

Monitoring of Natural Outbreaks of *P. ramorum* in the UK

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Over forty outbreaks of *P. ramorum* have occurred in managed gardens in the UK. Three of these sites, one in the south-east of England and two in the south-west, have been closely monitored since October 2003. These sites represented differing disease scenarios at the start of monitoring, as eradication action had already taken place at the site in the south-east, whereas no action had taken place in the south-west. The progress of existing infections and the development of new infections were monitored at all sites. A number of current or previously infected areas within the gardens were selected for experimentation and marked out in metre square grids to cover at least 3m in all directions from the original infected plant. Soil and leaf litter samples, taken each month, were analysed for presence of *P. ramorum* by isolation and microscopic examination of the cultures, and any positives were confirmed by TaqMan[®] PCR. In areas of high infection, sequential sampling was carried out through the soil profile to examine the depth of contamination. Baits were deployed along all watercourses on a three-monthly basis to investigate extent of contamination in ponds and streams within the gardens and to quantify the effect of seasonal variation on inoculum levels. The influence of environmental factors on timing and quantity of spore release were investigated using volumetric spore samplers, rain-water traps and logging of meteorological data by weather stations. Sampling strategies have successfully established the level of contamination at each of the sites and have shown that the pathogen can survive winter conditions in the south of England within plant material and in the wider environment. Monitoring of the selected sites revealed different levels of infection in terms of numbers of plants affected and degree of soil contamination, with higher levels of infection and contamination in the south-west sites. No direct evidence of significant vector involvement in pathogen dispersal was found, but a number of pathways used by members of the public were found to be infected in the south-east site. The seasonal baiting of water-courses at this site have indicated widespread contamination of streams, ponds and lakes. However, significantly lower levels of *P. ramorum* contamination were detected in summer compared to the spring. This may reflect a general reduction in inoculum as a result the earlier eradication strategies adopted but may also indicate less favourable conditions for sporulation and spread during the summer. There have been no new plant infections at the south-east site (other than on regrowth) and levels of soil and leaf litter contamination are low. This also suggests that the strategy of early removal of infected plants and surface leaf litter has been successful in reducing disease inoculum and spread.