

Observations of *Castanea sativa* as a Host of *Phytophthora ramorum* in England over a Decade¹

Mick Biddle,² Barnaby Wylder,² Anna Harris,³ and Joan Webber³

Abstract

Forestry Commission England aerial surveillance operations to detect *Phytophthora ramorum* between 2009 and 2014 were primarily focused on identifying infected larch (*Larix* spp.), although sweet chestnut (*Castanea sativa*) has been recognized as a sporulating host of *P. ramorum* since the mid-2000s (Denman and others 2006). During follow-up ground investigations, infected sweet chestnut was confirmed and considered an incidental host on 23 sites (54 laboratory positives), with individual trees or small discrete stands of sweet chestnut affected but always in close proximity to other infected sporulating hosts (usually *Rhododendron ponticum* and larch). Observed symptoms of sweet chestnut comprised foliar wilting, leaves with blackened petioles, discolored mid-ribs, and/or ‘water-soaked’ or discolored leaf margins. These symptoms were most common on abundant epicormic growth low on the stems of mature trees. In 2014 an area of sweet chestnut showing general symptoms of decline and crown dieback was noted. The site was in south-west England with known historic *P. ramorum* infection, so survey flights specifically targeting areas of sweet chestnut were added to the surveillance program in 2015. Between 2015 and 2017, 182 sweet chestnut woodland sites (predominantly in south-west England) were identified with crown dieback and mortality, ranging in severity from individual trees through to approximately $\geq 30\%$ trees affected. Follow-up ground investigations inspected trees for symptoms consistent with *P. ramorum* infection. Many of the sites were found to contain sweet chestnut trees with symptoms which yielded positive lateral flow test results, and laboratory testing of samples from 82 of the sites yielded 150 positive *P. ramorum* results, either based on isolation of *P. ramorum* (EU1) cultures and/or rtPCR confirmation. In addition to foliar symptoms, new symptoms observed included premature abscission of symptomatic leaves from the crown, cankers on epicormic shoots, and in some cases extensive cankers affecting branches and stems of mature trees. An apparent co-occurrence of symptoms with rapid or chronic crown dieback was observed.

In 64 cases, confirmed sweet chestnut infection was in a location with a current or historic presence of *P. ramorum* in larch or rhododendron. Dieback appeared to have progressed in

¹ A version of the paper was presented at the Seventh Sudden Oak Death Science and Management Symposium, June 25-27, 2019, San Francisco, California.

² UK Forestry Commission England, Bristol Business Park, Bristol, BS16 1EJ, UK.

³ UK Forest Research, Alice Holt Lodge, Farnham, Surrey, GU10 4LH, UK.

Corresponding author: M. Biddle, mick.biddle@forestrycommission.gov.uk.

recent years in spite of the removal of the other sporulating hosts on these sites. In a further 18 cases however, infected sweet chestnut trees with crown decline were confirmed in locations where any infected larch and rhododendron could be several km distant (up to 7.5 km in one instance). This suggests long distance aerial transmission of *P. ramorum* to sweet chestnut, and that the disease can also cycle on sweet chestnut in the absence of any other sporulating hosts.

Literature Cited

Denman, S.; Kirk, S.; Whybrow, A.; Orton, E. and Webber, J. 2006. *Phytophthora kernoviae* and *P. ramorum*: host susceptibility and sporulation potential on foliage of susceptible trees. EPPO Bulletin. 36(2): 373-376.