


Fungi in Gardens

Aad Termorshuizen

 November 22, 2018, Wageningen

Buxus



Google counts

" <i>Volutella buxi</i> "	34400
" <i>Cylindrocladium buxicola</i> "	35300
"box tree moth"	35600

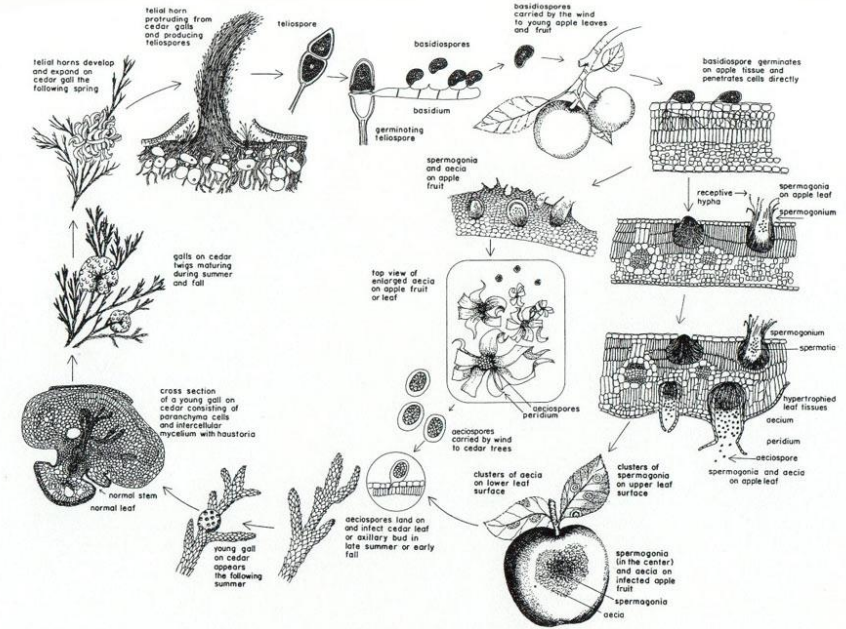


Pear rust (*Gymnosporangium sabinae*): an exote, introduced via ornamental juniper



Gymnosporangium sabinae on pear and *Juniperus sabinae*

source: Gerben Winkel & Edo Goverse



source: Agrios, Plant Pathology

What is really going on? - Aad's vegetable garden top-10

disease	pathogen	host	source
leaf spot disease	<i>Diplocarpon mespili</i>	quince	endemic
potato and tomato late blight	<i>Phytophthora infestans</i>	potato, tomato	C-, S-America
bud disease	<i>Pycnostysanus azaleae</i> (<i>Seifertia azaleae</i>)	rhododendron	?
powdery mildew	many	blackberry, gooseberry, pumpkin, apple, etc.	usually endemic
bean rust	<i>Uromyces appendiculatus</i>	bean	endemic
canker	<i>Neonectria galligena</i>	apple	endemic
rust	a.o. <i>Puccinia</i>	leeks, onion, pear	endemic
soilborne diseases	a.o. nematodes	many	endemic



source: MijnTuin.org

TrekNature

What is really going on?



www.verspreidingsatlas.nl

What is really going on?

NMV Verspreidingsatlas Paddenstoelen

a b c d e f g h i j k l m n o p q r s t u v w x y z

🔍 diploca

toon Nederlandse namen
verberg synoniemen
toon alleen geaccepteerde namen

Diplocarpa bloxamii
Diplocarpon mespili
Diplocarpon mespili anamorf
Diplocarpon rosae
Diplocarpon rosae anamorf
Diplocarpon rosae teleomorf

Diplocarpon mespili (Sorauer) B. Sutton

algemeen | feedback (0)

Taxonomie/morfologie
Groep: Ascomyceten, helotiid(schijfzwammen en verwanten) (Ahe)

NMV soortcode: 1007020

Ecologie
Functionele groep: Biotrofe parasiet (Pb)
Habitat: Struwelen, hakhout (20)
Substraat: bladeren, aan de plant (41)
Organisme: Crataegus (17)

Verspreiding/bedreiging
Zeldzaamheid: uiterst zeldzaam (zzzz)

Determinatie/bewijs
Microscopie: microscopische controle is nodig voor zekere determinatie
Collectie: bewaren van bewijsmateriaal is gewenst (goed geconserveerd, zonodig gedroogd, met beschrijving)

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source: MijnTuin.org

www.verspreidingsatlas.nl

Royal Horticultural Society

Gardeners' hit list announced



27 FEB
2018

Honey fungus is top of the rots again, while box tree caterpillar has nibbled away at the opposition to win top pest in our annual survey

Based on numbers of enquiries to the [members' advice service](#), this annual RHS ranking reveals the pests and diseases rife in UK gardens in 2017.



- [Honey fungus](#) was ranked number one disease for 22nd year in a row, and box (*Buxus*) suffered three top ten plant health issues
- [Fuchsia gall mite](#) and diseases of edible crops are expected to take hold in 2018

Now in its 22nd year, the annual ranking is a guide to new and growing areas of concern for gardeners and includes a number of pests and diseases first identified by the RHS - such as [kerria twig and leaf blight](#), which features in the top ten for the first time this year.



by RHS Staff

	pathogen	host
1	<i>Armillaria</i>	many trees and shrubs
2	<i>Phytophthora-root rot*</i>	a.o. <i>Chamaecyparuss*</i>
3	rusts (a.o. <i>Puccinia</i>)	a.o. <i>Puccinia vincae</i> on <i>Vinca major</i>
4	powdery mildews (a.o. <i>Erysiphe</i>)	a.o. on <i>Acer (Uncinula bicornis)</i>
5	buxus dieback (<i>Cylindrocladium buxicola</i>)*	Buxus
6	<i>Volutella buxi</i>	Buxus
7	<i>Xanthomonas arboricola</i> pv. <i>pruni</i> & <i>Pseudomonas syringae</i> pv. <i>morsprunorum*</i>	a.o. <i>Prunus laurocerasus*</i>
8	<i>Verticillium-wilt</i>	<i>Acer, Catalpa, Fraxinus</i>
9	<i>Monilinia</i> fruit rot	a.o. on apple and pear
10	Kerria dieback (<i>Blumeriella kerriae</i>)*	<i>Kerria*</i>



RHS Gardener's hit list 2017 (fungal diseases)

Diseases in gardens

Ornamental gardens

- plant “neophytes” → (possibly) no natural enemies
- good start for bio-invasive behaviour of plants
- pathogens may jump onto the exotic plant species or may be introduced later
- habitat also important (pH, texture)



Fallopia



Blumeriella kerriae

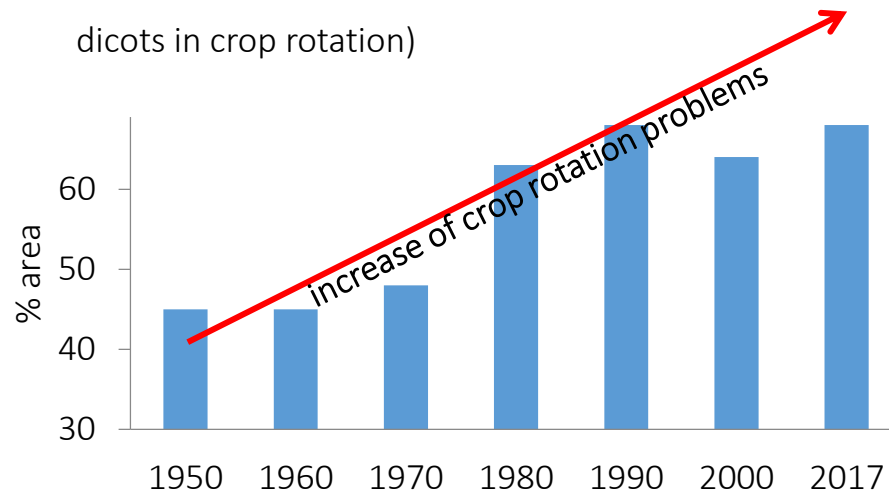
Heracleum mantegazzianum and other spp.



Diseases in gardens

Vegetable gardens

- usually the “regular” pathogens present
- narrow crop rotation (no cereals) → many soilborne pathogens (?)



- many legumes in rotation → many soilborne pathogens (?)
- wrong/no/few pesticides

Many new pathogens!

SOME RECENT INTRODUCTIONS TO THE UK OF ORNAMENTAL PLANT DISEASES				
Pathogen name	Host	Date of introduction or first UK record	Importance in the UK	Recorded by RHS
Leaf blights, spots & anthracnose				
<i>Cylindrocladium buxicola</i>	<i>Buxus</i>	1994	high	yes
<i>Cylindrocladium pauciramosum</i>	<i>Ceanothus</i>	2002	low	yes
<i>Discula destructiva</i>	<i>Cornus</i>	1993	mid	yes
<i>Elsinoë mattirolanum</i>	<i>Arbutus</i>	1978	high	yes
<i>Elsinoë quercus-ilicis</i>	<i>Quercus ilex</i>	2003	mid	yes
<i>Phaeocephalospora pbormii</i>	<i>Pbormium</i>	1983	low	yes
<i>Pbloeospora ceanothi</i>	<i>Ceanothus</i>	2001	low	yes
<i>Pseudocercospora cladosporioides</i>	<i>Olea</i>	2005	low	yes
<i>Septoria betulae</i>	<i>Betula</i>	2004	low	no
<i>Septoria cercidis</i>	<i>Cercis siliquastrum</i>	2007	mid	yes
<i>Septoria</i> species and <i>Cercospora</i> species	<i>Escallonia</i>	2007	high	yes
Powdery mildews				
<i>Erysiphe azaleae</i>	<i>Rhododendron</i>	1980	high	yes
<i>Erysiphe catalpa</i>	<i>Catalpa</i>	1990	low	yes
<i>Erysiphe deutziae</i>	<i>Deutzia</i>	2006	mid	yes
<i>Erysiphe echinops</i>	<i>Echinops</i>	1990	low	no
<i>Erysiphe elevata</i>	<i>Catalpa</i>	2004	high	yes
<i>Erysiphe flecosus</i>	<i>Aesculus</i>	2002	mid	yes
<i>Erysiphe magnicellulata</i>	<i>Pblox</i>	1990	low	data deficient
<i>Erysiphe symboricarpi</i>	<i>Symphoricarpos</i>	1990	low	data deficient
<i>Erysiphe syringae</i>	<i>Ligustrum</i>	1990	low	data deficient
<i>Erysiphe</i> species	<i>Crassulaceae</i>	2007	mid	yes
<i>Neoerysiphe galeopsidis</i>	<i>Catalpa, Acanthus</i>	2004 & 2005	high	yes
<i>Podospheera verbenae</i>	<i>Verbena</i>	1994	low	data deficient
<i>Podospheera</i> species	<i>Cuphea</i>	2007	low	no
<i>Erysiphe arcuata</i>	<i>Carpinus</i>	not formally recorded	mid	yes
<i>Erysiphe</i> species	<i>Calluna</i>	2000	low	no
Rusts				
<i>Puccinia heucherae</i>	<i>Heuchera</i>	2004	mid	yes
Oomycetes				
<i>Albugo trianthemae</i>	<i>Aizoaceae</i>	2007	mid	yes
<i>Peronospora bellahrii</i>	<i>Agastache, Ocimum, Solenostemon</i>	2009	high	yes
<i>Peronospora myosotidis</i>	<i>Brunnera</i>	2004	low	no
<i>Phytophthora alni</i>	<i>Alnus</i>	1993	high	yes
<i>Phytophthora ilicis</i>	<i>Ilex</i>	1989	high	yes
<i>Phytophthora inflata</i>	several	1991	mid	yes
<i>Phytophthora kernoviae</i>	several	2003	high	no
<i>Phytophthora niederbauerii</i>	several	2006	low	yes
<i>Phytophthora ramorum</i>	several	2002	high	yes
<i>Phytophthora tropicalis/capsici</i>	several	2006	low	yes
<i>Plasmopara obducens</i>	<i>Impatiens</i>	2003	high	yes
<i>Pythium attrantheridium</i>	several	2006	high	yes
Bacteria				
<i>Pseudomonas syringae</i> pathovar <i>aesculi</i>	<i>Aesculus</i>	2001	high	yes
Viruses				
<i>Canna</i> yellow mottle virus & <i>Canna</i> yellow streak virus	<i>Canna</i>	1999 & 2005	mid	yes
<i>Helleborus</i> necrosis virus	<i>Helleborus</i>	1990s	high	yes
<i>Impatiens</i> necrotic spot virus	several	1994	high	yes

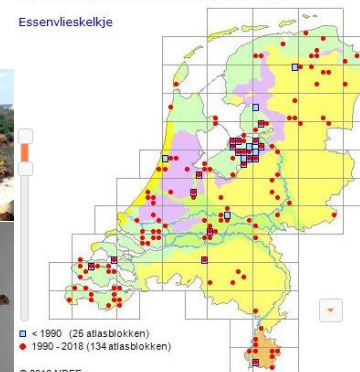
Ornamental gardens

host	pathogen	introduction	origin
Buxus	<i>Cylindrocladium buxicola</i>	1994	?
Arbutus	<i>Elsinoë mattirolanum</i>	1978	?
Catalpa	<i>Erysiphe elevata</i>	2004	?
Rhododendron	<i>Erysiphe azaleae</i>	1981	N-America?
many woody	<i>Phytophthora cinnamomi</i>	19 th century	Australia?
Fraxinus	<i>Hymenoscyphus fraxineus</i>	>2010	Asia?



Hymenoscyphus albidus (Gillet) W. Phillips

Essenvlieskelkje

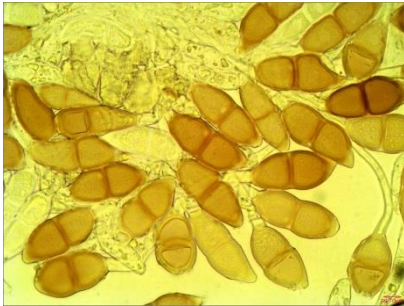


source: www.verspreidingsatlas.nl

Even more new pathogens



Puccinia opizii on lettuce – Aad's garden



Puccinia morthieri on *Geranium* – Aad's father garden

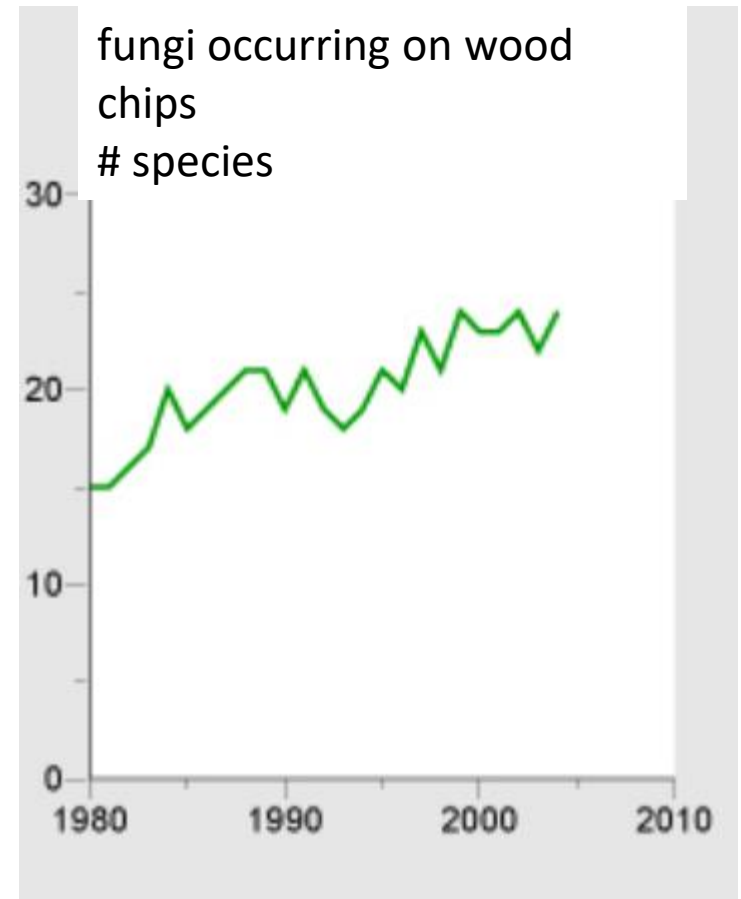


Albugo rorippae – Aad's garden

Not all fungi are cumbersome



Leratiomyces ceres



source: compendium voor de leefomgeving



source: heemtuin capelle

Relation with agriculture?

Relation with agriculture?

- agriculture → gardens?
- gardens → agriculture?

- many diseases in gardens are not important for agriculture and vice versa

Relation with urban farming?



bron: IVD



bron: De groene stad



bron: de broeikas nijmegen



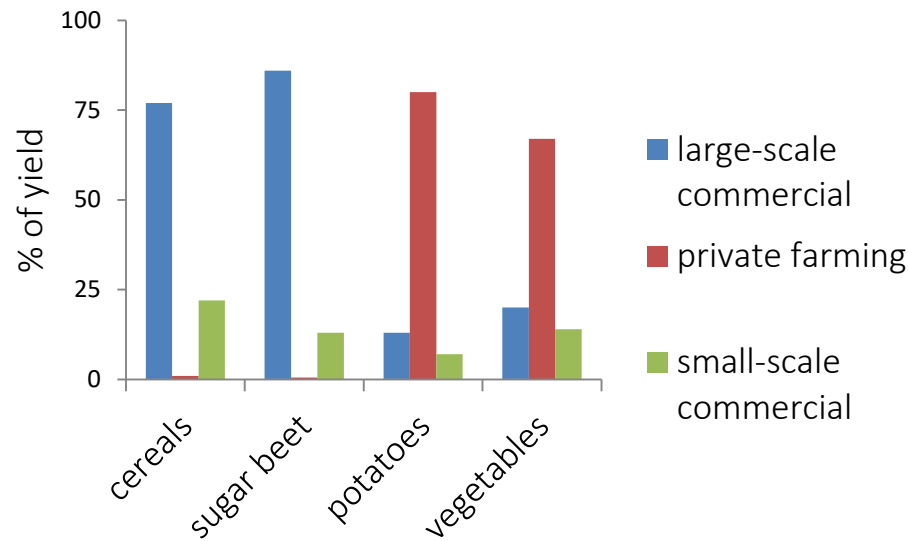
bron: Mooi wat planten doen

Relation with small-scale farming?

- e.g. Russia (dacha's)
- e.g. small-holder farms (Africa)

small-scale farming

Russia – dacha's



source: Donkers, 2014

Home > Lifestyle > Gardening > Gardens to visit

The Russian gardening revolution: where the good life meets luxury



Save 2



A dacha gardener, Kaliningrad, Russia CREDIT: AGENCIA FOTOGRAFICZNA CARO/ALAMY

small-scale farming

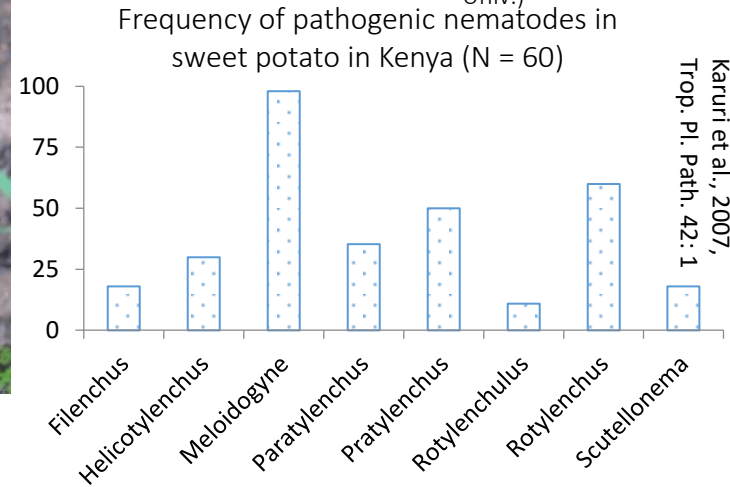
Afrika – smallholder farms



Meloidogyne enterolobii on sweet potato
(source: NC State Univ.)



Leptosphaerulina crassiasca



Smallholders access to fertilizers



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Conclusions

- most spectacular: Buxus problems (moths, fungi)
- more quantitative data are needed
- idem for all small-scale farming
- vegetable gardens: “regular” diseases
- ornamental gardens: exotic diseases more important
- information in NL about diseases and pests is generally low in quality

Thank you for your attention!

Aad Termorshuizen

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