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DISEASE NOTES

First Report of the EU1 Clonal Lineage of *Phytophthora ramorum* on Tanoak in an Oregon Forest

N. J. Grünwald , **M. M. Larsen**, and **Z. N. Kamvar**, USDA ARS, Horticultural Crops Research Lab, Corvallis, OR 97330; **P. W. Reeser**, Department of Botany and Plant Pathology, Oregon State University, Corvallis 97331; and **A. Kanaskie**, **J. Laine**, and **R. Wiese**, Oregon Department of Forestry, Salem, OR 97310.[Citation](#)[Open Access](#).

ABSTRACT

Initially reported in California as the causal agent of sudden oak death (SOD), efforts to limit spread of *Phytophthora ramorum* in Oregon natural forests have concentrated on quarantine regulations and eradication of the pathogen from infested areas. *P. ramorum* has four clonal lineages: NA1; NA2; EU1; and EU2 (Grünwald et al. 2012; Van Poucke et al. 2012). Forest infestations in Oregon have been limited to the NA1 clonal lineage, whereas EU1, NA1, and NA2 clonal lineages have all been found in U.S. nurseries (Kamvar et al. 2015; Prospero et al. 2007). In February 2015, in response to an aerial survey, *P. ramorum* was isolated from a dying *Notholithocarpus densiflorus* tree in the South Fork Pistol River drainage of Curry Co., Oregon. The isolated strain was identified as *P. ramorum* based on presence of chlamydospores, characteristic hyphae, and sporangial morphology. Microsatellite genotyping at 14 loci (Vercauteren et al. 2011) and comparison with reference cultures revealed that these isolates belonged to the EU1 clonal lineage. Subsequently, five more isolates were obtained from the original tree stump and the EU1 lineage was confirmed. Microsatellite alleles of the forest EU1 isolates were nearly identical to EU1 isolates collected in 2012 from a nearby nursery during routine *P. ramorum* nursery monitoring, except for one allele at locus PrMS145a. Interestingly, several isolates differed at locus ILVOPrMS131a within both the 2015 forest and the 2012 nursery findings with identical allele frequencies in each population for this locus. These data provide inconclusive support for the introduction of EU1 into Curry Co. from the 2012 populations found in nurseries, given that no direct match was found probably owing to the paucity of EU1 samples from nurseries. These results provide further evidence that multiple distinct *P.*

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ramorum introduction events into the Curry Co. forest are a critical component of the epidemic (Kamvar et al. 2015). The impact of the EU1 clonal lineage of *P. ramorum* on Oregon natural forests is uncertain, but it may result in potential sexual reproduction given that EU1 is of A1 mating type while the prior population consisted of NA1 A2 mating type individuals. While sexual populations of *P. ramorum* have not been observed in nature or were aberrant in the laboratory, the presence of both A1 and A2 mating types makes the potential for sexual recombination more likely. The EU1 forest infestation is undergoing eradication treatments. Additional monitoring is necessary to determine if the EU1 clonal lineage occurs elsewhere in Curry Co. forests.

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Section:

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