

Acute Oak Decline (AOD) in Germany – Study on associated bacteria

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The poly-bacterial syndrome Acute Oak Decline

Acute oak decline (AOD) describes a sudden, rapid loss of vitality in oak stands, which often leads to the death of affected trees within a few years. The causes of such damage are complex and result from the interaction of abiotic and biotic stressors, such as unfavourable site conditions or intense drought events followed by increased insect infestation. Current AOD events, which have spread across large parts of England and Wales since at least the 1980s, are characterised by high mortality rates and the occurrence of trunk necrosis, bark cracks and heavy slime flow, and are often associated with infestation by the two-spotted oak buprestid (*Agrilus biguttatus*) or bacteria from the Enterobacteriaceae family (*Brenneria goodwinii*, *Gibbsiella quercinecans*, *Rahnella victoriana*).

Current impacts in Europe and Germany

As a result of the widespread occurrence of acute oak decline in England, there have been increasing reports of this disease and the associated bacteria on the European mainland in recent years, with occurrences ranging from Eastern Europe, with reports from Poland, Latvia, Slovakia and Croatia, to Western Europe, including France, Spain and Portugal. Various *Quercus* species are primarily affected. However, there is also evidence for the AOD associated bacteria on *Carpinus betulus*, *Eucalyptus camadulensis*, *Fagus orientalis* and *Juglans regia*, among others.

In Germany, *Brenneria goodwinii* was first reported in Bavaria in 2022 (LfL 2022), followed by evidence of all three bacterial species mentioned in Thuringia in 2023 (Wenzel et al. 2024, JKI 2024). Following the first report of damage showing typical AOD symptoms in the area covered by the Northwest German Forest Research Institute, all three bacterial species were positively detected using the qPCR method. In order to better assess the spread of AOD in Germany, forestry officials throughout Germany were asked to send in samples from affected or suspected trees. As a result, samples from various regions of Germany, from Schleswig-Holstein in the north to Baden-Württemberg in the south, were examined. Initial results of the analysis indicate a potentially widespread occurrence of the damage.

References

JKI, 2024: Express PRA for *Brenneria goodwinii*. Julius Kühn Institute, Institute for National and International Plant Health. In German. URL: https://pflanzenengesundheit.julius-kuehn.de/dokumente/upload/Brenneria_goodwinii_expressPRA.pdf. Accessed: 14 November 2025

LfL, 2022: Annual Report 2022 – Bacteriology, Bavarian State Research Center for Agriculture, Institute for Plant Protection. In German. Jahresbericht 2022 – Bakteriologie, Bayerische Landesanstalt für Landwirtschaft, Institut Pflanzenschutz URL: <https://www.lfl.bayern.de/ips/ueberuns/324838/index.php>. Accessed: 18 November 2025.

Wenzel, A., J. Thiel, M. Sturtz, 2024: Forest protection situation in Thuringia in 2023. In German. Waldschutzsituation 2023 in Thüringen. AFZ - Der Wald. 9/2024, 30–33.



Fig. 1: Symptoms and damage on diseased oaks © NW-FVA

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