

An integrated approach to meet future plant health challenges in Scotland

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Abstract

Plants are a vital component for the maintenance of life on Earth and serve as the feedstock for many industries on which large parts of the World rely. Like all other forms of life, they are susceptible to disease and attack, sometimes with disastrous consequences for habitats and economies. Safeguarding plant health is therefore rightly recognised as one of the major objectives for the Scottish Government, and the reason for which the Government launched its Plant Health Strategy in 2016. This paper describes the drivers and aims for this Strategy and some of the industry-led initiatives which are enabling its implementation.

Maintaining plant health, either as a vital component of a vibrant rural economy or as the very foundation of our natural environment, is of paramount importance. The risk from introduced pests and pathogens to plant life as a result of trade, internet shopping and international travel is ever present and likely to increase as supply chains lengthen and become more complex, and long-distance travel becomes more accessible and affordable. Equally, the threat from indigenous pests and pathogens may become harder to predict and manage as the effects of climate change serve to extend their host range and geographic and environmental limits, and/or enhance their virulence.

A comprehensive analysis of pathogens introduced into the UK between 1970 and 2004 showed that of the 234 recorded, more than half were found on ornamentals (53 per cent), with fungi and oomycetes the largest group of organisms recorded (79 per cent; Jones & Baker, 2007). The significance of the oomycete genus *Phytophthora*, and its

impact on agriculture, forestry, horticulture and the wider environment, is undiminished in recent years and reflected in the number of studies on this (see, for example, Frediani *et al.*, Green *et al.*, Frankel *et al.*, Summerell & Liew and Hayden, all in this issue), highlighting our current understanding and the continued impact that these pathogens have on a wide range of plants. It is noteworthy that although Jones and Baker highlighted that *Viburnum tinus* (laurustinus) was the first recorded host of *Phytophthora ramorum* in the UK, they projected at that time that *Fagus sylvatica* (European beech) was potentially of greater significance as a host. The fact that *P. ramorum* went on to become a highly damaging pathogen of *Larix kaempferi* (Japanese larch), affecting many western parts of the UK and causing major problems in the south-west of Scotland (Scottish Forestry, 2018), serves to highlight how a pathogen which may have entered the country on one host has the potential to impose far-reaching consequences on another.

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More recent examples of introduced pests and pathogens can be found in *Hymenoscyphus fraxineus* (chalara ash dieback) and *Thaumetopoea processionea* (oak processionary moth; OPM) (Fig. 1). In the case of the former, the disease was first described in Poland in 1992, spreading from there across Europe, and was recorded for the first time in the UK in 2012, most likely arriving before that time on imported nursery stock (Woodward & Boa, 2013). Similarly, OPM, which had long been established in mainland Europe, was first recorded in Greater London in 2006 (Tomlinson *et al.*, 2015). In July 2019 the UK Plant Health Service intercepted a number of cases on recently planted oak trees imported from the Netherlands and Germany (Forest Research, 2019) and around 60 interceptions have now been identified in England, Scotland and Wales.



Fig. 1 Oak processionary moth. Photo: SASA ©Crown Copyright.

Largely in response to the growing threat that *Phytophthora ramorum* posed to Scottish larch trees and the increasing concern over chalara ash dieback, the Scottish Government launched its Plant Health Strategy in 2016 with the aim of marshalling and focusing resources in order to protect its agriculture, horticulture, forestry and natural environment (Scottish Government, 2016). The Strategy made, among other things, two major commitments: the appointment of a Chief Plant Health Officer for Scotland, and the creation of a virtual centre of expertise in plant health. The purpose behind each was to bring greater focus to the maintenance of plant health at a national level.

The Plant Health Centre,² the Scottish centre of expertise in plant health, was commissioned in 2018 and brings together the knowledge and skills of researchers working in the plant sciences in agriculture, forestry, horticulture and the natural environment sectors (Figs 2 & 3). The aim is to conduct targeted research into new and emerging threats and provide evidence and advice to Government on the pests and pathogens that threaten Scotland the most. Safeguarding plant health, therefore, is rightly recognised as one of the major objectives for the Scottish Government, as it underpins our agriculture, horticulture, forestry and rural land use, and is a major feedstock for the food and drink sector.

Clearly, Government has a key role in protecting plant life, through pest and disease surveillance, outbreak management and response, oversight of trade in plants and plant products, and advice to industry and the general public. It is also self-evident that the most effective way

² www.planthealthcentre.scot



Fig. 2 The Scottish Plant Health Centre leadership at its launch in May 2018. Left to right: Fiona Burnett (Scotland's Rural College), Sonia Humphris (The James Hutton Institute), Chris Quine (Forest Research), Gerry Sadler (SASA), Ian Toth (The James Hutton institute), Peter Hollingsworth (RBGE). Photo: Lynsey Wilson.



Fig. 3 Fiona Burnett and Mariella Marzano (Forest Research) compiling stakeholder priorities for the Plant Health Centre at the launch workshop. Photo: Lynsey Wilson.



Fig. 4 Public information graphic widely distributed online and at transport centres. Graphic based on a design by Steve Eldridge, DEFRA ©Crown Copyright.

to protect plant life at a national level is to block the importation of commodities which may harbour pests and diseases. However, decisions of this nature are seldom straightforward and must always be balanced against the requirement to maintain international trade, which is especially true for countries such as the UK that are not self-sufficient in food production. It is therefore inevitable that even with an ever-vigilant inspection service, pests and pathogens may evade detection and enter the country. The recognition of this likely occurrence is primarily why the Scottish Plant Health Strategy highlights that Government can only do so much, and therefore sets out a key commitment to encourage greater awareness, to build collaboration and greater involvement across sectors and with the general public. It is therefore encouraging to see industry-led initiatives such as Plant Healthy,³ designed and backed by the Horticultural Trade Association, increase awareness and highlight the importance of protecting plants from pests and diseases

as the cornerstone of a thriving horticulture industry. This initiative provides tools and resources to help growers, retailers and landscapers play their part in avoiding the importation and spread of pests and diseases. Similar efforts are also under way to raise awareness among the general public through the 'Don't risk it' campaign (SASA, no date), urging the public to play their part in protecting plant health by not bringing back flowers, fruit and vegetables when returning home from holidays abroad (Fig. 4).

In summary, the threat from pests and pathogens to plant life in Scotland is ever present and likely to grow as international trade continues to expand and diversify, consumers demand greater choice and all-year-round availability and gardeners/ horticulturists continue to seek out the exotic and unusual. It is only by maintaining vigilance and developing lasting partnerships between government, research institutes, industry and the general public that we will succeed in protecting plant life now and in the years to come.

³ <https://planthealthy.org.uk>

References

- FOREST RESEARCH (2019).** Oak processionary moth (*Thaumetopoea processionea*). Available online: www.forestresearch.gov.uk/tools-and-resources/pest-and-disease-resources/oak-processionary-moth-thaumetopoea-processionea (accessed September 2019).
- JONES, D.R. & BAKER, R.H.A. (2007).** Introductions of non-native plant pathogens into Great Britain, 1970-2004. *Plant Pathology*, 56: 891–910.
- SASA (no date).** Available online: www.sasa.gov.uk/dont-risk-it (accessed September 2019).
- SCOTTISH FORESTRY (2018).** *Phytophthora ramorum* in Scotland (2018). Available online: <https://forestry.gov.scot/sustainable-forestry/tree-health/phytophthora-ramorum> (accessed September 2019).
- SCOTTISH GOVERNMENT (2016).** The Scottish Plant Health Strategy. Available online: www.gov.scot/publications/scottish-plant-health-strategy (accessed September 2019).
- TOMLINSON, I., POTTER, C. & BAYLISS, H. (2015).** Managing tree pests and diseases in urban settings: the case of Oak Processionary Moth in London, 2006-2012. *Urban Forestry and Urban Greening*, 14: 286–292.
- WOODWARD, S. & BOA, E. (2013).** Ash dieback in the UK: a wake-up call. *Molecular Plant Pathology*, 14: 856–860.