Symptom recognition of *Phytophthora ramorum* and *Phytophthora kernoviae* diseases on bilberry (*Vaccinium myrtillus*)

Phytophthora is a devastating fungus-like organism that causes damage to a wide range of trees and plants. Recently two species of *Phytophthora* – *Phytophthora ramorum* and *Phytophthora kernoviae* – have been causing significant damage to our environment. Both are quarantine diseases which are under statutory control. The two pathogens cannot be distinguished based on visual symptoms so the purpose of this document is to provide guidelines to the recognition of symptoms of the two diseases on bilberry (*Vaccinium myrtillus*).

Very early symptom showing a brown lesion developing around the leaf node

Very early symptom development showing a dark brown/black, lesion. Lesions can develop at any point along the stem, not just at leaf nodes or buds

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Symptoms of early infection showing typical mid stem blackening and leaf necrosis. Leaves quickly abscise leaving only stem infection. Only the three leaves associated with the stem lesion are infected (circled). Mottling seen on other leaves is not *P. ramorum* or *P. kernoviae* infection

Bilberry regrowth showing typical stem blackening. Young, fresh shoots are particularly susceptible to infection with disease progressing from the stem base upwards due to infection from contaminated soil/leaf litter

Symptoms of ‘zebra striping’ caused by multiple infections on one stem. Lesion size can vary from not developing further than a couple of millimetres, being limited by branching of the stem, or may develop to encompass the whole plant if conditions are favourable

Heathland bilberry showing the typical reddy brown colouration of *P. kernoviae* infected stems

An area of bilberry showing severe dieback, with infection affecting almost the entire plant. As time progresses, the stem blackening lightens to become more chestnut brown / grey in colour. Once the disease has progressed to this stage, it becomes difficult to retrieve the pathogen and therefore give a positive confirmation

Disease symptoms on bilberry (*Vaccinium myrtillus*) commonly mistaken for *P. ramorum* and *P. kernoviae* infection

Browning and mottling on leaves. Stem symptoms are the best indicator of disease as infected leaves quickly abscise

Reddish black lesion with surrounding yellow necrotic tissue

Reddish brown mottling

Red colouration on stem however leaf buds remain green

Chestnut brown colouration similar to older *P. ramorum* or *P. kernoviae* infection, sampling would be advised.

Advisory Information

Phytophthora ramorum and *Phytophthora kernoviae* are quarantine diseases and Defra needs to be notified of any findings so action can be taken against them. If you suspect that such a pest or disease is present, you should report it immediately to your local Plant Health and Seeds Inspector (contact details below).

Regional teams are working to identify and eradicate outbreaks of the diseases as part of a wide-reaching programme to manage the impact of *Phytophthora ramorum* and *Phytophthora kernoviae* in the UK. This programme is being run by the Food and Environment Research Agency (Fera), on behalf of the Department for Environment, Food and Rural Affairs (Defra).

If you discover any plants showing the symptoms illustrated in this leaflet:

- Make a note of the location
- Take a photograph if possible
- Don’t touch the plant or take a cutting
- Use the contact information below

Telephone: 01904 465625
Email: planthealth.info@fera.gsi.gov.uk

The Food and Environment Research Agency (Fera). October 2012

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