



ActionOak

PROTECTING OUR OAK TREES

WELCOME TO AN ACTION OAK NEWSLETTER

On behalf of the Action Oak Steering Committee, can I take this opportunity to thank you for your interest in and your continued support of Action Oak. It is hard to believe that nearly two years have passed since the formal launch of Action Oak, at the 2018 R.H.S. Chelsea Flower Show, a memorable occasion indeed and one that created excellent publicity for this important initiative. Since then, a considerable amount of activity has taken place including, most notably, the appointment of Sarah Jeffery as Project Manager.

Action Oak is primarily concerned with identifying and commissioning much-needed research, to benefit the health of our iconic native oak trees, and in this newsletter you will get a snapshot of some of this research activity. In addition to our research partners, Action Oak has enjoyed collaborating with other organisations, in order to raise publicity and funds, including the International Garden Photographer of the Year competition and, more recently, Emma Bridgewater. My sincere thanks to all those partnering with us; your support is greatly appreciated.

I do hope that you enjoy this newsletter and please do refer to the Action Oak website, newly improved, for more information about the project.

During these strange and, for many, difficult times, this comes with my thanks and my very best wishes.

Geraint Richards, Chair - Action Oak.



Action Oak mug by
Emma Bridgewater

ACTION OAK UPDATE

The IGPTY (International Garden Photographer of the Year) "Celebrating Our Oaks" displays continued to travel around the UK, including Yorkshire Arboretum, Belvoir Park Forest (Belfast), Royal Botanic Gardens Edinburgh and The Green Wood Centre, Ironbridge (Small Woods Association). Reaching over 150,000 people on site and many more via social media, the exhibition has sparked much interest and a bi-lingual version, launched at the Royal Welsh Show, is on tour throughout 2020.

In June, there was a second successful Action Oak partner event, held at the Royal Botanic Gardens Kew. The event showcased some of the important research being carried out around the UK and saw the launch of the Action Oak Knowledge Review, highlighting the six grand challenges facing the UK's oak trees. The full document can be found at www.actionoak.org/downloads. or click [here](#).

Action Oak was a theme for a half-day within BIFoR's annual two-day meeting in January of this year. Our session included updates from researchers across the UK and a wonderful keynote address from Professor Lynne Boddy, Cardiff University, on the importance of mycology. The presentations from the BIFoR conference can be downloaded from [here](#)

Work is also underway with the Heart of England Forest to develop a new Action Oak woodland. The woodland will provide the possibility to demonstrate a variety of topics including species selection, planting technique and tree protection. The site will provide a valuable academic opportunity as well as a chance to show woodland managers the latest research findings put into practise.

An important crossbench debate on tree pests and diseases took place in the House of Lords this February, highlighting the importance of tackling the threats to UK biosecurity, the speakers mentioning all the key forestry organisations and initiatives, including Action Oak.



2nd Action Oak Partner Event - Kew



IGPTY at Westonbirt Arboretum.

INTERNATIONAL YEAR OF PLANT HEALTH

2020 has been designated by the Food and Agricultural Organisation (FAO) as the International Year of Plant Health 2020 (IYPH2020), a momentous opportunity to celebrate the benefits of healthy plants. Promoting responsible practices that reduce the spread of plant pests and scientific innovation to address pest threats are key objectives of the IYPH2020.

We want to be the first generation to leave the environment in a better state than we found it, protecting our country from pests and diseases so our plants can thrive in the future.

Factors such as globalisation of trade, increased travel and more plants and plant products entering the UK mean more threats to plant health.

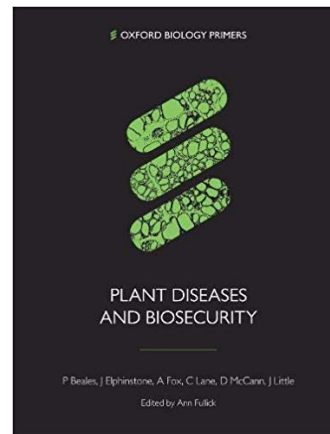
Everyone plays a role in keeping the UK free of pests and diseases – from travellers coming to our country, to growers producing crops or gardeners with an allotment.

See the website for news and updates.

www.yearofplanthealth.co.uk/

NEW PLANT DISEASES BOOK AVAILABLE

We are excited to announce a new publication, Plant Diseases and Biosecurity (Oxford University Press) where readers can explore the big picture of plant health and its importance to sustainable agriculture and protection of our environment. Primarily aimed at audiences who are new to the area of plant health or in the educational sector this book takes you on a journey with case studies highlighting the historical social impact of plant disease; a study of all the major groups of plant disease causing organisms with numerous illustrations and examples throughout; the increasing roles of technology to surveillance and diagnosis of diseases, plant health biosecurity and engagement approaches through citizen science activities and up to date management practices employed for plant health including latest molecular methods, integrated and biological controls. The book aims to inspire readers of all ages to understand more about the important role of plant diseases to our economy, environment and social well-being in an easy to read format. Buy from [here](#)



We have received some very positive reviews about the book

"I particularly like the running theme of biosecurity, which ties the book together. After giving in-depth explanations of plant pathogen spread due to global warming, for example, it is really refreshing to read about how this is being counteracted. Hopefully this will inspire the next brood of plant biologists. For a book which is considerably smaller than most other textbooks I own (this is a good thing – no one wants to lug around heavy books), it really does pack a punch!"

Authors: Paul Beales, John Elphinstone, Adrian Fox, Charles Lane, Derek McCann, Tim Lacey, Julian Little, Kerry Maguire, and Alice Turnbull

March 2019 ISBN: 9780198827726

A coordinated response to the oak processionary moth outbreak

While carrying out routine targeted inspections of oak trees in June 2019, a Government plant health inspector noticed something amiss – recently planted trees imported from the Netherlands were infested with [oak processionary moth \(OPM\) caterpillars](#).

OPM is an insect pest of oak, our most common broadleaved tree. The caterpillars feed on oak leaves and can increase a tree's vulnerability to attack by other pests and diseases, as well as harsh environmental conditions. OPM is established in most of Greater London and some surrounding counties, but thanks to a robust government programme in place and national measures, the rest of the UK is designated as a Protected Zone.

In response to these findings, the [Plant Health Service](#) looked at oak tree imports into the country and have since traced over 2000 consignments of oak from the Netherlands, Germany and Belgium. To ensure vigilance, [Government reached out to the trade](#) including landscapers and nurseries, asking those who had planted or imported larger oaks from the continent to urgently check their trees.

Thanks to a swift and coordinated response, oak processionary moth was intercepted at over 70 planting sites in the UK Protected Zone. All infested trees and material were rapidly destroyed to eradicate the pest.

Professor Nicola Spence, Defra Chief Plant Health Officer, said:

“Since 2012 we have invested more than £37 million in tree health research, including a dedicated programme of research and development on oak.

“We will continue to work with local authorities and land managers to tackle OPM with a control programme of surveillance and treatment.”



Oak processionary moth

BIFOR UPDATE

Reasons to be Cheerful

The University of Birmingham and Birmingham Institute of Forest Research (BIFoR) are pleased to welcome two new postdoctoral research associates Dr Thomas Welch and Dr Rosa Sanches-Lucas. Working under supervision of [Dr Graeme Kettles](#) and [Dr Estrella Luna-Diez](#), Thomas and Rosa will work on the JABBS Foundation-funded project to investigate genetic and metabolomic markers of resistance to the Acute Oak Decline (AOD) bacterial complex and the oak powdery mildew fungus.

Reasons To Be Cheerful is a podcast presented by Ed Miliband and Geoff Lloyd. Rob MacKenzie from the Birmingham Institute of Forest Research (BIFoR) featured on the 'shrubtastic' episode all about trees and ecosystem services, released on 28th July. Listed [here](#).

The first paper from the UK's unique [BIFoR FACE facility](#) has been published and is freely available [online](#): Hart, KM, Curioni, G, Blaen, P, et al. Characteristics of free air carbon dioxide enrichment of a northern temperate mature forest. *Glob Change Biol.*2019; 00: 1–15. <https://doi.org/10.1111/gcb.14786>

NATIONAL FOREST INDEX

A report showing information about oak in the UK is now available on the Forest Research website. The report "The National Forest Inventory" provides a record of the size and distribution of forests and woodlands in Great Britain and information on key forest attributes.

This preliminary National Forest Inventory Report provides estimates of the stocked area, numbers of trees, standing volume, carbon stocks, biomass, mortality rates, tree health and geographic distribution of Oak trees within forests and woodlands in Great Britain.

To look at the report in full please follow the link [Here](#).



Acute Oak Decline Update

AOD UPDATE FROM UWE

Prior to its closure in 2018, The Monument Trust, one of the Sainsbury Family Charitable Trusts, donated a further £500,000 towards research into Acute Oak Decline (AOD).



A supporter of AOD research via Woodland Heritage since 2011, The Monument Trust's final grant is enabling both new studies to get underway, such as a Taxonomic and Functional Genomic Investigation of Soil Microorganisms Associated with Acute Oak Decline, along with the continuation of ongoing studies such as the possible symbiotic relationship between AOD bacteria, as well as vital underpinning survey and modelling work.

Further work will be announced in due course with the current programmes underway at universities in England and Wales, as well as with Forest Research where The Monument Trust's support is also helping with key laboratory and administrative functions.

To read more about AOD research click [here](#)

The University of the West of England AOD research team has had a busy and successful year with quite a few meetings, presentations and publications. The first UWE-Woodland Heritage partnership-funded PhD student, Victoria Bueno-Gonzalez is coming to the end of her three year degree. The first part of Victoria's project has focussed on classifying several new *Pseudomonas* species which have been isolated from symptomatic oak, and may play a role in aiding the more virulent bacteria associated with AOD. She has recently had her first scientific publication accepted and has another two in preparation. The second part of her PhD has been to develop a rapid method to detect the four main bacteria in field samples in a single test. This has been an exciting advancement in the way we screen and identify isolates; there are many possible applications for Victoria's technique and it has already become a routine method in our lab to aid us in keeping our lab samples pure.

On the back of Victoria's successful partnership PhD, we approached Woodland Heritage and Forest Research to see if they would be interested in part-funding a second PhD student. Our application to UWE was successful and the second UWE-Woodland Heritage partnership-funded PhD student, Daniel Maddock, started in our lab at the beginning of October. Daniel's project will be aimed at identifying new bacteria in the soil of symptomatic oak and comparing the soil microbial communities of symptomatic and non-symptomatic oak. Carrie Brady (research fellow) is busy finishing up her project on the interactions between the bacteria causing the necrotic lesions in AOD-affected trees and plans to publish this work in the near future. She is also powering on with the taxonomy side of the project in an attempt to discover as many of the bacteria residing in oak as possible.

Victoria presented her research at the 'Molecular Biology of Plant Pathogens' conference at the John Innes Centre, Norwich in March, Carrie gave a review of the taxonomy of AOD-associated bacteria at the Action Oak meeting at Kew Gardens in June and Dawn presented an overview of UWE's AOD research at the 'Thinking Higher: towards biosecurity of forest trees' meeting at BIFOR, University of Birmingham in July.

Prof. Dawn Arnold, Dr Carrie Brady, Victoria Bueno-Gonzales and Daniel Maddock.

The biodiversity of oak trees

The BBSRC funded PuRpOsE project has uncovered just how many species use our native oak trees. A staggering 2300 species are known to be associated with oak, and that doesn't include all of the fungi, and any of bacteria and other micro-organisms which use oak! The 2300 species consist of 38 bird species, 229 bryophytes, 108 fungi, 1178 invertebrates, 716 lichens and 31 mammals. Of these species, 320 are only found on oak and a further 229 species are rarely found on species other than oak. These 549 species are the species identified as being most at risk if oak trees decline due pest, disease and/or climate change.

The project assessed the suitability of 30 other tree species to support the biodiversity associated with oak. The 30 tree species were selected as they are either currently already found in oak woods, and therefore might expand to fill canopy gaps created by the loss of oak, or are known to grow on site types that support oak. Ash was found to support the greatest number of oak-associated species. However, this tree is not currently a viable alternative to oak, as many ash trees are currently dying due to ash dieback.

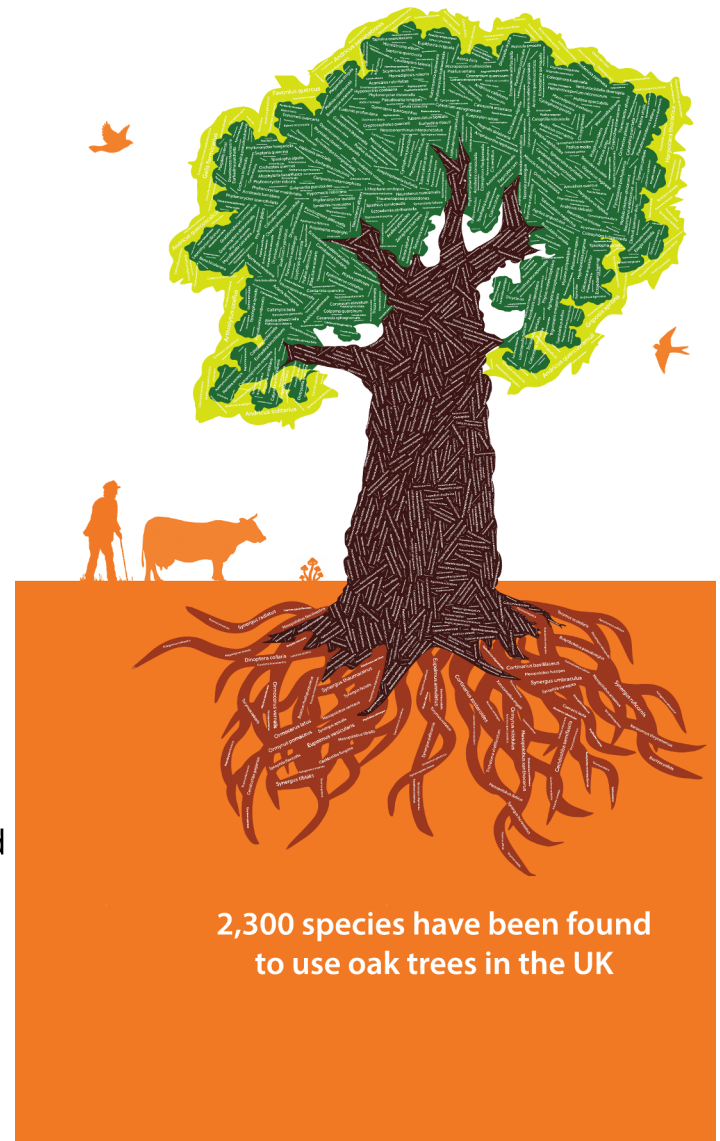
Whilst the general message from the work is around diversifying woodlands to support oak-associated biodiversity using tree species other than oak, the results from the project can be tailored to specific sites. All the information about oak-associated species and their use of other tree species is available in OakEcol (a database of oak associated biodiversity). Using site-specific species lists it is then possible to refine the list of potentially suitable tree species and identify management options. Examples of this approach have been done for 30 oak woodland case studies across the UK, which are available, together with the OakEcol database and further information at www.hutton.ac.uk/oak-decline.

For further information contact Ruth.Mitchell@hutton.ac.uk



PuRpOsE: Protect Oak Ecosystems

hutton.ac.uk/oak-decline



KEW UPDATE

Louise Gathercole and Gabriele Nocchi are two PhD researchers working at the Royal Botanical Gardens, Kew and Queen Mary University London under the supervision of Richard Buggs. They have a dataset of over 300 oak tree genomes from sites around England where the tree disease Acute Oak Decline (AOD) is present. Gabriele is investigating whether it is possible to predict susceptibility to AOD from the genomic data. He is also finding ways of using machine learning to categorise the symptoms of AOD. Louise will be using genomic reads from the leaf material of the trees to find out if any of the bacteria associated with AOD live on the leaves of healthy and AOD affected trees. She will also investigate whether there are differences in the metagenomic data from across the different sites.

Acute Oak Decline is a decline disorder found across England and into Wales. It is characterised by lesions in the bark which look like dark 'bleeds' in deep cracks. The lesions have been shown to be associated with several bacteria. They are also associated with the larvae of the two spotted buprestid beetle *Agrilus biguttatus*. The disorder can kill oak trees in 3-5 years, but some trees show signs of remission. Louise and Gabriele are part of a group of researchers around the country investigating different aspects of tree susceptibility to the disorder.

COVID - 19 UPDATE AND EVENTS

Due to the current situation and the Covid - 19 restrictions we have taken the decision to cancel the 2020 Action Oak Partner event.

However we are working hard with partners to provide on-line alternatives and alternative dates for conferences and events.

Watch this space!



Alan Price/IGPOTY Overall Winner - "Celebrating Our Oaks"

CONTACT US

Website: www.actionoak.org

Follow us on social media:



[Here](#)



[Here](#)

If you would like to support Action Oak go to woodlandheritage.org/acute-oak-decline.

Woodland Heritage is a Registered Charity No 1041611

Contact us:

info@actionoak.org

