

# Building the Plant Health Profession

Celia Knight, Charles Lane and Nicola Spence



Department  
for Environment  
Food & Rural Affairs

# Building the Plant Health Profession – why?

Big global issues depend on plant health:-

- Food production
- Land use
- Increased trade and leisure
- Impact of climate change

But many traditional plant-based professions e.g. horticulture, agriculture, forestry etc struggle to recruit.





# Career opportunities in Healthcare

## PROSPECTS

Jobs and work experience   Postgraduate study   Careers advice   Applying for university

< Healthcare

## Overview of the healthcare sector in the UK

 Emma Knowles, Editorial assistant    January, 2018

**Whether you're treating patients or conducting research, working in healthcare means you'll be making a difference to the lives of others. Find out what skills, qualifications and work experience you'll need**

What areas of healthcare can I work in?

## What areas of healthcare can I work in?

Employment opportunities can be grouped into:

- allied health (e.g. physiotherapy, radiography, occupational therapy)
- ambulance services
- complementary therapies
- dentistry
- health informatics
- health promotion
- healthcare administration and management
- healthcare science (e.g. clinical engineering, biomedical science, pathology)
- medical equipment sales
- medicine (e.g. doctors, surgeons, GPs)
- medical research
- midwifery
- nursing
- nutrition and diet
- optometry and opticians
- pharmacy
- psychological therapies.

You could work in the National Health Service (NHS), private healthcare or private/non-profit organisations in a range of settings including:

- care homes or hospices
- community healthcare (e.g. doctor's surgery, dental surgery, health clinic)
- hospitals
- medical laboratories
- people's homes.

# Why not Career opportunities in Plant Healthcare?

For example:-

*“Whether you’re identifying and managing disease in crops, gardens or forests, or conducting research on how to grow disease-resistant and healthy plants, working in plant healthcare means you’ll be making a difference to the lives of others and protecting the planet.”*

What areas of plant healthcare can I work in?

Government Plant Health and Seed Inspectorate

Forestry

Horticulture and Gardens

Agriculture and Farming

Plant Science Research

Education

Land use and Ecology

Food industry

Leisure industry

And more

..... “ but we can’t get the students – they’re not interested”

No longer quite so true.

The Gatsby Plant Science Summer School has been inspiring undergraduates since 2005.

Levesley, A, Jopson J and Knight C: (2012); The Gatsby Plant Science Summer School: Inspiring the next generation of plant science researchers. *The Plant Cell*: 24:4, 1306-1315.

But students report a lack of respect for plant science, poor career advice and a disconnect between academic study and the broader context of plant science.

The Student Voice project – Defra-funded 2014



# How can we build a Plant Health Profession?

1. Acknowledge plant health skills in all relevant workforces including those not traditionally associated with plant health e.g. LI
2. Inspire the next generation that plant health offers rewarding career prospects
3. Work with all relevant parties to share best practice e.g.
4. Identify future work needed and how best to achieve it for the benefit of all



**Landscape  
Institute**  
Inspiring great places



**The British Society for Plant Pathology**



# Our approaches to date

- Plant Health Professional Register: with the RSB - acknowledges workforce skills
- Plant Health and Biosecurity Workforce Skills Development: with the YNYER-LEP - engages and upskills local businesses
- Gatsby Plant Science Education Programme: with the University of Cambridge – inspires first year undergraduates
- Plant Health Undergraduate Studentships: with the RSB – offers research placements to undergraduates to give experience and an appreciation of Defra's R&D needs
- Schools curriculum – Charles Lane
- Citizen science - Charles Lane

# The Plant Health Professional Register

The Plant Health Professional Register recognises plant health competencies in various workforces and offers CPD opportunities to show compliance with GB Strategy

<https://www.rsb.org.uk/careers-and-cpd/register/plant-health-register>

Working with Joanne Needham, Daniel Garnett and Rachel Lambert-Forsyth



The screenshot shows the Royal Society of Biology website. At the top right, there is a navigation bar with links: Home, Login, Register, RSB Jobs, Job Board, Donate, and Contact us. Below this is the Royal Society of Biology logo. A secondary navigation bar includes links for About us, News, Events, Get involved, Membership, Policy, Education, and Careers & CPD. A breadcrumb trail reads: You are here > Home > Careers & CPD > Registers > Plant health register. On the left, a 'Careers & CPD' sidebar lists various categories, with 'Plant health register' highlighted in green. The main content area features a photograph of a pine branch with cones and a text box titled 'Plant Health Professionals' which states: 'The Plant Health Professional Register has been created in response to the Department of Environment, Food and Rural Affairs (Defra) and Government Office of Science reports<sup>1</sup> recommending development of plant health skills and creating opportunities for a wider community of trained plant health professionals. A new report from research councils was published in 2016<sup>2</sup>'.



# Building the competency framework

In 2016, a group of representatives from devolved administrations worked together with the RSB to develop a framework aligned to the GB Plant Biosecurity Strategy

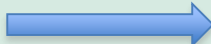
## The Plant Health Professional Register Advisory Group

Celia Knight (Consultant and chair)  
Charles Lane (Fera Science Ltd, vice-chair)  
Maureen Wakefield (Fera Science Ltd)  
Richard Harris (Defra)  
Ged Hayward and Paul Beales (APHA – England)  
Susan Ross, John Kerr and Gerry Saddler (SASA – Scotland)  
Sean McIntyre (DAERA – Northern Ireland)  
Nia Meddins (Welsh Government)  
Nick Mainprize (Forestry Commission)  
Joanne Needham and Daniel Garnet (Royal Society of Biology)  
Nicola Spence (Defra Chief Plant Health Officer)



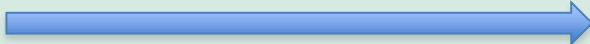
# Accessing the Plant Health Register as an RSB member

## Plant Health Professionals

This is about having an in-depth understanding and knowledge of how your role fits with and supports 'Protecting Plant Health – A Plant Biosecurity Strategy for Great Britain'. 

You would recognise that plants and trees are an essential economic, environmental and social asset making a vital contribution to our food and timber supply, rural economy and providing important ecosystem services.

For all colleagues, it is about focusing your contribution on the activities which will help in protecting agriculture, forestry and the natural environment both nationally and internationally whilst recognising the need and importance of international trade in plants and plant products. You would understand that threats to plant biosecurity have increased with the globalisation of trade and travel and that predicted climate change effects may influence the impact of damaging pests not yet present in the UK as well as those already present, requiring associated management practices. The level of your involvement and influence will range from local, regional, national to international and short term to long-term with increasing responsibility and competency level from associate, to registered to senior plant health professional.

For list of competencies please see [here](#) 

See our [guidance for applicants](#)

### You are currently on the Plant Health Professionals

[Manage your registration.](#)

[View the register directory](#) 

List of registrants



11 competencies  
within 4 clusters

# 11 competencies in 4 clusters

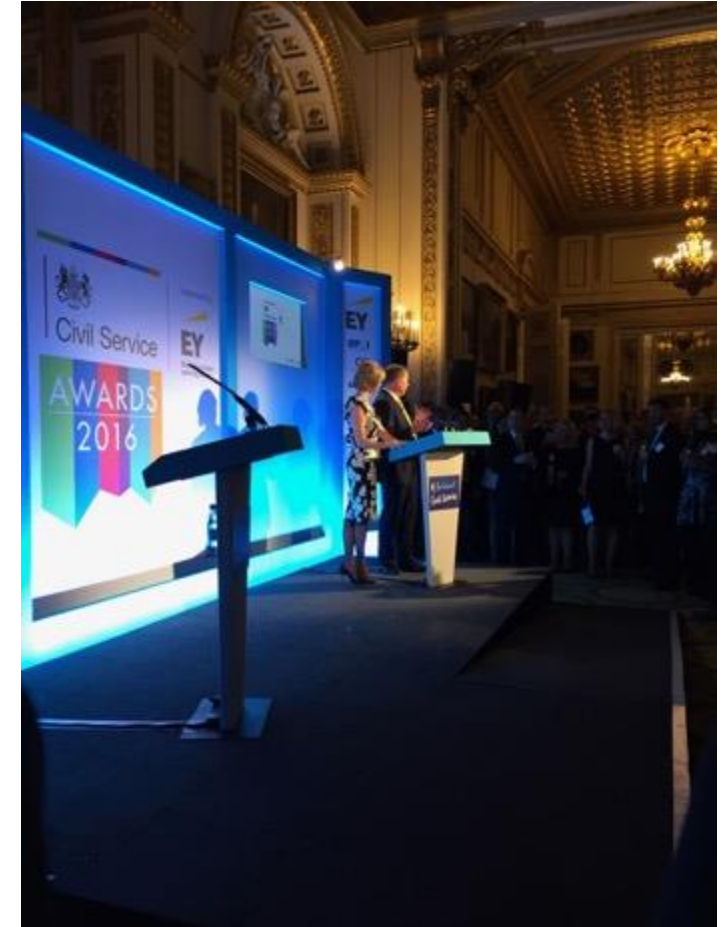
Competency Cluster	Elements
1 Plant Health Regulations	<ul style="list-style-type: none"><li>• Understanding how plant health services operate in the UK</li><li>• Understand the significance of international plant health</li><li>• Understanding plant biosecurity continuum</li></ul>
2 Roles and Responsibilities in Reporting Plant Health Concerns	<ul style="list-style-type: none"><li>• Demonstrate communication of the risks of plant health policy</li><li>• Understand roles and responsibilities for plant health within your organisation and outside your organisation</li></ul>
3 Risk Based Decision-Making	<ul style="list-style-type: none"><li>• Understand risk-based decision-making and identify which pests and diseases are high-risk within your area and to the UK</li><li>• Understand how trade and commodity pathways affect biosecurity and risk mitigation</li></ul>
4 Contingency Planning and Outbreak Management	<ul style="list-style-type: none"><li>• Demonstrate knowledge of good biosecurity practice</li><li>• Contingency planning an outbreak management</li><li>• Understand the impact of control strategies measures</li></ul>

## 3 levels – Associate, Registered and Senior

Competency	<i>Assessors will be looking for evidence that you know / do / take an active part in:-</i>		
	Associate	Registered	Senior
Competency Cluster 1. Plant Health Regulations			
1. Understand how Plant Health Services operate in the UK and reporting mechanisms for plant health concerns	Be able to describe the different government departments responsible for Plant Health and Forestry in the UK	Describe the flow of information and decisions about plant health in your organisation.  Understand the economic significance, diversity of trade and natural environment that could be affected by biosecurity.	Describe how you initiate the flow of information and decision making within your organisation and communicate with counterparts in other UK organisations.

# Summary status of PHPR

- 87 registered to date from government: 26 senior, 42 registered and 19 associate
- Competencies piloted with horticulture trade - April 2018
- 2 senior and 2 registered from horticulture
- Register ready to roll out to horticulture and apply to other sectors
- Shortlisted for Civil Service Skills award 2016
- Recommended part of development from Highgrove Biosecurity conference Feb 2018



# Acknowledging plant health skills in the workforce

“This is long overdue and much welcomed by the professionals I work with. It will enable a benchmark to be set for the roles undertaken and provide a system that recognises the experience and knowledge gained over time.”

Plant Health Professional comment



Some Plant Health Professionals receiving their certificates at the APHA conference Jan 2018

# Plant Health and Biosecurity Workforce Skills Development

Funded in 2 tranches through the York, N Yorkshire and East Riding Local Enterprise Partnership.

1. To develop the PPHR competency framework – 2015
2. To extend the PPHR to the horticulture and allied trades – 2017/18

Working with Charles Lane and Don Walker at Fera to deliver training workshops



Askham Bryan College



Fera Science Ltd

# Summary status of Plant Health and Biosecurity training

- 82 attended free workshops from 27 Yorkshire region businesses and reported a 55% increase in plant health and biosecurity competency.
- Workshop could extend to other plant health related disciplines e.g. agrifood
- Workshop could extend to other regions e.g. other LEPS



RHS Harlow Carr



# Gatsby Plant Science Education Programme

The annual undergraduate summer school introduces 80 end of first year high-achieving undergraduates from 27 UK Universities to plant science needs and research opportunities.

This year's programme includes a practical on ash dieback and a plenary on Action oak.

<https://www.slcu.cam.ac.uk/outreach/gatsby-plants/GPSSS>

Working with Dan Jenkins, Charlotte Carroll and Claire Pennycuick at The Sainsbury Laboratory, University of Cambridge

<http://celiaknightconsulting.co.uk>



**Gatsby Plant Science Summer School 2018**  
www.gatsbycamperschool.org.uk

**Monday evening**  
**Action Oak, Ms Lisa Smith**  
Ms Lisa Smith, Defra

Defra's new 25 Year Plan for Improving the Environment, lays down a commitment to improve and protect the natural environment, including actively monitoring and managing risks to plant health. Our native oak trees (*Quercus robur* and *Quercus petraea*) are robust and well adapted to a range of environmental conditions, but are now facing many pressures, such as increased air and soil pollutants, pests and disease, and changing weather patterns. Britain currently has more ancient oak trees than the rest of Europe combined. They support thousands of living organisms, but records show that the health and survival of oak trees are deteriorating. We need to take action now to ensure their long-term survival in our cherished landscapes.

However, we do not yet have enough information to protect our oak trees effectively. We need more evidence to know how to respond to the problems they face. Public-private partnerships are proving successful in funding research in other areas such as human health. The new Action Oak partnership, launched at the RHS Chelsea Flower Show 2018, is hoping to raise research funds to investigate the combined effects of long term changes in oak populations and multiple attacks on oak tree health and function, in order to safeguard our oak trees, and the hundreds of species associated with them, for future generations.

**Speaker Profile**



I am Head of Tree Health Policy and the Plant Health Evidence and Analysis team in the Department for Environment, Food and Rural Affairs (Defra), where I lead an interdisciplinary team of policy makers, natural scientists, statisticians, economists, social scientists and modellers that provide evidence to inform policy on the health of plants, trees and managed bees.

By background, I am an applied biologist with research experience studying the persistence of plasmid-borne antimicrobial resistance in natural environments. After teaching microbiology and molecular diagnostics at higher and further education level, and industry experience working as a microbiologist for Unilever, I joined Defra in 2000 as an animal health research officer – just in time to be involved in the Foot and Mouth Outbreak of 2001. Over the last 18 years, I have held a variety of roles, combining scientific knowledge with programme and financial management skills, and an in-depth understanding of Government policy and stakeholder management. In February 2013, I was moved into my current role to lead the government's scientific response to the threat from Ash Dieback and government policy on tree health. I am so passionate about my current role that I have refused all offers to move on!

[www.actionoak.org](http://www.actionoak.org)

**Plant Pathology Practical**

**Tutors:** Dr Charles Lane<sup>1</sup>, Dr Paul Beales<sup>2</sup>, Dr Andrea Harper<sup>3</sup>  
<sup>1</sup>Fera Science Ltd, York, <sup>2</sup>Animal and Plant Health Agency, York, <sup>3</sup>University of York, York

**■ You will need your hand lens for this practical**

**Aims**

**■ to gain an insight into the biology and impact of ash dieback disease, the diagnostic technologies available for surveillance of this fungal plant pathogen, and the potential strategies for managing this epidemic.**

Fungal pathogen *Hymenoscypha fraxineae*, has resulted in the loss of ash trees in Europe, and the disease is now widespread in the UK. However, a proportion of ash trees do exhibit a reduced level of susceptibility by asymptomatic for many years. Research into why these trees are tolerant is underway to identify as many tolerant trees as possible, such as those provided by FERA Science Ltd to Plant Health Research Agency, and restrictions on the movement of ash to limit the spread of the disease.

the biology, diagnosis and control of the disease, and practice how to identify and collect samples, microscopy of plant tissues, and molecular kits for diagnosis.

ing the many opportunities open up against disease.



**2018: Fungal Plant Pathogens-Protocol and Procedures**

rn, L. Hellebrand, Y. Li, M. Tick, F. Essex, L. Wang, A. Fellgett, oak, A. J. Dower, E.D. Kjaer, I. Bancroft. (2018) Molecular markers for ash dieback disease identified using Associative

# Plant Health Undergraduate Studentships PHUGS

PHUGS is a competitive academic scheme providing summer research placements for undergraduates (normally years 2-4) that address Defra priorities.

Priorities for 2018 were:-

*Detection or Control*

*Data & Modelling*

*Trade*

*Host plants / earth observations*

*High-risk pests or pathogens*

*Knowledge Exchange*

*Oak Health*

*Social research – biosecurity behaviours*

<https://www.rsb.org.uk/plant-studentships>

Working with Jon Carruthers, Laura Marshall, Laura Bellingan



The screenshot shows the Royal Society of Biology website. At the top right, there is a navigation bar with links: Home, Login, Register, RSB Jobs, Job Board, Donate, and Contact us. Below this is the Royal Society of Biology logo. A secondary navigation bar includes links for About us, News, Events, Get involved (highlighted), Membership, Policy, Education, and Career & CPI. A breadcrumb trail reads: You are here > Home > Get involved > Grants > Plant health UG studentships. A 'Get involved' sidebar menu lists: RSB Competitions, Intermediate Biology Olympiad, British Biology Olympiad, Biology Challenge, Photography competition, RSB Awards, Outreach and Engagement Awards, Nancy Rothwell Award, Top Student Award, Primary Science Teacher of the Year Award, and School Bioloav. The main content area features a photograph of a woman in a red shirt working with plants in a greenhouse. Below the photo, the heading 'Plant Health Undergraduate Studentships 2018' is followed by the text: 'Applications for 2018 have now closed. Please check this page again in early 2019 for information about applying for the next Plant Health Undergraduate Studentship programme.' At the bottom, it states: 'The projects below will take place over the summer of 2018. We are grateful to Defra, BSPP and N8 AgriFood for funding this programme.'

# Summary status of PHUGS

2017: 4 Defra-funded studentships  
 9 academic applications  
 145 undergraduate applications

2018: 4 Defra-funded studentships  
 3 BSPP-funded studentships  
 2 N8Agrifood funded studentships  
 20 academic applications  
 181 undergraduate applications

2019? + other sector contributors?  
 Cost £3K per studentship to add to the pool  
 that will access the student reach of the RSB  
 and offer interdisciplinary opportunities across  
 the UK

**Understanding *R* resistance evolution and biocontrol agent**  
 University of York

**Characterising the detection of invasive species**  
 eBay Development  
 Fera  
 John

**Developing a symptom straw**  
 NIAB  
 Harper  
 Coventry University

**Factors the major (Global) Linking high risk pests of woody species to host plant diversity in Britain**  
 Coventry University

**The consequences of underground plant-to-plant signalling for aphid fitness**  
 University of Manchester

**Getting straight to the point: Predicting the starting location of an epidemic following its first discovery**  
 University of Salford

**An investigation into the plant pathogenic oomycete community in the Lagan river, Belfast – the utility of the baiting technique**  
 Agri-Food and Biosciences Institute, Belfast

# How do we build on these approaches?

- Work with all relevant parties, many of whom have active outreach and education activities to raise awareness of plant health
- Work with relevant education providers e.g. Basis, Lantra, AFTP, universities and colleges to publicise and develop training courses
- Work with schools, awarding bodies and careers advisors to raise the profile of career routes depending on plant health
- Work with citizen science projects to engage the public

## Conclusion

There is a lot to do, but there is a lot of good practice and passion for plants out there

Talk to each other and share best practice and believe that young people are interested

Thank you