

## PHOENIX FROM THE ASHES: EXPLOITING HOST RESISTANCE TO CONSERVE AND RESTORE POPULATIONS OF EUROPEAN ASH

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The invasive ascomycete fungus (*Hymenoscyphus fraxineus*) has caused a serious, steady population decline of common ash (*Fraxinus excelsior*) across Europe. In Sweden, ash is an important species among the noble broad-leaved trees available to forest management. Since 2010, ash is a Red-listed species and its status has worsened during recent years to become critically endangered. This is concerning not only for this economically and culturally important species but also for its associated biodiversity given its role as a keystone species for natural communities throughout Europe. Several studies have shown large genotypic variation in the level of disease susceptibility among different individuals, and that a small proportion (1–5 percent) of the natural population of *F. excelsior* exhibits disease tolerance. Here we report on several activities aimed at selecting and testing *F. excelsior* genotypes including: (1) broad-scale mapping, identifying and selecting more than 500 disease-tolerant *F. excelsior* with respect to ash dieback damage in wild populations for further monitoring and testing, (2) screening resistance in *F. excelsior* genotypes in clonal trials, and (3) early results of progeny testing from known susceptible and tolerant families. In addition, phenomics technologies show great promise to advance breeding efforts. Fourier-transform Infrared (FT-IR) spectroscopy coupled with chemometric model was able to successfully discriminate between resistant and susceptible ash genotypes. Collectively, these activities and the implementation of rapid phenotyping technologies in practice will help support the development of a more resistant population of *F. excelsior* restoration activities aimed at repopulating Swedish forests, cities, and landscapes.

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