What Do We Know About Mechanisms for Tolerating Pathogens, and Can Tolerance Be Applied to Managing Tree Diseases?

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Abstract

The terms ‘‘resistance’’ and ‘‘tolerance’’ have been used by different scientists to refer to different things, and they have often been measured (and thus operationally defined) in ways that confuse the two concepts with each other. In keeping with the emerging consensus on resistance and tolerance, the following conceptual distinction is useful: resistance refers to traits that prevent infection or limit its extent, and tolerance refers to traits that do not reduce or eliminate infection, but instead reduce or offset its fitness consequences. Thus, resistance and tolerance can both improve host fitness; resistance does so by reducing infection, whereas tolerance does so by reducing the fitness loss under infection. In this review, I will briefly set up the differences between resistance and tolerance, then discuss what we know about mechanisms for tolerance and what is known about tolerance in relation to tree diseases.

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