

Investigating the effects of mixed plantations in resistance to ash dieback disease

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Background:

- Ash dieback is a disease infecting ash trees (*Fraxinus excelsior*) caused by a fungus, *Hymenoscyphus fraxineus*, which originated in eastern Asia
- The disease invaded eastern Europe in the 1990s, resulting in the death of millions of ash trees.
- The disease spread to the UK in 2012 and threatens to eradicate most of the UK's ash trees, which are an important species both commercially and environmentally

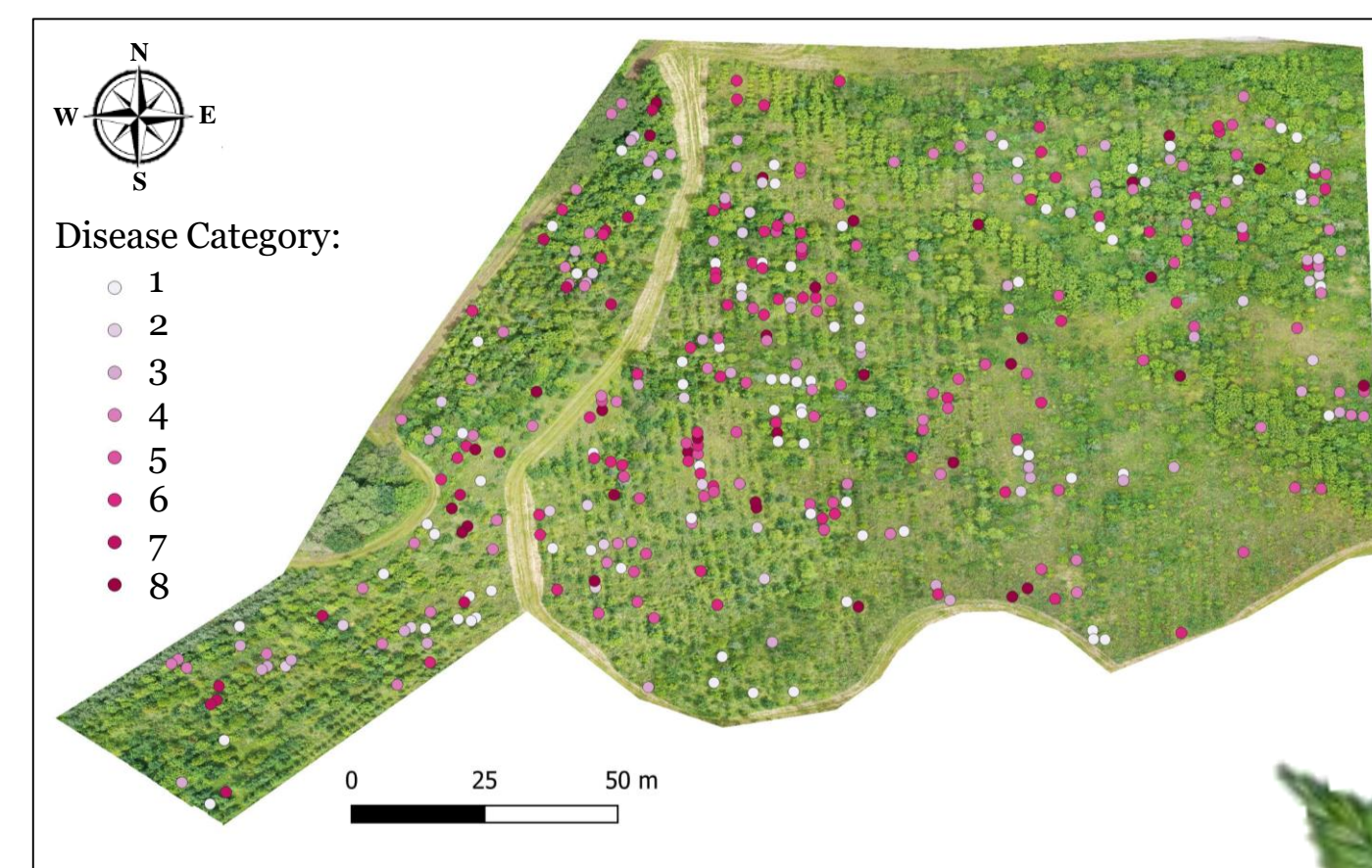
Objectives:

To investigate the effects of neighbouring tree species on resistance to ash dieback disease in mixed species plantations

Methodology:

Field 76a, Norbury Estate, Staffordshire

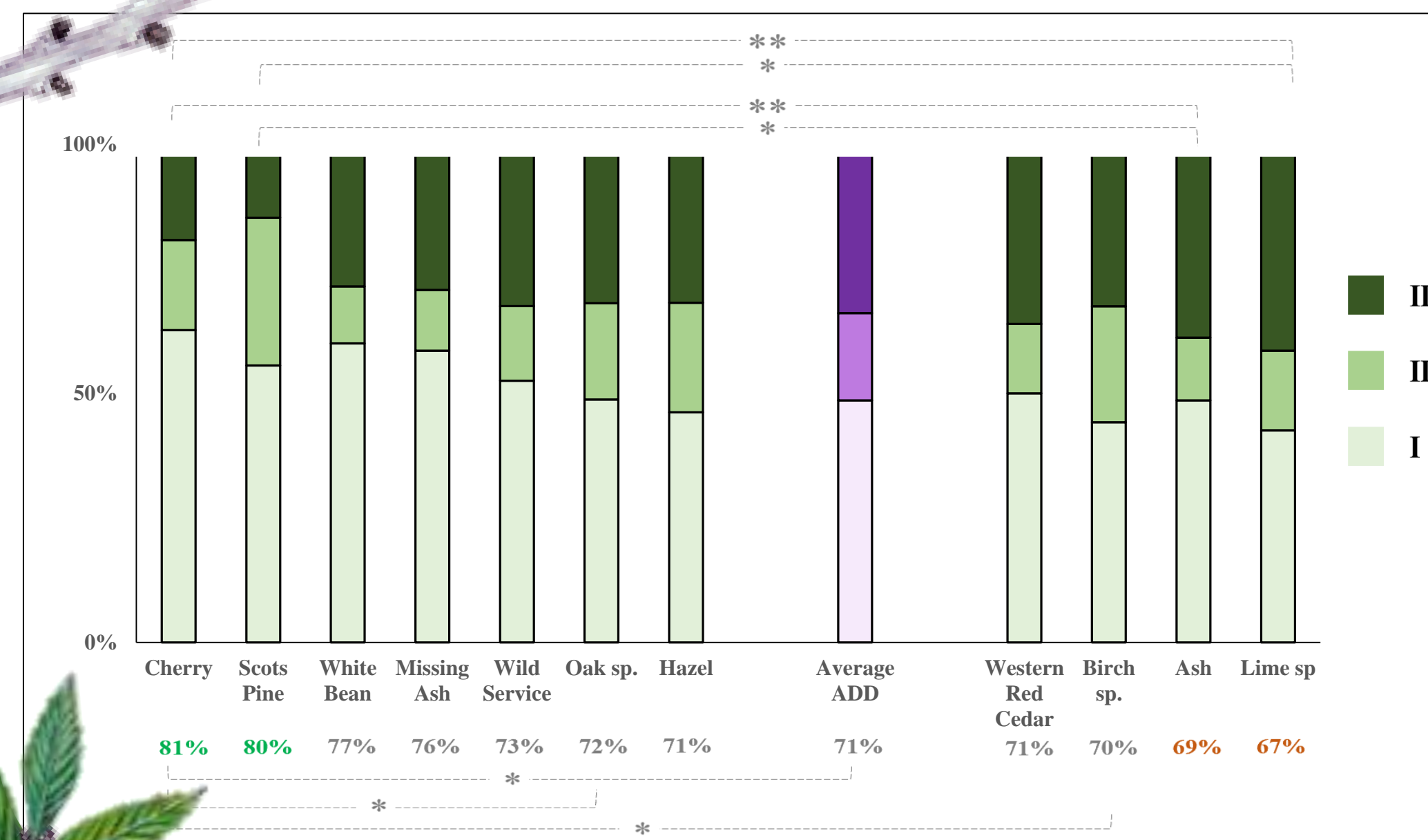
8 disease categories:



Map of field 76a. Each coloured dot represents one ash tree. Each shade of red corresponds to one of eight disease categories

Analysis:

Direct effect of adjacent species



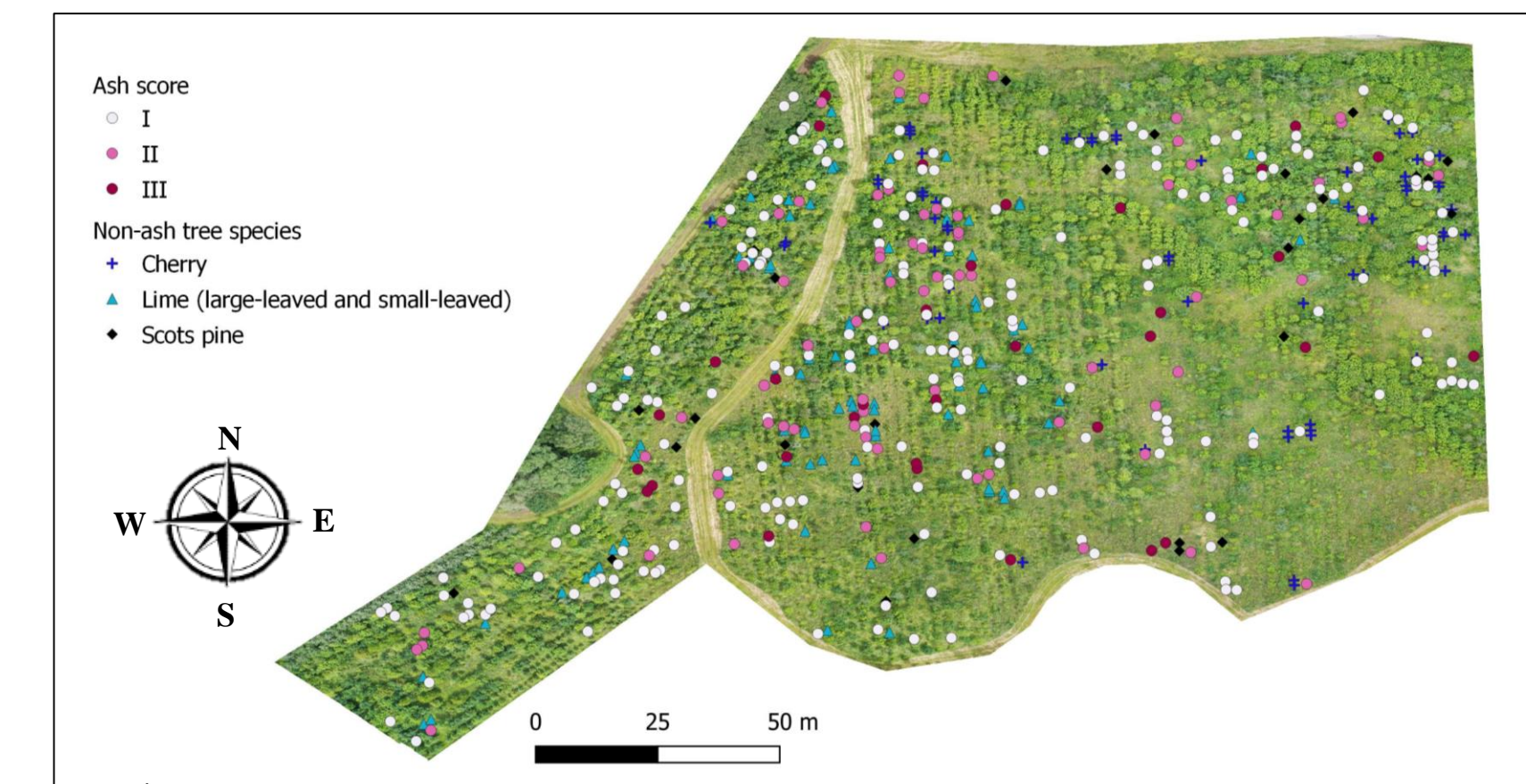
Percentage ash dieback disease level observed relative to each neighbouring tree species. Category I includes healthy ash trees, category II includes ash trees exhibiting crown dieback and category III includes all ash trees that have died. Percentage of infection for each neighbour species is recorded below each bar. "*" indicates 0.05 significance, "**" indicate 0.01 significance in Pearson's Chi-square tests

Conclusions:

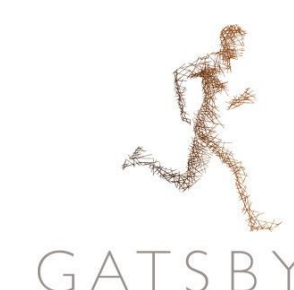
- There is variation in susceptibility to ash dieback disease among individual ash trees
- Cherry trees and scots pine appear to enhance resistance to ash dieback disease in directly adjacent ash trees
- Neighbouring limes and ash trees appear to enhanced susceptibility to ash dieback disease

Future work:

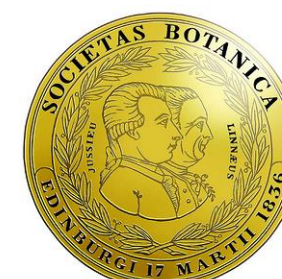
- To analyse the impact of the number of individuals of each species on ash dieback expression
- To analyse global effects of all tree species in different areas of the field



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