl

- www.essentaksterfte.nu