

### Resume of Ash Dieback Disease based on information from Natural England

An ash tree's level of susceptibility to ash dieback, is determined by its genetic makeup (genotype) and will be influenced by site conditions. Studies of European trees suggest that very few trees are completely resistant to the disease, but that some show more tolerance than others. A tree that is tolerant of a pathogen will be affected but survive, and will allow the pathogen to carry on its life cycle; while a tree that is resistant will not be affected, and will prevent the pathogen from continuing its life cycle. Trees with a low level of tolerance can die very quickly and even large trees can succumb in a few years. Other trees can tolerate the disease for longer periods of time and some trees, with high levels of tolerance may appear largely unaffected. Trees are likely to be more susceptible if they are poor specimens and/ or suffering additional stresses, for example from water logging or over-crowding. Secondary infections, such as those caused by honey fungus (*Armillaria* sp), can significantly increase decline and death.

Trees showing 0-25% dieback, can be considered as having a good level of disease tolerance where they are within a known area of infection and surrounding trees are more severely affected. Sometimes it can take several years following the arrival of ash dieback at a site to identify the more tolerant trees. Tolerant trees can still produce good annual growth increment. Trees with more than 50% of the crown affected will show little or no annual growth increment and are likely to die.

Within Europe to date no trees within infection zones have been found to be completely free of the disease, yet very recent research has shown that some degree of local resistance may be possible. Other studies have shown that ash trees which come into leaf early, and shed leaves early are more likely to be tolerant to the disease. However, there is some suggestion that the genes conferring resistance may be linked to those giving lower tolerance to herbivory by mammals or insect attack.

At best, the conclusion from studies in continental Europe estimate 2-5% of the ash population will remain unaffected by the disease