

Scaling up from Greenhouse to Field Resistance in Tanoaks¹

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Abstract

Sudden oak death (SOD) has had a devastating impact on tanoaks (*Notholithocarpus densiflorus* (Hook. & Arn.) Manos, Cannon & S.H. Oh) in California and Oregon. Tanoaks are a key component of the forests in which they are endemic and are one of the few species that are both killed by *Phytophthora ramorum* and contribute to its spread. Tanoaks were little studied prior to the onset of the SOD epidemic, resulting in few intellectual or material resources on which to base a disease resistance research program.

Since 2006, a comprehensive research program, centered on a common garden of open-pollinated seed families, has aided the understanding of the role resistance might play in the disease dynamics and management of tanoak populations. Seedlings have been assessed for growth and resistance traits in the nursery and have been transplanted into an infested field site in order to assess performance under natural disease pressures. Combined analysis of data from the three settings demonstrates the utility of disease resistance measured in year 2 nursery assays for predicting high fitness in the field, especially in combination with low to moderate growth over 3 years in the nursery. The resistance screens, our expanded screening of resistance from seedlings originating from across the geographic range, and the seed families we developed, promise to be useful tools in the conservation of western U.S. forests.

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