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Faculty of Science

Ash dieback:

a forest threat with limited impact in urban areas and the open landscape



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Experiences from Denmark

- Ash dieback in forests
 - Symptoms and biology
 - Effects and consequences
- Ash dieback in the landscape and urban environment
 - Why different from forests
 - Effects of the disease
 - Management
- Future of ash



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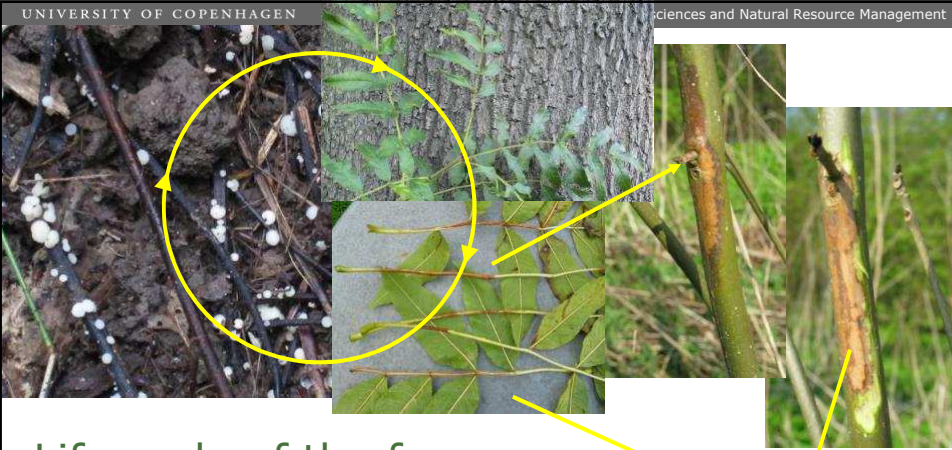
Typical symptoms of ash dieback



Dead shoots, thin crowns, brown necrotic areas and epicormic shoots on branches and stems



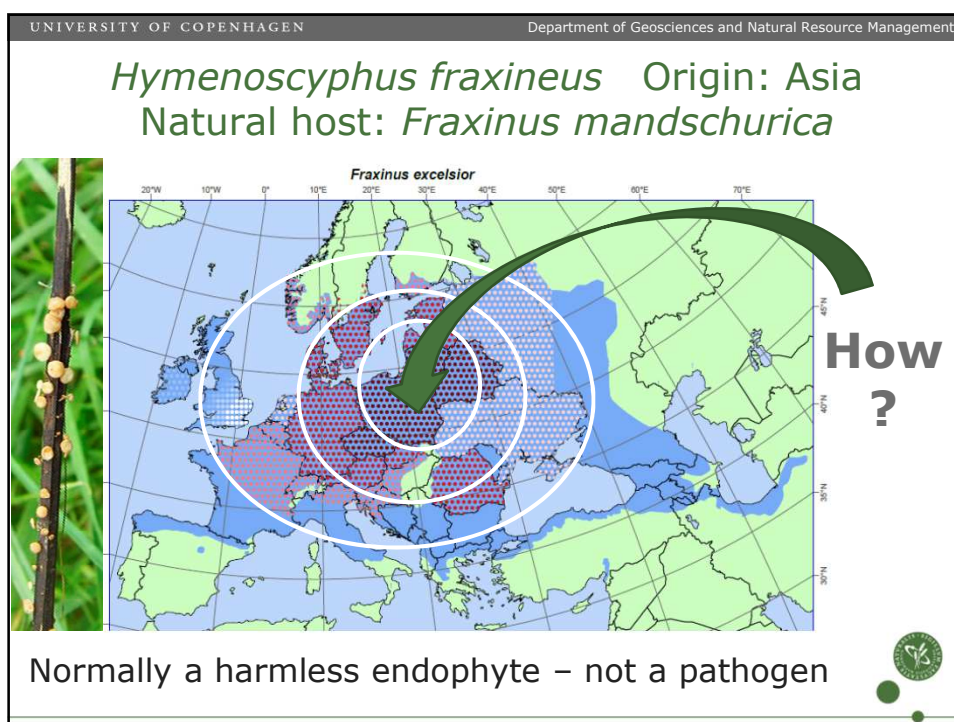
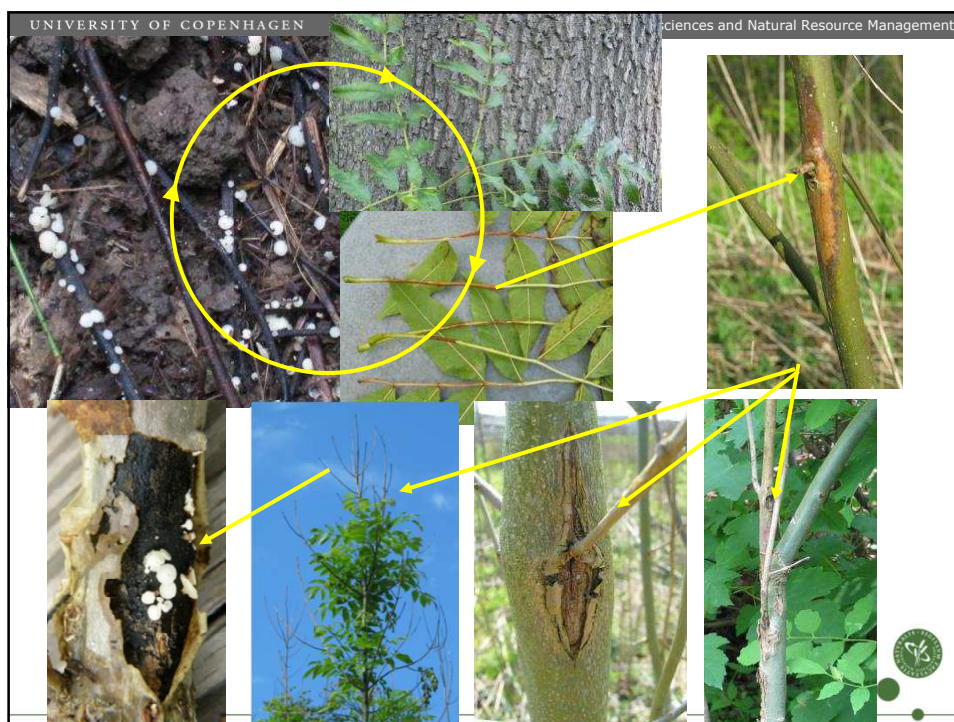
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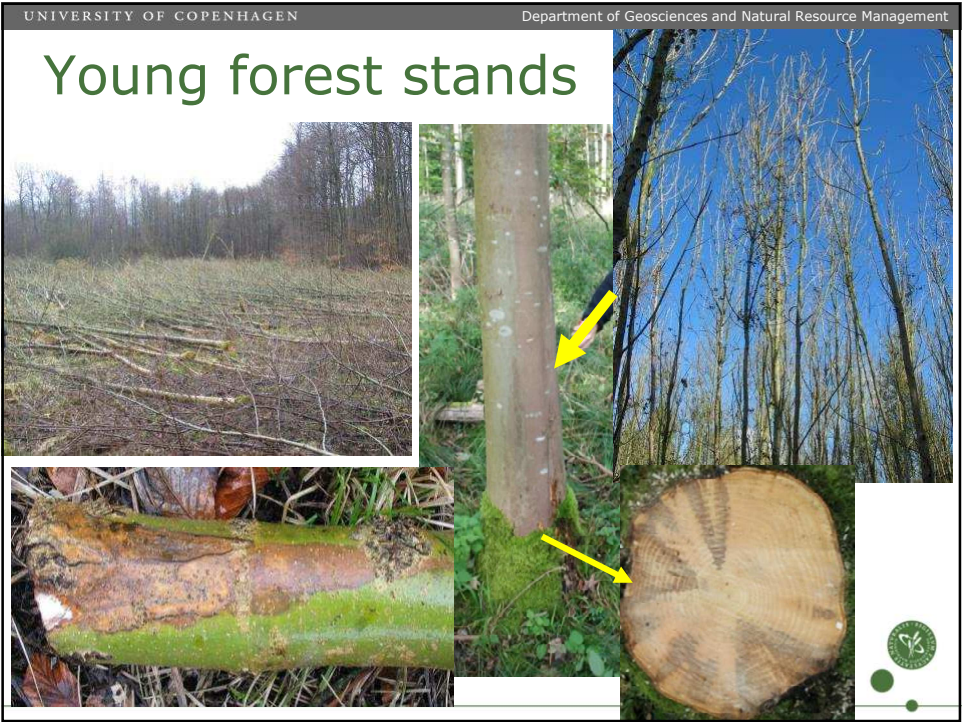
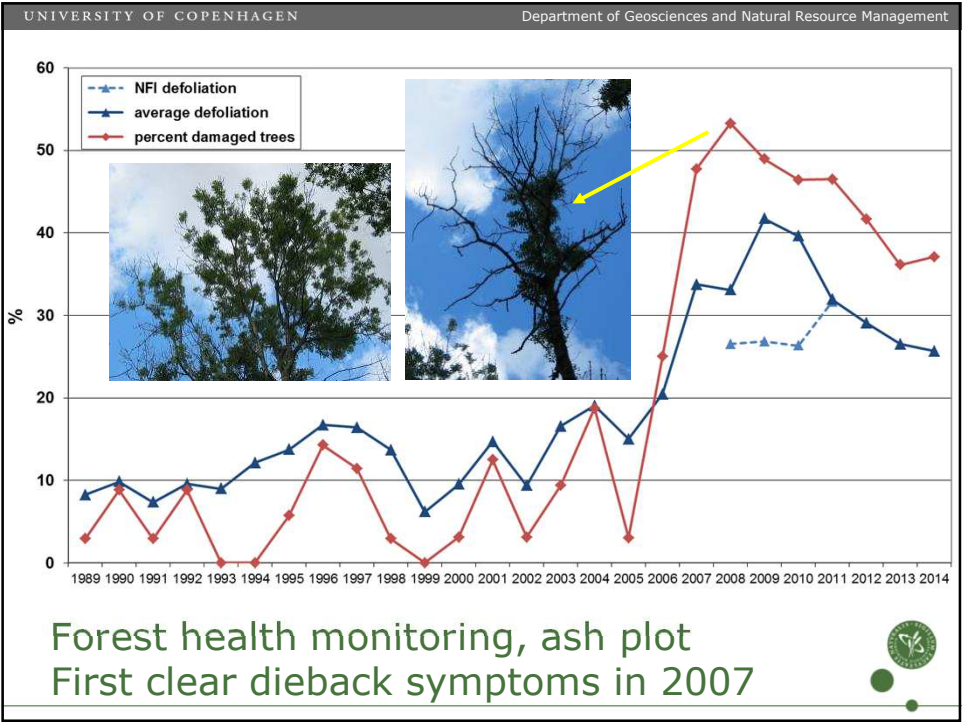


Life cycle of the fungus causing ash dieback

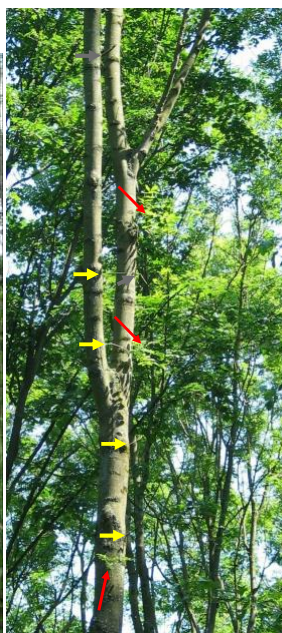
Chalara fraxinea
Hymenoscyphus pseudoalbidus
 = ***Hymenoscyphus fraxineus***







Ash dieback older stands

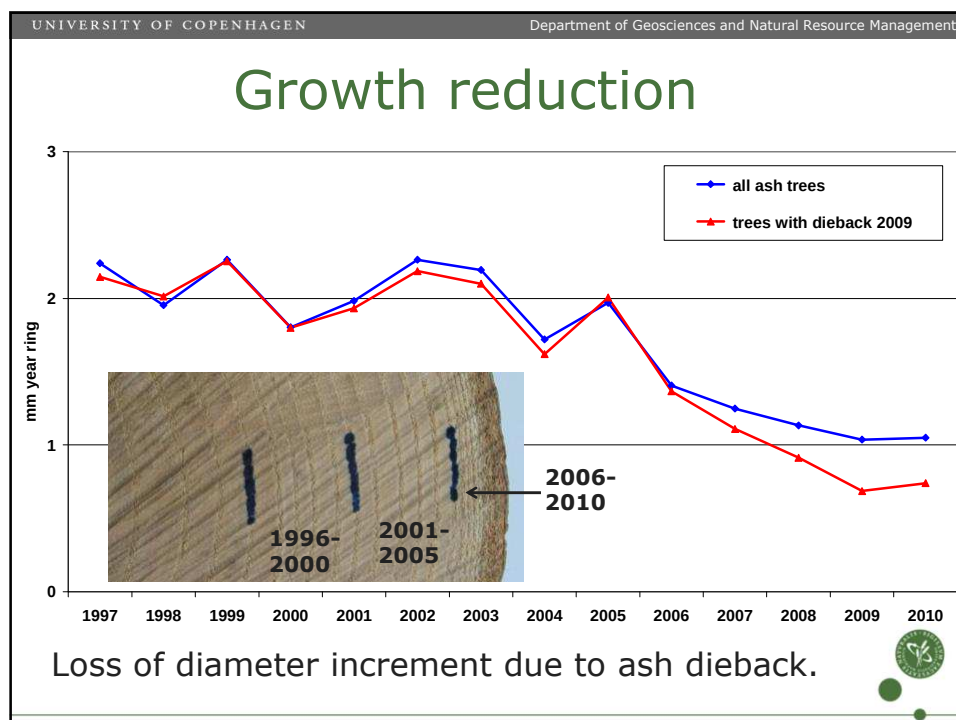


Epicormic shoots

on stems are danger signs in relation to timber value and survival.

They are a direct path into the main stem.





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The final stages in forests



Honey fungus attacks the roots and kills the trees + discolours the wood.

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And the regeneration dies



Ash Dieback



- is a disaster in forests but less fatal in towns and the open landscape.

WHY?



Reduced infection

- Removal of leaf litter
- Drier conditions = fewer fruitbodies and inoptimal infection conditions
- No basal infections



No secondary damaging agents

- No honey fungus (*Armillaria*)
- No ash bark beetles (*Hylesinus*)



Urban and roadside ash

- Many young ash trees will probably die at first.



Urban ash trees



But young established trees can be unaffected.



F. excelsior road trees in Copenhagen



Winter and summer (March 2014 & September 2015)



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Urban and roadside ash



- Old ash trees may degenerate / occasionally die.
- But most stay alive - probably for years.



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Landscape ash trees



- Old trees have high survival rates.
- Swedish study: approx. 1% died per year.



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Landscape ash trees



- Crown symptoms can have other causes.
- Ash dieback is simply another stress factor.



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Amongst the first to die are pendulate ash




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Young trees show symptoms before old trees



The image consists of two side-by-side photographs of a residential street. The left photo shows a large, mature tree with a thick trunk and dense foliage. The right photo shows a younger tree with a thinner trunk and less dense foliage. A yellow arrow points from the mature tree on the left to the younger tree on the right, indicating a comparison of tree health or age.



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Don't fell too soon



The image consists of three side-by-side photographs. The left photo shows a healthy, mature tree. The middle photo shows a tree stump, indicating a tree that has been felled. The right photo shows a young tree with a thin trunk and dense foliage.

Preserve ash trees in cities, along roads and in the landscape for as long as possible (keep safety in mind).



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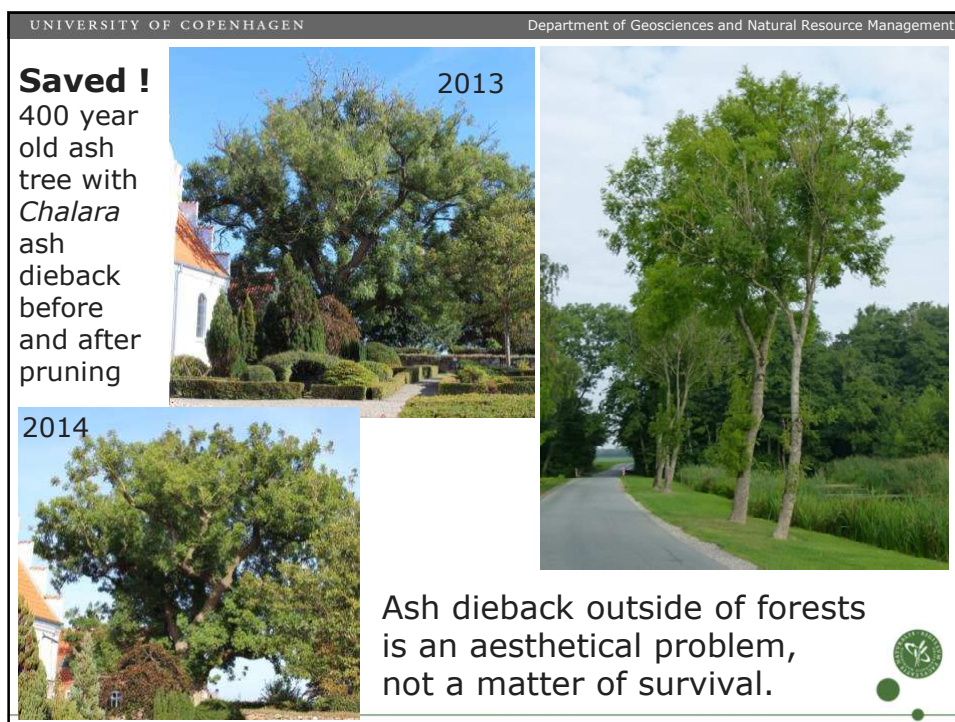
When should trees be felled ?



When they die, or when they do not regenerate their crowns 2-3 years in a row




Amsterdam cycle path
Is it worth spending money to prune trees?
YES !



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Don't give up on trees

Solitary old ash
Newgrange,
Ireland, 2014
No Chalara symptoms




Ash trees bordering
church yard,
Denmark, 2015
Symptoms for at
least five years



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Future of ash



F. excelsior



F. americana



F. ornus

Use resistant species /
clones
- if or when available

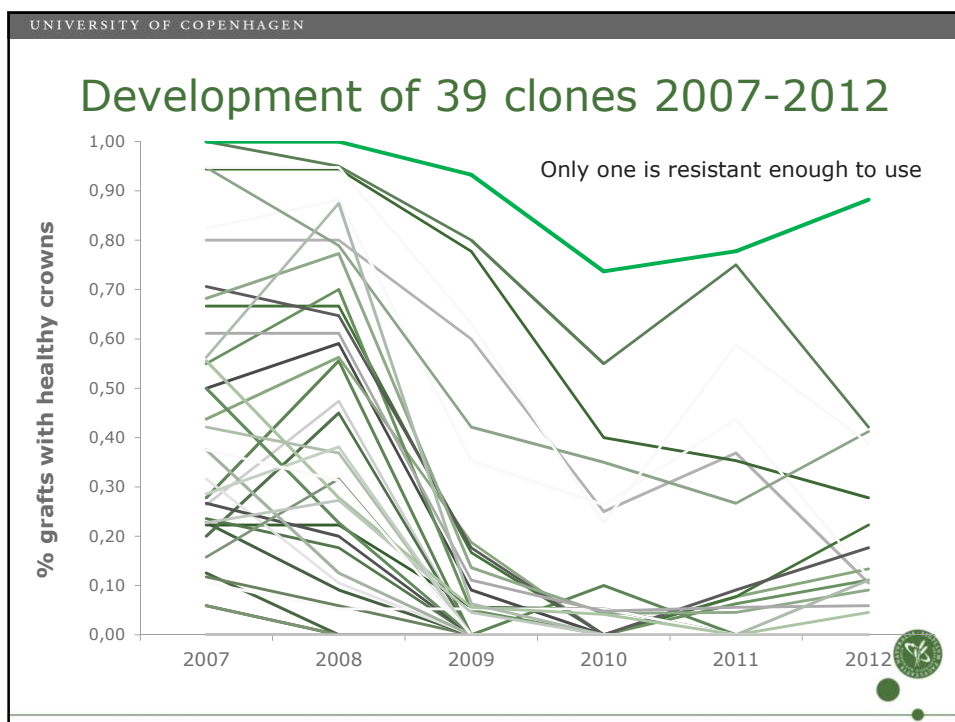
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The few healthy individuals



Tuse Næs 2007 Tuse Næs 2009

The seed orchard experience

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Finding healthy ash



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Testing resistance



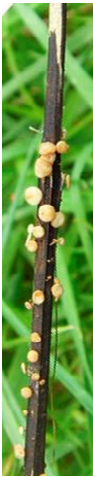
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Seed orchards, crossings and progeny



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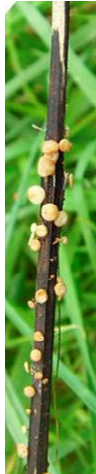
Conclusions



- The fungus does not kill trees 'on purpose'.
- Most infections come from old leaves.
- Including leaves from **healthy** trees.
- Removing sick trees is useless in relation to disease prevention.
- But removing dead shoots / branches can improve the aesthetic value.
- Deal with road tree safety issues as before.



Conclusions



- You're only at the start of the epidemic.
- But please do not panic !
- Ash trees outside forests can live with the disease for years.
- Preserve them as long as possible.
- 1-2 % of ash are resistant, look out for them.
- New ornamentals: use *Fraxinus ornus*, perhaps *Fraxinus americana*.
- *F. mandschurica* may be a future possibility (but avoid importing seedlings from Asia).



Fraxinus americana
in Amsterdam



Thank you for your attention