TOWARDS A FOREST HEALTH PARADIGM BASED ON HOST GENETICS AND PARTICIPATORY BREEDING

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Invasive pests and pathogens cause extensive damage to native forest trees and the ecosystems that depend on them and, given the continuing increase in globalization and mean global temperature, introductions of destructive invasive species are predicted to increase. To address these issues, the newly formed Forest Health Research and Education Center (FHC) at the University of Kentucky is focused on developing host resistance in forest trees and understanding the broader impacts of forest health issues on society. As is well known, the longstanding issues related to working on the genetics of forest trees presents a large challenge to breeding host resistance. However, they are no excuse to opt out and depend on shorter-term, less reliable or less environmentally friendly options. Instead, we argue that the long-term, proactive development of genetic, genomic and biotech resources in foundational forest tree species is critical to the implementation of host resistance when and if pest and pathogen problems arise. In addition, to develop these resources and implement these breeding programs over range-wide spatial- and multi-generational time-scales, participatory research networks will be required. We will discuss these concepts in relation to the ongoing work on various forest tree species by the FHC.

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